

Operating instructions

Function blocks Easy Mode RFID-Station IUT-F191-IO-V1 on Siemens TIA Portal with ICE1-8IOL IO-Link Master

UHF RFID-Station IUT-F191-IO-V1



Project Name:	UHF RFID-Station IUT-F191-IO-V1; EasyMode Function blocks
Date:	06.12.2022
Creator:	Karsten Reinhardt

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		1 of 115

Version history

Version	Release date	Comment
1	06.12.2022	Initial Version

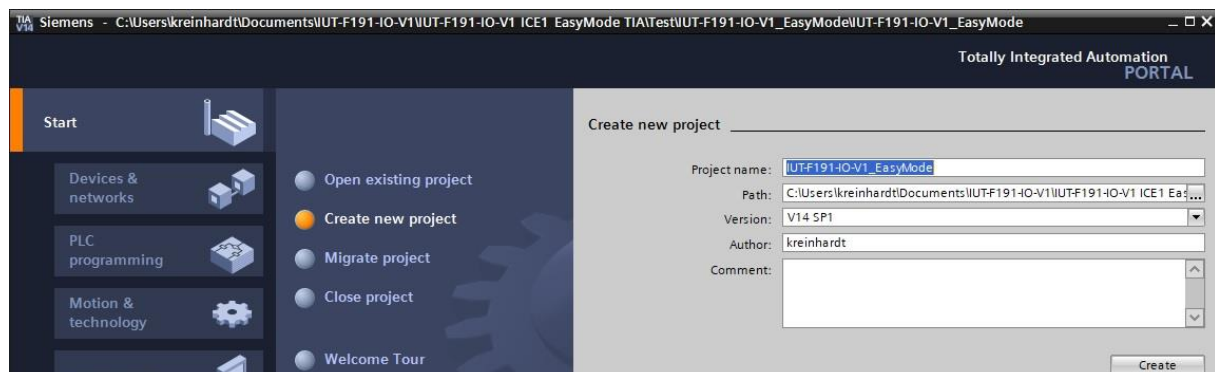
Table of contents

1.	Basic PLC configuration	3
2.	Hardware configuration IO-Link Master ICE1-8IOL.....	5
2.1	Set up IO-Link Parameter Storage	6
3.	Parameter IUT-F191-IO-V1	8
3.1	IO-Link Parameter 64 (16#40) „Operation Mode“	9
3.2	IO-Link Parameter 65 (16#41) „Read Task“	9
3.3	IO-Link Parameter 66 (16#42) „Write Task“	11
3.4	IO-Link Parameter 67 (16#43) „Input Representation“	12
3.5	IO-Link Parameter 96 (16#60) „Transmission Powers - PT“	14
3.6	IO-Link Parameter 97 (16#61) „Number of Tags to find - NT“	15
3.7	IO-Link Parameter 98 (16#62) „Tries allowed - TA“	16
3.8	IO-Link Parameter 99 (16#63) „Expected Number of Tags - QW“	17
3.9	IO-Link Parameter 100 (16#64) „Tag Lost Smoothing – E5“	18
3.10	IO-Link Parameter 105 (16#69) „Transmission Channels - CD“	19
3.11	IO-Link Parameter 224 (16#E0) „Operating hours“	20
3.12	IO-Link Parameter 225 (16#E1) „Temperature indicator“	20
3.13	IO-Link Parameter 226 (16#E2) „Temperature indicator“	21
3.14	IO-Link Parameter 227 (16#E3) „Power monitor“	21
3.15	IO-Link Parameter 2 (16#02) „System Command“	22
4.	Import library „IUT-F191-IO-V1_EasyMode“	22
5.	Function block FB19101 „IUT-F191_EasyMode_Basic“	25
5.1	Read data carrier without Autostart function	27
5.2	Read data carrier with Autostart function	34
5.3	Data structure access to User Memory	38
5.4	Data structure access to TID	39
5.5	Data structure access to auf UII/EPC	40
5.6	Writing to data carrier	40
5.7	Data structure system time for data carrier access	46
5.8	Error messages during the execution of write/read tasks	46
5.9	Example: Read User Memory (Memory Bank 11) with Autostart function	49
5.10	Example: Read User Memory (Memory Bank 11)	52
5.11	Example: Write User Memory (Memory Bank 11)	56
5.12	Example: Read UII/EPC (Memory Bank 01) with Autostart function	59
5.13	Example: Read UII/EPC (Memory Bank 01)	62
5.14	Example: Write UII/EPC (Memory Bank 01)	66
5.15	Example: Read TID (Memory Bank 10) with Autostart function	75
5.16	Example: Read TID (Memory Bank 10)	78
6.	Function block FB19102 „IUT-F191_EasyMode_Basic_1Tag“	81
6.1	Execution read task	84
6.2	Execution write task	89
7.	Function block FB19105 „IUT-F191_EasyMode_MultiTag_5Tag“	94
7.1	Execution read task	97
7.2	Execution write task	102
8.	Function block FB19107 „IUT-F191-FR1-01_EasyMode_Param“	106
8.1	Read IO-Link Parameter	110
8.2	Write IO-Link Parameter	111
9.	Easy-Mode – Structure process data	112
10.	Trouble shooting	115

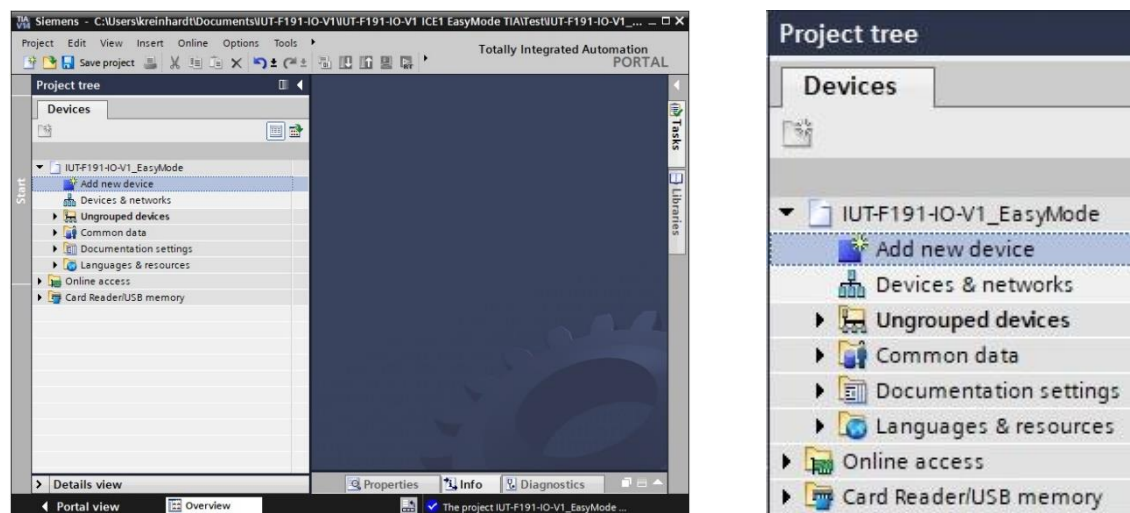
	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		2 of 115

1. Basic PLC configuration

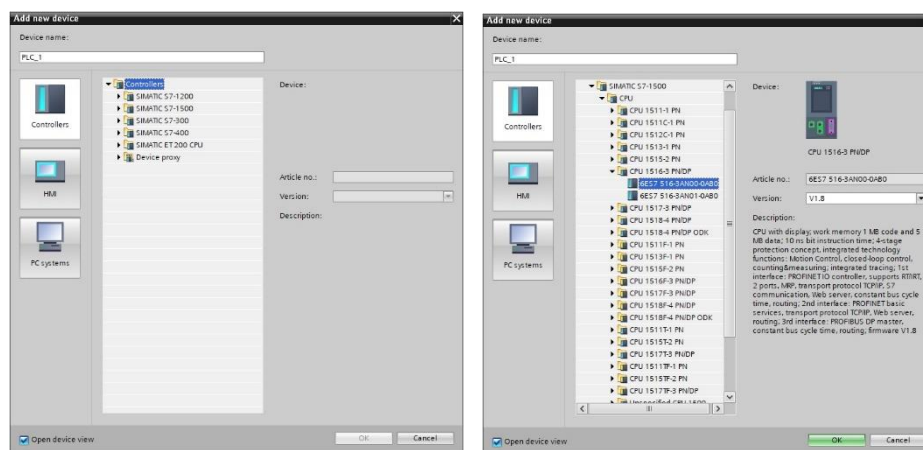
The first step is to create a new PLC project. For this purpose, a project name (e.g. "IUT-F191-IO-V1_EasyMode") and a storage path of the project must be entered or selected.



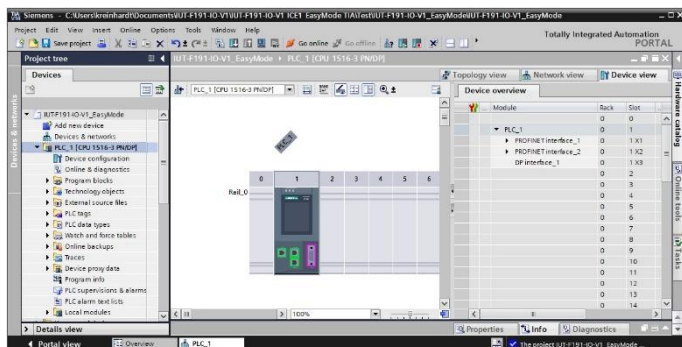
After creating the empty PLC project, switch to the project view. A selection window is called up by "Add new device" in the project navigation on the left.



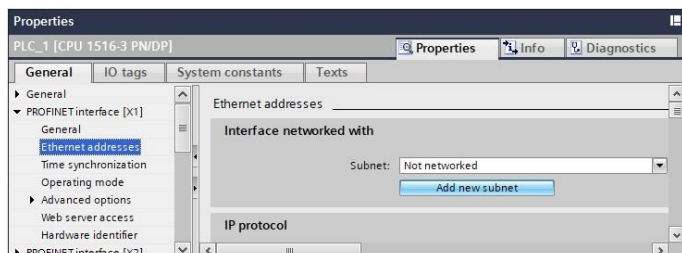
In this selection window, the appropriate PLC must be selected.



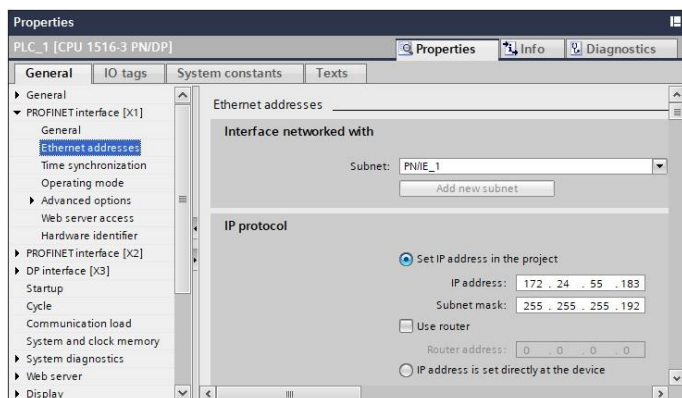
	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			3 of 115



After assigning the CPU, the project view switches to the setting of the PLC parameters.

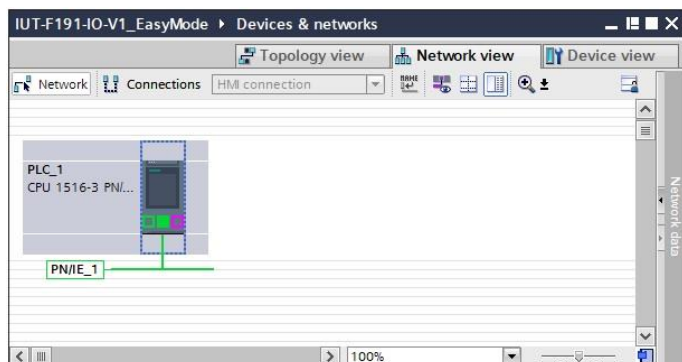


For the Profinet interface X1, a Profinet subnet must be added under the selection "Ethernet addresses" via the selection "Add new subnet". A subnet with the designation "PN/IE_1" is created.



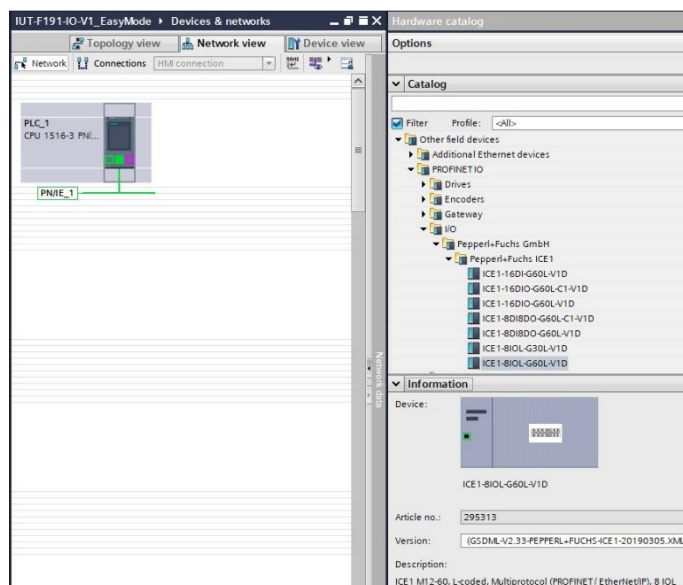
Then set the network parameters (IP address, subnet mask) of the PLC.

IP address: 172.24.55.183
Subnet mask: 255.255.255.192



The network view symbolically shows the configured PLC. Starting from the CPU, the subnet "PN/IE_1" is located.

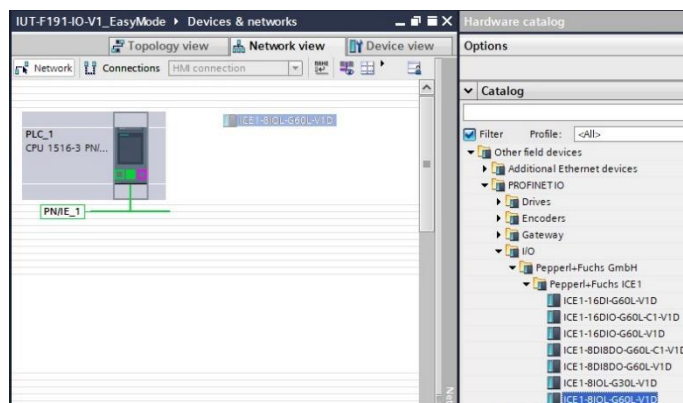
	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		4 of 115



On the right side the hardware catalog has to be called and the GSDML file of the IO-Link master has to be selected:
Other field devices → "Profinet IO" → "I/O" → "Pepperl+Fuchs GmbH" → "Pepperl+Fuchs ICE1" → "ICE1-8IOL-G60L-V1D".

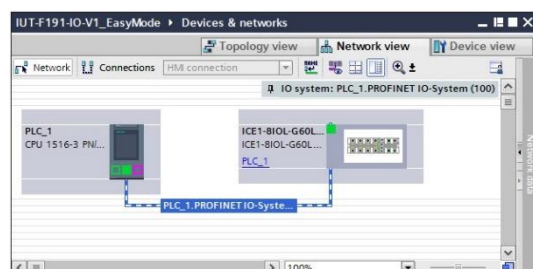
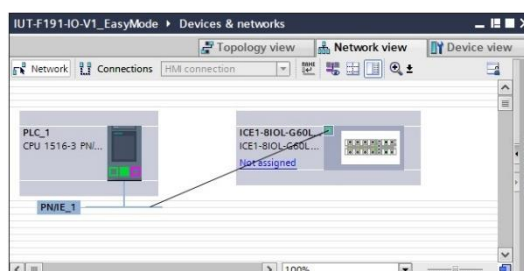
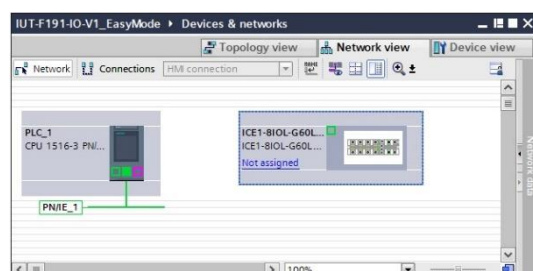
If the GSDML file is not in the catalog, it must be imported beforehand.

2. Hardware configuration IO-Link Master ICE1-8IOL



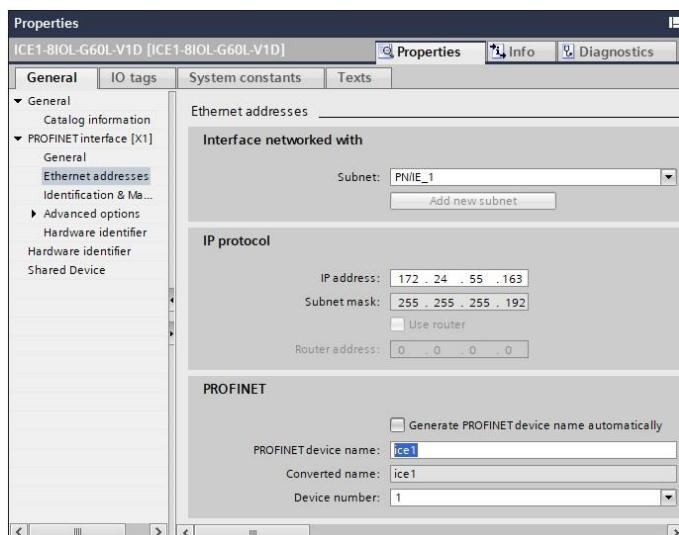
The GSDML for the IO-Link master ICE1-8IOL-G60-V1D is to be dragged over from the hardware catalog into the center window of the device view.

Other field devices → "Profinet IO" → "I/O" → "Pepperl+Fuchs GmbH" → "Pepperl+Fuchs ICE1" → "ICE1-8IOL-G60L-V1D".



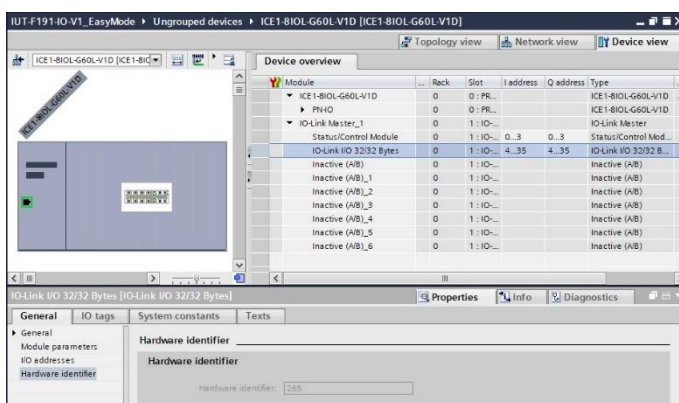
Connection IO-Link master to Profinet network PN/IE_1
The Profinet connection between ICE1-8IOL and PLC is connected manually in the network view via the mouse indicator. The IO-Link master is thus connected to the "PN/IE_1" subnet. The correct Profinet connection is displayed in green. The assignment to the CPU is visible on the ICE1-8IOL (PLC_1).

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		5 of 115



Then set the network parameters (IP address, subnet mask) and the Profinet name of the ICE1-8IOL.

IP address: 172.24.55.163
Subnet mask: 255.255.255.192
Profinet Name: ice1



Double-click on the ICE1-8IOL icon to open the device view. The corresponding communication modules for the individual ports of the IO-Link master are to be integrated from the hardware catalog. The "IO-Link I/O 32/32 bytes" module must be assigned for the port to which the IUT-F191-IO-V1 RFID station is connected. Ports that are not used must be set to inactive.

The added communication module has a hardware identifier. This identifier serves as input parameter "I_HWIO_Hardware_ID" of the function block. A symbolic addressing is possible.

„IO-Link I/O 32/32 Bytes“ = 265

2.1 Set up IO-Link Parameter Storage

The "IO-Link Parameter Storage" function offers the option of additionally storing the IO-Link parameters of the connected device within the IO-Link master. This makes it possible to automatically transfer the previously set parameter set of the device to a replacement device. Additional parameterization is therefore no longer necessary.

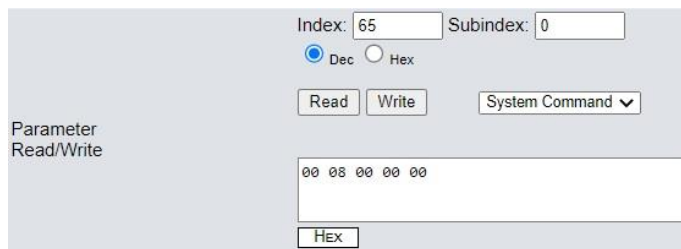
During initial commissioning, the "IOL parameter storage" module parameter is set to "Disable and Cleared". After this setting has been loaded to the controller, any parameter set already stored within the IO-Link master is deleted and the storage function is deactivated.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		6 of 115



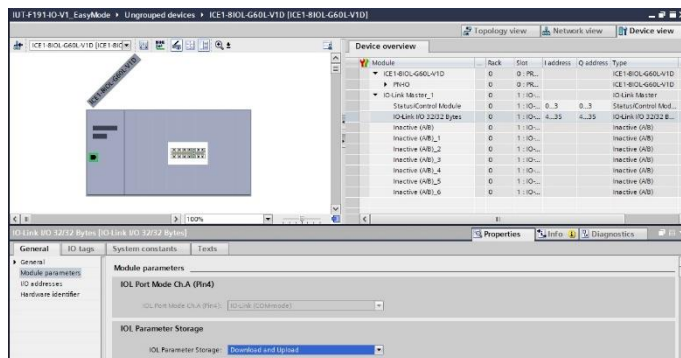
Setting the "IOL Parameter Storage" module parameter of the "IO-Link I/O 32/32 bytes" module to "Disable and Cleared".

Subsequently, the IO-Link parameters can be set via the web page.



Setting parameter 64 "Read Task Switch off the Autostart function"
16#00 → User memory
16#08 → 8 byte
16#0000 → Start address 0
16#00 → Autostart off

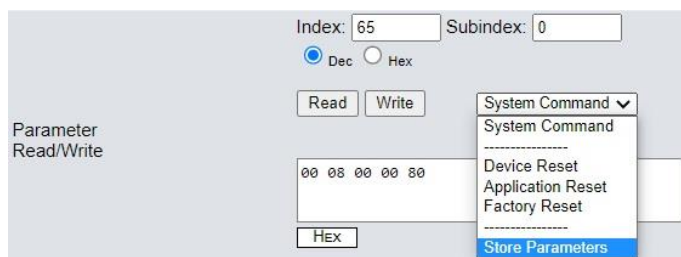
After the IO-Link parameters have been set via the web page, the "IOL Parameter Storage" module parameter must be changed to "Download and Upload". The new configuration must be transferred to the controller.



Setting the "IOL Parameter Storage" module parameter of the "IO-Link I/O 32/32 bytes" module to "Download and Upload"

The parameters are now stored both in the RFID Station IUT-F191-IO-V1 and within the IO-Link Master ICE1-8IOL. If a new replacement device is connected to the corresponding port, the stored IO-Link Parameters are automatically transferred to the device by the master (Download). The same applies when the IO-Link Master is replaced. Here, the IO-Link Device transfers the parameter data to the new IO-Link Master (Upload).

If an IO-Link parameter is to be subsequently changed and saved, this is possible via the "Store Parameters" command on the web page of the IO-Link master. First the parameter is changed and then the "Store Parameters" command is executed.



Store Parameters command
Saving the new IO-Link parameter configuration within the device and the IO-Link master

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		7 of 115

Following execution of the "Store Parameters" command, the parameter sets are updated within the IO-Link Master. The new parameter values are thus stored in the IO-Link Master.

3. Parameter IUT-F191-IO-V1

The mode of operation of the IUT-F191-IO-V1 RFID station can be set via various IO-Link parameters. In addition, device-specific information can be read out via the IO-Link parameters.

Name	Index Dec	Index Hex	Sub index	Length	Access	Value range	Default setting
Operation Mode	64	16#40	0	1 Byte	Read / Write	0 = Expert Mode 128 = Easy Mode	128 = Easy Mode
Read Task – Memory Area	65	16#41	1	1 Byte	Read / Write	0 = UII/EPC + User Memory 64 = UII/EPC 128 = UII/EPC + TID	0 = UII/EPC + User Memory
Read Task – Number of Bytes	65	16#41	2	1 Byte	Read / Write	1...28	8
Read Task – Start Address	65	16#41	3	1 Word	Read / Write	16#0000...16#FFFF	16#0000
Read Task – Autostart	65	16#41	4	1 Byte	Read / Write	0 = off 128 = on	128 = on
Write Task – Memory Area	66	16#42	1	1 Byte	Read / Write	0 = User Memory 32 = UII/EPC (incl. PC) 64 = EPC (excl. PC)	0 = User Memory
Write Task – Number of Bytes	66	16#42	2	1 Byte	Read / Write	1...28	8
Write Task – Start Address	66	16#42	3	1 Word	Read / Write	16#0000...16#FFFF	16#0000
Input Representation	67	16#43	0	1 Byte	Read / Write	0 = Long Form data format 128 = Short Form data format	0 = Long Form data format
Transmission Powers – Power 1	96	16#60	1	1 Word	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100	100 = 100mW
Transmission Powers – Power 2	96	16#60	2	1 Word	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; off	off
Transmission Powers – Power 3	96	16#60	3	1 Word	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; off	off
Transmission Powers – Power 4	96	16#60	4	1 Word	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; off	off
Transmission Powers – Power 5	96	16#60	6	1 Word	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; off	off
Number of Tags to find	97	16#61	0	1 Byte	Read / Write	1...20 255 = off	255
Tries Allowed	98	16#62	0	1 Byte	Read / Write	1...10	2
Expected Number of Tags	99	16#63	0	1 Byte	Read / Write	0...4	2
Tag Lost Smoothing	100	16#64	0	1 Byte	Read / Write	0...10	5
Operating hours	224	16#E0	0	4 Byte	Read	0...2^32-1	-
Temperature Indicator	225	16#E1	0	1 Byte	Read	0 = Operating condition OK 1 = Close to upper limit 2 = Upper limit ex-	-

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			8 of 115

						ceeded 3 = Close to lower limit 4 = Lower limit ex- ceeded	
Temperature Monitor – Overtemperature Oper- ating Hours	226	16#E2	1	4 Byte	Read	0...2^32-1	-
Temperature Monitor – Overtemperature Ex- ceeded Counter	226	16#E2	2	2 Byte	Read	0...65535	-
Temperature Monitor – Maximum Operating Temperature	226	16#E2	3	1 Byte	Read	-40...+125	-
Temperature Monitor – Minimum Operating Temperature	226	16#E2	4	1 Byte	Read	-40...+125	-
Temperature Monitor – Device Operating Tem- perature	226	16#E2	5	1 Byte	Read	-40...+125	-
Power Monitor – Power Cycles	227	16#E3	1	4 Byte	Read	0...2^32-1	-
Power Monitor – Maxi- mum Uptime	227	16#E3	2	4 Byte	Read	0...2^32-1	-
Power Monitor – Aver- age Uptime	227	16#E3	3	4 Byte	Read	0...2^32-1	-
Power Monitor –Uptime	227	16#E3	4	4 Byte	Read	0...2^32-1	-

3.1 IO-Link Parameter 64 (16#40) „Operation Mode“

The "Operation Mode" Parameter can be used to switch between Easy and Expert Mode. Easy Mode is preset at the factory and allows simplified data access to the data carrier. This means that no additional function block is required for data transfer. Expert Mode allows access to large amounts of data using a handshake procedure. This requires the use of a function block for transferring the data.

Parameter 64 (16#40) "Operation Mode":
Read parameter with factory setting; 128
(16#80) = Easy Mode activated; = factory
setting

Structure Parameter 64 (16#40) „Operation Mode“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
64	16#40	0	1 Byte	128	16#80	Read / Write	Operation Mode = Easy Mode Easy Mode active; factory setting; allows simplified data access to a maximum of 28 bytes of data
64	16#40	0	1 Byte	0	16#00	Read / Write	Operation Mode = Expert Mode Expert Mode active; setting for transferring large amounts of data via handshake procedure; use of a function block required

3.2 IO-Link Parameter 65 (16#41) „Read Task“

The "Read Task" parameter is used to configure read access to the data carrier. This includes the setting of which memory bank is to be accessed for reading. In addition, the number of bytes to be read and the start address are defined. It is also possible to set an Autostart function. This means that a permanent read task is executed automatically without additional control.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			
				9 of 115

The UII/EPC memory banks (memory bank 01), TID (memory bank 10) and user memory (memory bank 11) can be read out. Access to the "Reserved" memory area (memory bank 00) is not possible when using the Easy Mode.

The "Long Form" data format is activated in the factory setting of the IUT-F191-IO-V1 RFID station. This means that the UII/EPC information and length information are prefixed to the read-in data. This makes it possible to clearly assign the data set to a specific data carrier. By changing the data format to "Short Form", the prefixing of the UII/EPC information and the length information can be suppressed. This means that more space is available for transmitting the data.

Structure Parameter 65 (16#41) „Read Task“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
65	16#41	1	1 Byte	0	16#00	Read / Write	Memory bank: Read access to memory bank 11 (User Memory). UII/EPC (memory bank 01) + User Memory (memory bank 11); factory setting
65	16#41	1	1 Byte	64	16#40	Read / Write	Memory bank: Read access to memory bank 01 (UII/EPC) UII/EPC (memory bank 01)
65	16#41	1	1 Byte	128	16#80	Read / Write	Memory bank: Read access to memory bank 10 (TID) UII/EPC (memory bank 01) + TID (memory bank 10)
65	16#41	2	1 Byte	0...28	16#00... 16#1C	Read / Write	Number of bytes: Number of bytes to be read; factory setting 8 bytes
65	16#41	3	2 Byte / 1 Word	0.... 65535	16#0000 ... 16#FFFF	Read / Write	Start address: Start address for read access to memory bank 11 (user memory); factory setting 0 (16#0000).
65	16#41	4	1 Byte	0	16#00	Read / Write	Autostart: Autostart function disabled
65	16#41	4	1 Byte	128	16#80	Read / Write	Autostart: Autostart function activated; factory setting

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

0 8 0 0 128

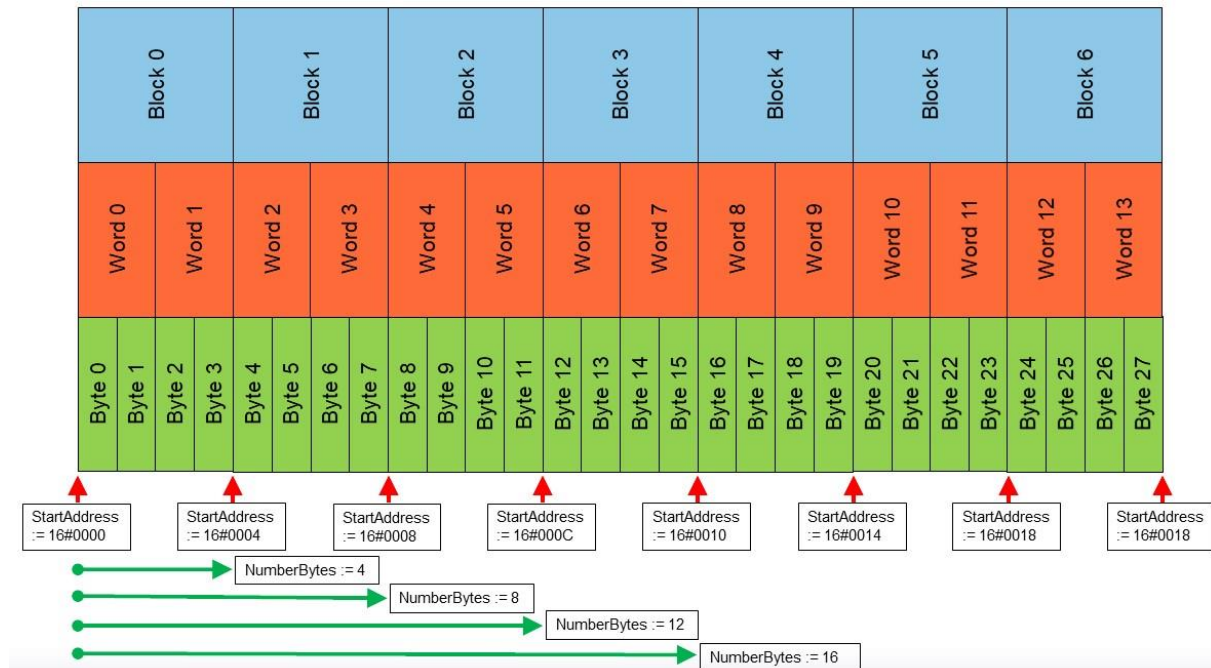
DEC OK

Parameter 65 (16#41) "Read Task": Read out parameters with factory setting;

- 0 → User memory
- 8 → 8 byte
- 00 → Start address 0
- 128 → Autostart on

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		10 of 115

Parameterization "Number of bytes" and "Start address" for access to user memory (memory bank 01)



The values for "Number of bytes" and "Start address" are always multiples of 4.

3.3 IO-Link Parameter 66 (16#42) „Write Task“

The "Write Task" parameter is used to configure write access to the data carrier. This includes the setting to which memory bank the write access is to be made. In addition, the number of bytes to be written and the start address are specified. A setting of the Autostart function is not possible for the execution of a write task. The write task is activated via the "Start Write" bit in the process output data field and at the same time the write data is to be transferred to the process output data.

The UII/EPC memory bank (memory bank 01) and user memory (memory bank 11) can be written. The UII/EPC memory bank can be programmed either with a PC word defined by the user or with a PC word value defined by the RFID station. Access to the "Reserved" memory area (memory bank 00) is not possible when using Easy Mode.

The "Long Form" data format is activated in the factory setting of the IUT-F191-IO-V1 RFID station. This means that if write access to a data carrier is successful, the UII/EPC information of the written data carrier is transferred to the PLC via the process data. This means that the write access can be assigned to a data carrier. When changing to the "Short Form" data format, the UII/EPC information is no longer transferred.

Structure Parameter 66 (16#42) „Write Task“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
66	16#42	1	1 Byte	0	16#00	Read / Write	Memory bank: Write access to memory bank 11 (user memory); factory setting.
66	16#42	1	1 Byte	32	16#20	Read / Write	Memory bank: Write access to memory bank 01 (UII/EPC); with freely definable PC word.
66	16#42	1	1 Byte	64	16#40	Read / Write	Memory bank: Write access to memory bank 01 (UII/EPC); PC word is automatically calculated by RFID station.
66	16#42	2	1 Byte	0...28	16#00... 16#1C	Read / Write	Number of bytes: Number of bytes to be written; factory setting 8 bytes; valid for write access to the user

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		11 of 115

							memory and to the UII/EPC
66	16#42	3	2 Byte / 1 Word	0.... 65535	16#0000 ... 16#FFFF	Read / Write	Start address: Start address for write access to memory bank 11 (user memory); factory setting 0 (16#0000).

