Operating instructions

Function blocks Easy Mode RFID device IQT3-FP-IO-V1 on Siemens TIA Portal with ICE1-8IOL IO-Link Master

IO-Link RFID-Device IQT3-FP-IO-V1

Project Name:	**IO-Link RFID-Device IQT3-FP-IO-V1; ISO15693; Easy Mode Function blocks**
Datum:	**11.05.2023**
Creator:	**Karsten Reinhardt**

Version history

Version	Release data	Comment
1	**11.05.2023**	Initial Version

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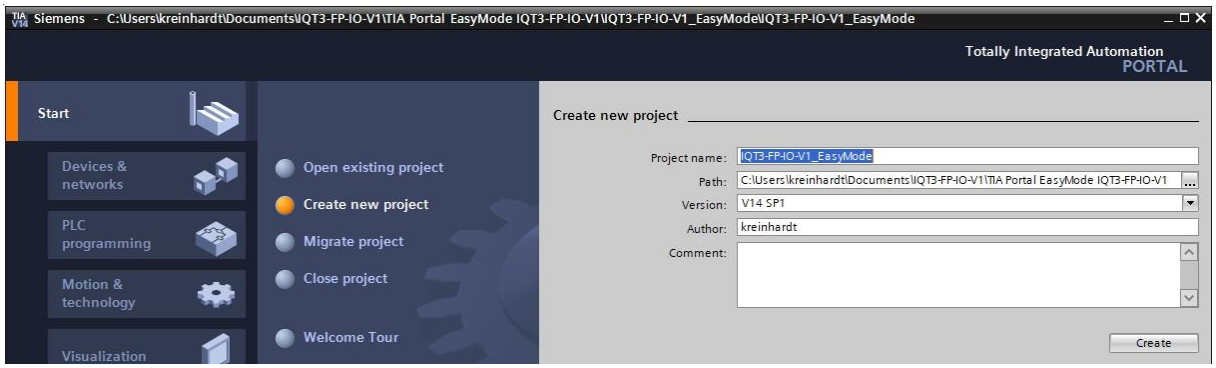
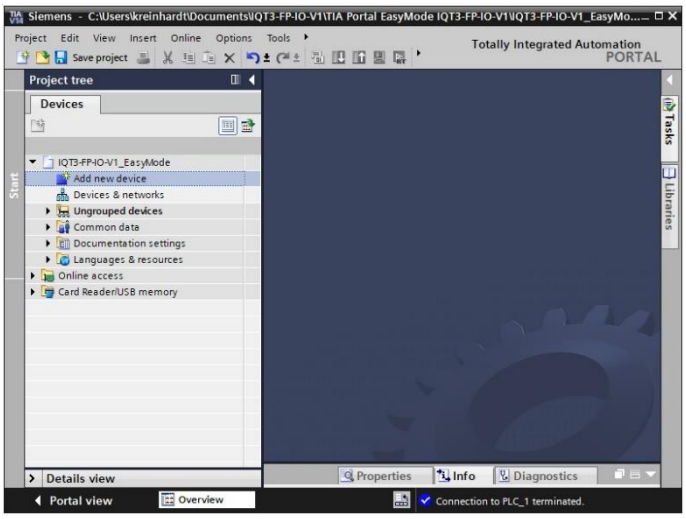
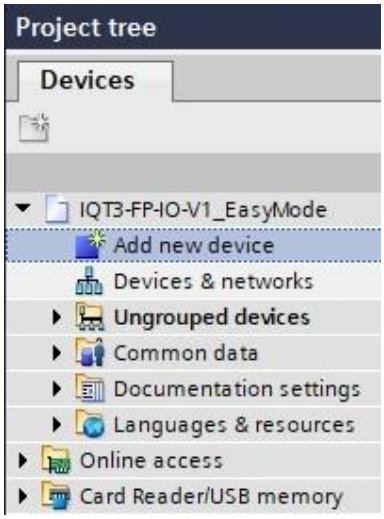
1. Basic PLC configuration

The first step is to create a new PLC project. For this purpose, a project name (e.g. "IQT3-FP-IO-V1_EasyMode") and a storage path of the project must be entered or selected.