Parameter Read/Write

Index: 66 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

0 8 0 0

Dec OK

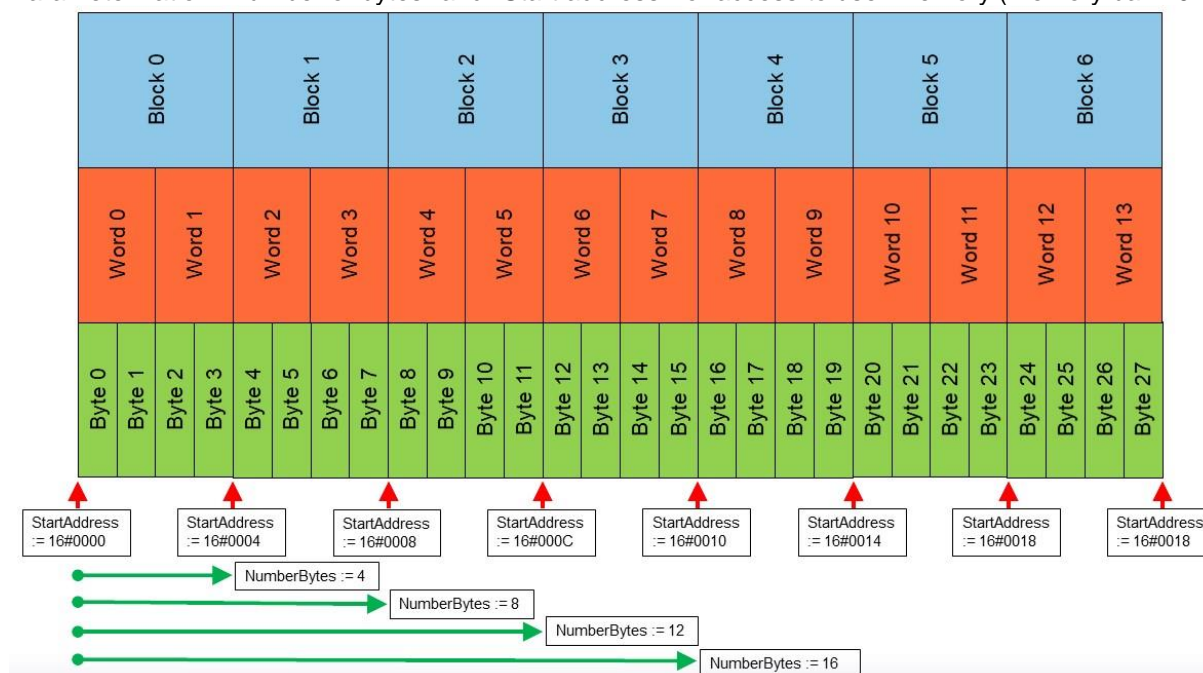
Parameter 66 (16#42) "Write Task": Read out parameter with factory setting;

0 → User memory

8 → 8 byte

00 → Start address 0

Parameterization "Number of bytes" and "Start address" for access to user memory (memory bank 01)



The values for "Number of bytes" and "Start address" are always multiples of 4.

3.4 IO-Link Parameter 67 (16#43) „Input Representation“

The "Input Representation" parameter can be used to influence the data format of the transmitted data. In the factory setting, the "Long Form" data format is used. This prefixes the read-in data with the UII/EPC code and length information. This is necessary in order to be able to assign the read-in data set to a data carrier unambiguously in MultiTag applications. However, this occupies a part of the process data that is no longer available for the read-in data. When using the "Short Form" data format, the UII/EPC code and the length information are omitted. This means that up to 28 bytes of read-in data can then be transferred. The "Short Form" data format can only be used for SingleTag applications.

Structure Parameter 67 (16#43) „Input Representation“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
67	16#43	0	1 Byte	0	16#00	Read / Write	Input Representation: Long Form Long Form data format; input data prefixed with UII/EPC information and length information; Multi- Tag applications possible; less space for addition- ally read-in information: Factory setting

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		12 of 115

67	16#43	0	1 Byte	128	16#80	Read / Write	Input Representation: Short Form Short Form data format; input data without preceding UII/EPC information and length information; only SingleTag applications; more space for additional read-in information
----	-------	---	--------	-----	-------	--------------	---

Telegram structure Process input data "Long Form" data format:

Byte	Content							
0	0	0	0	Tag Present	Error	Active	Write Valid	Read Valid
1	Length Data (Length between "Length UII/EPC Information High Byte" and "Information Byte Y")							
2	RSSI							
3	Transmission Power (dBm)							
4	Length UII/EPC Information (High Byte)							
5	Length UII/EPC Information (Low Byte)							
6	PC Word (High Byte)							
7	PC Word (Low Byte)							
8	UII/EPC Byte 1							
9	UII/EPC Byte 2							
...	...							
...	UII/EPC Byte X							
...	Length Information (High Byte)							
...	Length Information (Low Byte)							
...	Information Byte 1							
...	Information Byte 2							
...	...							
...	Information Byte Y							
...	16#00							
31	16#00							

When using the "Short Form" data format, the preceding UII/EPC information in the response is omitted. This format is designed for the identification of exactly one data carrier in the detection zone. If several data carriers are identified when using the "Short Form" data format, an error message is issued.

Telegram structure Process input data "Short Form" data format:

Byte	Content							
0	0	0	0	Tag Present	Error	Active	Write Valid	Read Valid
1	Length Data (Length between "Information Byte 1" and "Information Byte Y")							
2	RSSI							
3	Transmission Power (dBm)							
4	Information Byte 1							
5	Information Byte 2							
...	...							
...	Information Byte Y							
...	16#00							
31	16#00							

The "Long Form" data format offers the advantage that several data carriers can be identified simultaneously in addition to one data carrier. If more than one data carrier is identified, the information from all data carriers is transferred. There is no error message when identifying more than one data carrier. A disadvantage of the protocol is the required prefix of the UII/EPC information in the response. If the RFID station is to read the TID (memory bank 10) or the user data (memory bank 11) of only one data carrier, the UII/EPC information is not required. However, the UII/EPC information occupies a partial area of the telegram in the reply. I.e. not the complete telegram is available for the transmission of the intended information.

The "Short Form" data format is optimized for the identification of one data carrier. The UII/EPC information is omitted in the reply. By omitting the UII/EPC information, more information can be transmitted within the telegram.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		13 of 115

Parameter 67 (16#43) "Input Representation":
Readout of the parameter in the factory setting;
0 → Long form data format

3.5 IO-Link Parameter 96 (16#60) „Transmission Powers - PT“

The "Transmission Powers" parameter sets the transmission power of the RFID station IUT-F191-IO-V1. The transmission power can be set in the range between 3mW (5dBm) and 100mW (20dBm). Up to 5 power levels can be set simultaneously. The factory setting is a power level PT1 with an output power of 100mW.

Structure Parameter 96 (16#60) „Transmission Powers“

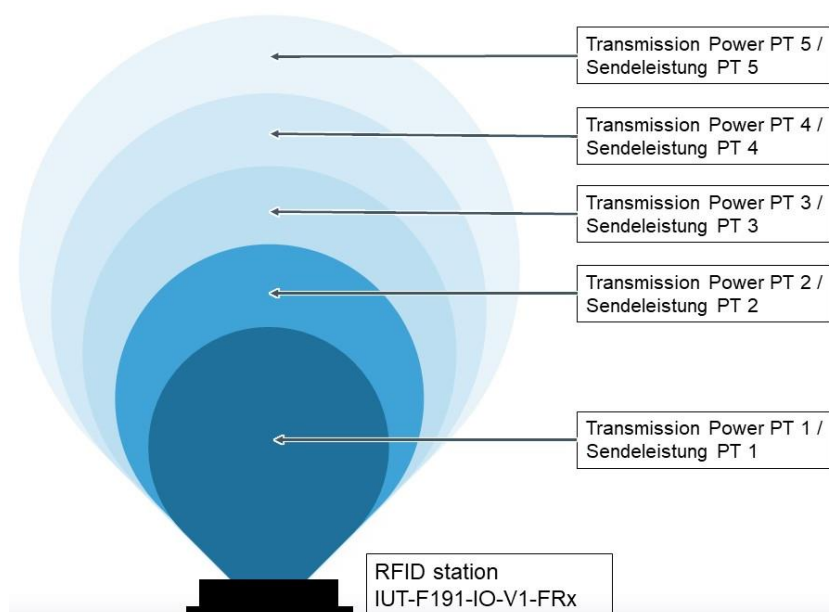
Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
96	16#60	1	2 Byte / 1 Word	3...100	16#0003 ... 16#0064	Read / Write	Transmission power level 1 Transmission Power PT 1; power level 1; factory setting PT 1 = 100mW
96	16#60	2	2 Byte / 1 Word	3...100	16#0003 ... 16#0064	Read / Write	Transmission power level 2 Transmission Power PT 2; power level 2; factory setting PT 2 = none
96	16#60	3	2 Byte / 1 Word	3...100	16#0003 ... 16#0064	Read / Write	Transmission power level 3 Transmission Power PT 3; power level 3; factory setting PT 3 = none
96	16#60	4	2 Byte / 1 Word	3...100	16#0003 ... 16#0064	Read / Write	Transmission power level 4 Transmission Power PT 4; power level 4; factory setting PT 4 = none
96	16#60	5	2 Byte / 1 Word	3...100	16#0003 ... 16#0064	Read / Write	Transmission power level 5 Transmission Power PT 5; power level 5; factory setting PT 5 = none

The following power values can be set:

3mW (5dBm); 4mW (6dBm); 5mW (7dBm); 6mW (8dBm); 8mW (9dBm); 10mW (10dBm); 13mW (11dBm); 15mW (12dBm); 20mW (13dBm); 25mW (14dBm); 30mW (15dBm); 40mW (16dBm); 50mW (17dBm); 60mW (18dBm); 80mW (19dBm); 100mW (20dBm)

The transmit power is set in the unit mW (Milliwatt). In addition, the associated power value in dBm (decibels milliwatts) is also listed. When using the Easy Mode, the value of the transmit power at which the data carrier access could be successfully performed is specified in the response. The transmission power is specified in the unit dBm.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim		Siemens TIA-Portal ICE1 IO-Link Master		
				14 of 115



The RFID station IUT-F191-IO-V1 offers the possibility to use up to 5 power levels (PT1...PT5) simultaneously. The power stages are passed through one after the other during the execution of the read or write tasks. This allows the data carrier to be accessed with the lowest possible transmission power in order to avoid overreach.

The transmission power required to access the data carrier depends on whether read access or write access is to be performed. Writing data to a data carrier requires greater power. Thus, the transmission power required for writing data is greater compared to read access to the same data carrier at an identical distance.

Thus, the range of the RFID station IUT-F191-IO-V1 for a write task with the same transmission power is smaller compared to the range when executing a read task. This must be taken into account when setting the transmission power, as this applies to both the read task and the write task.

Parameter Read/Write

Index: 96 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command

00 64 00 00 00 00 00 00 00

Hex OK

Parameter 96 (16#60) "Transmission Powers":
Read parameter with factory setting;
16#0064 → 100mW (PT1)
16#0000 → not parameterized (PT2)
16#0000 → not parameterized (PT3)
16#0000 → not parameterized (PT4)
16#0000 → not parameterized (PT5)

3.6 IO-Link Parameter 97 (16#61) „Number of Tags to find - NT“

The parameter "Number of tags to find" allows the definition of a termination criterion for the automatic termination of an activated write or read command as soon as the set number of tags has been detected. In the factory setting, the parameter has the value 255 (16#FF) and no premature abort takes place regardless of the number of identified tags.

Structure Parameter 97 (16#61) „Number of Tags to find“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
97	16#61	0	1 Byte	1...20 255	16#00 ... 16#14 16#FF	Read / Write	Termination criterion; 1 = termination after identification of one data carrier; 255 = no premature termination; factory setting = 255

The parameter "Number of Tags to find" has no effect when using the Easy Mode because the execution of the write or read task is controlled by the activation of the bits "Start Read" or "Start Write" in the process data. The tasks are aborted by resetting these bits.

This parameter can be used in conjunction with a single command when using the Expert mode. In addition, a ramp for the transmit power can be set by parameterizing several power levels. In this

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		15 of 115

case, the transmit power is continuously increased with the previously set power levels until the parameterized number of data carriers has been identified. The Single command then terminates automatically. This makes it possible to identify a tag with the lowest possible transmit power and to avoid overreach.

Parameter 97 (16#61) "Number of tags to find":
Read out parameter in factory setting;
255 → Abort criterion switched off

3.7 IO-Link Parameter 98 (16#62) „Tries allowed - TA“

The "Tries allowed" parameter can be used to set the number of scan attempts (inventory rounds) that are performed for each transmission channel (Transmission Channels parameter) per power level (Transmission Powers parameter). In the factory setting, the parameter has the value 2.

Structure Parameter 98 (16#62) „Tries allowed“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
98	16#62	0	1 Byte	1...10	16#00... 16#0A	Read / Write	Number of repetitions; factory setting = 2

When using only one transmit power level (PT 1), it is not necessary to set the "Tries allowed" parameter. The execution of the write or read task is controlled by the process image. The scan attempts on the data carrier are thus automatically repeated until the task is terminated via the process image. If several transmission power levels are parameterized (power ramp), the "Tries allowed" parameter can be used to influence the number of scan attempts that are performed for each power level set.

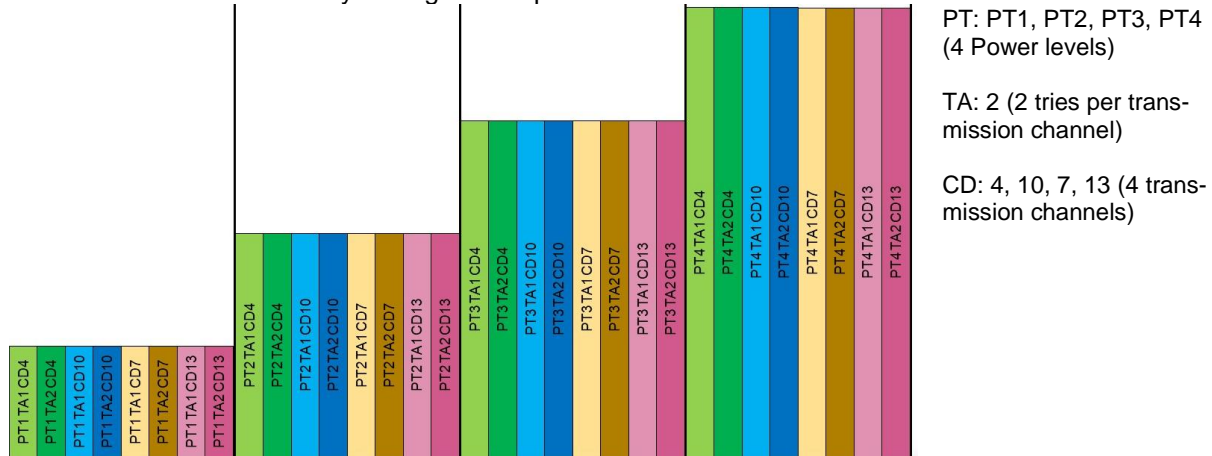
By increasing the number of access attempts, more scans are performed at one power level. As a result, the detection zone is scanned longer with one transmission power before switching to the next higher power level. This means that data carriers can be better identified even at lower power levels before the transmission power is increased.

With an increasing number of scan attempts, the execution time for the identification of more distant data carriers that must be identified via a higher performance level increases.

Parameter 98 (16#62) "Tries allowed": Read
out parameter with factory setting;
2 → Number of repetitions = 2; two
access attempts are made per transmission
channel at each power level

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		16 of 115

Number of scans with factory settings and 4 power levels:



For this configuration, 8 scans are performed per power level. The number of scans can be calculated as follows:

$$\begin{aligned} \text{Number of scans} &= (\text{Number of send channels CD}) \times (\text{Number of attempts TA}) \\ &= 4 \times 2 \\ &= 8 \end{aligned}$$

Taking into account 4 power levels, this results in 32 scan operations.

After all scans of the last power level have been completed, the transmit power is reduced again to the value of level 1 (PT1) and the ramp starts again. This process is repeated until the write or read task is aborted.

3.8 IO-Link Parameter 99 (16#63) „Expected Number of Tags - QW“

When identifying one or more data carrier via the air interface, each data carrier is assigned a defined time slot for data transmission by the IUT-F191-IO-V1-FRx RFID station. The greater the number of data carriers expected for identification, the greater the number of time slots available on the air interface must be. The number of time slots should correspond to the number of data carriers to be identified.

With the help of the parameter "Expected Number of Tags" (QW) the number of time slots is determined by 2^{QW} . In the factory setting, the parameter has the value 2, thus 4 time slots are used.

Structure Parameter 99 (16#63) „Expected Number of Tags“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
99	16#63	0	1 Byte	0...4	16#00 ... 16#04	Read / Write	Number of expected data carriers 0 → 1 time slot or 1 data carrier 1 → 2 time slots or 2 data carriers 2 → 4 time slots or 4 data carriers 3 → 8 time slots or 8 data carriers 4 → 16 time slots or 16 data carriers Factory setting = 2

In case of an intended identification of only one data carrier, the parameter "Expected Number of Tags" can be reduced to a value of 0 or 1. This shortens the processing time of a scan attempt, since fewer time slots are used in the communication on the air interface. It is thus possible to identify a data carrier more quickly.

If the number of time slots is too small when identifying a larger tag population (Multitag application), this leads to collisions of the responses from the data carriers on the air interface since they respond in the same time slot. Therefore, as the number of data carriers increases, the value of the QW parameter or the time slots should be adjusted accordingly. An increase in the number of time slots leads to slower identification of the data carriers.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			17 of 115

Parameter Read/Write

Index: 99 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command

2

Dec OK

Parameter 99 (16#63) "Expected Number of Tags": Read out parameter with factory setting; 2 → Number of time slots = 4; 2^2

3.9 IO-Link Parameter 100 (16#64) „Tag Lost Smoothing – E5“

If a data carrier leaves the detection zone, the IUT-F191-IO-V1-FRx RFID station continues to make access attempts to this data carrier. The "Tag Lost Smoothing" parameter can be used to set how many unsuccessful access attempts should be made before the data carrier leaves the detection zone and is reported to the PLC. In the factory setting, the parameter has the value 5.

Structure Parameter 100 (16#64) „Tag Lost Smoothing“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
100	16#64	0	1 Byte	0...10	16#00... 16#0A	Read / Write	Number of unsuccessful read accesses before the leave of the data carrier from the detection zone is reported; factory setting = 5

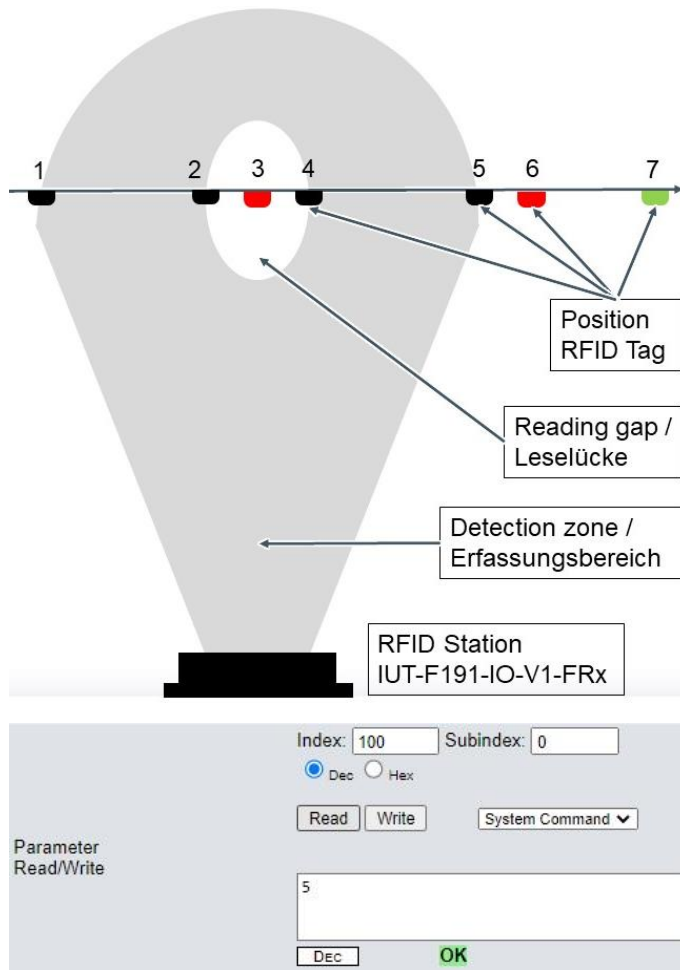
The parameter "Tag Lost Smoothing" (E5) has an influence on how fast the loss of a data carrier is reported to the PLC. The RFID station IUT-F191-IO-V1-FRx uses electromagnetic waves for the identification of data carriers. With electromagnetic waves, reflections occur on metal surfaces. This can create areas in the detection zone where no stable communication with the data carriers is possible (read gap). If a data carrier enters such an area, a message is sent to the controller that the tag can no longer be read. The "Tag Lost Smoothing" parameter can be used to delay this message until the tag leaves this area again and enters an area in which it can be stably recognized again.

By increasing the value of the "Tag Lost Smoothing", read gaps can be bridged for moving data carriers. This means that the data carriers can be identified without interruption in the entire detection zone. If a data carrier finally leaves the detection zone, the notification that the data carrier has left the detection zone is delayed. The system becomes slower with respect to these messages. The message about the leave of a data carrier from the detection zone is omitted completely if the read/write task was completed beforehand.

With a smaller value for the "Tag Lost Smoothing", the unsuccessful access to a known data carrier is reported more quickly. The system reacts more quickly when a data carrier leaves the detection zone. However, this increases the sensitivity to read gaps in the detection zone.

If a data carrier causes multiple changes between "read" and "not read" when passing through the detection zone, there are read gaps in the detection zone. In this case, the value of the "Tag Lost Smoothing" parameter should be increased.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim		Siemens TIA-Portal ICE1 IO-Link Master		
				18 of 115



- 1: Data carrier enters the detection zone; successful read access (Read valid = True) is immediately reported to the PLC.
- 2: Data carrier leaves detection zone and reaches the area of a read gap; no message to the PLC
- 3: Small value of "tag lost smoothing" → Exit of the data carrier from the detection zone is reported to the PLC (Read valid = False)
- 4: Data carrier re-enters the detection zone from the read gap; successful read access (Read valid = True) is reported to the PLC
- 5: Data carrier leaves detection zone permanently; no message to the PLC
- 6: Small value of "tag lost smoothing" → Exit of the data carrier from the detection zone is reported to the PLC (Read valid = False)
- 7: Large value of "tag lost smoothing" → Exit of the tag from the detection zone is reported to the PLC (Read valid = False)

Parameter 100 (16#64) "Tag Lost Smoothing":
Read out parameter with factory setting;
5 → 5 repetitions

3.10 IO-Link Parameter 105 (16#69) „Transmission Channels - CD“

The transmission channels to be used for the device version IUT-F191-IO-V1-FR1-01 (Europe) can be parameterized via the "Transmission Channels" parameter. This device uses the Dense Reader Mode (DRM) where only channels 4, 7, 10 and 13 of the channel spectrum can be used. It is possible to change the number and the order of the channels by this parameter. In the factory setting, channels 4, 10, 7 and 13 are active in this order.

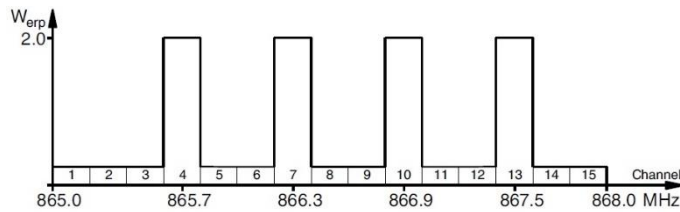
Structure Parameter 105 (16#69) „Transmission Channels“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
105	16#69	1	1 Byte	4; 7; 10; 13	16#04; 16#07; 16#0A; 16#0D	Read / Write	Channel 1; Factory setting channel 4
105	16#69	2	1 Byte	0; 4; 7; 10; 13	16#00; 16#04; 16#07; 16#0A; 16#0D	Read / Write	Channel 2; Factory setting channel 10; 0 = deactivated
105	16#69	3	1 Byte	0; 4; 7; 10; 13	16#04; 16#07; 16#0A; 16#0D	Read / Write	Channel 3; Factory setting channel 7; 0 = deactivated
105	16#69	4	1 Byte	0; 4; 7; 10; 13	16#04; 16#07; 16#0A; 16#0D	Read / Write	Channel 4; Factory setting channel 13; 0 = deactivated

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		19 of 115

IUT-F191-IO-V1-FR1-01 (Europe):

Channels 4, 7, 10 and 13 of the channel spectrum can be used for this device version. The number of channels can be between 1 (minimum) and 4 (maximum). The order of the channels is adjustable.



Channel spectrum IUT-F191-IO-V1-FR1-01:

Use of channels 4, 7, 10 and 13 for data transmission

The number of transmission channels used can be reduced by the "Transmission Channels" parameter. If fewer transmission channels are used, the cycle time for a scan cycle on a power stage is reduced. Fewer scans are executed per power stage and the ramp function for the output power is faster.

When reducing the number of transmit channels, it is recommended to keep channels 7 and 10, which are located in the middle of the channel spectrum, since data carriers are tuned to the middle frequency of the spectrum.

Parameter 105 (16#69) "Transmission Channels": Read out parameter with factory setting;
16#04 → channel 4
16#07 → channel 7
16#0A → channel 10
16#0D → channel 13

3.11 IO-Link Parameter 224 (16#E0) „Operating hours“

The parameter "Operating hours" can be used to read out the total operating time since the initial start-up.

Structure Parameter 224 (16#E0) „Operating hours“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
224	16#E0	0	4 Byte / 1 Double Word	0...2 ⁴⁸ 32-1		Read	Operating time

Parameter 224 (16#E0) "Operating hours":
Read out parameter;
49 → 49 hours

3.12 IO-Link Parameter 225 (16#E1) „Temperature indicator“

The "Temperature indicator" parameter can be used to read out whether the RFID station is operating within or outside the specified ambient temperature.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		20 of 115

Structure Parameter 225 (16#E1) „Temperature indicator“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
225	16#E1	0	1 Byte	0; 1; 2; 3; 4	16#00; 16#01; 16#02; 16#03; 16#04	Read	Temperature indicator 0 → Operating conditions OK 1 → near upper temperature limit 2 → upper temperature limit exceeded 3 → near lower temperature limit 4 → lower temperature limit exceeded

Parameter Read/Write

Index: 225 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

0

Dec OK

Parameter 225 (16#E1) "Temperature indicator": Read out parameter;
0 → Operating conditions OK

3.13 IO-Link Parameter 226 (16#E2) „Temperature indicator“

The "Temperature monitor" parameter can be used to read out information about the current temperature within the device. In addition, further information about the operation outside the temperature specification is transmitted.

Structure Parameter 226 (16#E2) „Temperature monitor“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
226	16#E2	1	4 Byte / 1 Double Word	0...2 ³² -1		Read	Display of the operating time of the device outside the permissible temperature specification
226	16#E2	2	2 Byte / 1 Word	0...65535	16#0000... 16#FFFF	Read	Display of the number of transitions from an operation within the permissible temperature specification to an operation outside the specification
226	16#E2	3	1 Byte	-40...+125°C		Read	Display of the maximum operating temperature reached since initial startup
226	16#E2	4	1 Byte	-40...+125°C		Read	Display of the minimum operating temperature reached since initial startup
226	16#E2	5	1 Byte	-40...+125°C		Read	Display of the current operating temperature of the device

Parameter Read/Write

Index: 226 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

0 0 0 0 0 0 0 0 46 21 38

Dec OK

Parameter 226 (16#E2) "Temperature monitor":
0 0 0 0 → hours operation out of specification
0 0 → no transitions
46 → 46°C Maximum temperature
21 → 21°C Minimum temperature
38 → 38°C current temperature

3.14 IO-Link Parameter 227 (16#E3) „Power monitor“

The parameter "Power monitor" displays additional information about the operating time and interruptions of the operating time.

Structure Parameter 227 (16#E3) „Power monitor“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
-----------	-----------	-----------	--------	-------------	-------------	--------	---------

	RFID-Station IUT-F191-IO-V1						2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode					KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master						21 of 115

227	16#E3	1	4 Byte / 1 Double Word	0...2^32-1		Read	Display of the restarts of the device since the initial commissioning
227	16#E3	2	4 Byte / 1 Double Word	0...2^32-1		Read	Maximum operating time between two inter- ruptions since the initial startup of the device; specified in seconds
227	16#E3	3	4 Byte / 1 Double Word	0...2^32-1		Read	Average operating time between two inter- ruptions since the initial startup of the device; specification in seconds
227	16#E3	4	4 Byte / 1 Double Word	0...2^32-1		Read	Current operating time since last restart; specified in seconds

Parameter Read/Write

Index: 227 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

44 29700 4201 5736

WORD (4/BE) OK

Parameter 227 (16#E3) "Power monitor":
44 → 44 restarts
29700 → 29700 Seconds between two inter-
rupts
4201 → 4201 Seconds between two inter-
rupts
5736 → 5736 seconds operating time

3.15 IO-Link Parameter 2 (16#02) „System Command“

The "System Command" parameter offers the option of resetting the IO-Link parameters to the factory setting. It must be ensured that access to the IO-Link parameters is enabled (device access locks not activated). The factory setting is only active after a manual power interruption.

Structure Parameter 2 (16#02) „System Command“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
2	16#02	0	1 Byte	129	16#81	Write	Application reset
2	16#02	0	1 Byte	131	16#83	Write	Back-To-Box

Parameter Read/Write

Index: 2 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

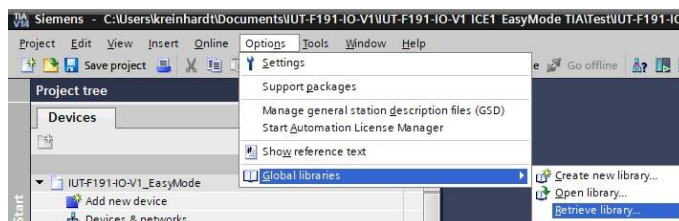
129

Dec OK

Parameter 2 (16#02) "System Command":
129 → Reset Application

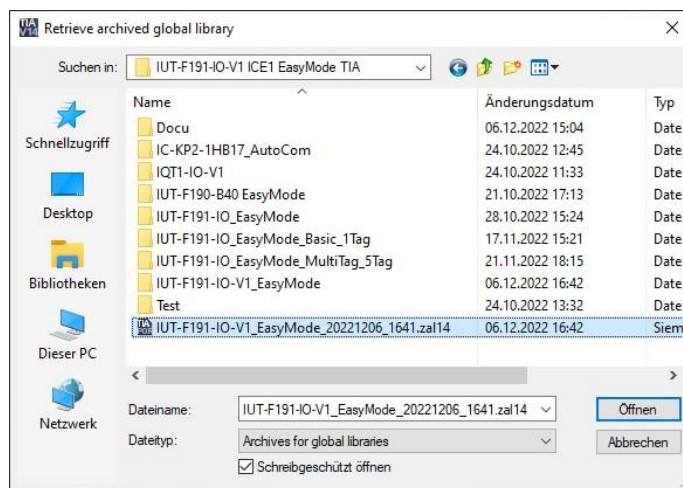
4. Import library “IUT-F191-IO-V1_EasyMode“

The "IUT-F191-IO-V1_EasyMode" library contains various function blocks for using the Easy Mode. This library must first be unpacked.



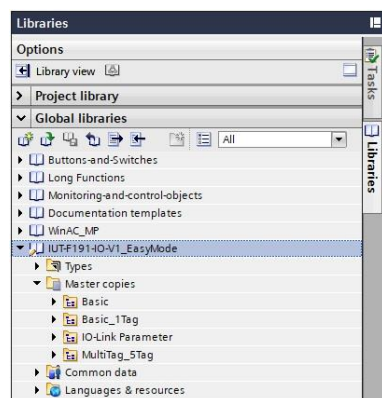
Retrieve Library:
Options → Global Libraries → Retrieve Library

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		22 of 115

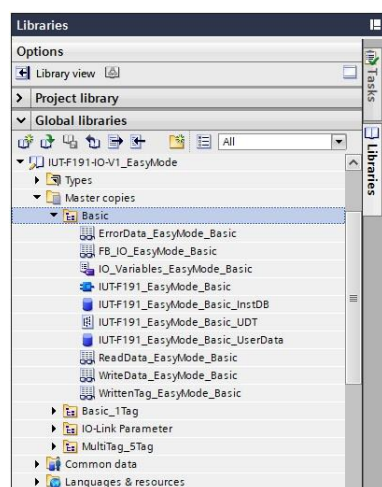


Select library:

Here: IUT-F191-IO-V1_EasyMode.....zal14



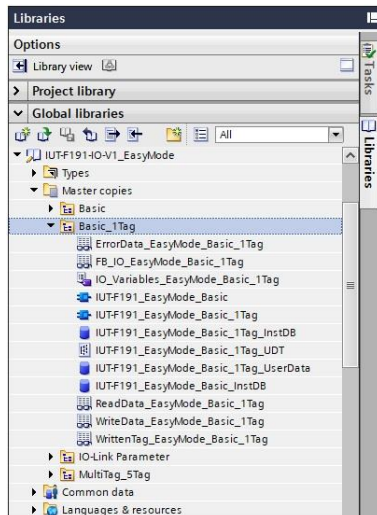
The "Master copies" folder contains 4 different function blocks. These function blocks provide different functionality based on the Easy Mode or for accessing the IO-Link parameters.



Basic:

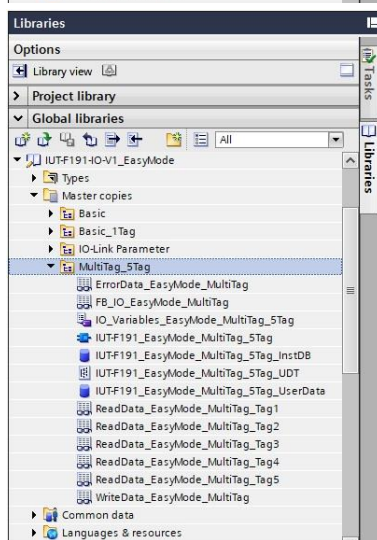
Basic version of the function block for executing read/write tasks. The number of read and write accesses is counted and output. A task is to be started and ended by the user.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		23 of 115



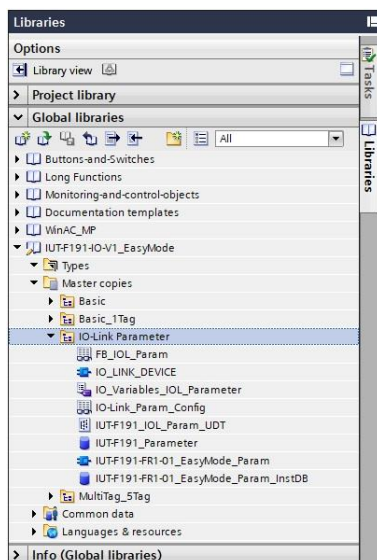
Basic_1Tag:

Function block for executing read/write tasks. The execution of the tasks is automatically terminated as soon as a data carrier is successfully read or written. Furthermore, an active task is aborted if no data carrier has been read or written within a configurable period of time. The execution time for a task is measured and output.



MultiTag_5Tag:

Function block for identifying up to 5 data carriers simultaneously in the detection zone. The data of the identified transponders are stored in separate data structures. A task is to be started and ended by the user.



IO-Link parameters:

Function block for optional access to the IO-Link parameters. Standard IO-Link parameters and device-specific IO-Link parameters can be read. It is also possible to write device-specific IO-Link parameters.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			24 of 115

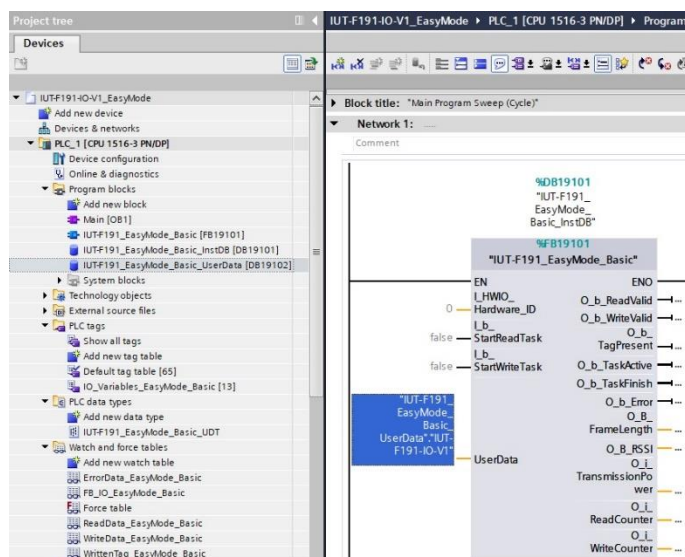
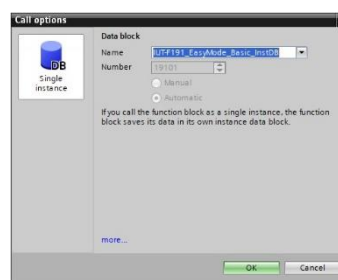
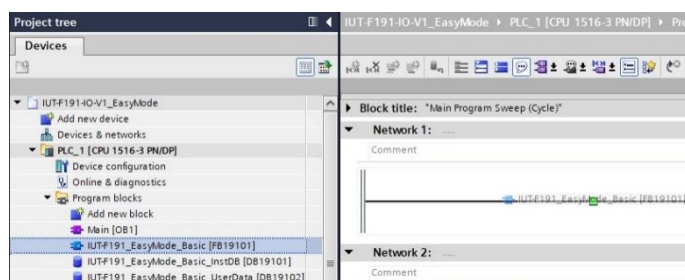
5. Function block FB19101 „IUT-F191_EasyMode_Basic“

Functional description "IUT-F191_EasyMode_Basic":

Basic version of a function block for using the Easy Mode. Write and read requests can be executed. The number of successful read or write accesses is output. In addition, the time of access to the data carrier is saved. When a new read or write job is started, all internal data and the outputs are reset. The read and write data as well as the access times are located within the data block "IUT-F191_EasyMode_Basic_UserData".

Implementation of function block "IUT-F191_EasyMode_Basic":

Drag function block "IUT-F191_EasyMode_Basic" (FB19101) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F191_EasyMode_Basic_InstDB" (DB19101) which can be used as instance data block. The instance data block can also be regenerated.



The read/write data, error information and the access times of the function block are located in a separate data block. This is parameterized at the "UserData" input. The "IUT-F191_EasyMode_Basic_UserData" data block is contained in the library and can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the "IUT-F191_EasyMode_Basic_UDT" data type.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		25 of 115

IUT-F191-IO-V1_EasyMode ▶ PLC_1 [CPU 1516-3 PN/DP] ▶ Pro

IUT-F191_EasyMode_Basic_UserData

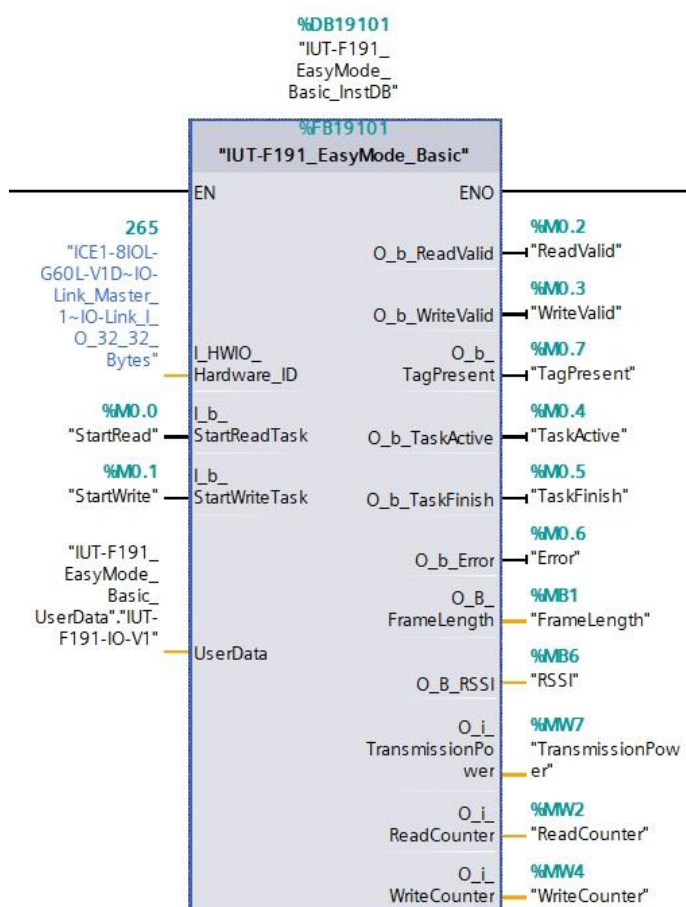
	Name	Data type
1	Static	
2	IUT-F191-IO-V1	"IUT-F191_EasyMode_Basic_UDT"
3	ReadData	Array[0..27] of Byte
4	Time_Read	DTL
5	WriteData	Array[0..27] of Byte
6	Time_Write	DTL
7	ErrorData	Array[0..27] of Byte
8	Time_Error	DTL
9	EPC_WrittenTag	Array[0..27] of Byte
10	RSSI	Byte
11	TransmissionPower	Int

The data block "IUT-F191_EasyMode_Basic_UserData" consists of the structure "IUT-F191-IO-V1". This is subdivided into the following fields:

ReadData → Read data from data carrier
Time_Read → Time of read access
WriteData → Write data for data carrier
Time_Write → Time of write access
ErrorData → Error information
Time_Error → Time of error condition
EPC_WrittenTag → UII/EPC information of a successfully written data carrier
RSSI → RSSI value for data carrier access
TransmissionPower → Transmission power in mW with which the tag was accessed

Complete wiring of the "IUT-F191_EasyMode_Basic" function block:

The input parameter "I_HWIO_Hardware_ID" corresponds to the identifier of the communication module from the hardware configuration.



The following table shows the meaning of the input and output variables:

Name	Input / Output	Data type	Meaning
I_HWIO_Hardware_ID	Input	HW_IO	Hardware identifier of the communication module from the hardware configuration
I_b_StartRead	Input	Bool	Start Read Task; with signal change from 0 → 1; starts execution of read task; end read task with signal change 1 → 0;
I_b_StartWrite	Input	Bool	Start Write Task; with signal change from 0 → 1; starts execution of write task; end write task with signal change 1 → 0;

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		26 of 115

UserData	InOut	DB	Data block „UserData“ → IUT-F191 _EasyMode_Basic.IUT-F191-IO-V1
O_b_ReadValid	Output	Bool	Read successful; 1 := data carrier within detection zone and data read successfully; 0 := data carrier outside detection zone; no data read
O_b_WriteValid	Output	Bool	Write successful; 1 := data carrier within detection zone and data written successfully; 0 := data carrier outside detection zone; no data written
O_b_TagPresent	Output	Bool	Presence of data carriers: 1 := one or more data carriers in the detection zone. 0 := no data carrier in the detection zone
O_b_TaskActive	Output	Bool	Read or Write Task active: 1 := read or write task active; 0 := no read or write task active; RFID station off
O_b_TaskFinish	Output	Bool	Read or Write Task completed: 0 := read or write task active; 1 := no read or write task active; RFID station off
O_b_Error	Output	Bool	Error: 1 := error occurred during read or write task 0 := no error condition active
O_B_FrameLength	Output	Byte	Length of the read-in data: Indication of the length of the read-in data in bytes; in case of error condition the length of the error message is indicated.
O_B_RSSI	Output	Byte	RSSI value for data carrier access: Received signal strength in the range between 0dec (weak) and 100dec (strong)
O_i_TransmissionPower	Output	Integer	Transmission power: Value of the transmission power in mW with which the data carrier could be accessed
O_i_ReadCounter	Output	Integer	Counter read operations: Number of successful reads during the execution of a read task
O_i_WriteCounter	Output	Integer	Counter write operations: Number of successful writes during the execution of a write task

5.1 Read data carrier without Autostart function

Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user data (memory bank 11; User Memory), the UII/EPC code (memory bank 01) and the TID (memory bank 10) can be accessed. If the Autostart function is deactivated, the read task must be triggered via the function block. When using the "Long Form" data format, the UII/EPC information is always placed in front of the read data set in the returned data for unique assignment to a data carrier. When using the "Short Form" data format, the UII/EPC information is omitted.

Parameter 65 (16#41) „Read Task“ → Setting read access to user data (user memory)

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00 00

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#00 = off

Parameter 65 (16#41) „Read Task“ → Setting read access to the TID

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

80 08 00 00 00

Hex

Index 1 = MemoryArea → 16#80 = TID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 0 = off

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		27 of 115

Parameter 65 (16#41) „Read Task“ → Setting read access to the UII/EPC code

Index: 65 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 40 08 00 00 00
 Hex

Index 1 = MemoryArea → 16#40 = UII/EPC
 Index 2 = Number Of Bytes → not relevant
 Index 3 = StartAddress → not relevant
 Index 4 = Autostart → 0 = off

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 00
 Hex

Index 1 = Input Representation → 16#00 = Long Form data format
 16#80 = Short Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

The read task is not started by the RFID station itself due to the deactivated Autostart function. It is necessary to start the read task via the "I_b_StartReadTask" input on FB19101.

Example 1: Read access to several data carriers in succession

There is always only one data carrier in the detection zone.

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB6	DEC	0	
TransmissionPower	%MW7	DEC+/-	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	

Initial state before the start of the read task:

StartRead = False
 ReadValid = False
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 ReadCounter = 0

The read task starts as soon as "StartRead" is set to True.

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB6	DEC	0	
TransmissionPower	%MW7	DEC+/-	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	

Read task active; no data carrier in the detection zone

StartRead = True
 ReadValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 0
 RSSI = 0
 Transmission Power = 0
 ReadCounter = 0

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		28 of 115

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	6	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier A in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 6 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	6	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 6 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	40	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	2	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier B in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 40 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 2

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	40	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	2	
"WriteCounter"	%MW4	DEC	0	

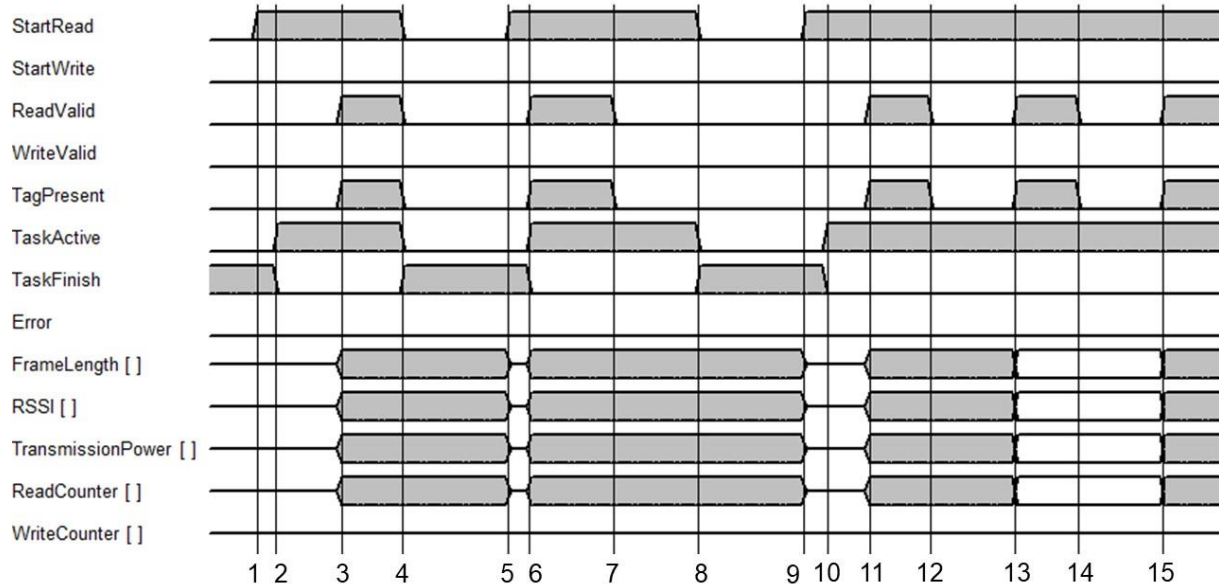
Read task active; data carrier has left the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 40 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 2

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		29 of 115

If a data carrier enters the detection zone and is read, a signal change from 0 to 1 occurs at the "ReadValid" and "TagPresent" outputs. The "ReadCounter" output is incremented for each newly read data carrier. The "ReadCounter" counts the edge changes from 0 to 1 at the "ReadValid" output. If a data carrier leaves the detection zone and there is no further tag in it, the signal changes from 1 to 0 at the "ReadValid" and "Tag-Present" outputs. No Ull/EPC information of the tag that has left the detection zone is transmitted.

Flowchart Execution of read task without Autostart function with exactly one tag in the detection zone:



Point in Time	Meaning
1	Read task is started StartRead := True;
2	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0;
3	Data carrier A read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 6; TransmissionPower = 100; ReadCounter = 1;
4	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 26; RSSI = 6; TransmissionPower = 100; ReadCounter = 1;
5	Next read task is started StartRead := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter := 0;
6	Data carrier B read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 13; TransmissionPower = 100; ReadCounter = 1;
7	Data carrier B has left detection zone; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 13; TransmissionPower = 100; ReadCounter = 1;
8	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 16; RSSI = 13; TransmissionPower = 100; ReadCounter = 1;
9	Read task is started StartRead := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0;
10	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0;
11	Data carrier C read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 46; TransmissionPower = 100; ReadCounter = 1;
12	Data carrier C has left detection zone; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 46; TransmissionPower = 100; ReadCounter = 1;

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		30 of 115

13	Data carrier D read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 13; TransmissionPower = 100; ReadCounter = 2;
14	Data carrier D has left detection zone; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 13; TransmissionPower = 100; ReadCounter = 2;
15	Data carrier E read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 23; TransmissionPower = 100; ReadCounter = 3;

Example 2: Read access to several data carriers simultaneously

Several data carriers are inserted into the detection zone one after the other. The data carriers are then removed again in the same order.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state before the start of the read task:

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

The read task starts as soon as "StartRead" is set to True.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Read task active; no data carrier in the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier A in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 20 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		31 of 115

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	13	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	2	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier B in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 13 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 2

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	3	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier C in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 26 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 3

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	3	
WriteCounter	%MW4	DEC	0	

Read task active; a data carrier has left the detection zone

StartRead = True
ReadValid = False
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 3

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	3	
WriteCounter	%MW4	DEC	0	

Read task active; another data carrier has left the detection zone; no change from the previous state

StartRead = True
ReadValid = False
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 3

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			32 of 115

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	3	
"WriteCounter"	%MW4	DEC	0	

Read task active; the last data carrier has left the detection zone; no data carrier left in the detection zone; TagPresent = False;

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 3

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	3	
"WriteCounter"	%MW4	DEC	0	

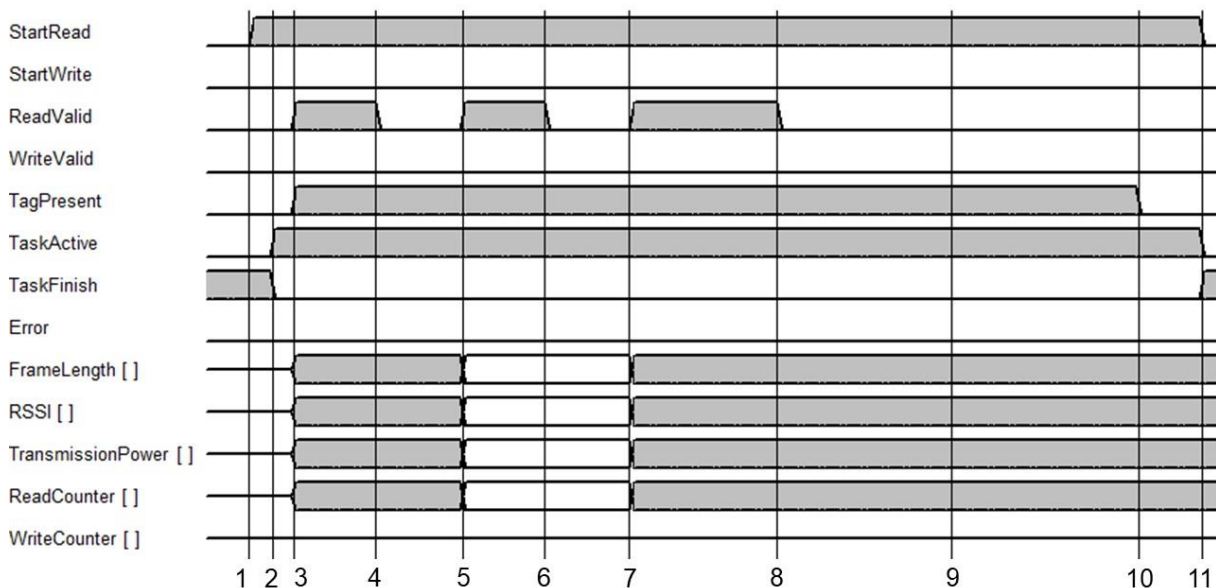
Read task finished

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 3

Read access to a new data carrier is signaled by the signal change from 0 to 1 at the "ReadValid" output. If there is already a data carrier in the detection zone ("ReadValid" = 1), the "ReadValid" output is first reset to 0 for 50ms. It is then set to 1 again, thus signaling successful read access to the next data carrier.

If a data carrier leaves the detection zone, the signal at the "ReadValid" output changes from 1 to 0. If another data carrier then leaves the detection zone, the signal status at the "ReadValid" output ("ReadValid" = 0) remains unchanged. The exit of this data carrier from the detection zone cannot be detected by the Easy Mode. Only when the last data carrier leaves the detection zone does the "TagPresent" output change from 1 to 0. This signals that there are no more data carriers in the detection zone.

Flow chart Execution of read task without auto start function with 3 data carriers in the detection zone:



	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		33 of 115

Point in Time	Meaning
1	Read task is started StartRead := True;
2	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0;
3	Data carrier A read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 20; TransmissionPower = 100; ReadCounter = 1;
4	Data carrier B enters the detection zone and is read; ReadValid goes to False for 50ms StartRead := True; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 20; TransmissionPower = 100; ReadCounter = 1;
5	Read-in data from data carrier B are transferred; ReadValid goes to True after 50ms StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 13; TransmissionPower = 100; ReadCounter := 2;
6	Data carrier C enters the detection zone and is read; ReadValid goes to False for 50ms StartRead := True; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 13; TransmissionPower = 100; ReadCounter = 2;
7	Data read from data carrier C is transferred; ReadValid goes to True after 50ms StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 3;
8	A data carrier leaves the detection zone StartRead := True; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 3;
9	Another data carrier leaves the detection zone; no changes to the output signals StartRead := True; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 3;
10	The last data carrier leaves the detection zone; no data carrier left in the detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 3;
11	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 3;

5.2 Read data carrier with Autostart function

Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user data (memory bank 11; User Memory), the UII/EPC code (memory bank 01) and the TID (memory bank 10) can be accessed. If the Autostart function is activated, the read task is started automatically by the RFID station. A trigger via the function block is therefore not necessary. When using the "Long Form" data format, the UII/EPC information for unique assignment to a data carrier is always placed in front of the read data set in the returned data. When using the "Short Form" data format, the UII/EPC information is omitted.

Parameter 65 (16#41) „Read Task“ → Setting read access to user data (user memory)

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00 80

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#80 = on

Parameter 65 (16#41) „Read Task“ → Setting read access to the TID

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

80 08 00 00 80

Hex

Index 1 = MemoryArea → 16#80 = TID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 16#80 = on

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		34 of 115

Parameter 65 (16#41) „Read Task“ → Setting read access to the UII/EPC code

Index: 65 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 40 08 00 00 80
 Hex

Index 1 = MemoryArea → 16#40 = UII/EPC
 Index 2 = Number Of Bytes → not relevant
 Index 3 = StartAddress → not relevant
 Index 4 = Autostart → 16#80 = on

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 00
 Hex

Index 1 = Input Representation → 16#00 = Long Form data format
 16#80 = Short Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

The read task is started by the RFID station itself via the switched-on Autostart function. It is not necessary to start the read task via the "I_b_StartReadTask" input on FB19101.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state: Read task was started by RFID station

StartRead = False
 ReadValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 ReadCounter = 0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier A in detection zone and data read in

StartRead = False
 ReadValid = True
 TagPresent = True
 TaskActive = True
 TaskFinish = False
 FrameLength = 26 (depending on the length of the read in data)
 RSSI = 26 (depending on the signal quality)
 TransmissionPower = 100 (Transmit power level 100mW)
 ReadCounter = 1

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			35 of 115

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	1	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	2	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier B in detection zone and data read in

StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 26 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 2

The read-in data as well as the time for the access to the data carrier are located within the data block "IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.

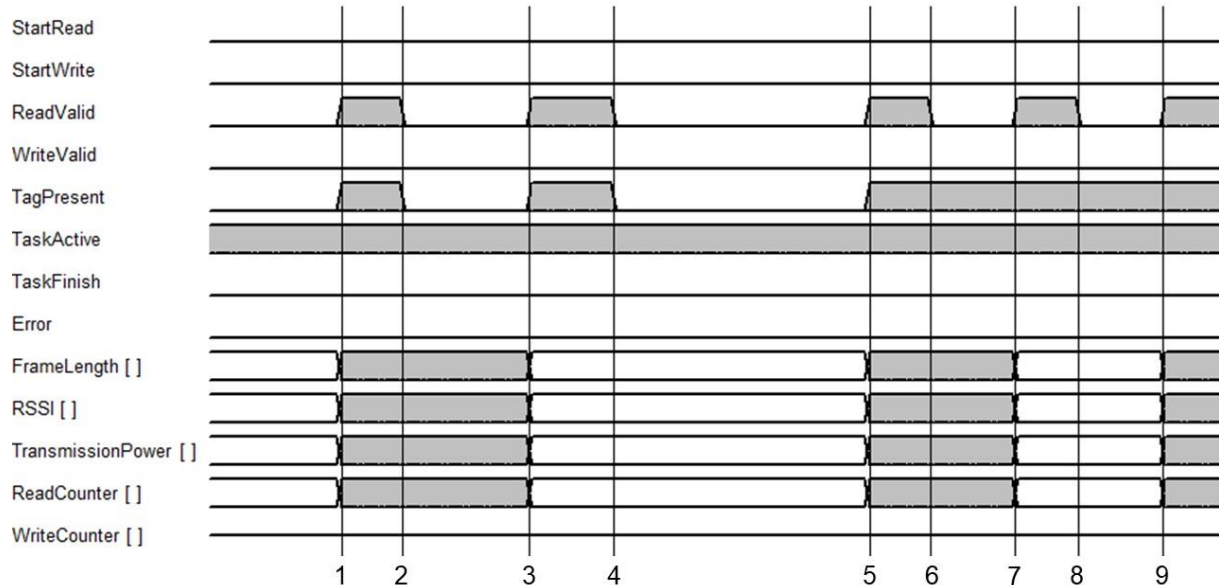
Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	2	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 2

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			36 of 115

Flowchart execution read task with Autostart function:



Point in Time	Meaning
1	Read task activated; data carrier A read StartRead := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 1;
2	Data carrier A has left the detection zone; no more data carrier in the detection zone StartRead := False; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 26; TransmissionPower = 100; ReadCounter = 1;
3	Data carrier B read StartRead := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 16; TransmissionPower = 100; ReadCounter = 2;
4	Data carrier B has left the detection zone; no more data carrier in the detection zone StartRead := False; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 16; TransmissionPower = 100; ReadCounter = 2;
5	Data carrier C read; there is a data carrier in the detection zone StartRead := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 55; TransmissionPower = 100; ReadCounter = 3;
6	Data carrier D enters the detection zone; ReadValid is set to False for 50ms StartRead := False; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 55; TransmissionPower = 100; ReadCounter = 3;
7	Read-in data from data carrier D are transferred; ReadValid goes to True after 50ms; there are two data carriers in the detection zone StartRead := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 18; TransmissionPower = 100; ReadCounter = 4;
8	Data carrier E enters the detection range; ReadValid is set to False for 50ms StartRead := False; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 18; TransmissionPower = 100; ReadCounter = 4;
9	Read-in data from data carrier E are transferred; ReadValid goes to True after 50ms; there are 3 data carriers in the detection zone StartRead := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 26; RSSI = 12; TransmissionPower = 100; ReadCounter = 5;

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		37 of 115

5.3 Data structure access to User Memory

IUT-F191_EasyMode_Basic_UserData				
	Name	Data ...	Start...	Monit...
[-]	Static			
[-]	[-] IUT-F191-IO-V1	"IUT..."		
[-]	[-] [-] ReadData	Array...		
[-]	[-] [-] ReadData[0]	Byte	16#0	16#00
[-]	[-] [-] ReadData[1]	Byte	16#0	16#0E
[-]	[-] [-] ReadData[2]	Byte	16#0	16#34
[-]	[-] [-] ReadData[3]	Byte	16#0	16#00
[-]	[-] [-] ReadData[4]	Byte	16#0	16#30
[-]	[-] [-] ReadData[5]	Byte	16#0	16#14
[-]	[-] [-] ReadData[6]	Byte	16#0	16#F7
[-]	[-] [-] ReadData[7]	Byte	16#0	16#33
[-]	[-] [-] ReadData[8]	Byte	16#0	16#7C
[-]	[-] [-] ReadData[9]	Byte	16#0	16#00
[-]	[-] [-] ReadData[10]	Byte	16#0	16#1F
[-]	[-] [-] ReadData[11]	Byte	16#0	16#00
[-]	[-] [-] ReadData[12]	Byte	16#0	16#00
[-]	[-] [-] ReadData[13]	Byte	16#0	16#00
[-]	[-] [-] ReadData[14]	Byte	16#0	16#74
[-]	[-] [-] ReadData[15]	Byte	16#0	16#83
[-]	[-] [-] ReadData[16]	Byte	16#0	16#00
[-]	[-] [-] ReadData[17]	Byte	16#0	16#08
[-]	[-] [-] ReadData[18]	Byte	16#0	16#01
[-]	[-] [-] ReadData[19]	Byte	16#0	16#02
[-]	[-] [-] ReadData[20]	Byte	16#0	16#03
[-]	[-] [-] ReadData[21]	Byte	16#0	16#04
[-]	[-] [-] ReadData[22]	Byte	16#0	16#05
[-]	[-] [-] ReadData[23]	Byte	16#0	16#06
[-]	[-] [-] ReadData[24]	Byte	16#0	16#07
[-]	[-] [-] ReadData[25]	Byte	16#0	16#08
[-]	[-] [-] ReadData[26]	Byte	16#0	16#00

Long Form data format:

ReadData[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in user memory data
Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[18...25]: read User Memory data
Length depends on the "Number of Bytes" setting; read subarea of the user memory

IUT-F191_EasyMode_Basic_UserData				
	Name	Data ...	Start...	Monit...
[-]	Static			
[-]	[-] IUT-F191-IO-V1	"IUT..."		
[-]	[-] [-] ReadData	Array...		
[-]	[-] [-] ReadData[0]	Byte	16#0	16#01
[-]	[-] [-] ReadData[1]	Byte	16#0	16#02
[-]	[-] [-] ReadData[2]	Byte	16#0	16#03
[-]	[-] [-] ReadData[3]	Byte	16#0	16#04
[-]	[-] [-] ReadData[4]	Byte	16#0	16#05
[-]	[-] [-] ReadData[5]	Byte	16#0	16#06
[-]	[-] [-] ReadData[6]	Byte	16#0	16#07
[-]	[-] [-] ReadData[7]	Byte	16#0	16#08
[-]	[-] [-] ReadData[8]	Byte	16#0	16#00

Short Form data format:

ReadData[0...7]: read user memory data
Length depends on the setting "Number of Bytes"; read part of the user memory.

When using the "Short Form" data format, the UII/EPC information of the identified data carrier is not prepended to the read-in data. No length information is transferred either.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			38 of 115

5.4 Data structure access to TID

IUT-F191_EasyMode_Basic_UserData

Name	Data ...	Start..	Monit...
Static			
IUT-F191-IO-V1	*IUT...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#0C
ReadData[18]	Byte	16#0	16#E2
ReadData[19]	Byte	16#0	16#80
ReadData[20]	Byte	16#0	16#11
ReadData[21]	Byte	16#0	16#05
ReadData[22]	Byte	16#0	16#20
ReadData[23]	Byte	16#0	16#00
ReadData[24]	Byte	16#0	16#5A
ReadData[25]	Byte	16#0	16#5E
ReadData[26]	Byte	16#0	16#F1
ReadData[27]	Byte	16#0	16#A2

Long Form data format:

ReadData[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in TID; length 2 bytes; length of TID depends on data carrier type.

IUT-F191_EasyMode_Basic_UserData

Name	Data ...	Start..	Monit...
Static			
IUT-F191-IO-V1	*IUT...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#E2
ReadData[1]	Byte	16#0	16#80
ReadData[2]	Byte	16#0	16#11
ReadData[3]	Byte	16#0	16#05
ReadData[4]	Byte	16#0	16#20
ReadData[5]	Byte	16#0	16#00
ReadData[6]	Byte	16#0	16#5A
ReadData[7]	Byte	16#0	16#5E
ReadData[8]	Byte	16#0	16#F1
ReadData[9]	Byte	16#0	16#A2
ReadData[10]	Byte	16#0	16#08
ReadData[11]	Byte	16#0	16#A6
ReadData[12]	Byte	16#0	16#00

Short Form data format:

ReadData[0...11]: TID read in

Length of the read-in TID depends on the chip type within the data carrier. The length can be different for each chip type. For one chip type, however, the length is constant.

When using the "Short Form" data format, the UII/EPC information of the identified tag is not prepended to the read-in TID. No length information is transmitted either.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		39 of 115

5.5 Data structure access to auf UII/EPC

IUT-F191_EasyMode_Basic_UserData				
Name	Data ...	Start..	Monit...	
Static				
IUT-F191-IO-V1	"IUT...			
ReadData	Array...			
ReadData[0]	Byte	16#0	16#00	
ReadData[1]	Byte	16#0	16#0E	
ReadData[2]	Byte	16#0	16#34	
ReadData[3]	Byte	16#0	16#00	
ReadData[4]	Byte	16#0	16#30	
ReadData[5]	Byte	16#0	16#14	
ReadData[6]	Byte	16#0	16#F7	
ReadData[7]	Byte	16#0	16#33	
ReadData[8]	Byte	16#0	16#7C	
ReadData[9]	Byte	16#0	16#00	
ReadData[10]	Byte	16#0	16#1F	
ReadData[11]	Byte	16#0	16#00	
ReadData[12]	Byte	16#0	16#00	
ReadData[13]	Byte	16#0	16#00	
ReadData[14]	Byte	16#0	16#74	
ReadData[15]	Byte	16#0	16#83	
ReadData[16]	Byte	16#0	16#00	

Long Form data format:

ReadData[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

IUT-F191_EasyMode_Basic_UserData				
Name	Data ...	Start..	Monit...	
Static				
IUT-F191-IO-V1	"IUT...			
ReadData	Array...			
ReadData[0]	Byte	16#0	16#34	
ReadData[1]	Byte	16#0	16#00	
ReadData[2]	Byte	16#0	16#30	
ReadData[3]	Byte	16#0	16#14	
ReadData[4]	Byte	16#0	16#F7	
ReadData[5]	Byte	16#0	16#33	
ReadData[6]	Byte	16#0	16#7C	
ReadData[7]	Byte	16#0	16#00	
ReadData[8]	Byte	16#0	16#1F	
ReadData[9]	Byte	16#0	16#00	
ReadData[10]	Byte	16#0	16#00	
ReadData[11]	Byte	16#0	16#00	
ReadData[12]	Byte	16#0	16#74	
ReadData[13]	Byte	16#0	16#83	
ReadData[14]	Byte	16#0	16#00	

Short Form data format:

ReadData[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12 byte long UII/EPC code

ReadData[2...13]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

When using the "Short Form" data format, the transmission of the length specification is omitted.

5.6 Writing to data carrier

When using Easy mode, write access to a data carrier can be made either to the user data (memory bank 11; User Memory) or to the UII/EPC code (memory bank 01; UII/EPC). Two variants are available for write access to the UII/EPC (memory bank 01). In the first variant, the UII/EPC is transferred together with the PC word via the process data field. This allows the user to define a value for the PC word that he configures himself. In the second variant, the required PC word is not transferred via the process data, but is automatically calculated and automatically programmed by the IUT-F191-IO-V1 RFID station. The write access is to be set by parameter 66 "Write Task". The Autostart function is not supported for a write task. When using the "Long Form" data format, the UII/EPC information of the written data carrier is always returned in the event of a successful write access to a data carrier. This means that the write access can be assigned to a data carrier. When using the "Short Form" data format, the transmission of the UII/EPC information after a successful write access is omitted.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		40 of 115

Parameter 66 (16#42) „Write Task“ → Setting write access to user data (user memory)

Index: 66 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 00 08 00 00
 Hex

Index 1 = MemoryArea → 16#00 = User Memory
 Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
 Index 3 = StartAddress → 16#0000 = Start address 0

Parameter 66 (16#42) „Write Task“ → Setting write access to UII/EPC including PC word

Index: 66 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 20 0e 00 00
 Hex

Index 1 = MemoryArea → 16#20 = UII/EPC incl. PC-Wort
 Index 2 = Number Of Bytes → 16#0E = 14 Bytes = 2 Byte PC + 12 Byte UII/EPC
 Index 3 = StartAddress → not relevant

Parameter 66 (16#42) „Write Task“ → Setting write access to EPC exclusive PC word

Index: 66 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 40 0c 00 00
 Hex

Index 1 = MemoryArea → 16#40 = EPC excl. PC-Wort
 Index 2 = Number Of Bytes → 16#0C = 12 Bytes = 12 Byte EPC
 Index 3 = StartAddress → not relevant

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 00
 Hex

Index 1 = Input Representation → 16#00 = Long Form data format
 16#80 = Short Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

Before the write task is started, the write data must be transferred in the data structure "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.WriteData". The write task is started by the "I_b_Start-WriteTask" input at FB319101. When a write access is successfully executed, the UII/EPC information of the described data carrier is transferred to the data structure "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.WrittenTag".

Name	...	Displ...	Monit...	Modify ...
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[0]	Hex	16#01	16#01	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[1]	Hex	16#02	16#02	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[2]	Hex	16#03	16#03	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[3]	Hex	16#04	16#04	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[4]	Hex	16#05	16#05	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[5]	Hex	16#06	16#06	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[6]	Hex	16#07	16#07	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[7]	Hex	16#08	16#08	
"IUT-F191_EasyMode_Basic_UserData".IUT-F191-IO-V1.WriteData[8]	Hex	16#00	16#00	

Name	Data ...	Start...	Monit...
Static	16#01		
IUT-F191-IO-V1	IUT...		
ReadData	Array...		
Time_Read	DTL	DTL#1	DTL#2
WriteData	Array...		
WriteData[0]	Byte	16#0	16#01
WriteData[1]	Byte	16#0	16#02
WriteData[2]	Byte	16#0	16#03
WriteData[3]	Byte	16#0	16#04
WriteData[4]	Byte	16#0	16#05
WriteData[5]	Byte	16#0	16#06
WriteData[6]	Byte	16#0	16#07
WriteData[7]	Byte	16#0	16#08
WriteData[8]	Byte	16#0	16#00

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		41 of 115

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> FALSE	TRUE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB6	DEC	0	
TransmissionPower	%MW7	DEC+/-	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	

Initial state before the start of the write task:

StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 0
RSSI = 0
TransmissionPower = 0
WriteCounter = 0

The write task starts as soon as "StartWrite" is set to True.