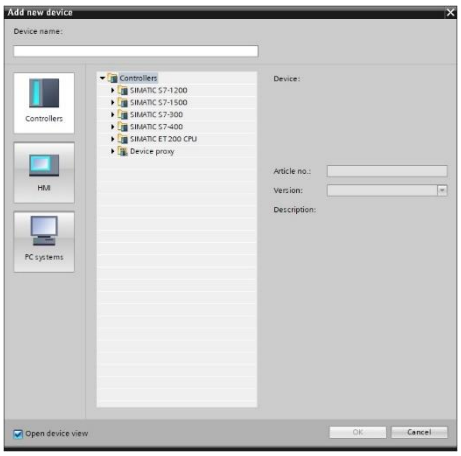


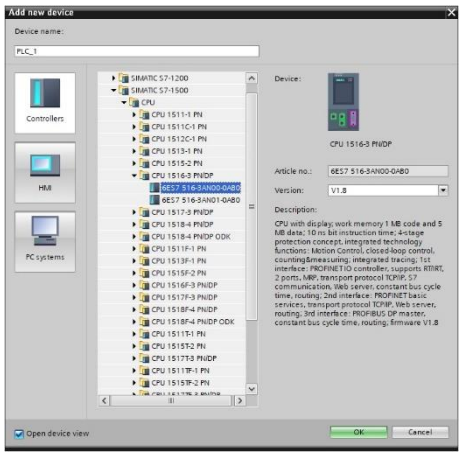
After creating the empty PLC project, switch to the project view. A selection window is called up by "Add new device" in the project navigation on the left.

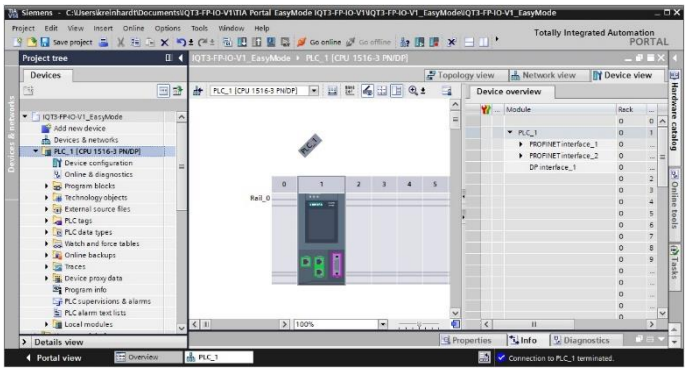




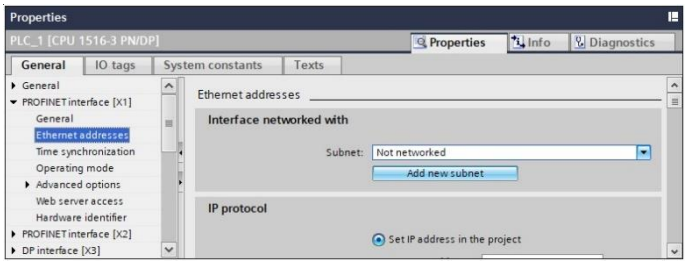
In this selection window, the appropriate PLC must be selected.



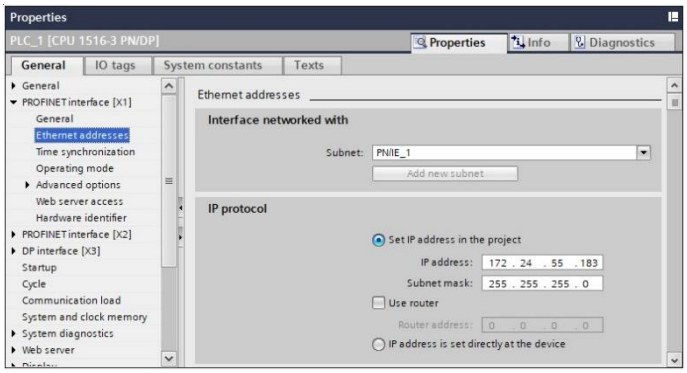




After assigning the CPU, the project view switches to the setting of the PLC parameters.