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB6	DEC	0	
TransmissionPower	%MW7	DEC+/-	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	

Write task active; no data carrier in the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
WriteCounter = 0

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	16	
RSSI	%MB6	DEC	26	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	1	

Write task active; data carrier A in detection zone; data written

StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)
RSSI = 26 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		42 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Data ...	Start...	Monit...	
Static				
IUT-F191-IO-V1	"IUT...			
ReadData	Array...			
Time_Read	DTL	DTL# 1	DTL# 2...	
WriteData	Array...			
Time_Write	DTL	DTL# 1	DTL# 2...	
ErrorData	Array...			
Time_Error	DTL	DTL# 1	DTL# 1...	
EPC_WrittenTag	Ar...			
EPC_WrittenTag[0]	Byte	16#0	16#00	
EPC_WrittenTag[1]	Byte	16#0	16#0E	
EPC_WrittenTag[2]	Byte	16#0	16#34	
EPC_WrittenTag[3]	Byte	16#0	16#00	
EPC_WrittenTag[4]	Byte	16#0	16#30	
EPC_WrittenTag[5]	Byte	16#0	16#14	
EPC_WrittenTag[6]	Byte	16#0	16#F7	
EPC_WrittenTag[7]	Byte	16#0	16#33	
EPC_WrittenTag[8]	Byte	16#0	16#7C	
EPC_WrittenTag[9]	Byte	16#0	16#00	
EPC_WrittenTag[10]	Byte	16#0	16#1F	
EPC_WrittenTag[11]	Byte	16#0	16#00	
EPC_WrittenTag[12]	Byte	16#0	16#00	
EPC_WrittenTag[13]	Byte	16#0	16#00	
EPC_WrittenTag[14]	Byte	16#0	16#74	
EPC_WrittenTag[15]	Byte	16#0	16#83	
EPC_WrittenTag[16]	Byte	16#0	16#00	

UII/EPC information of the successfully written data carrier within the data block "IUT-F191_EasyMode_Basic_UserData" in the structure "EPC_WrittenTag":

WrittenTag[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

WrittenTag[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

WrittenTag[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier has left the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	40	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	2	

Write task active; data carrier B in detection zone; data written

StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)
RSSI = 40 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 2

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		43 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Data ...	Start...	Monit...	
Static				
IUT-F191-IO-V1	*IUT...			
ReadData	Array...			
Time_Read	DTL	DTL# 1	DTL# 2...	
WriteData	Array...			
Time_Write	DTL	DTL# 1	DTL# 2...	
ErrorData	Array...			
Time_Error	DTL	DTL# 1	DTL# 1...	
EPC_WrittenTag	Ar...			
EPC_WrittenTag[0]	Byte	16#0	16#00	
EPC_WrittenTag[1]	Byte	16#0	16#0E	
EPC_WrittenTag[2]	Byte	16#0	16#34	
EPC_WrittenTag[3]	Byte	16#0	16#00	
EPC_WrittenTag[4]	Byte	16#0	16#01	
EPC_WrittenTag[5]	Byte	16#0	16#02	
EPC_WrittenTag[6]	Byte	16#0	16#03	
EPC_WrittenTag[7]	Byte	16#0	16#04	
EPC_WrittenTag[8]	Byte	16#0	16#05	
EPC_WrittenTag[9]	Byte	16#0	16#06	
EPC_WrittenTag[10]	Byte	16#0	16#07	
EPC_WrittenTag[11]	Byte	16#0	16#08	
EPC_WrittenTag[12]	Byte	16#0	16#09	
EPC_WrittenTag[13]	Byte	16#0	16#0A	
EPC_WrittenTag[14]	Byte	16#0	16#0B	
EPC_WrittenTag[15]	Byte	16#0	16#0C	
EPC_WrittenTag[16]	Byte	16#0	16#0D	

UII/EPC information of the successfully written data carrier within the data block "IUT-F191_EasyMode_Basic_UserData" in the structure "EPC_WrittenTag":

WrittenTag[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

WrittenTag[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

WrittenTag[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	16	
RSSI	%MB6	DEC	40	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	2	

Write task active; data carrier has left the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)
RSSI = 40 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 2

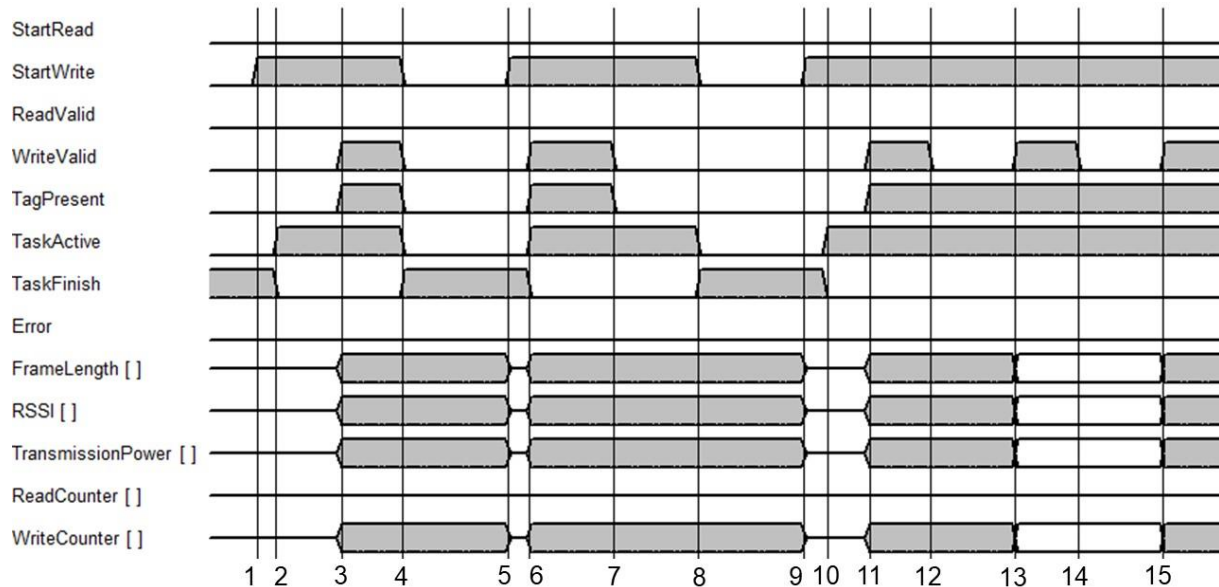
Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	16	
RSSI	%MB6	DEC	40	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	2	

Write task finished:

StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 16 (depending on the length of the last UII/EPC information)
RSSI = 40 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 2

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		44 of 115

Flowchart execution write task:



Point in Time	Meaning
1	Write task is started StartWrite := True;
2	Write task is activated; no data carrier in detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0;
3	Data carrier A successfully written StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 46; RSSI = 26; TransmissionPower = 100; WriteCounter = 1;
4	Write task is finished StartWrite := False; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 16; RSSI = 46; TransmissionPower = 100; WriteCounter = 1;
5	Next write task is started StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter := 0;
6	Data carrier B successfully written StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 60; TransmissionPower = 100; WriteCounter = 1;
7	Data carrier B has left detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 60; TransmissionPower = 100; WriteCounter = 1;
8	Write task is finished StartWrite := False; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 16; RSSI = 60; TransmissionPower = 100; WriteCounter = 1;
9	Write task is started StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0;
10	Write task is activated; no data carrier in detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0;
11	Data carrier C successfully written StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 26; TransmissionPower = 100; WriteCounter = 1;
12	Data carrier D enters the detection zone; WriteValid is set to False for 50ms StartWrite := True; WriteValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 26; TransmissionPower = 100; WriteCounter = 1;
13	Data carrier D successfully written; WriteValid bit is set to True after 50ms StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 46; TransmissionPower = 100; WriteCounter = 2;
14	Data carrier E enters the detection zone; WriteValid is set to False for 50ms StartWrite := True; WriteValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 46; TransmissionPower = 100; WriteCounter = 2;
15	Data carrier E successfully written; Write Valid bit is set to True after 50ms StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 16; RSSI = 16; TransmissionPower = 100; WriteCounter = 3;

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		45 of 115

5.7 Data structure system time for data carrier access

The function block reads the local system time of the PLC at certain events and stores the times within the data block "IUT-F191_EasyMode_Basic_UserData" in corresponding structures. The system time is read for the following events:

- Successful read access to a data carrier (ReadValid = True)
- Successful write access to a data carrier (WriteValid = True)
- Error condition (Error = True)

IUT-F191_EasyMode_Basic_UserData				
Name	Data t...	St...	Monitor value	
Static				
IUT-F191-IO-V1	*IUT-F...			
ReadData	Array[...			
Time_Read	DTL	DTL#	DTL#2022-11-10-07:17:02.916646319	
YEAR	UInt	197C	2022	
MONTH	USInt	1	11	
DAY	USInt	1	10	
WEEKDAY	USInt	5	5	
HOUR	USInt	0	7	
MINUTE	USInt	0	17	
SECOND	USInt	0	2	
NANOSECOND	UDInt	0	916_646_319	

Time of successful read access to a data carrier:

Data structure IUT-F191-IO-V1.Time_Read

IUT-F191_EasyMode_Basic_UserData				
Name	Data t...	St...	Monitor value	
Static				
IUT-F191-IO-V1	*IUT-F...			
ReadData	Array[...			
Time_Read	DTL	DTL#	DTL#2022-11-10-07:17:02.916646319	
WriteData	Array[...			
Time_Write	DTL	DTL#	DTL#2022-11-10-07:20:34.443680728	
YEAR	UInt	197C	2022	
MONTH	USInt	1	11	
DAY	USInt	1	10	
WEEKDAY	USInt	5	5	
HOUR	USInt	0	7	
MINUTE	USInt	0	20	
SECOND	USInt	0	34	
NANOSECOND	UDInt	0	443_680_728	

Time of successful write access to a data carrier:

Data structure IUT-F191-IO-V1.Time_Write

IUT-F191_EasyMode_Basic_UserData				
Name	Data t...	St...	Monitor value	
Static				
IUT-F191-IO-V1	*IUT-F...			
ReadData	Array[...			
Time_Read	DTL	DTL#	DTL#2022-11-10-07:17:02.916646319	
WriteData	Array[...			
Time_Write	DTL	DTL#	DTL#2022-11-10-07:20:34.443680728	
ErrorData	Array[...			
Time_Error	DTL	DTL#	DTL#2022-11-10-07:21:40.953212395	
YEAR	UInt	197C	2022	
MONTH	USInt	1	11	
DAY	USInt	1	10	
WEEKDAY	USInt	5	5	
HOUR	USInt	0	7	
MINUTE	USInt	0	21	
SECOND	USInt	0	40	
NANOSECOND	UDInt	0	953_212_395	

Time error state:

Data structure IUT-F191-IO-V1.Time_Error

5.8 Error messages during the execution of write/read tasks

The IUT-F191-IO-V1 RFID station sends an error message to the PLC via the process data field as soon as an error condition occurs during the execution of a read or write task. The error message consists of an error code and a short error description, which is coded in ASCII characters. The error

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode Siemens TIA-Portal ICE1 IO-Link Master		KReinhardt	UHF RFID
Mannheim				46 of 115

code and the error description are located in the data block "IUT-F191_EasyMode_Basic_UserData" in the data structure "IUT-F191-IO-V1.ErrorData". At the same time the output "O_b_Error" at FB19101 "IUT-F191_EasyMode_Basic" is set. The "O_B_FrameLength" output indicates the length of the error message.

Example 1: Read and write task triggered simultaneously

It is not permitted that both a read task (I_b_StartReadTask) and a write task (I_b_StartWriteTask) are triggered at the same time. This leads to an error state of the RFID station.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%MO.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%MO.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%MO.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%MO.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%MO.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%MO.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%MO.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%MO.6	Bool	<input checked="" type="checkbox"/> TRUE	
"FrameLength"	%MB1	DEC	19	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC +/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Parallel trigger of read and write task:

StartRead = True
StartWrite = True
Error = True
FrameLength = 19
RSSI = 0
TransmissionPower = 0

IUT-F191_EasyMode_Basic_UserData

Name	Dat...	St...	Monit...
Static			
IUT-F191-IO-V1	"IUT..."		
ReadData	Arra...		
Time_Read	DTL	DTL#	DTL#2...
WriteData	Arra...		
Time_Write	DTL	DTL#	DTL#2...
ErrorData	Arra...		
ErrorData[0]	Byte	16#C 16#04	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[0]
ErrorData[1]	Byte	16#C 16#72	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[1]
ErrorData[2]	Byte	16#C 16#65	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[2]
ErrorData[3]	Byte	16#C 16#61	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[3]
ErrorData[4]	Byte	16#C 16#64	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[4]
ErrorData[5]	Byte	16#C 16#20	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[5]
ErrorData[6]	Byte	16#C 16#41	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[6]
ErrorData[7]	Byte	16#C 16#4E	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[7]
ErrorData[8]	Byte	16#C 16#44	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[8]
ErrorData[9]	Byte	16#C 16#20	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[9]
ErrorData[10]	Byte	16#C 16#77	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[10]
ErrorData[11]	Byte	16#C 16#72	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[11]
ErrorData[12]	Byte	16#C 16#69	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[12]
ErrorData[13]	Byte	16#C 16#74	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[13]
ErrorData[14]	Byte	16#C 16#65	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[14]
ErrorData[15]	Byte	16#C 16#20	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[15]
ErrorData[16]	Byte	16#C 16#73	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[16]
ErrorData[17]	Byte	16#C 16#65	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[17]
ErrorData[18]	Byte	16#C 16#74	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[18]
ErrorData[19]	Byte	16#C 16#00	"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".ErrorData[19]

Example 2: Two data carriers were detected when using the Short Form data format.

When using the Short Form data format, only the identification of one data carrier is permitted in the detection zone. If another data carrier is detected during the execution of the read or write task, an error message is issued.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		47 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 80
 Hex

Index 1 = Input Representation → 16#80 =
 Short Form data format
 16#00 = Long Form data format
 Long Form → Identification of one or
 more data carriers
 Short Form → Identification of only one
 data carrier

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input checked="" type="checkbox"/> TRUE	
FrameLength	%MB1	DEC	23	
RSSI	%MB6	DEC	100	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	2	
WriteCounter	%MW4	DEC	0	

Trigger Read task

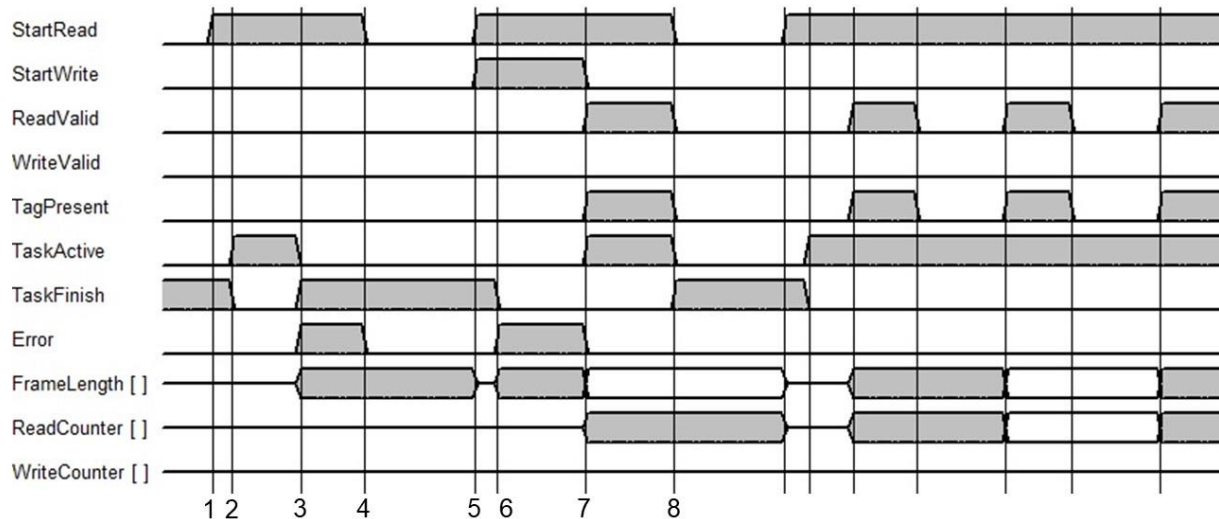
StartRead = True
 ReadValid = True
 TagPresent = True
 TaskActive = True
 TaskFinish = False
 Error = True
 FrameLength = 23
 RSSI = 100
 TransmissionPower = 100
 ReadCounter = 2

IUT-F191_EasyMode_Basic_UserData

Name	Dat...	St...	Monit...
Static			
IUT-F191-IO-V1	*IUT...		
ReadData	Arra...		
Time_Read	DTL#	DTL#	DTL#2...
WriteData	Arra...		
Time_Write	DTL#	DTL#	DTL#2...
ErrorData	Arra...		
ErrorData[0]	Byte	16#C	16#0A
ErrorData[1]	Byte	16#C	16#6D
ErrorData[2]	Byte	16#C	16#75
ErrorData[3]	Byte	16#C	16#6C
ErrorData[4]	Byte	16#C	16#74
ErrorData[5]	Byte	16#C	16#69
ErrorData[6]	Byte	16#C	16#70
ErrorData[7]	Byte	16#C	16#6C
ErrorData[8]	Byte	16#C	16#65
ErrorData[9]	Byte	16#C	16#20
ErrorData[10]	Byte	16#C	16#74
ErrorData[11]	Byte	16#C	16#61
ErrorData[12]	Byte	16#C	16#67
ErrorData[13]	Byte	16#C	16#73
ErrorData[14]	Byte	16#C	16#20
ErrorData[15]	Byte	16#C	16#69
ErrorData[16]	Byte	16#C	16#6E
ErrorData[17]	Byte	16#C	16#20
ErrorData[18]	Byte	16#C	16#66
ErrorData[19]	Byte	16#C	16#69
ErrorData[20]	Byte	16#C	16#65
ErrorData[21]	Byte	16#C	16#6C
ErrorData[22]	Byte	16#C	16#64
ErrorData[23]	Byte	16#C	16#00

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		48 of 115

Flowchart behavior RFID station in error state:



Point in Time	Meaning
1	Read task is started StartRead := True;
2	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; Error = False; FrameLength = 0; ReadCounter = 0;
3	Data carrier A (no user memory or user memory too small) enters detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; Error = True; FrameLength = 16; ReadCounter = 0;
4	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; Error = False; FrameLength = 16; ReadCounter = 0;
5	Read and write task started simultaneously StartRead := True; StartWrite := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; Error = False; FrameLength = 0; ReadCounter := 0;
6	Read and write task must not be active at the same time StartRead := True; StartWrite := True; ReadValid = True; TagPresent = False; TaskActive = False; TaskFinish = False; Error = True; FrameLength = 19; ReadCounter = 0;
7	Trigger on write task is reset; data carrier in the detection zone StartRead := True; StartWrite := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; Error = False; FrameLength = 16; ReadCounter = 1;
8	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 16; ReadCounter = 1;

5.9 Example: Read User Memory (Memory Bank 11) with Autostart function

In the delivery state of the IUT-F191-IO-V1, the Autostart function is activated and the first 8 bytes of memory bank 11 (user memory) are read automatically starting from start address 0. A start of the read task by the process output data is not necessary. In the delivery state, the Long Form data format is activated, i.e. memory bank 01 (UII/EPC) and additional length information is also transferred.

Parameter 65 (16#41) „Read Task“ → Setting read access to user data (user memory)

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00 80

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#80 = on

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		49 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

00

Hex

Index 1 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state: Read task was started by RFID station

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	40	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 40 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		50 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Address	Displ...	Monitor...	Modify...
Static				
IUT-F191-IO-V1	*IUT...			
ReadData	Arra...			
ReadData[0]	Byte	16#C	16#00	
ReadData[1]	Byte	16#C	16#0E	
ReadData[2]	Byte	16#C	16#34	
ReadData[3]	Byte	16#C	16#00	
ReadData[4]	Byte	16#C	16#30	
ReadData[5]	Byte	16#C	16#14	
ReadData[6]	Byte	16#C	16#F7	
ReadData[7]	Byte	16#C	16#33	
ReadData[8]	Byte	16#C	16#7C	
ReadData[9]	Byte	16#C	16#00	
ReadData[10]	Byte	16#C	16#1F	
ReadData[11]	Byte	16#C	16#00	
ReadData[12]	Byte	16#C	16#00	
ReadData[13]	Byte	16#C	16#00	
ReadData[14]	Byte	16#C	16#74	
ReadData[15]	Byte	16#C	16#83	
ReadData[16]	Byte	16#C	16#00	
ReadData[17]	Byte	16#C	16#08	
ReadData[18]	Byte	16#C	16#01	
ReadData[19]	Byte	16#C	16#02	
ReadData[20]	Byte	16#C	16#03	
ReadData[21]	Byte	16#C	16#04	
ReadData[22]	Byte	16#C	16#05	
ReadData[23]	Byte	16#C	16#06	
ReadData[24]	Byte	16#C	16#07	
ReadData[25]	Byte	16#C	16#08	
Name	Address	Displ...	Monitor...	Modify...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	26	
*RSSI	%MB6	DEC	40	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	1	
*WriteCounter	%MW4	DEC	0	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Long Form data format. This additionally contains the UII/EPC information as well as length information.

ReadData[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in user memory data
Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[18...25]: read User Memory data
Length depends on the "Number of Bytes" setting; read subarea of the user memory

Read task active; data carrier has left the detection zone

StartRead	= False
ReadValid	= False
TagPresent	= False
TaskActive	= True
TaskFinish	= False
FrameLength	= 26 (depending on the length of the previously read in data)
RSSI	= 40 (unchanged)
TransmissionPower	= 100 (unchanged)
ReadCounter	= 1

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for data transmission. Here, additional information such as the UII/EPC code and length specifications are also transmitted. This reduces the area available for the transmission of the user memory. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This eliminates the additional information and up to 28 bytes of user memory can be transferred.

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		51 of 115

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	3	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 8 (depending on the length of the read in data)
RSSI = 100 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 3

IUT-F191_EasyMode_Basic_UserData

Name	Dat...	St...	Monit...
Static			
IUT-F191-IO-V1	*IUT...		
ReadData	Arra...		
ReadData[0]	Byte	16#C	16#01
ReadData[1]	Byte	16#C	16#02
ReadData[2]	Byte	16#C	16#03
ReadData[3]	Byte	16#C	16#04
ReadData[4]	Byte	16#C	16#05
ReadData[5]	Byte	16#C	16#06
ReadData[6]	Byte	16#C	16#07
ReadData[7]	Byte	16#C	16#08
ReadData[8]	Byte	16#C	16#00

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Short Form data format. Thus the UII/EPC information as well as the length information are omitted.

ReadData[0...7]: read User Memory data
Length depends on the "Number of Bytes" setting; read partial area of the user memory

When using the "Short Form" data format, the UII/EPC information of the identified data carrier is not prepended to the read-in data. No length information is transmitted either.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	3	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 8 (depending on the length of the previously read in data)
RSSI = 100 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 3

5.10 Example: Read User Memory (Memory Bank 11)

In the delivery state of the IUT-F191-IO-V1, the Autostart function is activated and the first 8 bytes of memory bank 11 (user memory) are automatically read in starting from start address 0. In the delivery state, the Long Form data format is activated, i.e. memory bank 01 (UII/EPC) and other length information is also transferred. The Autostart function must be switched off via parameter 65 "Read Task". This means that the read task must be triggered by the "Start Read" bit on the function block.

Parameter 65 (16#41) „Read Task“ → Setting read access to user data (user memory)

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

00 08 00 00 00

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#00 = off

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		52 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

00

Hex

Index 1 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ...	Modify ...
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB6	DEC	0	
TransmissionPower	%MW7	DEC+/-	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	

Read task active; no data carrier in the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	26	
RSSI	%MB6	DEC	13	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	1	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the read in data)
RSSI = 13 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		53 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Address	Displ...	Monitor ...	Modify ...
Static				
IUT-F191-IO-V1				
ReadData				
ReadData[0]	Byte	16#C	16#00	
ReadData[1]	Byte	16#C	16#0E	
ReadData[2]	Byte	16#C	16#34	
ReadData[3]	Byte	16#C	16#00	
ReadData[4]	Byte	16#C	16#30	
ReadData[5]	Byte	16#C	16#14	
ReadData[6]	Byte	16#C	16#F7	
ReadData[7]	Byte	16#C	16#33	
ReadData[8]	Byte	16#C	16#7C	
ReadData[9]	Byte	16#C	16#00	
ReadData[10]	Byte	16#C	16#1F	
ReadData[11]	Byte	16#C	16#00	
ReadData[12]	Byte	16#C	16#00	
ReadData[13]	Byte	16#C	16#00	
ReadData[14]	Byte	16#C	16#74	
ReadData[15]	Byte	16#C	16#83	
ReadData[16]	Byte	16#C	16#00	
ReadData[17]	Byte	16#C	16#08	
ReadData[18]	Byte	16#C	16#01	
ReadData[19]	Byte	16#C	16#02	
ReadData[20]	Byte	16#C	16#03	
ReadData[21]	Byte	16#C	16#04	
ReadData[22]	Byte	16#C	16#05	
ReadData[23]	Byte	16#C	16#06	
ReadData[24]	Byte	16#C	16#07	
ReadData[25]	Byte	16#C	16#08	
Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	13	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	
Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB6	DEC	13	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Long Form data format. This additionally contains the UII/EPC information as well as length information.

ReadData[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in user memory data
Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[18...25]: read User Memory data
Length depends on the "Number of Bytes" setting; read subarea of the user memory

Read task active; data carrier has left the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 13 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

Read task finished
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 26 (depending on the length of the previously read in data)
RSSI = 13 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for data transmission. Here, additional information such as the UII/EPC code and length specifications are also

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		54 of 115

transmitted. This reduces the area available for the transmission of the user memory. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This eliminates the additional information and up to 28 bytes of user memory can be transferred.

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 80
 Hex

Index 1 = Input Representation → 16#80 = Short Form data format
 16#00 = Long Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	33	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in
 StartRead = False
 ReadValid = True
 TagPresent = True
 TaskActive = True
 TaskFinish = False
 FrameLength = 8 (depending on the length of the read in data)
 RSSI = 33 (depending on the signal quality)
 TransmissionPower = 100 (Transmit power level 100mW)
 ReadCounter = 1

IUT-F191_EasyMode_Basic_UserData

Name	Dat...	St...	Monit...
Static			
IUT-F191-IO-V1	"IUT...		
ReadData	Arra...		
ReadData[0]	Byte	16#C	16#01
ReadData[1]	Byte	16#C	16#02
ReadData[2]	Byte	16#C	16#03
ReadData[3]	Byte	16#C	16#04
ReadData[4]	Byte	16#C	16#05
ReadData[5]	Byte	16#C	16#06
ReadData[6]	Byte	16#C	16#07
ReadData[7]	Byte	16#C	16#08
ReadData[8]	Byte	16#C	16#00

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Short Form data format. Thus the UII/EPC information as well as the length information are omitted.

ReadData[0...7]: read User Memory data
 Length depends on the "Number of Bytes" setting; read partial area of the user memory

When using the "Short Form" data format, the UII/EPC information of the identified data carrier is not prepended to the read-in data. No length information is transmitted either.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	33	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = True
 ReadValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 8 (depending on the length of the previously read in data)
 RSSI = 33 (unchanged)
 TransmissionPower = 100 (unchanged)
 ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		55 of 115

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	33	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task finished

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 8 (depending on the length of the Previously read in data)
RSSI = 33 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

5.11 Example: Write User Memory (Memory Bank 11)

The execution of a write task of the RFID station IUT-F191-IO-V1 is triggered via the "Start Write" bit at the function block. The Autostart function is not supported during a write process and must be switched off beforehand. The write process is set via parameter 66 "Write Task". In the delivery state, 8 bytes are written to the user memory (memory bank 11) of the data carrier starting from address 0. Simultaneously with the activation of the "Start Write" bit, the write data are to be transferred to the process output data. A maximum of 28 bytes of user memory can be written. If a write access to a data carrier is successful, the UID/EPC information of the programmed data carrier and an additional length specification are returned.

Parameter 66 (16#42) „Write Task“ → Setting write access to user data (user memory)

Index: 66 Subindex: 0
☒ Dec ☐ Hex
Read Write System Command ▼
00 08 00 00
Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
Read Write System Command ▼
00
Hex

Index 1 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	...	Displ...	Monit...	Modify ...
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[0]		Hex	16#11	16#11
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[1]		Hex	16#22	16#22
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[2]		Hex	16#33	16#33
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[3]		Hex	16#44	16#44
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[4]		Hex	16#55	16#55
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[5]		Hex	16#66	16#66
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[6]		Hex	16#77	16#77
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[7]		Hex	16#88	16#88
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[8]		Hex	16#00	16#00

Name	...	Displ...	Monit...	Modify ...
IUT-F191_EasyMode_Basic_UserData				
Static				
IUT-F191-IO-V1				
ReadData	Arra...			
Time_Read	DTL	DTL#	DTL#2	
WriteData	Arra...			
WriteData[0]	Byte	16#C	16#11	
WriteData[1]	Byte	16#C	16#22	
WriteData[2]	Byte	16#C	16#33	
WriteData[3]	Byte	16#C	16#44	
WriteData[4]	Byte	16#C	16#55	
WriteData[5]	Byte	16#C	16#66	
WriteData[6]	Byte	16#C	16#77	
WriteData[7]	Byte	16#C	16#88	
WriteData[8]	Byte	16#C	16#00	

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		56 of 115

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Write task active; no data carrier in the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
WriteCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier in the detection zone; data written

StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)
RSSI = 26 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 1

IUT-F191_EasyMode_Basic_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1	"IUT..."			
ReadData	Arra...			
Time_Read	DTL	DTL#	DTL#2...	
WriteData	Arra...			
Time_Write	DTL	DTL#	DTL#2...	
ErrorData	Arra...			
Time_Error	DTL	DTL#	DTL#1...	
EPC_WrittenTag	Arra...			
EPC_WrittenTag[0]	Byte	16#C	16#00	
EPC_WrittenTag[1]	Byte	16#C	16#0E	
EPC_WrittenTag[2]	Byte	16#C	16#34	
EPC_WrittenTag[3]	Byte	16#C	16#00	
EPC_WrittenTag[4]	Byte	16#C	16#30	
EPC_WrittenTag[5]	Byte	16#C	16#14	
EPC_WrittenTag[6]	Byte	16#C	16#F7	
EPC_WrittenTag[7]	Byte	16#C	16#33	
EPC_WrittenTag[8]	Byte	16#C	16#7C	
EPC_WrittenTag[9]	Byte	16#C	16#00	
EPC_WrittenTag[10]	Byte	16#C	16#1F	
EPC_WrittenTag[11]	Byte	16#C	16#00	
EPC_WrittenTag[12]	Byte	16#C	16#00	
EPC_WrittenTag[13]	Byte	16#C	16#00	
EPC_WrittenTag[14]	Byte	16#C	16#74	
EPC_WrittenTag[15]	Byte	16#C	16#83	
EPC_WrittenTag[16]	Byte	16#C	16#00	

UII/EPC information of the successfully described data carrier within the data block "IUT-F191_EasyMode_Basic_UserData" in the structure "EPC_WrittenTag":

Long Form data format is activated. This returns the UII/EPC information as well as a length information of the programmed data carrier

WrittenTag[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

WrittenTag[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

WrittenTag[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		57 of 115

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier has left the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Read task finished:

StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 16 (depending on the length of the last UII/EPC information)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for the transmission of the data. This means that the UII/EPC information of the programmed data carrier as well as length information is returned in the event of a successful write access to a data carrier. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This means that the length information is omitted from the response and only the UII/EPC information is returned.

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier in the detection zone; data written

StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the UII/EPC information)
RSSI = 20 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		58 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1		*IUT...		
ReadData	Arra...			
Time_Read	DTL	DTL#	DTL# 2...	
WriteData	Arra...			
Time_Write	DTL	DTL#	DTL# 2...	
ErrorData	Arra...			
Time_Error	DTL	DTL#	DTL# 1...	
EPC_WrittenTag	Arra...			
EPC_WrittenTag[0]	Byte	16#C	16#34	
EPC_WrittenTag[1]	Byte	16#C	16#00	
EPC_WrittenTag[2]	Byte	16#C	16#30	
EPC_WrittenTag[3]	Byte	16#C	16#14	
EPC_WrittenTag[4]	Byte	16#C	16#F7	
EPC_WrittenTag[5]	Byte	16#C	16#33	
EPC_WrittenTag[6]	Byte	16#C	16#7C	
EPC_WrittenTag[7]	Byte	16#C	16#00	
EPC_WrittenTag[8]	Byte	16#C	16#1F	
EPC_WrittenTag[9]	Byte	16#C	16#00	
EPC_WrittenTag[10]	Byte	16#C	16#00	
EPC_WrittenTag[11]	Byte	16#C	16#00	
EPC_WrittenTag[12]	Byte	16#C	16#74	
EPC_WrittenTag[13]	Byte	16#C	16#83	
EPC_WrittenTag[14]	Byte	16#C	16#00	

UII/EPC information of the successfully programmed data carrier within the data block "IUT-F191_EasyMode_Basic_UserData" in the structure "EPC_WrittenTag":

Short Form data format is activated. This means that the UII/EPC information of the programmed tag is also transferred. The length information is omitted.

WrittenTag[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code.

WrittenTag[2...13]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	14	
*RSSI	%MB6	DEC	20	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	0	
*WriteCounter	%MW4	DEC	1	

Write task active; data carrier has left the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the UII/EPC information)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
*TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	14	
*RSSI	%MB6	DEC	20	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	0	
*WriteCounter	%MW4	DEC	1	

Write task finished:

StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 14 (depending on the length of the last UII/EPC information)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

5.12 Example: Read UII/EPC (Memory Bank 01) with Autostart function

To access the UII/EPC area (memory bank 01), the delivery status of the IUT-F191-IO-V1 must be changed. For this purpose, the memory area within parameter 65 "Read Task" must be changed. A start of the read task by the process output data is not necessary. In the delivery state, the long form data format is activated, i.e. in addition to the UII/EPC information (memory bank 01), length information is also transferred.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			59 of 115

Parameter 65 (16#41) „Read Task“ → Setting read access to UII/EPC (memory bank 01)

Index: 65 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 40 08 00 00 80
 Hex

Index 1 = MemoryArea → 16#40 = UII/EPC
 Index 2 = Number Of Bytes → not relevant
 Index 3 = StartAddress → not relevant
 Index 4 = Autostart → 16#80 = on

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 00
 Hex

Index 1 = Input Representation → 16#00 = Long Form data format
 16#80 = Short Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	0	
*RSSI	%MB6	DEC	0	
*TransmissionPower	%MW7	DEC+/-	0	
*ReadCounter	%MW2	DEC	0	
*WriteCounter	%MW4	DEC	0	

Initial state: Read task was started by RFID station

StartRead = False
 ReadValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	16	
*RSSI	%MB6	DEC	20	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	1	
*WriteCounter	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = False
 ReadValid = True
 TagPresent = True
 TaskActive = True
 TaskFinish = False
 FrameLength = 16 (depending on the length of the read in data)
 RSSI = 20 (depending on the signal quality)
 TransmissionPower = 100 (Transmit power level 100mW)
 ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		60 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1	"IUT...			
ReadData	Arra...			
ReadData[0]	Byte	16#C	16#00	
ReadData[1]	Byte	16#C	16#0E	
ReadData[2]	Byte	16#C	16#34	
ReadData[3]	Byte	16#C	16#00	
ReadData[4]	Byte	16#C	16#30	
ReadData[5]	Byte	16#C	16#14	
ReadData[6]	Byte	16#C	16#F7	
ReadData[7]	Byte	16#C	16#33	
ReadData[8]	Byte	16#C	16#7C	
ReadData[9]	Byte	16#C	16#00	
ReadData[10]	Byte	16#C	16#1F	
ReadData[11]	Byte	16#C	16#00	
ReadData[12]	Byte	16#C	16#00	
ReadData[13]	Byte	16#C	16#00	
ReadData[14]	Byte	16#C	16#74	
ReadData[15]	Byte	16#C	16#83	
ReadData[16]	Byte	16#C	16#00	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Long Form data format. This contains beside the UII/EPC information an additional length information.

ReadData[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the previously read in data)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for data transmission. In addition to the UII/EPC information, an additional length specification is also transmitted. Parameter 67 "Input Representation" can be used to change the data format to short form. This eliminates the transmission of the length information.

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		61 of 115

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	6	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the read in data)
RSSI = 20 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 6

IUT-F191_EasyMode_Basic_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1	"IUT...			
ReadData	Arra...			
ReadData[0]	Byte	16#C	16#34	
ReadData[1]	Byte	16#C	16#00	
ReadData[2]	Byte	16#C	16#30	
ReadData[3]	Byte	16#C	16#14	
ReadData[4]	Byte	16#C	16#F7	
ReadData[5]	Byte	16#C	16#33	
ReadData[6]	Byte	16#C	16#7C	
ReadData[7]	Byte	16#C	16#00	
ReadData[8]	Byte	16#C	16#1F	
ReadData[9]	Byte	16#C	16#00	
ReadData[10]	Byte	16#C	16#00	
ReadData[11]	Byte	16#C	16#00	
ReadData[12]	Byte	16#C	16#74	
ReadData[13]	Byte	16#C	16#83	
ReadData[14]	Byte	16#C	16#00	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Short Form data format. This eliminates the additional length specification and only the UII/EPC information is transferred.

ReadData[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12 byte long UII/EPC code

ReadData[2...13]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	6	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the previously read in data)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 6

5.13 Example: Read UII/EPC (Memory Bank 01)

In the delivery state of the IUT-F191-IO-V1, the Autostart function is activated and the first 8 bytes of memory bank 11 (user memory) are read in automatically starting from start address 0. In the delivery state, the Long Form data format is activated, i.e. memory bank 01 (UII/EPC) and length information are also transferred. The Autostart function must be switched off via parameter 65 "Read Task". This means that the read task must be triggered by the "Start Read" bit on the function block. In addition, the memory area within parameter 65 "Read Task" must be changed to the UII/EPC area.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		62 of 115

Parameter 65 (16#41) „Read Task“ → Setting read access to the UII/EPC code

Index: 65 Subindex: 0
☒ Dec ☐ Hex
Read Write System Command ▼
40 08 00 00 00
Hex

Index 1 = MemoryArea → 16#40 = UII/EPC
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 0 = off

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
Read Write System Command ▼
00
Hex

Index 1 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	0	
*RSSI	%MB6	DEC	0	
*TransmissionPower	%MW7	DEC+/-	0	
*ReadCounter	%MW2	DEC	0	
*WriteCounter	%MW4	DEC	0	

Read task active; no data carrier in the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	16	
*RSSI	%MB6	DEC	20	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	1	
*WriteCounter	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the read in data)
RSSI = 20 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		63 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Dat..	Star..	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
ReadData[0]	Byte	16#0	16#00	
ReadData[1]	Byte	16#0	16#0E	
ReadData[2]	Byte	16#0	16#34	
ReadData[3]	Byte	16#0	16#00	
ReadData[4]	Byte	16#0	16#30	
ReadData[5]	Byte	16#0	16#14	
ReadData[6]	Byte	16#0	16#F7	
ReadData[7]	Byte	16#0	16#33	
ReadData[8]	Byte	16#0	16#7C	
ReadData[9]	Byte	16#0	16#00	
ReadData[10]	Byte	16#0	16#1F	
ReadData[11]	Byte	16#0	16#00	
ReadData[12]	Byte	16#0	16#00	
ReadData[13]	Byte	16#0	16#00	
ReadData[14]	Byte	16#0	16#74	
ReadData[15]	Byte	16#0	16#83	
ReadData[16]	Byte	16#0	16#00	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Long Form data format. This contains beside the UII/EPC information an additional length information.

ReadData[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone
StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the previously read in data)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task finished
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 16 (depending on the length of the previously read in data)
RSSI = 20 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for data transmission. In addition to the UII/EPC information, an additional length specification is also transmitted. Parameter 67 "Input Representation" can be used to change the data format to short form. This eliminates the transmission of the length information.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		64 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 =
Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or
more data carriers
Short Form → Identification of only one
data carrier

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in
StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the read
in data)
RSSI = 20 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

IUT-F191_EasyMode_Basic_UserData

Name	Dat..	Star..	Monit...
Static			
IUT-F191-IO-V1			
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#34
ReadData[1]	Byte	16#0	16#00
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#14
ReadData[4]	Byte	16#0	16#F7
ReadData[5]	Byte	16#0	16#33
ReadData[6]	Byte	16#0	16#7C
ReadData[7]	Byte	16#0	16#00
ReadData[8]	Byte	16#0	16#1F
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#00
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#74
ReadData[13]	Byte	16#0	16#83
ReadData[14]	Byte	16#0	16#00

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Short Form data format. This eliminates the additional length specification and only the UII/EPC information is transferred.

ReadData[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12 byte long UII/EPC code

ReadData[2...13]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone
StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the
previously read in data)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		65 of 115

Name	Address	Displ...	Monitor ...	Modify ...	
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE	Read task finished
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE		StartRead = False
					ReadValid = False
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE		TagPresent = False
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE		TaskActive = False
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE		TaskFinish = True
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE		FrameLength = 14 (depending on the length of the previously read in data)
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE		RSSI = 20 (unchanged)
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE		TransmissionPower = 100 (Transmit power level 100mW)
"FrameLength"	%MB1	DEC	14		ReadCounter = 1
"RSSI"	%MB6	DEC	20		
"TransmissionPower"	%MW7	DEC+/-	100		
"ReadCounter"	%MW2	DEC	1		
"WriteCounter"	%MW4	DEC	0		

5.14 Example: Write UII/EPC (Memory Bank 01)

The execution of a write task of the RFID station IUT-F191-IO-V1 is controlled via the "Start Write" bit at the function block. The Autostart function is not supported during a write task and must be switched off beforehand. The write task is set via parameter 66 "Write Task". In the delivery state, 8 bytes are written to the user memory (memory bank 11) of the data carrier starting from address 0. Simultaneously with the activation of the "Start Write" bit, the write data are to be transferred to the process output data.

Two variants are available for write access to the UII/EPC (memory bank 01). In the first variant, the UII/EPC is transferred together with the PC word via the process data field transferred. This allows the user to define a value for the PC word that he configures himself. In the second variant, the required PC word is not transmitted together with the process data, but is calculated and programmed automatically by the IUT-F191-IO-V1 RFID station.

In contrast to the other read or write requests, the write access to the UII/EPC (memory bank 01) is only executed once. This automatically terminates the write access regardless of whether the write access was successful or not and regardless of the signal state of the "Start Write" bit on the function block. The data carrier must therefore be in the detection zone of the IUT-F191-IO-V1 RFID station at the time the write process is started.

During write access to the UII/EPC (memory bank 01), only one data carrier may be located in the detection zone at any one time. The programming of several data carriers with an identical UII/EPC code is not permitted.

The activated write process must be actively terminated by the user, regardless of whether the write access was successful or not. It is recommended to monitor the duration of the write process via an additional timer. An unsuccessful write access can thus be terminated after the timer has expired.

Write UII/EPC (memory bank 01) including PC word

Parameter 66 (16#42) „Write Task“ → Setting write access to UII/EPC including PC word

Parameter Read/Write

Index: 66 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

20 0e 00 00

Hex

Index 1 = MemoryArea → 16#20 = UII/EPC incl. PC-Wort
Index 2 = Number Of Bytes → 16#0E = 14 Bytes = 2 Byte PC + 12 Byte UII/EPC
Index 3 = StartAddress → not relevant

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		66 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command v
 Parameter Read/Write
 00
 Hex

Index 1 = Input Representation → 16#00 =
 Long Form data format
 16#80 = Short Form data format
 Long Form → Identification of one or
 more data carriers
 Short Form → Identification of only one
 data carrier

Name	...	Displ...	Monit...	Modify ...
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[0]		Hex	16#30	16#30
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[1]		Hex	16#00	16#00
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[2]		Hex	16#11	16#11
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[3]		Hex	16#22	16#22
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[4]		Hex	16#33	16#33
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[5]		Hex	16#44	16#44
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[6]		Hex	16#55	16#55
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[7]		Hex	16#66	16#66
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[8]		Hex	16#77	16#77
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[9]		Hex	16#88	16#88
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[10]		Hex	16#99	16#99
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[11]		Hex	16#AA	16#AA
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[12]		Hex	16#BB	16#BB
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[13]		Hex	16#CC	16#CC

Name	Da...	St...	Monit...
Static			
IUT-F191-IO-V1			
ReadData	Arr...		
Time_Read	DTL#	DTL#	DTL#1...
WriteData	Arr...		
WriteData[0]	Byte	16#	16#30
WriteData[1]	Byte	16#	16#00
WriteData[2]	Byte	16#	16#11
WriteData[3]	Byte	16#	16#22
WriteData[4]	Byte	16#	16#33
WriteData[5]	Byte	16#	16#44
WriteData[6]	Byte	16#	16#55
WriteData[7]	Byte	16#	16#66
WriteData[8]	Byte	16#	16#77
WriteData[9]	Byte	16#	16#88
WriteData[10]	Byte	16#	16#99
WriteData[11]	Byte	16#	16#AA
WriteData[12]	Byte	16#	16#BB
WriteData[13]	Byte	16#	16#CC
WriteData[14]	Byte	16#	16#00

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	93	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier in the detection zone; data written
 StartWrite = True
 WriteValid = True
 TagPresent = True
 TaskActive = True
 TaskFinish = False
 FrameLength = 16 (depending on the length of the
 UII/EPC information)
 RSSI = 93 (depending on the signal quality)
 TransmissionPower = 100 (Transmit power level 100mW)
 WriteCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		67 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Da...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
Time_Read	DTL	DTL#	DTL# 1 ...	
WriteData	Arr...			
Time_Write	DTL	DTL#	DTL# 2 ...	
ErrorData	Arr...			
Time_Error	DTL	DTL#	DTL# 2 ...	
EPC_WrittenTag	Arr...			
EPC_WrittenTag[0]	Byte	16#	16#00	
EPC_WrittenTag[1]	Byte	16#	16#0E	
EPC_WrittenTag[2]	Byte	16#	16#30	
EPC_WrittenTag[3]	Byte	16#	16#00	
EPC_WrittenTag[4]	Byte	16#	16#11	
EPC_WrittenTag[5]	Byte	16#	16#22	
EPC_WrittenTag[6]	Byte	16#	16#33	
EPC_WrittenTag[7]	Byte	16#	16#44	
EPC_WrittenTag[8]	Byte	16#	16#55	
EPC_WrittenTag[9]	Byte	16#	16#66	
EPC_WrittenTag[10]	Byte	16#	16#77	
EPC_WrittenTag[11]	Byte	16#	16#88	
EPC_WrittenTag[12]	Byte	16#	16#99	
EPC_WrittenTag[13]	Byte	16#	16#AA	
EPC_WrittenTag[14]	Byte	16#	16#BB	
EPC_WrittenTag[15]	Byte	16#	16#CC	
EPC_WrittenTag[16]	Byte	16#	16#00	

UII/EPC information of the successfully described data carrier within the data block "IUT-F191_EasyMode _Basic_UserData" in the structure "EPC_WrittenTag":

Long Form data format is activated. This returns the UII/EPC information as well as a length information of the programmed data carrier

WrittenTag[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

WrittenTag[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

WrittenTag[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

Name	Address	Displ...	Monitor ..	Modify ..
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
*TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	16	
*RSSI	%MB6	DEC	93	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	0	
*WriteCounter	%MW4	DEC	1	

Write task finished:

StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 16 (depending on the length of the last UII/EPC information)
RSSI = 93 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
*StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	0	
*RSSI	%MB6	DEC	0	
*TransmissionPower	%MW7	DEC+/-	0	
*ReadCounter	%MW2	DEC	0	
*WriteCounter	%MW4	DEC	0	

Write task active; no data carrier in the detection zone or no data carrier could be programmed.

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
WriteCounter = 0
This state must be terminated by the user after a defined time interval by resetting StartWrite.

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for the transmission of the data. This means that the UII/EPC information of the programmed data carrier as well as length information is returned in the event of a successful write access to a data carrier. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This means that the length information is omitted from the response and only the UII/EPC information is returned.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			68 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 =
Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or
more data carriers
Short Form → Identification of only one
data carrier

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier in the detection zone; data written
StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the
UII/EPC information)
RSSI = 100 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 1

IUT-F191_EasyMode_Basic_UserData

Name	Da...	St...	Monit...
Static			
IUT-F191-IO-V1			
ReadData	Arr...		
Time_Read	DTL	DTL#	DTL#1...
WriteData	Arr...		
Time_Write	DTL	DTL#	DTL#2...
ErrorData	Arr...		
Time_Error	DTL	DTL#	DTL#2...
EPC_WrittenTag	Arr...		
EPC_WrittenTag[0]	Byte	16#	16#30
EPC_WrittenTag[1]	Byte	16#	16#00
EPC_WrittenTag[2]	Byte	16#	16#11
EPC_WrittenTag[3]	Byte	16#	16#22
EPC_WrittenTag[4]	Byte	16#	16#33
EPC_WrittenTag[5]	Byte	16#	16#44
EPC_WrittenTag[6]	Byte	16#	16#55
EPC_WrittenTag[7]	Byte	16#	16#66
EPC_WrittenTag[8]	Byte	16#	16#77
EPC_WrittenTag[9]	Byte	16#	16#88
EPC_WrittenTag[10]	Byte	16#	16#99
EPC_WrittenTag[11]	Byte	16#	16#AA
EPC_WrittenTag[12]	Byte	16#	16#BB
EPC_WrittenTag[13]	Byte	16#	16#CC
EPC_WrittenTag[14]	Byte	16#	16#00

UII/EPC information of the successfully programmed data carrier
within the data block "IUT-F191_EasyMode _Basic_UserData" in the
structure "EPC_WrittenTag":

Short Form data format is activated. This means that the UII/EPC
information of the programmed data carrier is also transferred. The
length information is omitted.

WrittenTag[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g.
length) about the UII/EPC code; does not belong to the actual
UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte
UII/EPC code.

WrittenTag[2...13]: UII/EPC code
Length depends on the programming of the data carrier; length can
be changed by reprogramming; length always multiple of 2 bytes;
the UII/EPC code of all data carriers in the detection zone must be
unique

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		69 of 115

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task finished:

StartWrite = False
 WriteValid = False
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 FrameLength = 14 (depending on the length of the last UII/EPC information)
 RSSI = 100 (unchanged)
 TransmissionPower = 100 (unchanged)
 WriteCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Write task active; no data carrier in the detection zone or no data carrier could be programmed.

StartWrite = True
 WriteValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 WriteCounter = 0

This state must be terminated by the user after a defined time interval by resetting StartWrite.

Write UII/EPC (memory bank 01) exclusive PC word

Parameter 66 (16#42) „Write Task“ → Setting write access to EPC exclusive PC word

Index: 66 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

40 0c 00 00

Hex

Index 1 = MemoryArea → 16#40 = EPC excl. PC-Word
 Index 2 = Number Of Bytes → 16#0C = 12 Bytes = 12 Byte EPC
 Index 3 = StartAddress → not relevant

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 1 = Input Representation → 16#00 = Long Form data format
 16#80 = Short Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		70 of 115

Name	...	Displ...	Monit...	Modify ...
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[0]		Hex	16#01	16#01
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[1]		Hex	16#02	16#02
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[2]		Hex	16#03	16#03
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[3]		Hex	16#04	16#04
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[4]		Hex	16#05	16#05
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[5]		Hex	16#06	16#06
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[6]		Hex	16#07	16#07
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[7]		Hex	16#08	16#08
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[8]		Hex	16#09	16#09
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[9]		Hex	16#0A	16#0A
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[10]		Hex	16#0B	16#0B
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[11]		Hex	16#0C	16#0C
"IUT-F191_EasyMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[12]		Hex	16#00	16#00

Name	Da...	St...	Monit...
Static			
IUT-F191-IO-V1			
ReadData	Arr...		
Time_Read	DTL	DTL#	DTL#1...
WriteData	Arr...		
WriteData[0]	Byte	16#(	16#01
WriteData[1]	Byte	16#(	16#02
WriteData[2]	Byte	16#(	16#03
WriteData[3]	Byte	16#(	16#04
WriteData[4]	Byte	16#(	16#05
WriteData[5]	Byte	16#(	16#06
WriteData[6]	Byte	16#(	16#07
WriteData[7]	Byte	16#(	16#08
WriteData[8]	Byte	16#(	16#09
WriteData[9]	Byte	16#(	16#0A
WriteData[10]	Byte	16#(	16#0B
WriteData[11]	Byte	16#(	16#0C
WriteData[12]	Byte	16#(	16#00

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier in the detection zone; data written

StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 16 (depending on the length of the UII/EPC information)

RSSI = 100 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 1

Name	Da...	St...	Monit...
Static			
IUT-F191-IO-V1			
ReadData	Arr...		
Time_Read	DTL	DTL#	DTL#1...
WriteData	Arr...		
Time_Write	DTL	DTL#	DTL#2...
ErrorData	Arr...		
Time_Error	DTL	DTL#	DTL#2...
EPC_WrittenTag	Arr...		
EPC_WrittenTag[0]	Byte	16#(	16#00
EPC_WrittenTag[1]	Byte	16#(	16#0E
EPC_WrittenTag[2]	Byte	16#(	16#30
EPC_WrittenTag[3]	Byte	16#(	16#00
EPC_WrittenTag[4]	Byte	16#(	16#01
EPC_WrittenTag[5]	Byte	16#(	16#02
EPC_WrittenTag[6]	Byte	16#(	16#03
EPC_WrittenTag[7]	Byte	16#(	16#04
EPC_WrittenTag[8]	Byte	16#(	16#05
EPC_WrittenTag[9]	Byte	16#(	16#06
EPC_WrittenTag[10]	Byte	16#(	16#07
EPC_WrittenTag[11]	Byte	16#(	16#08
EPC_WrittenTag[12]	Byte	16#(	16#09
EPC_WrittenTag[13]	Byte	16#(	16#0A
EPC_WrittenTag[14]	Byte	16#(	16#0B
EPC_WrittenTag[15]	Byte	16#(	16#0C
EPC_WrittenTag[16]	Byte	16#(	16#00

UII/EPC information of the successfully programmed data carrier within the data block "IUT-F191_EasyMode_Basic_UserData" in the structure "EPC_WrittenTag":

Long Form data format is activated. This returns the UII/EPC information as well as a length information of the programmed data carrier

WrittenTag[0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

WrittenTag[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

WrittenTag[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		71 of 115

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	16	
RSSI	%MB6	DEC	100	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	1	

Write task finished:

StartWrite = False
 WriteValid = False
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 FrameLength = 16 (depending on the length of the last UII/EPC information)
 RSSI = 100 (unchanged)
 TransmissionPower = 100 (unchanged)
 WriteCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB6	DEC	0	
TransmissionPower	%MW7	DEC+/-	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	

Write task active; no data carrier in the detection zone or no data carrier could be programmed.

StartWrite = True
 WriteValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 WriteCounter = 0

This state must be terminated by the user after a defined time interval by resetting StartWrite.

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for the transmission of the data. This means that the UII/EPC information of the programmed data carrier as well as length information is returned in the event of a successful write access to a data carrier. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This means that the length information is omitted from the response and only the UII/EPC information is returned.

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 = Short Form data format
 16#00 = Long Form data format
 Long Form → Identification of one or more data carriers
 Short Form → Identification of only one data carrier

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		72 of 115

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task active; data carrier in the detection zone; data written

StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 14 (depending on the length of the UII/EPC information)
RSSI = 100 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
WriteCounter = 1

IUT-F191_EasyMode_Basic_UserData				
Name	Da...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
Time_Read	DTL	DTL#	DTL#1...	
WriteData	Arr...			
Time_Write	DTL	DTL#	DTL#2...	
ErrorData	Arr...			
Time_Error	DTL	DTL#	DTL#2...	
EPC_WrittenTag	Arr...			
EPC_WrittenTag[0]	Byte	16#(	16#30	
EPC_WrittenTag[1]	Byte	16#(	16#00	
EPC_WrittenTag[2]	Byte	16#(	16#01	
EPC_WrittenTag[3]	Byte	16#(	16#02	
EPC_WrittenTag[4]	Byte	16#(	16#03	
EPC_WrittenTag[5]	Byte	16#(	16#04	
EPC_WrittenTag[6]	Byte	16#(	16#05	
EPC_WrittenTag[7]	Byte	16#(	16#06	
EPC_WrittenTag[8]	Byte	16#(	16#07	
EPC_WrittenTag[9]	Byte	16#(	16#08	
EPC_WrittenTag[10]	Byte	16#(	16#09	
EPC_WrittenTag[11]	Byte	16#(	16#0A	
EPC_WrittenTag[12]	Byte	16#(	16#0B	
EPC_WrittenTag[13]	Byte	16#(	16#0C	
EPC_WrittenTag[14]	Byte	16#(	16#00	

UII/EPC information of the successfully programmed data carrier within the data block "IUT-F191_EasyMode _Basic_UserData" in the structure "EPC_WrittenTag":

Short Form data format is activated. This means that the UII/EPC information of the programmed data carrier is also transferred. The length information is omitted.

WrittenTag[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code.

WrittenTag[2...13]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	14	
"RSSI"	%MB6	DEC	100	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task finished:

StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 14 (depending on the length of the last UII/EPC information)
RSSI = 100 (unchanged)
TransmissionPower = 100 (unchanged)
WriteCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		73 of 115

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Write task active; no data carrier in the detection zone or no data carrier could be programmed.

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
WriteCounter = 0

This state must be terminated by the user after a defined time interval by resetting StartWrite.

Various additional information for the UII/EPC is stored within the PC word. For example, the PC word contains a length specification of the UII/EPC and information about whether the code was programmed according to the ISO standard (UII) or the GS1 standard (EPC). This results in different values for the PC word for UII/EPC codes of identical length.

Parameter "Number of bytes" for writing UII/EPC including PC word

Length UII or EPC Code	PC Word EPC	PC Word UII	Number Bytes	Output data including PC word for EPC code
2	16#0800	16#0900	4	16#0800_0102
4	16#1000	16#1100	6	16#1000_0102_0304
6	16#1800	16#1900	8	16#1800_0102_0304_0506
8	16#2000	16#2100	10	16#2000_0102_0304_0506_0708
10	16#2800	16#2900	12	16#2800_0102_0304_0506_0708_090A
12	16#3000	16#3100	14	16#3000_0102_0304_0506_0708_090A_0B0C
14	16#3800	16#3900	16	16#3800_0102_0304_0506_0708_090A_0B0C_0D0E
16	16#4000	16#4100	18	16#4000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00
18	16#4800	16#4900	20	16#4800_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102
20	16#5000	16#5100	22	16#5000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304
22	16#5800	16#5900	24	16#5800_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506
24	16#6000	16#6100	26	16#6000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708
26	16#6800	16#6900	28	16#6800_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708_090A

Parameter "Number of bytes" when writing UII/EPC without PC word

Length EPC Code	PC Word EPC	Number Bytes	Output data without PC word for EPC code
2	16#0800	2	16#0102
4	16#1000	4	16#0102_0304
6	16#1800	6	16#0102_0304_0506
8	16#2000	8	16#0102_0304_0506_0708
10	16#2800	10	16#0102_0304_0506_0708_090A
12	16#3000	12	16#0102_0304_0506_0708_090A_0B0C
14	16#3800	14	16#0102_0304_0506_0708_090A_0B0C_0D0E
16	16#4000	16	16#0102_0304_0506_0708_090A_0B0C_0D0E_0F00
18	16#4800	18	16#0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102
20	16#5000	20	16#0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304
22	16#5800	22	16#0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506
24	16#6000	24	16#0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			
				74 of 115

26	16#6800	26	16#0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708_090A
----	---------	----	---

5.15 Example: Read TID (Memory Bank 10) with Autostart function

To access the TID area (memory bank 10), the delivery status of the IUT-F191-IO-V1 must be changed. For this purpose, the memory area within parameter 65 "Read Task" must be changed.

Parameter 65 (16#41) „Read Task“ → Setting read access to the TID (memory bank 10)

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

80 08 00 00 80

Hex

Index 1 = MemoryArea → 16#80 = TID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 16#80 = on

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 1 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state: Read task was started by RFID station

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	30	
"RSSI"	%MB6	DEC	20	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 30 (depending on the length of the read in data)
RSSI = 20 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		75 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Da...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
ReadData[0]	Byte	16#0	16#00	
ReadData[1]	Byte	16#0	16#0E	
ReadData[2]	Byte	16#0	16#34	
ReadData[3]	Byte	16#0	16#00	
ReadData[4]	Byte	16#0	16#30	
ReadData[5]	Byte	16#0	16#14	
ReadData[6]	Byte	16#0	16#F7	
ReadData[7]	Byte	16#0	16#33	
ReadData[8]	Byte	16#0	16#7C	
ReadData[9]	Byte	16#0	16#00	
ReadData[10]	Byte	16#0	16#1F	
ReadData[11]	Byte	16#0	16#00	
ReadData[12]	Byte	16#0	16#00	
ReadData[13]	Byte	16#0	16#00	
ReadData[14]	Byte	16#0	16#74	
ReadData[15]	Byte	16#0	16#83	
ReadData[16]	Byte	16#0	16#00	
ReadData[17]	Byte	16#0	16#0C	
ReadData[18]	Byte	16#0	16#E2	
ReadData[19]	Byte	16#0	16#80	
ReadData[20]	Byte	16#0	16#11	
ReadData[21]	Byte	16#0	16#05	
ReadData[22]	Byte	16#0	16#20	
ReadData[23]	Byte	16#0	16#00	
ReadData[24]	Byte	16#0	16#5A	
ReadData[25]	Byte	16#0	16#5E	
ReadData[26]	Byte	16#0	16#F1	
ReadData[27]	Byte	16#0	16#A2	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Long Form data format. This additionally contains the UII/EPC information as well as length information.

ReadData[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in TID data
Length 2 bytes; 16#000C = 12 bytes

ReadData[18...25]: read-in TID data
Length depends on the length of the TID of the data carrier

In this example, the UII/EPC code has a length of 12 bytes and the length of the TID is also 12 bytes. When using the Long Form data format, this means that there is not enough space available to transmit the complete TID. If a data carrier uses a smaller UII/EPC code, the complete TID can be transmitted.

Name	Address	Displ...	Monitor ..	Modify ..
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	30	
RSSI	%MB6	DEC	20	
TransmissionPower	%MW7	DEC+/-	100	
ReadCounter	%MW2	DEC	1	
WriteCounter	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 30 (depending on the length of the previously read in data)
RSSI = 20 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for data transmission. Here, additional information such as the UII/EPC code and length information is also transmitted. This reduces the area available for the transmission of the TID. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This eliminates the additional information and the complete TID can be transmitted.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		76 of 115

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command

Parameter Read/Write

80

Hex

Index 1 = Input Representation → 16#80 =
Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or
more data carriers
Short Form → Identification of only one
data carrier

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	12	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	2	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in
StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 12 (depending on the length of the read
in data)
RSSI = 26 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 2

IUT-F191_EasyMode_Basic_UserData

Name	Da...	St...	Monit...
Static			
IUT-F191-IO-V1			
ReadData	Arr...		
ReadData[0]	Byte	16#C	16#E2
ReadData[1]	Byte	16#C	16#80
ReadData[2]	Byte	16#C	16#11
ReadData[3]	Byte	16#C	16#05
ReadData[4]	Byte	16#C	16#20
ReadData[5]	Byte	16#C	16#00
ReadData[6]	Byte	16#C	16#5A
ReadData[7]	Byte	16#C	16#5E
ReadData[8]	Byte	16#C	16#F1
ReadData[9]	Byte	16#C	16#A2
ReadData[10]	Byte	16#C	16#08
ReadData[11]	Byte	16#C	16#A6
ReadData[12]	Byte	16#C	16#00

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Short Form data format. Thus the
UII/EPC information as well as the length information are omitted.

ReadData[0...11]: read-in TID data
Length dependent on the length of the TID of the data carrier

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	12	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	2	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 12 (depending on the length of the
previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 2

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		77 of 115

5.16 Example: Read TID (Memory Bank 10)

In the delivery state of the IUT-F191-IO-V1, the Autostart function is activated and the first 8 bytes of memory bank 11 (user memory) are read in automatically starting from start address 0. A start of the read task by the process output data is not necessary. In the delivery state, the Long Form data format is activated, i.e. memory bank 01 (UII/EPC) and length information are also transferred. The Autostart function must be switched off via parameter 65 "Read Task". This means that the read task must be triggered by the "Start Read" bit on the function block. In addition, the memory area within parameter 65 "Read Task" must be changed to the TID area (memory bank 10).

Parameter 65 (16#41) „Read Task“ → Setting read access to the TID

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

80 08 00 00 00

Hex

Index 1 = MemoryArea → 16#80 = TID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 16#00 = off

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 1 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"TransmissionPower"	%MW7	DEC+/-	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Read task active; no data carrier in the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
TransmissionPower = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	30	
"RSSI"	%MB6	DEC	26	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 30 (depending on the length of the read in data)
RSSI = 26 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		78 of 115

IUT-F191_EasyMode_Basic_UserData				
Name	Da...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
ReadData[0]	Byte	16#0	16#00	
ReadData[1]	Byte	16#0	16#0E	
ReadData[2]	Byte	16#0	16#34	
ReadData[3]	Byte	16#0	16#00	
ReadData[4]	Byte	16#0	16#30	
ReadData[5]	Byte	16#0	16#14	
ReadData[6]	Byte	16#0	16#F7	
ReadData[7]	Byte	16#0	16#33	
ReadData[8]	Byte	16#0	16#7C	
ReadData[9]	Byte	16#0	16#00	
ReadData[10]	Byte	16#0	16#1F	
ReadData[11]	Byte	16#0	16#00	
ReadData[12]	Byte	16#0	16#00	
ReadData[13]	Byte	16#0	16#00	
ReadData[14]	Byte	16#0	16#74	
ReadData[15]	Byte	16#0	16#83	
ReadData[16]	Byte	16#0	16#00	
ReadData[17]	Byte	16#0	16#0C	
ReadData[18]	Byte	16#0	16#E2	
ReadData[19]	Byte	16#0	16#80	
ReadData[20]	Byte	16#0	16#11	
ReadData[21]	Byte	16#0	16#05	
ReadData[22]	Byte	16#0	16#20	
ReadData[23]	Byte	16#0	16#00	
ReadData[24]	Byte	16#0	16#5A	
ReadData[25]	Byte	16#0	16#5E	
ReadData[26]	Byte	16#0	16#F1	
ReadData[27]	Byte	16#0	16#A2	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Long Form data format. This additionally contains the UII/EPC information as well as length information.

ReadData[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in TID data
Length 2 bytes; 16#000C = 12 bytes

ReadData[18...25]: read-in TID data
Length depends on the length of the TID of the data carrier

In this example, the UII/EPC code has a length of 12 bytes and the length of the TID is also 12 bytes. When using the Long Form data format, this means that there is not enough space available to transmit the complete TID. If a data carrier uses a smaller UII/EPC code, the complete TID can be transmitted.

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	30	
*RSSI	%MB6	DEC	26	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	1	
*WriteCounter	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 30 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ...	Modify ...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
*TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	30	
*RSSI	%MB6	DEC	26	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	1	
*WriteCounter	%MW4	DEC	0	

Read task finished:
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 30 (depending on the length of the previously read in data)
RSSI = 26 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		79 of 115

In the delivery state of the RFID station IUT-F191-IO-V1, the Long Form data format is used for data transmission. Here, additional information such as the UII/EPC code and length information is also transmitted. This reduces the area available for the transmission of the TID. Parameter 67 "Input Representation" can be used to change the data format to Short Form. This eliminates the additional information and the complete TID can be transmitted.

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

80

Hex

Index 1 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Name	Address	Displ...	Monitor ..	Modify ..
*StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	12	
*RSSI	%MB6	DEC	13	
*TransmissionPower	%MW7	DEC+/-	100	
*ReadCounter	%MW2	DEC	1	
*WriteCounter	%MW4	DEC	0	

Read task active; data carrier in detection zone and data read in
StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 12 (depending on the length of the read in data)
RSSI = 13 (depending on the signal quality)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

IUT-F191_EasyMode_Basic_UserData				
Name	Da...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
ReadData[0]	Byte	16#0	16#E2	
ReadData[1]	Byte	16#0	16#80	
ReadData[2]	Byte	16#0	16#11	
ReadData[3]	Byte	16#0	16#05	
ReadData[4]	Byte	16#0	16#20	
ReadData[5]	Byte	16#0	16#00	
ReadData[6]	Byte	16#0	16#5A	
ReadData[7]	Byte	16#0	16#5E	
ReadData[8]	Byte	16#0	16#F1	
ReadData[9]	Byte	16#0	16#A2	
ReadData[10]	Byte	16#0	16#08	
ReadData[11]	Byte	16#0	16#A6	
ReadData[12]	Byte	16#0	16#00	

Read data in DB "IUT-F191_EasyMode_Basic_UserData.IUT-F191-IO-V1.ReadData".

The data is transferred via the Short Form data format. Thus the UII/EPC information as well as the length information are omitted.

ReadData[0...11]: read-in TID data
Length dependent on the length of the TID of the data carrier

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		80 of 115

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	12	
"RSSI"	%MB6	DEC	13	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 12 (depending on the length of the previously read in data)
RSSI = 13 (unchanged)
TransmissionPower = 100 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	12	
"RSSI"	%MB6	DEC	13	
"TransmissionPower"	%MW7	DEC+/-	100	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task finished:

StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 12 (depending on the length of the previously read in data)
RSSI = 13 (unchanged)
TransmissionPower = 100 (Transmit power level 100mW)
ReadCounter = 1

6. Function block FB19102 „IUT-F191_EasyMode_Basic_1Tag“

Function description "IUT-F191_EasyMode_Basic_1Tag":

This function block can be used to start a read or write task. The task is automatically terminated as soon as exactly one data carrier has been read or written. If no data carrier is detected within a configurable time, the active read or write task is automatically terminated by the function block after this time has elapsed. This function block makes it possible to scan an area for a defined period of time until a tag is identified.

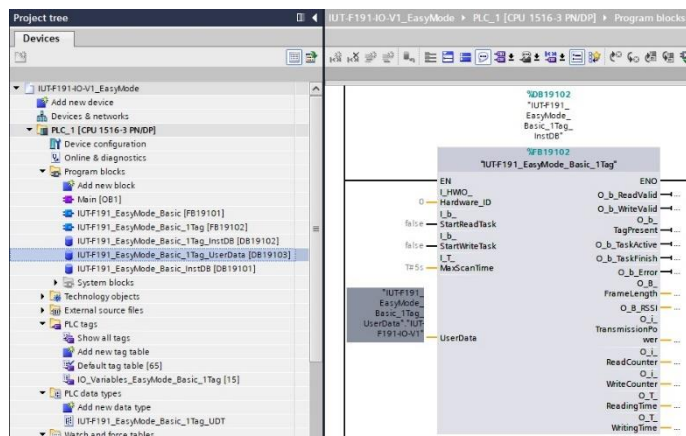
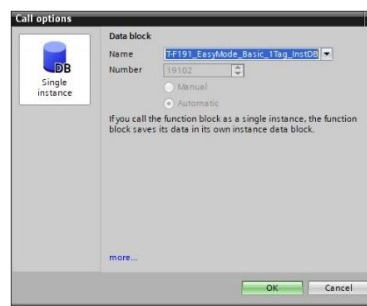
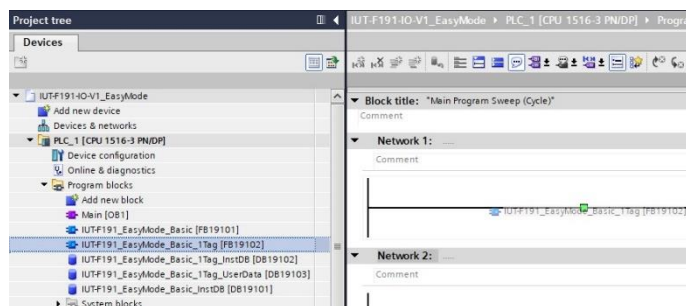
In conjunction with the ramp function (parameter PT), the transmit power can be increased continuously until a data carrier is identified. As a result, a data carrier is read or written with the minimum required transmit power. The number of access attempts for each set power level can be increased via the TA parameter.

Within the block "IUT-F191_EasyMode_Basic_1Tag" the function block "IUT-F191_EasyMode_Basic" with associated instance data block "IUT-F191_EasyMode_Basic_InstDB" is called. With the start of a new write or read job, all internal data and the outputs are reset. The read and write data are inside the data block "IUT-F191_EasyMode_Basic_1Tag_UserData".

Implementation of function block "IUT-F191_EasyMode_Basic_1Tag":

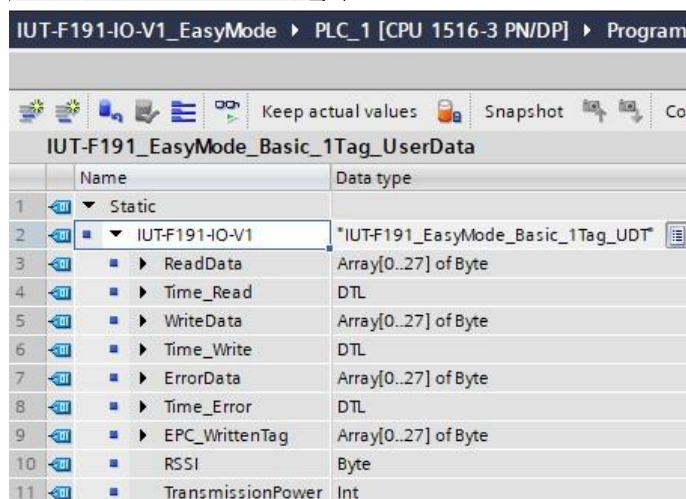
Drag function block "IUT-F191_EasyMode_Basic_1Tag" (FB19102) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F191_EasyMode_Basic_1Tag_InstDB" (DB19102) which can be used as instance data block. However, the instance data block can also be regenerated.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode Siemens TIA-Portal ICE1 IO-Link Master		KReinhardt	UHF RFID
Mannheim				81 of 115



The read/write data of the function block are located in a separate data block. This is parameterized at the "UserData" input. The "IUT-F191_EasyMode_Basic_1Tag_UserData" data block is contained in the library and can be used for this purpose.

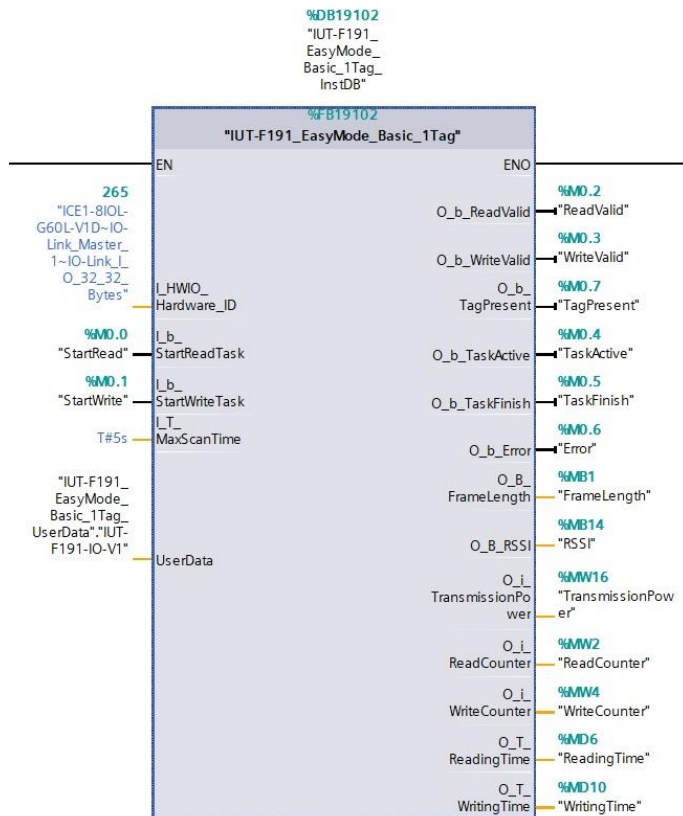
The data block can be generated by the user. The internal data structure is generated from the library via the data type "IUT-F191_EasyMode_Basic_1Tag_UDT".



The data block "IUT-F191_EasyMode_Basic_1Tag_UserData" consists of the structure "IUT-F191-IO-V1". This is divided into the following fields:

ReadData → Read data from data carrier
Time_Read → Time of read access
WriteData → Write data for data carrier
Time_Write → Time of write access
ErrorData → Error information
Time_Error → Time of error condition
EPC_WrittenTag → UII/EPC information of a successfully written data carrier
RSSI → RSSI value for data carrier access
TransmissionPower → Transmission power in mW with which the data carrier was accessed

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			82 of 115



Complete wiring of the "IUT-F191_EasyMode_Basic_1Tag" function block:

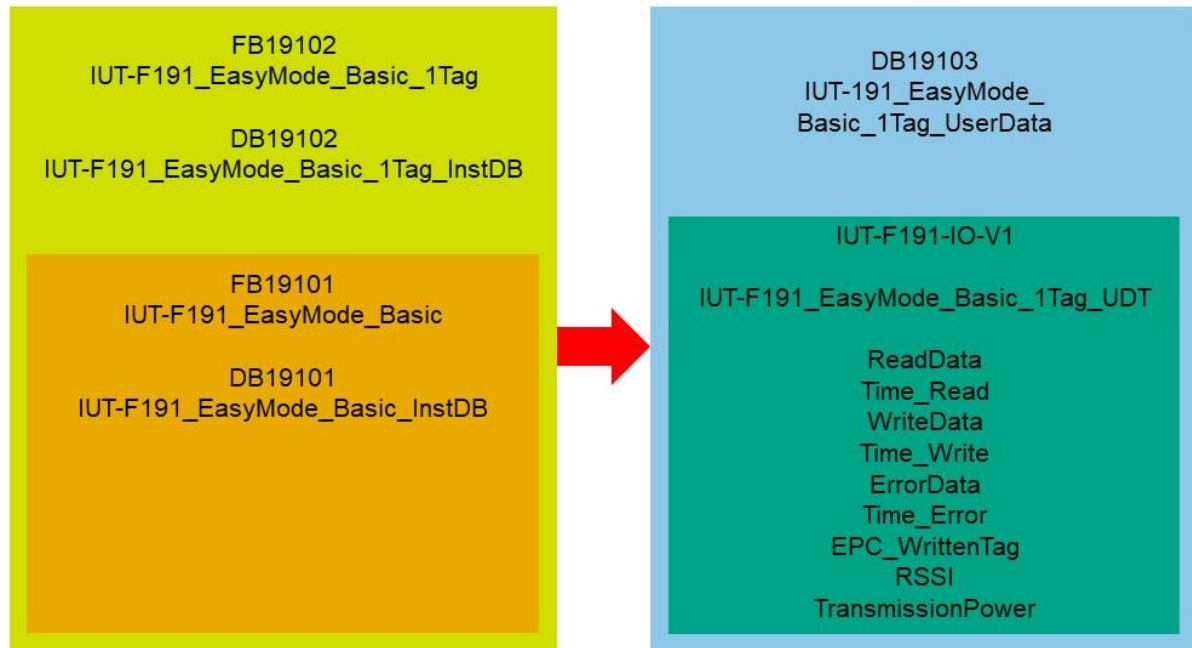
The input parameter "L_HWIO_Hardware_ID" corresponds to the identifier of the communication module from the hardware configuration.

The following table shows the meaning of the input and output variables:

Name	Input / Output	Data type	Meaning
L_HWIO_Hardware_ID	Input	HW_IO	Hardware identifier of the communication module from the hardware configuration
L_b_StartReadTask	Input	Bool	Start read task; with signal change from 0 → 1; starts execution of read task; end read task with signal change 1 → 0;
L_b_StartWriteTask	Input	Bool	Start write task; with signal change from 0 → 1; starts execution of write task; end write task with signal change 1 → 0;
L_T_ScanTime	Input	Time	Maximum execution time read/write task; default = 5 seconds (T#5s)
UserData	InOut	DB	Data area for read and write data as well as error information "IUT-F191_EasyMode_Basic_1Tag_UserData". "IUT-F191-IO-V1"
O_b_ReadValid	Output	Bool	Read successful; 1 := data carrier within detection zone and data read successfully; 0 := data carrier outside detection zone; no data read
O_b_WriteValid	Output	Bool	Write successful; 1 := data carrier within detection zone and data written successfully; 0 := data carrier outside acquisition zone; no data written
O_b_TagPresent	Output	Bool	Presence of data carriers: 1 := one or more data carriers in the detection zone. 0 := no data carrier in the detection zone
O_b_TaskActive	Output	Bool	Read or write task active; 1 := read or write task active; 0 := no read or write task active; RFID head off
O_b_TaskFinish	Output	Bool	Read or write task completed; 0 := read or write task active; 1 := no read or write task active; RFID head off
O_b_Error	Output	Bool	Error; 1 := error occurred during read or write task 0 := no error condition active
O_B_FrameLength	Output	Byte	Length of the read-in data; Indication of the length of the read-in data in bytes; in case of error condition the length of the error message is indicated

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		83 of 115

O_B_RSSI	Output	Byte	RSSI value for data carrier access; Received signal strength in the range between 0dec (weak) and 100dec (strong)
O_i_TransmissionPower	Output	Integer	Transmit power; Value of the transmission power in mW with which the data carrier could be accessed
O_i_ReadCounter	Output	Integer	Counter read operations; Number of successful reads during the execution of a read task
O_i_WriteCounter	Output	Integer	Counter write operations; Number of successful writes during the execution of a write task
O_T_ReadingTime	Output	Time	Time between start and end of a read task
O_T_WritingTime	Output	Time	Time between start and end of a write task



6.1 Execution read task

Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user data (memory bank 11; User Memory), the UII/EPC code (memory bank 01) and the TID (memory bank 10) can be accessed.

The Autostart function must be switched off when using this function block, because the read or write task is aborted when the first data carrier is identified and does not remain permanently active.

When using the "Long Form" data format, the UII/EPC information is always prefixed to the read data set in the returned data for unique assignment to a data carrier. When using the "Short Form" data format, the UII/EPC information is omitted.

Several transmission power levels can be defined via the PT parameter. These are run through during the execution of the task. The number of access attempts to be made per power level can be set via the TA parameter. The larger the value, the more scans are executed per power level and the slower the ramp for the transmit power is run through.

The following example shows the parameterization for executing a read access to the user memory (memory bank 11). Examples of parameterization for read access to other memory areas can be found here:

[Read access to UII/EPC \(Memory Bank 01\)](#)

[Read access to TID \(Memory Bank 10\)](#)

[Read access to User Memory \(Memory Bank 11\)](#)

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		84 of 115

Parameter 65 (16#41) „Read Task“ → Setting read access to user data (user memory)

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00 00

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#00 = off

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 0 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Parameter 96 (16#60) „Transmission Powers“ → Setting ramp function for the transmit power

Parameter Read/Write

Index: 96 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 05 00 0a 00 14 00 32 00 00

Hex

Index 1 = PT 1 → 16#0005 = 5mW (7dBm)
Index 2 = PT 2 → 16#000A = 10mW (10dBm)
Index 3 = PT 3 → 16#0014 = 20mW (13dBm)
Index 4 = PT 4 → 16#0032 = 50mW (17dBm)
Index 5 = PT 5 → 16#0000 = not configured
A maximum of 5 values can be set. The values are to be set according to their size. The larger the number of values, the longer the ramp takes to run.

Parameter 98 (16#62) „Tries allowed“ → Setting the access attempts per transmission power level

Parameter Read/Write

Index: 98 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

0a

Hex

Index 0 = TA → 16#0A = 10 Access attempts

The read task is started by the "I_b_StartReadTask" input at FB19102.

Name	Address	Displ...	Monitor value	Modify ...
StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	TRUE
StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
FrameLength	%MB1	DEC	0	
RSSI	%MB14	DEC	0	
TransmissionPower	%MW16	DEC	0	
ReadCounter	%MW2	DEC	0	
WriteCounter	%MW4	DEC	0	
ReadingTime	%MD6	Time	T#0MS	
WritingTime	%MD10	Time	T#0MS	

Initial state before start of read task

StartRead = False
ReadValid = depending on previous state
TagPresent = depending on previous state
TaskActive = False
TaskFinish = True
FrameLength = depending on previous state
RSSI = 0
TransmissionPower = 0
ReadCounter = depending on previous state
ReadingTime = depending on previous state
The read task starts as soon as "StartRead" is set to True.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		85 of 115

Name	Address	Displ...	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%M0.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	DEC	0	
"TransmissionPower"	%MW16	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#0MS	

Read task active; detection range is scanned

StartRead = True

ReadValid = False

TagPresent = False

TaskActive = True

TaskFinish = False

FrameLength = 0

RSSI = 0

TransmissionPower = 0

ReadCounter = 0

ReadingTime = T#0MS

The read task is activated. The detection range is scanned. No data carrier has been detected yet.

Name	Address	Displ...	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB14	DEC	26	
"TransmissionPower"	%MW16	DEC	50	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#25_982MS	
"WritingTime"	%MD10	Time	T#0MS	

Data carrier read in; read task completed

StartRead = True

ReadValid = True

TagPresent = True

TaskActive = False

TaskFinish = True

FrameLength = 26 (depending on the data length)

RSSI = 26 (depending on the signal quality)

TransmissionPower = 50 (Transmit power level 50mW)

ReadCounter = 1

ReadingTime = Read time (depending on the task duration)

The read-in data are located within the data block "IUT-F191_EasyMode_Basic_1Tag_UserData".
"IUT-F191-IO-V1" in the data structure "ReadData".

Name	Address	Displ...	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	26	
"RSSI"	%MB14	DEC	26	
"TransmissionPower"	%MW16	DEC	50	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#25_982MS	
"WritingTime"	%MD10	Time	T#0MS	

Trigger for read task reset

StartRead = False

ReadValid = True

TagPresent = True

TaskActive = False

TaskFinish = True

FrameLength = 26 (depending on the data length)

RSSI = 26 (unchanged)

TransmissionPower = 50 (unchanged)

ReadCounter = 1

ReadingTime = Reading time (depending on the task duration)

Name	Address	Displ...	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	DEC	0	
"TransmissionPower"	%MW16	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#0MS	

No data carrier read; read task ended after timer expired

StartRead = True

ReadValid = False

TagPresent = False

TaskActive = False

TaskFinish = True

FrameLength = 0

RSSI = 0

TransmissionPower = 0

ReadCounter = 0

ReadingTime = 0ms

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			86 of 115

IUT-F191_EasyMode_Basic_1Tag_UserData				
Name	Data ...	St...	Monit...	
Static				
IUT-F191-IO-V1	"I..."			
ReadData	Array...			
ReadData[0]	Byte	16#C	16#00	
ReadData[1]	Byte	16#C	16#0E	
ReadData[2]	Byte	16#C	16#34	
ReadData[3]	Byte	16#C	16#00	
ReadData[4]	Byte	16#C	16#30	
ReadData[5]	Byte	16#C	16#14	
ReadData[6]	Byte	16#C	16#F7	
ReadData[7]	Byte	16#C	16#33	
ReadData[8]	Byte	16#C	16#7C	
ReadData[9]	Byte	16#C	16#00	
ReadData[10]	Byte	16#C	16#1F	
ReadData[11]	Byte	16#C	16#00	
ReadData[12]	Byte	16#C	16#00	
ReadData[13]	Byte	16#C	16#00	
ReadData[14]	Byte	16#C	16#74	
ReadData[15]	Byte	16#C	16#83	
ReadData[16]	Byte	16#C	16#00	
ReadData[17]	Byte	16#C	16#08	
ReadData[18]	Byte	16#C	16#11	
ReadData[19]	Byte	16#C	16#22	
ReadData[20]	Byte	16#C	16#33	
ReadData[21]	Byte	16#C	16#44	
ReadData[22]	Byte	16#C	16#55	
ReadData[23]	Byte	16#C	16#66	
ReadData[24]	Byte	16#C	16#77	
ReadData[25]	Byte	16#C	16#88	
ReadData[26]	Byte	16#C	16#00	

Data structure of read data when accessing the user memory using the "Long Form" data format:

ReadData[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in user memory data
Length 2 bytes; corresponds to "Number of Bytes" from the "Read Task" parameter; 16#0008 = 8 bytes

ReadData[18...25]: read User Memory data
Length depends on the "Number of Bytes" setting; read subarea of the user memory

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command

Parameter Read/Write

80

Hex

Index 0 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

IUT-F191_EasyMode_Basic_1Tag_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1	"..."			
ReadData	Arr...			
ReadData[0]	Byte	16#C	16#11	
ReadData[1]	Byte	16#C	16#22	
ReadData[2]	Byte	16#C	16#33	
ReadData[3]	Byte	16#C	16#44	
ReadData[4]	Byte	16#C	16#55	
ReadData[5]	Byte	16#C	16#66	
ReadData[6]	Byte	16#C	16#77	
ReadData[7]	Byte	16#C	16#88	
ReadData[8]	Byte	16#C	16#00	

Data structure of read-in data when accessing the user memory using the "Short Form" data format:

ReadData[0...7]: read User Memory data
Length depends on the "Number of Bytes" setting; read partial area of the user memory

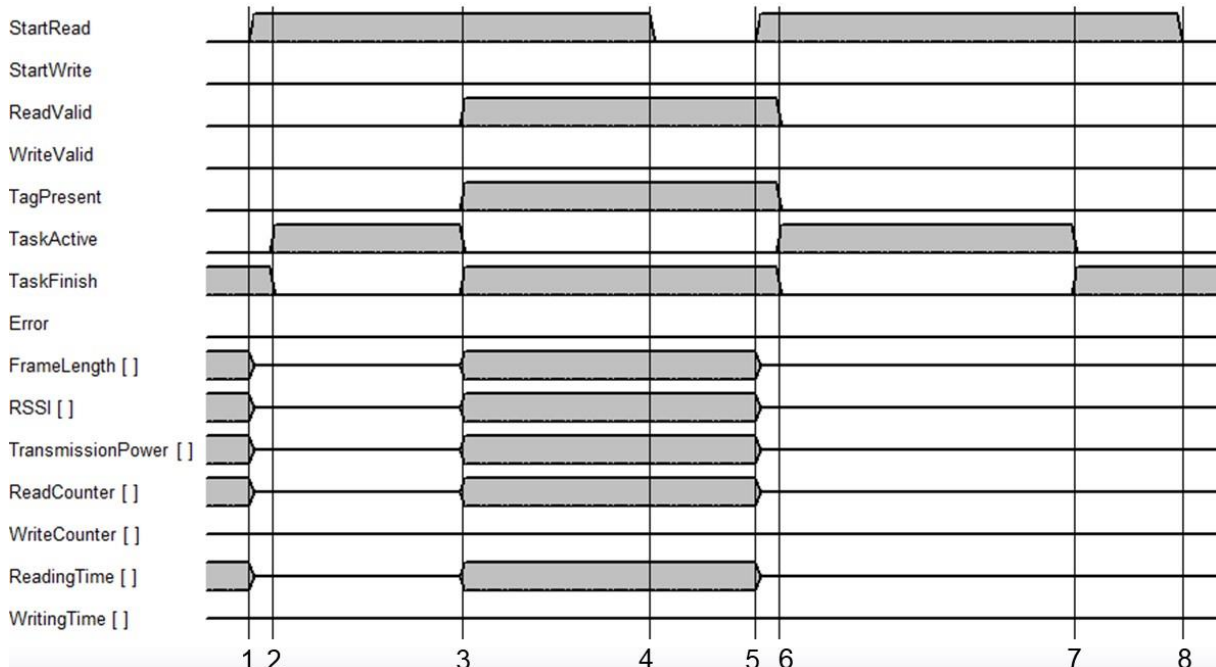
	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			87 of 115

IUT-F191_EasyMode_Basic_1Tag_UserData				
Name	Data ...	St...	Monitor value	
Static				
IUT-F191-IO-V1	*I...			
ReadData	Array...			
Time_Read	DTL	DTL#	DTL#2022-11-16-17:46:43.071495257	
YEAR	UInt	1970	2022	
MONTH	USInt	1	11	
DAY	USInt	1	16	
WEEKDAY	USInt	5	4	
HOUR	USInt	0	17	
MINUTE	USInt	0	46	
SECOND	USInt	0	43	
NANOSECOND	UDInt	0	71495257	
WriteData	Array...			
Time_Write	DTL	DTL#	DTL#1970-01-01-00:00:00	
ErrorData	Array...			
Time_Error	DTL	DTL#	DTL#1970-01-01-00:00:00	
EPC_WrittenTag	Array...			
RSSI	Byte	16#0	16#0D	
TransmissionPo...	Int	0	50	

Time of successful read access to a data carrier:

Data structure IUT-F191_EasyMode_Basic_1Tag_UserData.Time_Read

Flowchart execution read task:



Point of Time	Meaning
1	Read task is started StartRead := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0; ReadingTime = 0ms
2	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0; ReadingTime = 0ms
3	Data carrier read and read task completed StartRead := True; ReadValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 26; RSSI = 33; TransmissionPower = 50; ReadCounter = 1; ReadingTime = T#4s_6ms
4	Trigger for start read task is reset StartRead := False; ReadValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 26; RSSI = 33; TransmissionPower = 50; ReadCounter = 1; ReadingTime = T#4s_6ms
5	Read task is started StartRead := True; ReadValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0; ReadingTime = 0ms
6	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False;

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		88 of 115

	FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0; ReadingTime = 0ms
7	Read task finished after timer expires StartRead := True; ReadValid = True; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0; ReadingTime = 0ms
8	Trigger for start read task is reset StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; ReadCounter = 0; ReadingTime = 0ms

6.2 Execution write task

Write access to a data carrier is configured via IO-Link parameter 66 (16#42) "Write Task". When using Easy mode, the user memory (memory bank 11) and the UII/EPC area (memory bank 01) can be programmed. The Autostart function is not supported when executing a write task. To use the function block, the Autostart function must be deactivated within the IO-Link parameter 65 (16#41) "Read Task". When using the "Long Form" data format, the UII/EPC information of the data carrier that was successfully written is always transmitted in the data returned by the RFID station. This information consists of a length specification, the PC word and the actual UII/EPC code. This ensures that write access to a data carrier is unambiguously assigned. When using the "Short Form" data format, the length information is omitted and only the PC word and the UII/EPC code are transmitted. Several transmission power levels can be defined via the PT parameter. These are passed through during the execution of the task. A write access to a data carrier requires a higher transmission power than a read access to the same data carrier in the same position. The number of access attempts to be executed per power level can be set via the TA parameter. The larger the data carrier, the more scans are executed per power level and the slower the ramp for the transmit power is run through.

The following example shows the parameterization for executing a write access to the user memory (memory bank 11). Examples of parameterization for write access to other memory areas can be found here:

[Write access to UII/EPC \(Memory Bank 01\)](#)

[Write access to User Memory \(Memory Bank 11\)](#)

Parameter 66 (16#42) „Write Task“ → Setting write access to user data (user memory)

Parameter Read/Write

Index: 66 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 0 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Parameter 96 (16#60) „Transmission Powers“ → Setting ramp function for the transmit power

Parameter Read/Write

Index: 96 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 05 00 0a 00 14 00 32 00 00

Hex

Index 1 = PT 1 → 16#0005 = 5mW (7dBm)
Index 2 = PT 2 → 16#000A = 10mW (10dBm)
Index 3 = PT 3 → 16#0014 = 20mW (13dBm)
Index 4 = PT 4 → 16#0032 = 50mW (17dBm)
Index 5 = PT 5 → 16#0000 = not configured
A maximum of 5 values can be set. The values are to be set according to their size. The larger the number of values, the longer the ramp takes to run.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		89 of 115

Parameter 98 (16#62) „Tries allowed“ → Setting the access attempts per transmission power level

Index: 98 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 Parameter Read/Write
 0a
 Hex

Index 0 = TA → 16#0A = 10 Access attempts

Before starting a write task, the write data must first be defined. These are located in the "IUT-F191_EasyMode_Basic_1Tag_UserData.IUT-F191-IO-V" data block in the "WriteData" data structure.

Name	Displ...	Monit...	Modify ...
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[0]	Hex	16#01	16#01
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[1]	Hex	16#02	16#02
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[2]	Hex	16#03	16#03
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[3]	Hex	16#04	16#04
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[4]	Hex	16#05	16#05
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[5]	Hex	16#06	16#06
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[6]	Hex	16#07	16#07
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[7]	Hex	16#08	16#08
"IUT-F191_EasyMode_Basic_1Tag_UserData"."IUT-F191-IO-V1".WriteData[8]	Hex	16#00	16#00

The write task is started by the "I_b_StartWriteTask" input at FB19102.

Name	Address	Displ...	Monitor value	Modify ...
"StartRead"	%MO.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%MO.1	Bool	<input type="checkbox"/> FALSE	TRUE
"ReadValid"	%MO.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%MO.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%MO.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%MO.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%MO.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%MO.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	DEC	0	
"TransmissionPower"	%MW16	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#0MS	

Initial state before start of write task

StartWrite = False
 WriteValid = depending on previous state
 TagPresent = depending on previous state
 TaskActive = False
 TaskFinish = True
 FrameLength = depending on previous state
 RSSI = 0
 TransmissionPower = 0
 WriteCounter = depending on previous state
 The write task starts as soon as "StartWrite" is set to True.

Name	Address	Displ...	Monitor value	Modify ...
"StartRead"	%MO.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%MO.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%MO.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%MO.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%MO.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%MO.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%MO.5	Bool	<input type="checkbox"/> FALSE	
"Error"	%MO.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	DEC	0	
"TransmissionPower"	%MW16	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#0MS	

Write task active; detection zone is scanned

StartWrite = True
 WriteValid = False
 TagPresent = False
 TaskActive = True
 TaskFinish = False
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 WriteCounter = 0
 The write task is activated. The detection range is scanned. No data carrier has been detected yet.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		90 of 115

Name	Address	Displ.	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB14	DEC	33	
"TransmissionPower"	%MW16	DEC	20	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#2S_624MS	

Data carrier written; write task completed

StartWrite = True
 WriteValid = True
 TagPresent = True
 TaskActive = False
 TaskFinish = True
 FrameLength = 16 (depending on the data length)
 RSSI = 33 (depending on the signal quality)
 TransmissionPower = 20 (Transmit power level 20mW)
 WriteCounter = 1
 WritingTime = Write time (depending on the task duration)

The UII/EPC information of the described data carrier is located within the data block "IUT-F191_EasyMode_Basic_1Tag_UserData.IUT-F191-IO-V" in the data structure "EPC_WrittenTag".

Name	Address	Displ.	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	FALSE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"RSSI"	%MB14	DEC	33	
"TransmissionPower"	%MW16	DEC	20	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#2S_624MS	

Trigger for write task reset

StartWrite = False
 WriteValid = True (depending on previous state)
 TagPresent = True (depending on previous state)
 TaskActive = False
 TaskFinish = True
 FrameLength = 16 (depending on the data length)
 RSSI = 33 (unchanged)
 TransmissionPower = 20 (unchanged)
 WriteCounter = 1 (depending on previous state)
 WritingTime = Write time (depending on the task duration)

Name	Address	Displ.	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%M0.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	DEC	0	
"TransmissionPower"	%MW16	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#0MS	

No data carrier detected and no data written; write task terminated after timer expires

StartWrite = True
 WriteValid = False
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 FrameLength = 0
 RSSI = 0
 TransmissionPower = 0
 WriteCounter = 0
 WritingTime = 0ms

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode Siemens TIA-Portal ICE1 IO-Link Master		KReinhardt	UHF RFID
Mannheim				91 of 115

IUT-F191_EasyMode_Basic_1Tag_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
Time_Read	DTL	DTL#	DTL#...	
WriteData	Arr...			
Time_Write	DTL	DTL#	DTL#...	
ErrorData	Arr...			
Time_Error	DTL	DTL#	DTL#...	
EPC_WrittenTag	Arr...			
EPC_WrittenTag[0]	Byte	16#	16#00	
EPC_WrittenTag[1]	Byte	16#	16#0E	
EPC_WrittenTag[2]	Byte	16#	16#34	
EPC_WrittenTag[3]	Byte	16#	16#00	
EPC_WrittenTag[4]	Byte	16#	16#30	
EPC_WrittenTag[5]	Byte	16#	16#14	
EPC_WrittenTag[6]	Byte	16#	16#F7	
EPC_WrittenTag[7]	Byte	16#	16#33	
EPC_WrittenTag[8]	Byte	16#	16#7C	
EPC_WrittenTag[9]	Byte	16#	16#00	
EPC_WrittenTag[10]	Byte	16#	16#1F	
EPC_WrittenTag[11]	Byte	16#	16#00	
EPC_WrittenTag[12]	Byte	16#	16#00	
EPC_WrittenTag[13]	Byte	16#	16#00	
EPC_WrittenTag[14]	Byte	16#	16#74	
EPC_WrittenTag[15]	Byte	16#	16#83	
EPC_WrittenTag[16]	Byte	16#	16#00	

UII/EPC information of the successfully written data carrier within the data block IUT-F191_EasyMode_Basic_1Tag_UserData.IUT-F191-IO-V1" in the structure "EPC_WrittenTag"; when using the Long Form data format

EPC_WrittenTag[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

EPC_WrittenTag[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12 byte UII/EPC code

EPC_WrittenTag[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

IUT-F191_EasyMode_Basic_1Tag_UserData				
Name	Dat...	St...	Monitor value	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
Time_Read	DTL	DTL#	DTL#2022-11-17-07:20:19.641919573	
WriteData	Arr...			
Time_Write	DTL	DTL#	DTL#2022-11-17-08:04:21.984061746	
YEAR	UInt	1970	2022	
MONTH	USInt	1	11	
DAY	USInt	1	17	
WEEKDAY	USInt	5	5	
HOUR	USInt	0	8	
MINUTE	USInt	0	4	
SECOND	USInt	0	21	
NANOSECOND	UDI...	0	984_061_746	
ErrorData	Arr...			
Time_Error	DTL	DTL#	DTL#1970-01-01-00:00:00	
EPC_WrittenTag	Arr...			
RSSI	Byte	16#	16#21	
TransmissionPower	Int	0	20	

Time of successful write access to a data carrier:

Data structure IUT-F191_EasyMode_Basic_1Tag_UserData.Time_Write

Parameter 67 (16#43) "Input Representation" → Setting data format RFID station

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

Parameter Read/Write

80

Hex

Index 0 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		92 of 115

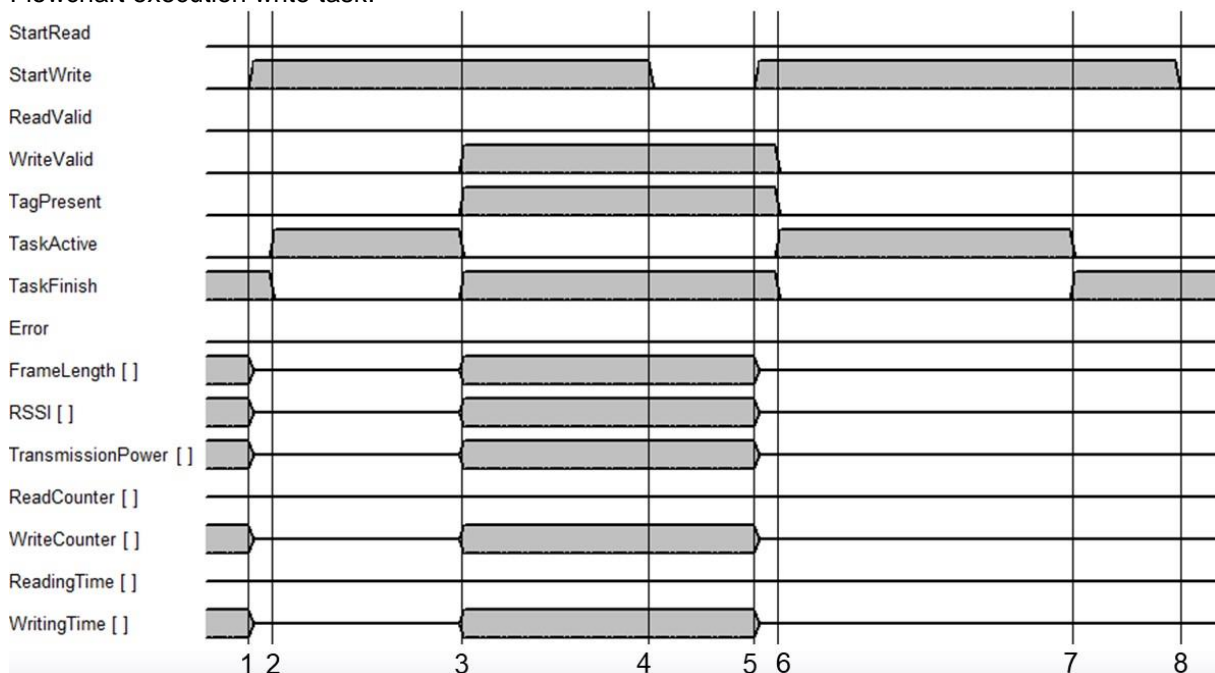
IUT-F191_EasyMode_Basic_1Tag_UserData				
Name	Dat...	St...	Monit...	
Static				
IUT-F191-IO-V1				
ReadData	Arr...			
Time_Read	DTL	DTL#	DTL#2...	
WriteData	Arr...			
Time_Write	DTL	DTL#	DTL#2...	
ErrorData	Arr...			
Time_Error	DTL	DTL#	DTL#1...	
EPC_WrittenTag	Arr...			
EPC_WrittenTag[0]	Byte	16#	16#34	
EPC_WrittenTag[1]	Byte	16#	16#00	
EPC_WrittenTag[2]	Byte	16#	16#30	
EPC_WrittenTag[3]	Byte	16#	16#14	
EPC_WrittenTag[4]	Byte	16#	16#F7	
EPC_WrittenTag[5]	Byte	16#	16#33	
EPC_WrittenTag[6]	Byte	16#	16#7C	
EPC_WrittenTag[7]	Byte	16#	16#00	
EPC_WrittenTag[8]	Byte	16#	16#1F	
EPC_WrittenTag[9]	Byte	16#	16#00	
EPC_WrittenTag[10]	Byte	16#	16#00	
EPC_WrittenTag[11]	Byte	16#	16#00	
EPC_WrittenTag[12]	Byte	16#	16#74	
EPC_WrittenTag[13]	Byte	16#	16#83	
EPC_WrittenTag[14]	Byte	16#	16#00	

Ull/EPC information of the successfully written tag within the data block IUT-F191_EasyMode_Basic_1Tag_UserData.IUT-F191-IO-V1" in the structure "EPC_WrittenTag"; when using the Short Form data format

EPC_WrittenTag[0...1]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the Ull/EPC code; does not belong to the actual Ull/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12 byte long Ull/EPC code

EPC_WrittenTag[2...13]: Ull/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the Ull/EPC code of all data carriers in the detection zone must be unique

Flowchart execution write task:



Point of Time	Meaning
1	Write task is started StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0; WritingTime = 0ms
2	Write task is activated; no data carrier in detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0; WritingTime = 0ms
3	Data carrier written and write task completed StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 26; RSSI = 46; TransmissionPower = 50; WriteCounter = 1; WritingTime = T#4s_6ms
4	Trigger for start write task is reset StartWrite := False; WriteValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 26; RSSI = 46; TransmissionPower = 50; WriteCounter = 1; WritingTime = T#4s_6ms

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		93 of 115

5	Write task is started StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0; WritingTime = 0ms
6	Write task is activated; no data carrier in detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0; WritingTime = 0ms
7	Write task finished after timer expires StartWrite := True; WriteValid = True; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0; WritingTime = 0ms
8	Trigger for start write task is reset StartWrite := False; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; TransmissionPower = 0; WriteCounter = 0; WritingTime = 0ms

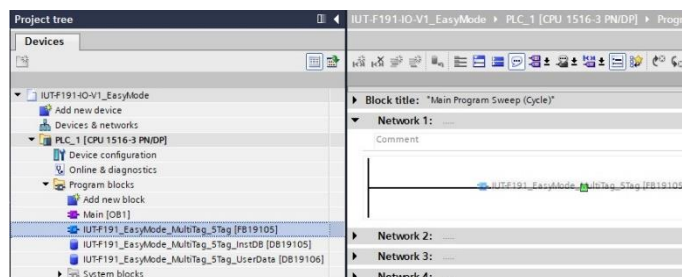
7. Function block FB19105 „IUT-F191_EasyMode_MultiTag_5Tag“

Function description "IUT-F191_EasyMode_Multitag_5Tag":

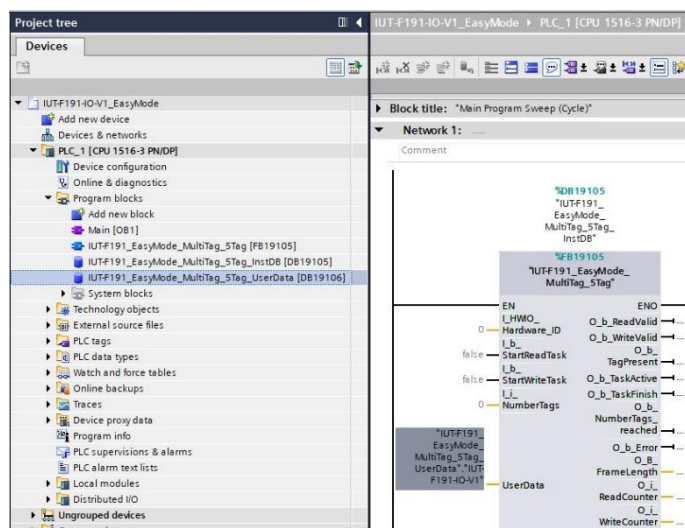
The function block can be used to identify up to 5 data carriers simultaneously via a read task. The information read in from the data carriers is stored in separate structures within the "IUT-F191_EasyMode_MultiTag_5Tag_UserData" data block. In conjunction with the ramp function (PT parameter), the transmit power can be increased continuously. This means that the data carriers are read or written with the minimum required transmit power. The number of access attempts for each set power level can be increased via the TA parameter. By increasing parameter E5, it is possible to suppress multiple readings of a data carrier. This is necessary if there are reading gaps within the detection zone. The function block can also be used to program up to 5 data carriers simultaneously. The same data record is programmed in the user data in all data carriers. For the unique assignment of the programmed data carriers, the UII/EPC information of the data carrier is stored within the data block. The function block reads the local system time of the PLC at the start of the task execution and at successful write and read accesses to data carriers. From this, the execution time for the accesses to the individual data carriers is formed. The system times and the execution times are also stored within the data block. With the start of a new write or read task, all internal data and the outputs are reset.

Implementation of function block "IUT-F191_EasyMode_MultiTag":

Drag function block "IUT-F191_EasyMode_MultiTag_5Tag" (FB19105) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F191_EasyMode_MultiTag_5Tag_InstanceDB" (DB19105) which can be used as instance data block. However, the instance data block can also be regenerated.



	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			94 of 115



The read/write data and the access times to the data carriers are located in a separate data block. This is parameterized at the "UserData" input. The library contains the data block "IUT-F191_EasyMode_MultiTag_5Tag_UserData" which can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the "IUT-F191_EasyMode_MultiTag_5Tag_UDT" data type.

IUT-F191-IO-V1_EasyMode ▶ PLC_1 [CPU 1516-3 PN/DP] ▶ Program blocks ▶		
IUT-F191_EasyMode_MultiTag_5Tag_UserData		
	Name	Data type
1	Static	
2	IUT-F191-IO-V1	"IUT-F191_EasyMode_MultiTag_5Tag_UDT"
3	Date_Trigger	DTL
4	Date_Scan_Tag1	DTL
5	ScanTime_Tag1	Time
6	ReadData_Tag1	Array[0..27] of Byte
7	EPC_Written_Tag1	Array[0..27] of Byte
8	RSSI_Tag1	Byte
9	TransmissionPower_Tag1	Int
10	Date_Scan_Tag2	DTL
11	ScanTime_Tag2	Time
12	ReadData_Tag2	Array[0..27] of Byte
13	EPC_Written_Tag2	Array[0..27] of Byte
14	RSSI_Tag2	Byte
15	TransmissionPower_Tag2	Int
16	Date_Scan_Tag3	DTL
17	ScanTime_Tag3	Time
18	ReadData_Tag3	Array[0..27] of Byte
19	EPC_Written_Tag3	Array[0..27] of Byte
20	RSSI_Tag3	Byte
21	TransmissionPower_Tag3	Int
22	Date_Scan_Tag4	DTL
23	ScanTime_Tag4	Time
24	ReadData_Tag4	Array[0..27] of Byte
25	EPC_Written_Tag4	Array[0..27] of Byte
26	RSSI_Tag4	Byte
27	TransmissionPower_Tag4	Int
28	Date_Scan_Tag5	DTL
29	ScanTime_Tag5	Time
30	ReadData_Tag5	Array[0..27] of Byte
31	EPC_Written_Tag5	Array[0..27] of Byte
32	RSSI_Tag5	Byte
33	TransmissionPower_Tag5	Int
34	Date_Scan_LastTag	DTL
35	ScanTime_LastTag	Time
36	ReadData_LastTag	Array[0..27] of Byte
37	EPC_Written_LastTag	Array[0..27] of Byte
38	RSSI_LastTag	Byte
39	TransmissionPower_LastTag	Int
40	WriteData	Array[0..27] of Byte
41	ErrorData	Array[0..27] of Byte
42	Date_Error	DTL

The "IUT-F191_EasyMode_MultiTag_5Tag" data block consists of the "IUT-F191-IO-V1" structure. This structure is formed from the "IUT-F191_EasyMode_MultiTag_5Tag_UDT" UDT.

The structure is divided into the following subareas:

Date_Trigger → System time to start the read/write task

Date_Scan_Tag1/2/3/4/5 → System time to access data carrier 1/2/3/4/5

ScanTime_Tag1/2/3/4/5 → Execution time for access to data carrier 1/2/3/4/5; difference between "Date_Scan_Tag" and "Date_Trigger"

ReadData_Tag1/2/3/4/5 → data read from data carrier 1/2/3/4/5

EPC_Written_Tag1/2/3/4/5 → UII/EPC information of the successfully written data carrier 1/2/3/4/5

RSSI_Tag1/2/3/4/5 → RSSI value for data carrier access

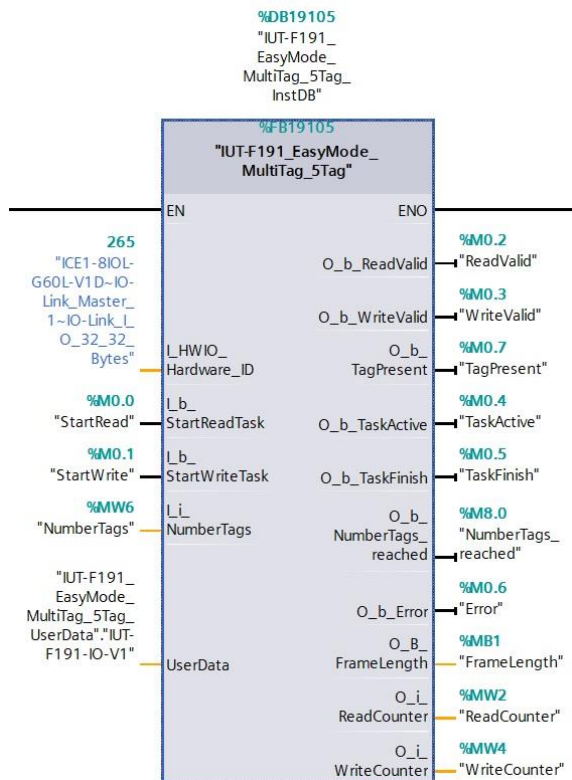
TransmissionPower_Tag1/2/3/4/5 → Transmission power level with which the tag was accessed

WriteData → User data for write access to a data carrier

ErrorData → Error information

Date_Error → System time Error status

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		95 of 115



Complete wiring of the "IUT-F191_EasyMode_MultiTag_5Tag" function block:

The input parameter "I_HWIO_Hardware_ID" corresponds to the identifier of the communication module from the hardware configuration.

The following table shows the meaning of the input and output variables:

Name	Input / Output	Data types	Meaning
I_i_HardwareID	Input	HW_IO	Hardware identifier of the communication module in the hardware configuration
I_b_StartRead	Input	Bool	Start read task; with signal change from 0 → 1; starts execution of read task; end read task with signal change 1 → 0
I_b_StartWrite	Input	Bool	Start write task; with signal change from 0 → 1; starts execution of write task; end write task with signal change 1 → 0
I_i_NumberTags	Input	Integer	Number of expected data carriers; value range 1 to 5
UserData	InOut	DB	Data area for read and write data, access times and error information → "IUT-F191_EasyMode_MultiTag_5Tag"
O_b_ReadValid	Output	Bool	Read successful; 1 := data carrier within detection zone and data read successfully; 0 := data carrier outside detection zone; no data read
O_b_WriteValid	Output	Bool	Write successful; 1 := data carrier within detection zone and data written successfully; 0 := data carrier outside detection zone; no data written
O_b_TagPresent	Output	Bool	Presence of data carriers: 1 := one or more data carriers in the detection zone. 0 := no data carrier in the detection zone
O_b_TaskActive	Output	Bool	Read or write task active; 1 := read or write task active; 0 := no read or write task active; RFID head off
O_b_TaskFinish	Output	Bool	Read or write task completed; 0 := read or write task active; 1 := no read or write task active; RFID head off
O_b_NumberTags_reached	Output	Bool	Expected number of data carriers reached 0 := expected number of data carriers not reached 1 := expected number of data carriers reached
O_b_Error	Output	Bool	Error; 1 := error occurred during read or write task 0 := no error condition active
O_B_FrameLength	Output	Byte	Length of the read-in data; Indication of the length of the read-in data in bytes; in case of error condition the length of the error message is indicated.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		96 of 115

O_i_ReadCounter	Output	Integer	Counter read operations; Number of successful reads during the execution of a read task
O_i_WriteCounter	Output	Integer	Counter write operations; Number of successful writes during the execution of a write task

7.1 Execution read task

Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user data (memory bank 11; User Memory), the UII/EPC code (memory bank 01) and the TID (memory bank 10) can be accessed. The Autostart function must be switched off when using this function block, because the read or write task is aborted when the first data carrier is identified and does not remain permanently active. When using the "Long Form" data format, the UII/EPC information for unique assignment to a data carrier is always placed in front of the read data set in the returned data. The use of the "Short Form" data format for the identification of several data carriers is not possible. Several transmission power levels can be defined via the PT parameter. These are passed through during the execution of the task. The number of access attempts to be executed per power level can be set via the TA parameter. The larger the value, the more scans are executed per power level and the slower the ramp for the transmit power is run through. By increasing the parameter E5, the RFID station can be set to be more tolerant of reading gaps.

The following example shows the parameterization for executing a read access to the user memory (memory bank 11). Examples of parameterization for read access to other memory areas can be found here:

[Read access to UII/EPC \(Memory Bank 01\)](#)

[Read access to TID \(Memory Bank 10\)](#)

[Read access to User Memory \(Memory Bank 11\)](#)

Parameter 65 (16#41) „Read Task“ → Setting read access to user data (user memory)

Parameter Read/Write

Index: 65 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00 00

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#00 = off

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 0 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Parameter 96 (16#60) „Transmission Powers“ → Setting ramp function for the transmit power

Parameter Read/Write

Index: 96 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 05 00 0a 00 14 00 32 00 00

Hex

Index 1 = PT 1 → 16#0005 = 5mW (7dBm)
Index 2 = PT 2 → 16#000A = 10mW (10dBm)
Index 3 = PT 3 → 16#0014 = 20mW (13dBm)
Index 4 = PT 4 → 16#0032 = 50mW (17dBm)
Index 5 = PT 5 → 16#0000 = not configured
A maximum of 5 values can be set. The values are to be set according to their size. The larger the number of values, the longer the ramp takes to run.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		97 of 115

Parameter 98 (16#62) „Tries allowed“ → Setting the access attempts per transmission power level

Index: 98 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 0a
 Hex

Index 0 = TA → 16#0A = 10 Access attempts

The function block does not perform a check for multiple reading of a data carrier. If a data carrier is read multiple times by the RFID station, the new read access is treated as a read access to a new data carrier. To reduce the probability of multiple reads, parameter E5 can be increased.

Parameter 100 (16#64) „Tag Lost Smoothing“ → Number of unsuccessful access attempts

Index: 100 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command
 0a
 Hex

Index 0 = E5 → 16#0A = 10 unsuccessful access attempts

The read task is started by the "I_b_StartRead" input at FB19105.

Name	Addr...	Dis...	Monitor...	Mod...
*StartRead	%M0.0	Bool	<input type="checkbox"/> FALSE	TRUE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*NumberTags	%MW6	DE...	3	3
*ReadValid	%M0.2	Bool	<input type="checkbox"/> FALSE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input type="checkbox"/> FALSE	
*TaskActive	%M0.4	Bool	<input type="checkbox"/> FALSE	
*TaskFinish	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
*NumberTags_reached	%M8.0	Bool	<input checked="" type="checkbox"/> TRUE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	0	
*ReadCounter	%MW2	DEC	3	
*WriteCounter	%MW4	DEC	0	

Initial state before the start of the read task:

StartRead = False
 NumberTags = 3 (3 data carriers are expected)
 ReadValid = False
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 NumberTags_reached = True (depending on previous state)
 FrameLength = 0
 ReadCounter = 3 (depending on previous state)
 The read task starts as soon as "StartRead" is set to True.

Name	Addr...	Dis...	Monitor...	Mod...
*StartRead	%M0.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
*StartWrite	%M0.1	Bool	<input type="checkbox"/> FALSE	
*NumberTags	%MW6	DE...	3	3
*ReadValid	%M0.2	Bool	<input checked="" type="checkbox"/> TRUE	
*WriteValid	%M0.3	Bool	<input type="checkbox"/> FALSE	
*TagPresent	%M0.7	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskActive	%M0.4	Bool	<input checked="" type="checkbox"/> TRUE	
*TaskFinish	%M0.5	Bool	<input type="checkbox"/> FALSE	
*NumberTags_reached	%M8.0	Bool	<input checked="" type="checkbox"/> TRUE	
*Error	%M0.6	Bool	<input type="checkbox"/> FALSE	
*FrameLength	%MB1	DEC	26	
*ReadCounter	%MW2	DEC	3	
*WriteCounter	%MW4	DEC	0	

Read task active; data carriers in the detection zone are read one after the other

StartRead = True
 NumberTags = 3
 ReadValid = True (positive edge with each new data carrier)
 TagPresent = True
 TaskActive = True
 TaskFinish = False
 NumberTags_reached = True
 FrameLength = 26 (depending on the data length)
 ReadCounter = 3 (Number of data carriers read)

If the first data carrier is read after the start of command execution, the "ReadValid" output changes to True. As soon as another data carrier is read, the "ReadValid" output initially changes to False for 50ms and then changes back to True. A successful read access to a new data carrier is signaled with each positive edge at the "ReadValid" output. The "ReadCounter" output counts the positive edges at the "ReadValid" output.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		98 of 115

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%M0.0	Bool	<input type="checkbox"/> FALSE	FALSE
"StartWrite"	%M0.1	Bool	<input type="checkbox"/> FALSE	
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%M0.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%M0.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%M0.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%M0.5	Bool	<input checked="" type="checkbox"/> TRUE	
"NumberTags_reached"	%M8.0	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%M0.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"ReadCounter"	%MW2	DEC	3	
"WriteCounter"	%MW4	DEC	0	

Read task finished:

StartRead = False
 NumberTags = 3
 ReadValid = False
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 NumberTags_reached = True (depending on previous state)
 FrameLength = 0
 ReadCounter = 3 (depending on the number of Previously read in data carriers)

The read-in data is located within the data block "IUT-F191_EasyMode_MultiTag_5Tag_UserData.IUT-F191-IO-V1.ReadData_Tag1/2/3.

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Moni...	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#...	
Date_Scan_Tag1	DTL	DTL#	DTL#...	
ScanTime_Tag1	Ti...	T#0m	T#80...	
ReadData_Tag1	Ar...			
ReadData_Tag1[0]	Byte	16#0	16#00	
ReadData_Tag1[1]	Byte	16#0	16#0E	
ReadData_Tag1[2]	Byte	16#0	16#34	
ReadData_Tag1[3]	Byte	16#0	16#00	
ReadData_Tag1[4]	Byte	16#0	16#01	
ReadData_Tag1[5]	Byte	16#0	16#02	
ReadData_Tag1[6]	Byte	16#0	16#03	
ReadData_Tag1[7]	Byte	16#0	16#04	
ReadData_Tag1[8]	Byte	16#0	16#05	
ReadData_Tag1[9]	Byte	16#0	16#06	
ReadData_Tag1[10]	Byte	16#0	16#07	
ReadData_Tag1[11]	Byte	16#0	16#08	
ReadData_Tag1[12]	Byte	16#0	16#09	
ReadData_Tag1[13]	Byte	16#0	16#0A	
ReadData_Tag1[14]	Byte	16#0	16#0B	
ReadData_Tag1[15]	Byte	16#0	16#0C	
ReadData_Tag1[16]	Byte	16#0	16#00	
ReadData_Tag1[17]	Byte	16#0	16#08	
ReadData_Tag1[18]	Byte	16#0	16#01	
ReadData_Tag1[19]	Byte	16#0	16#02	
ReadData_Tag1[20]	Byte	16#0	16#03	
ReadData_Tag1[21]	Byte	16#0	16#04	
ReadData_Tag1[22]	Byte	16#0	16#05	
ReadData_Tag1[23]	Byte	16#0	16#06	
ReadData_Tag1[24]	Byte	16#0	16#07	
ReadData_Tag1[25]	Byte	16#0	16#08	
ReadData_Tag1[26]	Byte	16#0	16#00	

Data carrier 1: ReadData_Tag1

ReadData[0...1]: Length UII/EPC information
 Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
 16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
 Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
 Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

ReadData[16...17]: Length of read-in user memory data
 Length 2 bytes; corresponds to "Number of Bytes" from IO-Link parameter 65 (16#41) "Read Task"; 16#0008 = 8 bytes

ReadData[18...25]: read-in user memory data
 Length depends on the "Number of Bytes" setting; read partial area of the user memory

The read-in data for data carrier 2 are located in the data structure ReadData_Tag2 and the read-in data for data carrier 3 are located in the data structure ReadData_Tag3. The structure of the data sets is analogous to data carrier 1. In addition to the read-in data for each data carrier, system times for data carrier access are also stored within the data block.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			99 of 115

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-18-12:51:15.858235182	
Date_Scan_Tag1	DTL	DTL#	DTL#2022-11-18-12:51:15.938726613	
ScanTime_Tag1	Ti...	T#0m	T#80MS	
ReadData_Tag1	Ar...			
EPC_Written_Tag1	Ar...			
RSSI_Tag1	Byte	16#0	16#50	
TransmissionPower_Tag1	Int	0	5	
Date_Scan_Tag2	DTL	DTL#	DTL#2022-11-18-12:51:16.036309977	
ScanTime_Tag2	Ti...	T#0m	T#178MS	
ReadData_Tag2	Ar...			
EPC_Written_Tag2	Ar...			
RSSI_Tag2	Byte	16#0	16#42	
TransmissionPower_Tag2	Int	0	5	
Date_Scan_Tag3	DTL	DTL#	DTL#2022-11-18-12:51:17.640747057	
ScanTime_Tag3	Ti...	T#0m	T#15_782MS	
ReadData_Tag3	Ar...			
EPC_Written_Tag3	Ar...			
RSSI_Tag3	Byte	16#0	16#14	
TransmissionPower_Tag3	Int	0	10	
Date_Scan_Tag4	DTL	DTL#	DTL#1970-01-01-00:00:00	
ScanTime_Tag4	Ti...	T#0m	T#0MS	
ReadData_Tag4	Ar...			
EPC_Written_Tag4	Ar...			
RSSI_Tag4	Byte	16#0	16#00	
TransmissionPower_Tag4	Int	0	0	
Date_Scan_Tag5	DTL	DTL#	DTL#1970-01-01-00:00:00	
ScanTime_Tag5	Ti...	T#0m	T#0MS	
ReadData_Tag5	Ar...			
EPC_Written_Tag5	Ar...			
RSSI_Tag5	Byte	16#0	16#00	
TransmissionPower_Tag5	Int	0	0	
Date_Scan_LastTag	DTL	DTL#	DTL#2022-11-18-12:51:17.640747057	
ScanTime_LastTag	Ti...	T#0m	T#15_782MS	
ReadData_LastTag	Ar...			
EPC_Written_LastTag	Ar...			
RSSI_LastTag	Byte	16#0	16#14	
TransmissionPower_LastTag	Int	0	10	
WriteData	Ar...			
ErrorData	Ar...			
Date_Error	DTL	DTL#	DTL#1970-01-01-00:00:00	

Date_Trigger local system time (date) of the PLC at the time of start read request
DTL#2022-11-18-12:51:15.858235182

Date_Scan_Tag1 → local system time (date) of the PLC at the time of read access to data carrier 1
DTL#2022-11-18-12:51:15.938726613

ScanTime_Tag1 → read time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1"
T#80ms

RSSI_Tag1 → RSSI value for access to data carrier 1 (16#50)

TransmissionPower_Tag1 → Transmission power level with which the data carrier could be accessed (5mW)

Date_Scan_Tag2 → local system time (date) of the PLC at the time of the read access to data carrier 2
DTL#2022-11-18-12:51:036309977

ScanTime_Tag2 → read time for data carrier 2; difference of "Date_Trigger" and "Date_Scan_Tag2"
T#178ms

RSSI_Tag2 → RSSI value for access to data carrier 2 (16#42)

TransmissionPower_Tag2 → Transmission power level with which the tag could be accessed (5mW)

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-18-12:51:15.858235182	
YEAR	UInt	1970	2022	
MONTH	US...	1	11	
DAY	US...	1	18	
WEEKDAY	US...	5	6	
HOUR	US...	0	12	
MINUTE	US...	0	51	
SECOND	US...	0	15	
NANOSECOND	U...	0	858_235_182	

Date_Trigger → local system time (date) of the PLC at the time of start read task
DTL#2022-11-18-12:51:15.858235182
YEAR → 2022
MONTH → 11
DAY → 18
WEEKDAY → 6
HOUR → 12
MINUTE → 51
SECOND → 15
NANOSECOND → 858_235_182

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			100 of 115

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-18-12:51:15.858235182	
Date_Scan_Tag1	DTL	DTL#	DTL#2022-11-18-12:51:15.938726613	
YEAR	UInt	1970	2022	
MONTH	US...	1	11	
DAY	US...	1	18	
WEEKDAY	US...	5	6	
HOUR	US...	0	12	
MINUTE	US...	0	51	
SECOND	US...	0	15	
NANOSECOND	U...	0	938_726_613	

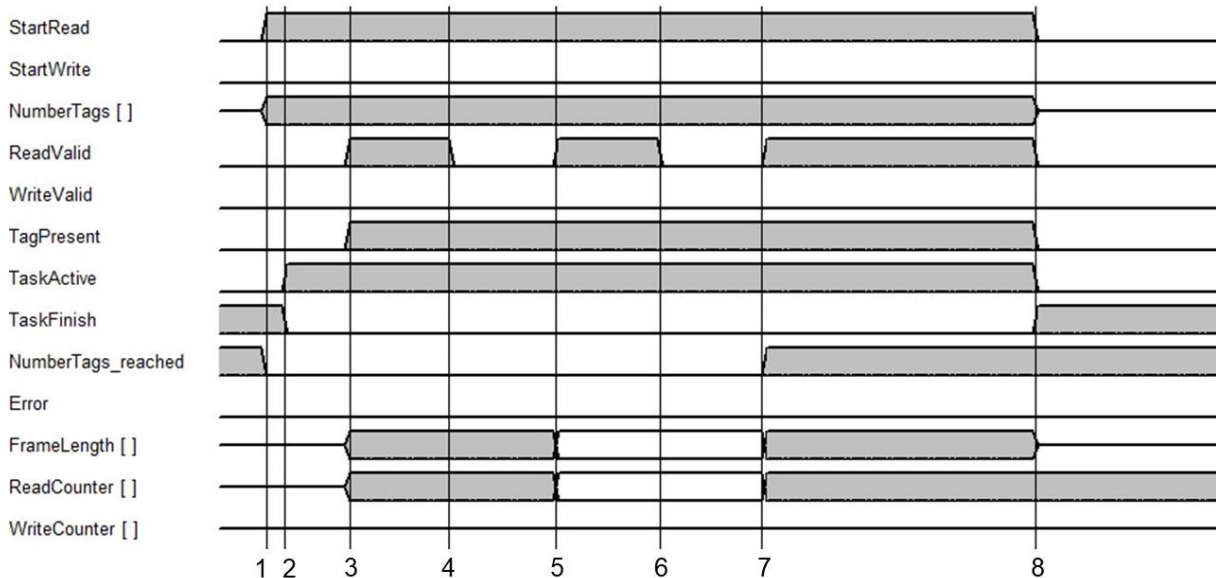
IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1		*IU...		
Date_Trigger	DTL	DTL#	DTL#2022-11-18-12:51:15.858235182	
Date_Scan_Tag1	DTL	DTL#	DTL#2022-11-18-12:51:15.938726613	
ScanTime_Tag1	Ti...	T#0m	T#80MS	
ReadData_Tag1	Ar...			

Date_Scan_Tag1 → local system time (date) of the PLC at the time of read access to data carrier 1
DTL#2022-11-18-12:51:15.938726613

YEAR → 2022
MONTH → 11
DAY → 18
WEEKDAY → 6
HOUR → 12
MINUTE → 51
SECOND → 15
NANOSECOND → 938_726_613

ScanTime_Tag1 → Read time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1".
T#80ms

Flowchart execution read task:



Point of Time	Meaning
1	Read task is started StartRead := True; NumberTags := 3; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; NumberTags_reached = False; FrameLength = 0; ReadCounter = 0
2	Read task is activated; no data carrier in detection zone StartRead := True; NumberTags := 3; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; NumberTags_reached = False; FrameLength = 0; ReadCounter = 0
3	Data carrier A read in StartRead := True; NumberTags := 3; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; NumberTags_reached = False; FrameLength = 26; ReadCounter = 1
4	Data carrier B detected; ReadValid is reset for 50ms StartRead := True; NumberTags := 3; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; NumberTags_reached = False; FrameLength = 26; ReadCounter = 1
5	Data carrier B read in; ReadValid is set again after 50ms StartRead := True; NumberTags := 3; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; NumberTags_reached = False; FrameLength = 26; ReadCounter = 2
6	Data carrier C detected; ReadValid is reset for 50ms StartRead := True; NumberTags := 3; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; NumberTags_reached = False; FrameLength = 26; ReadCounter = 2

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		101 of 115

7	Data carrier C read in; ReadValid is set again after 50ms StartRead := True; NumberTags := 3; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; NumberTags_reached = True; FrameLength = 26; ReadCounter = 3
8	Trigger for start read task is reset; read task ended StartRead := False; NumberTags := 0; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; NumberTags_reached = True; FrameLength = 0; ReadCounter = 3

7.2 Execution write task

Write access to a data carrier is configured via IO-Link parameter 66 (16#42) "Write Task". When using the Easy mode, it is possible to write to the user memory and to the UII/EPC area. In MultiTag applications, only write access to the user memory is permitted. The Autostart function is not supported when executing a write operation. To use the function block, the Autostart function must be deactivated within the "Read Task".

When using the "Long Form" data format, the data returned by the RFID station always contains the UII/EPC information of the data carrier that was successfully written to. This ensures a clear assignment of the write access to a data carrier. The use of the "Short Form" data format is not possible with MultiTag applications. Several transmission power levels can be defined via the PT parameter. These are passed through during the execution of the task. A write access to a data carrier requires a higher transmission power than a read access to the same data carrier in the same position. The number of access attempts to be executed per power level can be set via the TA parameter. The larger the value, the more scans are executed per power level and the slower the ramp for the transmit power is run through.

The following example shows the parameterization for executing a read access to the user memory (memory bank 11).

Parameter 66 (16#42) „Write Task“ → Setting write access to user data (user memory)

Parameter Read/Write

Index: 66 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 08 00 00

Hex

Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0

Parameter 67 (16#43) „Input Representation“ → Setting data format RFID station

Parameter Read/Write

Index: 67 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00

Hex

Index 0 = Input Representation → 16#00 = Long Form data format
16#80 = Short Form data format
Long Form → Identification of one or more data carriers
Short Form → Identification of only one data carrier

Parameter 96 (16#60) „Transmission Powers“ → Setting ramp function for the transmit power

Parameter Read/Write

Index: 96 Subindex: 0

☒ Dec ☐ Hex

Read Write System Command ▼

00 05 00 0a 00 14 00 32 00 00

Hex

Index 1 = PT 1 → 16#0005 = 5mW (7dBm)
Index 2 = PT 2 → 16#000A = 10mW (10dBm)
Index 3 = PT 3 → 16#0014 = 20mW (13dBm)
Index 4 = PT 4 → 16#0032 = 50mW (17dBm)
Index 5 = PT 5 → 16#0000 = not configured
A maximum of 5 values can be set. The values are to be set according to their size. The larger the number of values, the longer the ramp takes to run.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		102 of 115

Parameter 98 (16#62) „Tries allowed“ → Setting the access attempts per transmission power level

Index: 98 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 Parameter Read/Write
 0a
 Hex

Index 0 = TA → 16#0A = 10 Access attempts

The function block does not perform a check for multiple reading of a data carrier. If a data carrier is read multiple times by the RFID station, the new read access is treated as a read access to a new data carrier. To reduce the probability of multiple reads, parameter E5 can be increased.

Parameter 100 (16#64) „Tag Lost Smoothing“ → Number of unsuccessful access attempts

Index: 100 Subindex: 0
☒ Dec ☐ Hex
 Read Write System Command ▼
 Parameter Read/Write
 0a
 Hex

Index 0 = E5 → 16#0A = 10 unsuccessful access attempts

Before starting a write task, the write data must first be defined. These are located in the data block "IUT-F191_EasyMode_MultiTag_5Tag_UserData" in the data structure "IUT-F191-IO-V1". WriteData".

Name	A...	Dis...	Moni...	Modify ...	IUT-F191_EasyMode_MultiTag_5Tag_UserData
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[0]	Hex	16#31	16#31		Name Da... Sta... Monitor v...
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[1]	Hex	16#32	16#32		WriteData Ar...
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[2]	Hex	16#33	16#33		WriteData[0] Byte 16#0 16#31
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[3]	Hex	16#34	16#34		WriteData[1] Byte 16#0 16#32
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[4]	Hex	16#35	16#35		WriteData[2] Byte 16#0 16#33
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[5]	Hex	16#36	16#36		WriteData[3] Byte 16#0 16#34
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[6]	Hex	16#37	16#37		WriteData[4] Byte 16#0 16#35
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[7]	Hex	16#38	16#38		WriteData[5] Byte 16#0 16#36
"IUT-F191_EasyMode_MultiTag_5Tag_UserData"."IUT-F191-IO-V1".WriteData[8]	Hex	16#00	16#00		WriteData[6] Byte 16#0 16#37
					WriteData[7] Byte 16#0 16#38
					WriteData[8] Byte 16#0 16#00

The read task is started by the "I_b_StartWrite" input at FB19105.

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%MO.0	Bool	FALSE	
"StartWrite"	%MO.1	Bool	FALSE	TRUE
"NumberTags"	%MW6	DE...	0	3
"ReadValid"	%MO.2	Bool	FALSE	
"WriteValid"	%MO.3	Bool	FALSE	
"TagPresent"	%MO.7	Bool	FALSE	
"TaskActive"	%MO.4	Bool	FALSE	
"TaskFinish"	%MO.5	Bool	TRUE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%MO.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state before start of write task

StartWrite = False
 NumberTags = 0
 WriteValid = depending on previous state
 TagPresent = False
 TaskActive = False
 TaskFinish = True
 NumberTags_reached = depending on previous state
 FrameLength = depending on previous state
 WriteCounter = depending on previous state

The write task starts as soon as "StartWrite" is set to True.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		103 of 115

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%MO.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%MO.1	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%MO.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%MO.3	Bool	<input checked="" type="checkbox"/> TRUE	
"TagPresent"	%MO.7	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskActive"	%MO.4	Bool	<input checked="" type="checkbox"/> TRUE	
"TaskFinish"	%MO.5	Bool	<input type="checkbox"/> FALSE	
"NumberTags_reached"	%M8.0	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%MO.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	16	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	3	

Write task active; 3 data carriers were written successfully

StartWrite = True
NumberTags = 3
WriteValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
NumberTags_reached = True
FrameLength = 16 (depending on the length of the UII/EPC information)
WriteCounter = 3

If the first data carrier is written after the start of task execution, the "WriteValid" output changes to True. As soon as another data carrier has been written, the "WriteValid" output initially changes to False for 50ms and then back to True. Each positive edge at the "WriteValid" output signals successful write access to a new data carrier. The "WriteCounter" output counts the positive edges at the "WriteValid" output.

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%MO.0	Bool	<input type="checkbox"/> FALSE	
"StartWrite"	%MO.1	Bool	<input type="checkbox"/> FALSE	FALSE
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%MO.2	Bool	<input type="checkbox"/> FALSE	
"WriteValid"	%MO.3	Bool	<input type="checkbox"/> FALSE	
"TagPresent"	%MO.7	Bool	<input type="checkbox"/> FALSE	
"TaskActive"	%MO.4	Bool	<input type="checkbox"/> FALSE	
"TaskFinish"	%MO.5	Bool	<input checked="" type="checkbox"/> TRUE	
"NumberTags_reached"	%M8.0	Bool	<input checked="" type="checkbox"/> TRUE	
"Error"	%MO.6	Bool	<input type="checkbox"/> FALSE	
"FrameLength"	%MB1	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	3	

Write task finished:

StartWrite = False
NumberTags = 3
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
NumberTags_reached = True
FrameLength = 0
WriteCounter = 3 (depending on the number of previously programmed data carriers)

Within the data block "IUT-F191_EasyMode_MultiTag_5Tag_UserData" the UII/EPC information of the successfully programmed data carriers are located in the structures "EPC_Written_Tag1/2/3".

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor v...	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#202...	
Date_Scan_Tag1	DTL	DTL#	DTL#202...	
ScanTime_Tag1	Ti...	T#0rr	T#121MS	
ReadData_Tag1	Ar...			
EPC_Written_Tag1	Ar...			
EPC_Written_Tag1[0]	Byte	16#0	16#00	
EPC_Written_Tag1[1]	Byte	16#0	16#0E	
EPC_Written_Tag1[2]	Byte	16#0	16#34	
EPC_Written_Tag1[3]	Byte	16#0	16#00	
EPC_Written_Tag1[4]	Byte	16#0	16#01	
EPC_Written_Tag1[5]	Byte	16#0	16#02	
EPC_Written_Tag1[6]	Byte	16#0	16#03	
EPC_Written_Tag1[7]	Byte	16#0	16#04	
EPC_Written_Tag1[8]	Byte	16#0	16#05	
EPC_Written_Tag1[9]	Byte	16#0	16#06	
EPC_Written_Tag1[10]	Byte	16#0	16#07	
EPC_Written_Tag1[11]	Byte	16#0	16#08	
EPC_Written_Tag1[12]	Byte	16#0	16#09	
EPC_Written_Tag1[13]	Byte	16#0	16#0A	
EPC_Written_Tag1[14]	Byte	16#0	16#0B	
EPC_Written_Tag1[15]	Byte	16#0	16#0C	
EPC_Written_Tag1[16]	Byte	16#0	16#00	

Data carrier 1: EPC_Written_Tag1

ReadData[0...1]: Length UII/EPC Information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code;
16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

ReadData[2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

ReadData[4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		104 of 115

The UII/EPC information for the programmed data carrier is located in the EPC_Written_Tag2 data structure and the UII/EPC information for the programmed data carrier 3 is located in the EPC_Written_Tag3 data structure. The structure of the data sets is analogous to data carrier 1.

In addition to the UII/EPC information for each successfully programmed data carrier, system times for data carrier access are also stored within the data block.

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-21-15:17:34.894632804	
Date_Scan_Tag1	DTL	DTL#	DTL#2022-11-21-15:17:35.015762555	
ScanTime_Tag1	Ti...	T#0rr	T#121MS	
ReadData_Tag1	Ar...			
EPC_Written_Tag1	Ar...			
RSSI_Tag1	Byte	16#0	16#64	
TransmissionPower_Tag1	Int	0	100	
Date_Scan_Tag2	DTL	DTL#	DTL#2022-11-21-15:17:35.115970559	
ScanTime_Tag2	Ti...	T#0rr	T#221MS	
ReadData_Tag2	Ar...			
EPC_Written_Tag2	Ar...			
RSSI_Tag2	Byte	16#0	16#64	
TransmissionPower_Tag2	Int	0	100	
Date_Scan_Tag3	DTL	DTL#	DTL#2022-11-21-15:17:35.214169511	
ScanTime_Tag3	Ti...	T#0rr	T#319MS	
ReadData_Tag3	Ar...			
EPC_Written_Tag3	Ar...			
RSSI_Tag3	Byte	16#0	16#56	
TransmissionPower_Tag3	Int	0	100	
Date_Scan_Tag4	DTL	DTL#	DTL#1970-01-01-00:00:00	
ScanTime_Tag4	Ti...	T#0rr	T#0MS	
ReadData_Tag4	Ar...			
EPC_Written_Tag4	Ar...			
RSSI_Tag4	Byte	16#0	16#00	
TransmissionPower_Tag4	Int	0	0	
Date_Scan_Tag5	DTL	DTL#	DTL#1970-01-01-00:00:00	
ScanTime_Tag5	Ti...	T#0rr	T#0MS	
ReadData_Tag5	Ar...			
EPC_Written_Tag5	Ar...			
RSSI_Tag5	Byte	16#0	16#00	
TransmissionPower_Tag5	Int	0	0	
Date_Scan_LastTag	DTL	DTL#	DTL#2022-11-21-15:17:35.214169511	
ScanTime_LastTag	Ti...	T#0rr	T#319MS	
ReadData_LastTag	Ar...			
EPC_Written_LastTag	Ar...			
RSSI_LastTag	Byte	16#0	16#56	
TransmissionPower_Last.	Int	0	100	
WriteData	Ar...			
ErrorData	Ar...			
Date_Error	DTL	DTL#	DTL#1970-01-01-00:00:00	

Date_Trigger → local system time (date) of the PLC at the time of start write task
DTL#2022-11-21-15:17:34.894632804

Date_Scan_Tag1 → local system time (date) of the PLC at the time of write access to data carrier 1
DTL#2022-11-21-15:17:35.015762555

ScanTime_Tag1 → write time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1"
T#121ms

RSSI_Tag1 → RSSI value for access to data carrier 1 (16#64)

TransmissionPower_Tag1 → Transmission power level with which the tag could be accessed (100mW)

Date_Scan_Tag2 → local system time (date) of the PLC at the time of write access to data carrier 2
DTL#2022-11-21-15:17:35.11590559

ScanTime_Tag2 → read time for data carrier 2; difference of "Date_Trigger" and "Date_Scan_Tag2"
T#221ms

RSSI_Tag2 → RSSI value for access to data carrier 2 (16#64)

TransmissionPower_Tag2 → Transmission power level with which the tag could be accessed (100mW)

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-21-15:17:34.894632804	
YEAR	UInt	1970	2022	
MONTH	US...	1	11	
DAY	US...	1	21	
WEEKDAY	US...	5	2	
HOUR	US...	0	15	
MINUTE	US...	0	17	
SECOND	US...	0	34	
NANOSECOND	U...	0	894_632_804	

Date_Trigger → local system time (date) of the PLC at the time of start write task
DTL#2022-11-21-15:17:34.894632804

YEAR → 2022
MONTH → 11
DAY → 21
WEEKDAY → 2
HOUR → 15
MINUTE → 17
SECOND → 34
NANOSECOND → 894_632_804

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			105 of 115

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-21-15:17:34.894632804	
Date_Scan_Tag1	DTL	DTL#	DTL#2022-11-21-15:17:35.015762555	
YEAR	UInt	1970	2022	
MONTH	US...	1	11	
DAY	US...	1	21	
WEEKDAY	US...	5	2	
HOUR	US...	0	15	
MINUTE	US...	0	17	
SECOND	US...	0	35	
NANOSECOND	U...	0	15762555	

Date_Scan_Tag1 → local system time (date) of the PLC at the time of write access to data carrier 1
DTL#2022-11-21-15:17:35.015762555
YEAR → 2022
MONTH → 11
DAY → 21
WEEKDAY → 2
HOUR → 15
MINUTE → 17
SECOND → 35
NANOSECOND → 15762555

IUT-F191_EasyMode_MultiTag_5Tag_UserData				
Name	Da...	Sta...	Monitor value	
Static				
IUT-F191-IO-V1				
Date_Trigger	DTL	DTL#	DTL#2022-11-21-15:17:34.894632804	
Date_Scan_Tag1	DTL	DTL#	DTL#2022-11-21-15:17:35.015762555	
ScanTime_Tag1	Tl...	T# 0m	T# 121MS	

ScanTime_Tag1 → Write time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1".
T#121ms

8. Function block FB19107 „IUT-F191-FR1-01_EasyMode_Param“

Functional description "IUT-F191-FR1-01_EasyMode_Param":

Function block for reading and changing the IO-Link parameters of the IUT-F191-IO-V1-FR1-01 RFID station (Europe). Read access is made on the one hand to the IO-Link standard parameters (e.g., vendor name) and on the other hand to the device-specific IO-Link parameters. Write access for a parameter change, on the other hand, is only performed on the device-specific IO-Link parameters.

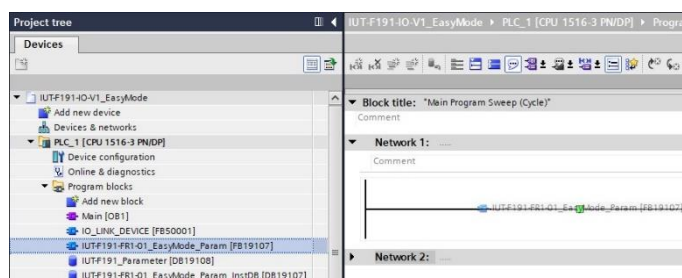
When executing write access to the device-specific IO-Link parameters, it should be noted that the number of possible write operations is limited by the storage of the parameter data in an EEPROM. It is therefore recommended that write access only be performed when a device has been newly installed. The device-specific IO-Link parameters are stored in non-volatile memory.

The DB19108 "IUT-F191_Parameter" data block contains the data structures for the IO-Link parameters read in. The data structures for changing the IO-Link parameters are preset with values identical to the factory setting of the RFID station.

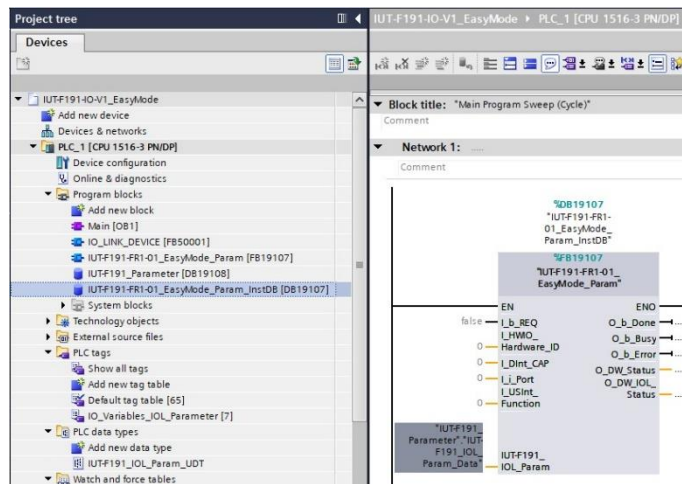
Within the function block FB19107 "IUT-F191-FR1-01_EasyMode_Param" the standard function block FB50001 "IO_LINK_DEVICE" is called. This function block carries out the actual transfer of the parameter data. This function block must also be copied into the project.

Implementation of function block "IUT-F191-FR1-01_EasyMode_Param":

Drag function block "IUT-F191-FR1-01_EasyMode_Param" (FB19107) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F191-FR1-01_EasyMode_Param_InstanceDB" (DB19107) which can be used as instance data block. The instance data block can also be regenerated.



	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master			106 of 115



The IO-Link parameters read in are located in a separate data block. This is parameterized at the "IUT-F191_IOL_Param" input. The library contains the data block DB1908 "IUT-F191_Parameter" which can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the "IUT-F191_IOL_Param_UDT" data type.

IUT-F191-IO-V1_EasyMode ▶ PLC_1 [CPU 1516-3 PN/DP] ▶ Program block		
IUT-F191_Parameter		
	Name	Data type
1	Static	
2	IUT-F191_IOL_Param_Data	"IUT-F191_IOL_Param_UDT"
3	16_Vendor_Name	String[32]
4	17_Vendor_Text	String[32]
5	18_Product_Name	String[32]
6	19_Product_ID	String[32]
7	20_Product_Text	String[32]
8	21_Serial_Number	String[16]
9	22_Hardware_Revision	String[8]
10	23_Firmware_Revision	String[8]
11	24_Application_Specific_Tag	String[32]
12	25_Function_Tag	String[32]
13	26_Location_Tag	String[32]
14	27_Product_URI	String[100]
15	64_Operation_Mode	Byte
16	65_Read_Task	Struct
17	66_Write_Task	Struct
18	67_Input_Representation	Byte
19	96_Transmission_Powers_PT	Struct
20	97_Number_Of_Tags_To_Find_NT	Byte
21	98_Tries_Allowed_TA	Byte
22	99_Expected_Number_Of_Tags_QW	Byte
23	100_Tag_Lost_Smoothing	Byte
24	105_Transmission_Channels_CD	Struct
25	224_Operating_Hours	Struct
26	225_Temperature_Indicator	Byte
27	226_Temperature_Monitor	Struct
28	227_Power_Monitor	Struct
29	Config_Param	Struct

The "IUT-F191_Parameter" data block consists of the "IUT-F191_IOL_Param_Data" structure. This structure is formed from the "IUT-F191_IOL_Param_UDT" UDT.

Overview IO-Link parameters

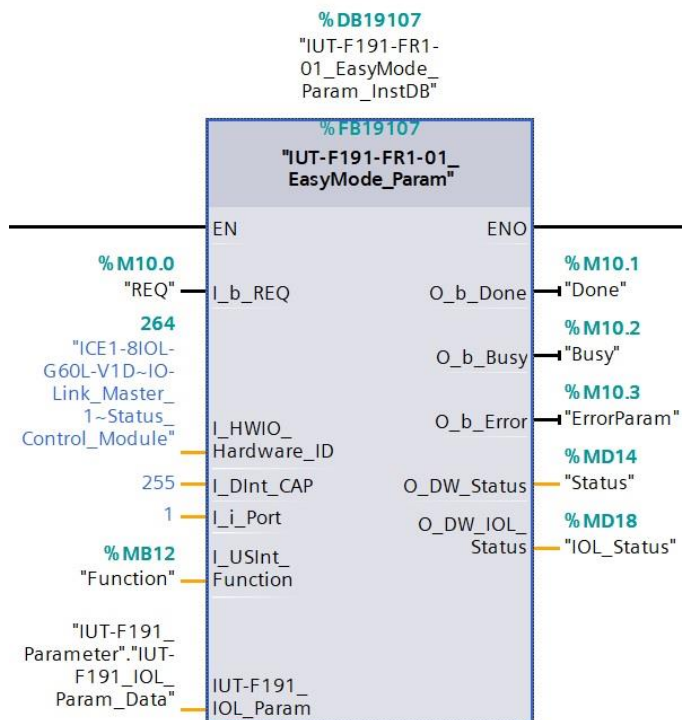
Name	Index Dec	Length	Access	Value range	Factory setting
16_Venor_Name	16	String[32]	Read		'Pepperl+Fuchs'
17_Venor_Name	17	String[32]	Read		'www.pepperl-fuchs.com/io-link'
18_Product_Name	18	String[32]	Read		'IUT-F191-IO-V1-FR1-01'
19_Product_ID	19	String[32]	Read		'70113810'
20_Product_Text	20	String[32]	Read		'RFID read/write station'
21_Serial_Number	21	String[16]	Read		'xxxxxxxxxxxxxx'
22_Hardware_Revision	22	String[8]	Read		'HW01.00'

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim		Siemens TIA-Portal ICE1 IO-Link Master		
				107 of 115

23_Firmware_Revision	23	String[8]	Read		'FW01.00'
24_Application_Specific_Tag	24	String[32]	Read		'Your automa- tion, our pas- sion.'
25_Function_Tag	25	String[32]	Read		*****
26_Location_Tag	26	String[32]	Read		*****
27_Product_URI	27	String[10 0]	Read		'https://pefu.de/x xxxxxxxxxxxxx'
64_Operation_Mode	64	Byte	Read / Write	0 (16#00) = Expert Mode; 128 (16#80) = Easy Mode	128 (16#80) = Easy Mode
65_Read_Task	65	Struct	Read / Write		
65_Read_Task. 1_MemoryArea	65	Byte	Read / Write	0 = UII/EPC + User Memory; 64 = UII/EPC; 128 = UII/EPC + TID	
65_Read_Task. 2_NumberOfBytes	65	Byte	Read / Write	1...28	
65_Read_Task. 3_StartAddress	65	Int	Read / Write	16#0000...16#FFFF	
65_Read_Task. 4_Autostart	65	Byte	Read / Write	0 = off; 128 = on	
66_Write_Task	66	Struct	Read / Write		
66_Write_Task. 1_MemoryArea	66	Byte	Read / Write	0 = User Memory; 32 = UII/EPC (incl. PC); 64 = EPC (excl. PC)	0 = User Memory
66_Write_Task. 2_NumberOfBytes	66	Byte	Read / Write	1...28	8
66_Write_Task. 3_StartAddress	66	Int	Read / Write	16#0000...16#FFFF	16#0000
67_Input_Representation	67	Byte	Read / Write	0 = Long Form data format; 128 = Short Form data format	0 = Long Form data format
96_Transmission_Powers_PT	96	Struct	Read / Write		
96_Transmission_Powers_PT. 1_Power_1	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100	100 = 100mW
96_Transmission_Powers_PT. 2_Power_2	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
96_Transmission_Powers_PT. 3_Power_3	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
96_Transmission_Powers_PT. 4_Power_4	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
96_Transmission_Powers_PT. 5_Power_5	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
97_Number_Of_Tags_To_Find_NT	97	Byte	Read / Write	1...20; 255 = off	255
98_Tries Allowed_TA	98	Byte	Read / Write	1...10	2
99_Expected_Number_Of_Tags_QW	99	Byte	Read / Write	0...4	2
100_Tag_Lost_Smoothing_E5	100	Byte	Read / Write	0...10	5
105_Transmission_Channels_CD	105	Struct	Read / Write		
105_Transmission_Channels_CD. 1_Channel_1	105	Byte	Read / Write	4, 7, 10, 13	4
105_Transmission_Channels_CD. 2_Channel_2	105	Byte	Read / Write	4, 7, 10, 13; 0 (= off)	7
105_Transmission_Channels_CD. 3_Channel_3	105	Byte	Read / Write	4, 7, 10, 13; 0 (= off)	10
105_Transmission_Channels_CD. 4_Channel_4	105	Byte	Read / Write	4, 7, 10, 13; 0 (= off)	13
224_Operating_Hours	224	Struct	Read		
224_Operating_Hours. Operating_Hours	224	DInt	Read	0...2^32-1	
225_Temperature_Indicator	225	Byte	Read	0 = Operating condition OK; 1 = Close to upper limit; 2 = Upper limit exceeded; 3 = Close to lower limit; 4 = Lower limit exceeded	
226_Temperature_Monitor	226	Struct	Read		
226_Temperature_Monitor. 1_Overtemperature_Operating_Hours	226	DInt	Read	0...2^32-1	
226_Temperature_Monitor. 2_Overtemperature_Exceeded_Counter	226	Int	Read	0...65535	
226_Temperature_Monitor. 3_Maximum_Operating_Temperature	226	Byte	Read	-40...+125	
226_Temperature_Monitor. 4_Minimum_Operating_Temperature	226	Byte	Read	-40...+125	
226_Temperature_Monitor. 5_Device_Operating_Temperature	226	Byte	Read	-40...+125	

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode Siemens TIA-Portal ICE1 IO-Link Master		KReinhardt	UHF RFID
Mannheim				108 of 115

227_Power_Monitor	227	Struct	Read		
227_Power_Monitor.1_Power_Cycles	227	DInt	Read	0...2^32-1	
227_Power_Monitor.2_Maximum_Uptime_s	227	DInt	Read	0...2^32-1	
227_Power_Monitor.3_Average_Uptime_s	227	DInt	Read	0...2^32-1	
227_Power_Monitor.4_Uptime_s	227	DInt	Read	0...2^32-1	



Complete wiring of the function block FB19107 "IUT-F191-FR1-01_EasyMode_Param":

The input parameter "I_HWIO_Hardware_ID" corresponds to the identifier of the status control module from the hardware configuration.

The following table shows the meaning of the input and output variables:

Name	Input / Output	Data type	Meaning
I_b_REQ	Input	Bool	Start reading or writing the IO-Link parameters
I_Hardware_ID	Input	HW_IO	Hardware identification of the status control module from the hardware configuration
I_DInt_CAP	Input	DInt	CAP (Client Access Point); always 255
I_i_Port	Input	Integer	Number of the port to which the RFID station is connected to the IO-Link master
I_USInt_Function	Input	USInt	Definition whether parameters are read (16#00) or written (16#01)
IUT-F191_IOL_Param	InOut	DB	Data area for the IO-Link parameters → "IUT-F191_Parameter". "IUT-F191_IOL_Param_Data"
O_b_Done	Output	Bool	Access to IO-Link parameters completed
O_b_Busy	Output	Bool	Access to IO-Link parameters active
O_b_Error	Output	Bool	Error when accessing the IO-Link parameters
O_DW_Status	Output	Double Word	Status
O_DW_IOL_Status	Output	Double Word	IO-Link Status

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		109 of 115

8.1 Read IO-Link Parameter

When executing the read access, all IO-Link parameters listed in the table above are read out one after the other.

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input type="checkbox"/> FALSE	TRUE
Function	%MB12	DEC	0	0
Done	%M10.1	Bool	<input checked="" type="checkbox"/> TRUE	
Busy	%M10.2	Bool	<input type="checkbox"/> FALSE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Initial state before the start of the read task:

REQ = False
 Function = 0 (Read access)
 Done = True (depending on previous state)
 Busy = False
 ErrorParam = False
 Status = 16#0000_0000
 IOL_Status = 16#0000_0000
 The read task starts as soon as "REQ" is set to True.

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
Function	%MB12	DEC	0	0
Done	%M10.1	Bool	<input type="checkbox"/> FALSE	
Busy	%M10.2	Bool	<input checked="" type="checkbox"/> TRUE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Execution Read access to IO-Link parameters enabled:

REQ = True
 Function = 0 (Read access)
 Done = False
 Busy = True (Read access active)
 ErrorParam = False
 Status = 16#0000_0000
 IOL_Status = 16#0000_0000

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
Function	%MB12	DEC	0	0
Done	%M10.1	Bool	<input checked="" type="checkbox"/> TRUE	
Busy	%M10.2	Bool	<input type="checkbox"/> FALSE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Execution Read access to IO-Link parameters finished

REQ = True
 Function = 0 (Read access)
 Done = True
 Busy = False
 ErrorParam = False
 Status = 16#0000_0000
 IOL_Status = 16#0000_0000

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input type="checkbox"/> FALSE	FALSE
Function	%MB12	DEC	0	0
Done	%M10.1	Bool	<input checked="" type="checkbox"/> TRUE	
Busy	%M10.2	Bool	<input type="checkbox"/> FALSE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Trigger for execution read access reset

REQ = False
 Function = 0 (Read access)
 Done = True
 Busy = False
 ErrorParam = False
 Status = 16#0000_0000
 IOL_Status = 16#0000_0000

The IO-Link parameters read in are stored within the DB19108 "IUT-F191_Parameter" data block in the "IUT-F191_IOL_Param_Data" data structure.

IUT-F191_Parameter			
Name	Dat...	St...	Monitor value
Static			
IUT-F191_IOL_Param_Data		*IUT...	
16_Vendor_Name	Stri...	"	'Pepperl+Fuchs'
17_Vendor_Text	Stri...	"	'www.pepperl-fuchs.com/io-link'
18_Product_Name	Stri...	"	'IUT-F191-IO-V1-FR1-01'
19_Product_ID	Stri...	"	'70113810'
20_Product_Text	Stri...	"	'RFID read/write station'
21_Serial_Number	Stri...	"	'xxxxxxxxxxxxxxxx'
22_Hardware_Revision	Stri...	"	'HW01.00'
23_Firmware_Revision	Stri...	"	'FW01.00'
24_Application_Specific_Tag	Stri...	"	'Your automation, our passion.'
25_Function_Tag	Stri...	"	'****'
26_Location_Tag	Stri...	"	'****'
27_Product_URI	Stri...	"	'https://pefu.de/xxxxxxxxxxxxxxxx'

Read-in standard IO-Link parameters.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		110 of 115

IUT-F191_Parameter				
Name	Dat...	St...	Monitor value	
64_Operation_Mode	Byte	16#	16#80	
65_Read_Task	Struct			
1_MemoryArea	Byte	16#	16#00	
2_NumberOfBytes	Byte	16#	16#08	
3_StartAddress	Int	0	0	
4_Autostart	Byte	16#	16#80	
66_Write_Task	Struct			
1_MemoryArea	Byte	16#	16#00	
2_NumberOfBytes	Byte	16#	16#08	
3_StartAddress	Int	0	0	
67_Input_Representation	Byte	16#	16#00	

Read-in device-specific IO-Link parameters for setting the read/write functionality.

IUT-F191_Parameter				
Name	Dat...	St...	Monitor value	
96_Transmission_Powers_PT	Struct			
1_Power_1	Int	0	100	
2_Power_2	Int	0	0	
3_Power_3	Int	0	0	
4_Power_4	Int	0	0	
5_Power_5	Int	0	0	
97_Number_Of_Tags_To_Find_NT	Byte	16#	16#FF	
98_Tries_Allowed_TA	Byte	16#	16#02	
99_Expected_Number_Of_Tags_QW	Byte	16#	16#02	
100_Tag_Lost_Smoothing	Byte	16#	16#05	
105_Transmission_Channels_CD	Struct			
1_Channel_1	Byte	16#	16#04	
2_Channel_2	Byte	16#	16#07	
3_Channel_3	Byte	16#	16#0A	
4_Channel_4	Byte	16#	16#0D	

Read-in device-specific IO-Link parameters for setting the UHF functionality.

IUT-F191_Parameter				
Name	Dat...	St...	Monitor value	
224_Operating_Hours	Struct			
Operating_Hours	DInt	0	231	
Operating_Days	DInt	0	9	
225_Temperature_Indicator	Byte	16#	16#00	
226_Temperature_Monitor	Struct			
1_Overtemperature_Operating_Hours	DInt	0	0	
2_Overtemperature_Exceeded_Counte	Int	0	0	
3_Maximum_Operating_Temperature	Byte	16#	16#2E	
4_Minimum_Operating_Temperature	Byte	16#	16#11	
5_Device_Operating_Temperature	Byte	16#	16#25	
Max_Op_Temp_°C	Int	0	46	
Min_Op_Temp_°C	Int	0	17	
Device_Op_Temp_°C	Int	0	37	
227_Power_Monitor	Struct			
1_Power_Cycles	DInt	0	186	
2_Maximum_Uptime_s	DInt	0	32400	
3_Average_Uptime_s	DInt	0	4481	
4_Uptime_s	DInt	0	21717	
Max_Uptime_min	DInt	0	540	
Max_Uptime_h	DInt	0	9	
Max_Uptime_d	DInt	0	0	
Ave_Uptime_min	DInt	0	74	
Ave_Uptime_h	DInt	0	1	
Ave_Uptime_d	DInt	0	0	
Uptime_min	DInt	0	361	
Uptime_h	DInt	0	6	
Uptime_d	DInt	0	0	

Read-in IO-Link parameters with additional device information.

8.2 Write IO-Link Parameter

Before starting write access to the IO-Link parameters, the new parameter values must be transferred to the DB19108 "IUT-F191_Parameter" data block in the "Config_Param" data structure via a variable table.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim		Siemens TIA-Portal ICE1 IO-Link Master		
				111 of 115

Name	Ad...	Displ...	Monitor ...	Modify...	IUT-F191_Parameter
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."64_Operation_Mode".Operation_Mode	Hex	16#B0			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."65_Read_Task"."1_MemoryArea"	Hex	16#00			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."65_Read_Task"."2_NumberOfBytes"	Hex	16#00			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."65_Read_Task"."3_StartAddress"	Hex	16#0000			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."65_Read_Task"."4_AutoStart"	Hex	16#80			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."66_Write_Task"."1_MemoryArea"	Hex	16#00			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."66_Write_Task"."2_NumberOfBytes"	Hex	16#00			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."66_Write_Task"."3_StartAddress"	Hex	16#0000			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."67_Input_Representation".Input_Representation	Hex	16#00			
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."1_Power_1"	DEC	10	10		
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."2_Power_2"	DEC	20	20		
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."3_Power_3"	DEC	50	50		
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."4_Power_4"	DEC	100	100		
"IUT-F191_Parameter"."IUT-F191_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."5_Power_5"	DEC	0	0		

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input type="checkbox"/> FALSE	TRUE
Function	%MB12	DEC	1	1
Done	%M10.1	Bool	<input checked="" type="checkbox"/> TRUE	
Busy	%M10.2	Bool	<input type="checkbox"/> FALSE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Initial state before the start of the write access:

REQ = False
Function = 1 (Write access)
Done = True (depending on previous state)
Busy = False
ErrorParam = False
Status = 16#0000_0000
IOL_Status = 16#0000_0000

The write access starts as soon as "REQ" is set to True.

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
Function	%MB12	DEC	1	1
Done	%M10.1	Bool	<input type="checkbox"/> FALSE	
Busy	%M10.2	Bool	<input checked="" type="checkbox"/> TRUE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Execution Write access to IO-Link parameters enabled:

REQ = True
Function = 1 (Write access)
Done = False
Busy = True (Write access active)
ErrorParam = False
Status = 16#0000_0000
IOL_Status = 16#0000_0000

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input checked="" type="checkbox"/> TRUE	TRUE
Function	%MB12	DEC	1	1
Done	%M10.1	Bool	<input checked="" type="checkbox"/> TRUE	
Busy	%M10.2	Bool	<input type="checkbox"/> FALSE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Execution Write access to IO-Link parameters finished

REQ = True
Function = 1 (Write access)
Done = True
Busy = False
ErrorParam = False
Status = 16#0000_0000
IOL_Status = 16#0000_0000

Name	Address	Displ...	Monitor value	Modify ...
REQ	%M10.0	Bool	<input type="checkbox"/> FALSE	FALSE
Function	%MB12	DEC	1	1
Done	%M10.1	Bool	<input checked="" type="checkbox"/> TRUE	
Busy	%M10.2	Bool	<input type="checkbox"/> FALSE	
ErrorParam	%M10.3	Bool	<input type="checkbox"/> FALSE	
Status	%MD14	Hex	16#0000_0000	
IOL_Status	%MD18	Hex	16#0000_0000	

Trigger for execution write access reset

REQ = False
Function = 1 (Write Access)
Done = True
Busy = False
ErrorParam = False
Status = 16#0000_0000
IOL_Status = 16#0000_0000

9. Easy-Mode – Structure process data

The process data fields are used to transfer the process data between the IUT-F191-IO-V1 RFID station and a PLC. There is a process data field for input data, i.e. from the direction of the station to the PLC, and a process data field for output data, i.e. from the direction of the PLC to the RFID station. Both process data fields have a fixed length of 32 bytes. This length is constant and is permanently set in the hardware configuration of the PLC.

Within the telegram 4 bytes are used for control information. The telegram length minus the 4 bytes of control information can thus be used for the user data.

The following table shows the structure of the process data field for the output data:

Byte	Content							
0	0	0	0	0	0	0	Start Write	Start Read

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		112 of 115

1	Unused
2	Unused
3	Unused
4	Write Data
5	Write Data
6	Write Data
....	Write Data
31	Write Data

The "Start Read" bit controls the execution of a read task. The read task is started as soon as the bit is set. The "Start Write" bit is used to control a write task. This starts as soon as the "Start Write" bit is set. A read task or a write task is executed as long as the associated start bit is set. The task can only be aborted by resetting the start bit.

The parameters required for data carrier access, such as "Memory area", "Number of bytes" and "Start address", must be set beforehand via the IO-Link parameters. A change during system operation is possible. The IO-Link parameters are stored within an EEPROM. The parameters should therefore be set appropriately during initial startup.

An "Autostart" function can be activated within IO-Link parameter 65 (16#41) "Read Task". If the "Autostart" function is activated, no output data has to be sent. The RFID station performs a permanent read access. The memory area to be read by the read access is defined by the setting within the IO-Link parameter 65 (16#41) "Read Task". When using the "Autostart" function, the "Start Read" and "Start Write" bits have no relevance.

The following table shows the structure of the process data field for the input data when using the "Long Form" data format:

Byte	Content				
0	0	0	0	TagPresent	Error Active Write Valid Read Valid
1	Length Data				
2	RSSI				
3	Transmission Power (dBm)				
4	Length UII/EPC Information (High Byte)				
5	Length UII/EPC Information (Low Byte)				
6	PC Word (High Byte)				
7	PC Word (Low Byte)				
8	UII/EPC Byte 1				
9	UII/EPC Byte 2				
...	...				
...	UII/EPC Byte X				
...	Length Information (High Byte)				
...	Length Information (Low Byte)				
...	Information Byte 1				
...	Information Byte 2				
...	...				
...	Information Byte Y				
...	16#00				
31	16#00				

As soon as a read or write task is started and executed, this is indicated by the "Active" bit. This bit remains set for the complete period of the task execution. The "Active" bit is only reset when the read or write job is canceled. If a read task is active, the "Read Valid" bit is set when the data carrier is in the detection range and the data has been read. The bit remains set for the duration of the data carrier's stay in the detection range. This bit is only reset when the data carrier leaves the detection range.

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode		KReinhardt	UHF RFID
Mannheim		Siemens TIA-Portal ICE1 IO-Link Master		
				113 of 115

The "Write Valid" bit behaves identically. It is set when the data carrier is in the detection zone and the data has been successfully written to the data carrier. The bit is reset as soon as the data carrier leaves the detection zone again.

The presence of at least one data carrier in the detection zone is signaled via the "TagPresent" bit. If no data carrier is present in the detection zone, this bit is reset.

When several data carrier are identified simultaneously, successful read or write access is indicated by a positive signal change (0 → 1) at the "Read Valid" or "Write Valid" bits. If a new tag enters the detection zone, the "ReadValid" or "WriteValid" bit is initially reset for 50ms. The bit is then set again, thus signaling successful read access or write access.

The "Length data" byte contains the length specification of the read-in data in bytes. The length depends on the size of the UII/EPC and the number of bytes set by IO-Link parameter 65 (16#41) "Read Task". Starting from byte 4, the number of transmitted user data is specified for "Length data".

The RSSI value for data carrier access is transmitted via the "RSSI" byte. The RSSI has a value between 0 and 100. The greater the value, the better the signal quality of the data transmission between the data carrier and the RFID station.

With the RFID station, the use of several power levels can be set one after the other (transmission power ramp). The "Transmission Power (dBm)" byte specifies the value of the transmission power in dBm with which access to the data carrier could be successfully performed. The transmission power is specified in dBm and not in mW, since this value can be represented by a byte.

For an unambiguous assignment of the transmitted data to a data carrier, the UII/EPC information must be specified. The length of the EPC information is first transmitted in bytes 4 and 5, since the UII/EPC of data carriers can have a different length. This is followed by the PC word in bytes 6 and 7. Starting from byte 8, the process input data field contains the UII/EPC of the read data carrier.

In the case of a read access to the TID or the user data, the UII/EPC is followed by an indication of the length of the TID or user data read in. This is followed by the TID or the read-in area of the user data.

An error may occur during the execution of a read or write task. The error status is indicated via the "Error" bit. If an error condition exists, additional error information is transmitted via the input data field. This information contains an error code and an error description in plain text (ASCII characters). A check of the error description provides an indication of the cause of the error condition.

The following table shows the structure of the process data field of the input data in the error state:

Byte	Content							
0	0	0	0	TagPresent	Error	Active	Write Valid	Read Valid
1	Length Data							
2	Unused							
3	Unused							
4	Error Code (HEX)							
5	Error String							
6	Error String							
...	Error String							
31	Error String							

	RFID-Station IUT-F191-IO-V1			2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode Siemens TIA-Portal ICE1 IO-Link Master		KReinhardt	UHF RFID
Mannheim				114 of 115

10. Trouble shooting

Index	Description	Correction
1	Profinet communication does not work	<ol style="list-style-type: none"> 1. Check whether the setting of the Profinet name in the device and in the PLC are identical 2. Check whether the rotary switch "X100" on the front of the device is in the "P" position (P = Profinet)
2	All data within the DBs for the Easy Mode are 16#00	<ol style="list-style-type: none"> 1. Control of a read task by StartRead check if input data have a change. 2. Check whether the input parameter "I_HWIO_Hardware_ID" is parameterized with the hardware ID of the communication module IO-Link I/O 32/32 bytes of the associated port; symbolic addressing possible
3	Function block does not react to the control of the inputs	<ol style="list-style-type: none"> 1. Check whether the Autostart function has been activated (read IO-Link parameter 65 "Read Task") → when the Autostart function is used, a read task is automatically started by the station (blue LED on the station is on) and the station does not respond to the process output data of the controller. 2. Deactivation of the Autostart function (change IO-Link parameter 65 "Read Task")
4	The EPC information has a different length than described in the documentation	<ol style="list-style-type: none"> 1. An EPC code can have a different length and depends on the delivery status of the transponder. 2. In the majority the EPC has a length of 12 bytes 3. The length of the EPC information results from the length of the EPC plus the PC word (2 bytes).
5	Writing the EPC is not possible	<ol style="list-style-type: none"> 1. Write access to the UII/EPC data area is possible when using the Easy Mode. 2. Setting of write access via IO-Link parameter 66 "Write Task" 3. Option for writing with PC word and also without PC word 4. Adaptation of the "Number of Bytes" value to the length of the write data
6	ReadCounter or WriteCounter are constantly increased when the presence of a data carrier remains unchanged (standstill)	<ol style="list-style-type: none"> 1. Counters for successful reading or writing are incremented for each access to a data carrier 2. Data carrier is constantly re-read → unstable communication between RFID station and data carrier. 3. Increase of IO-Link parameter 99 (Tag Lost Smoothing - E5). As a result, the logoff of the data carrier from the RFID station is delayed.
7	An error message with the status value 16#0A appears	<ol style="list-style-type: none"> 1. Check whether "Long Form" or "Short Form" data format is activated (IO-Link parameter 67 Input Representation). 2. Long form: at least 2 data carriers with the same UII/EPC information are → not permitted in the detection zone; only data carriers with different UII/EPC information are allowed 3. Short form: at least 2 data carriers are in the detection zone → not permitted; only one data carrier can be in the detection zone.
8	An error message with the status value 16#04 appears when a data carrier enters the detection zone	<ol style="list-style-type: none"> 1. Access to the parameterized data area is not possible 2. Either the data carrier does not have a memory bank for the user data or the amount of data to be read in is larger than the available memory inside the data carrier.
9	Read task is active (blue LED on), but the data carrier can only be read at a small distance	<ol style="list-style-type: none"> 1. Check the mounting requirements of the data carrier (on metal or on plastic or non-conductive substrate). 2. If there is an "-M-" in the P+F specific designation (e.g. IUC76-F157-M-FRx), the data carrier is optimized for mounting on metal. The range is optimal with appropriate mounting 3. If there is no "-M-" in the P+F specific designation (e.g. IUC77-25L110), the mounting can be done on non-conductive substrate 4. The transmission power can be increased using IO-Link parameter 96 "Transmission Powers - PT"
10	Several data carriers are identified at the same time	<ol style="list-style-type: none"> 1. Reading from several data carriers is possible, since it is a radio system. 2. Parameterization a ramp function for the transmission power (IO-Link parameter 96 "Transmission Powers - PT) with increasing power values as well as increasing the number of access attempts (IO-Link parameter 98 "Tries Allowed - TA"). 3. Use of the "IUT-F191_EasyMode_Basic_1Tag" function block. This immediately cancels the read task after successfully reading a data carrier.

	RFID-Station IUT-F191-IO-V1		2022/12/06
	Operating instructions Function Block: IUT-F191-IO-V1 Easy Mode	KReinhardt	UHF RFID
Mannheim	Siemens TIA-Portal ICE1 IO-Link Master		115 of 115