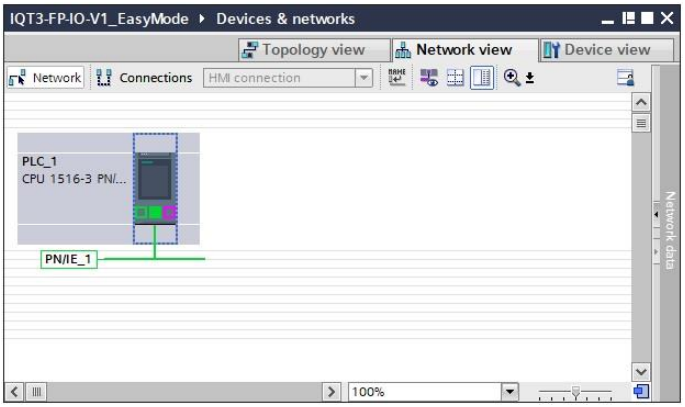


For the Profinet interface X1, a Profinet subnet must be added under the selection "Ethernet addresses" via the selection "Add new subnet". A subnet with the designation "PN/IE_1" is created.

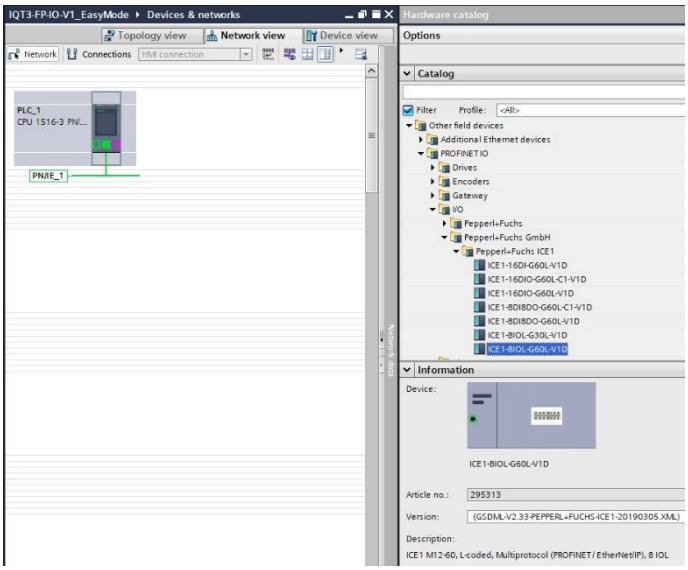


Then set the network parameters (IP address, subnet mask) of the PLC.

IP address: 172.24.55.183
Subnet mask: 255.255.255.192



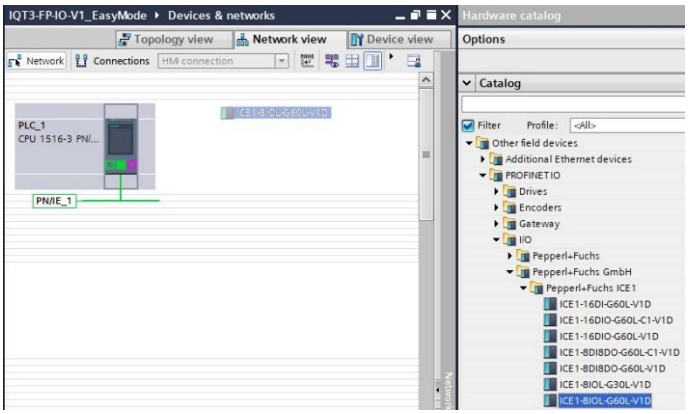
The network view symbolically shows the configured PLC. Starting from the CPU, the subnet "PN/IE_1" is located.



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-G60-V1D".

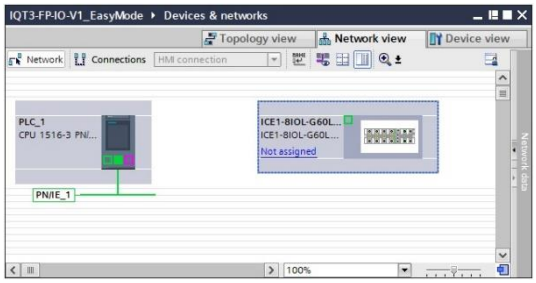
If the GSDML file is not in the catalog, it must be imported beforehand.

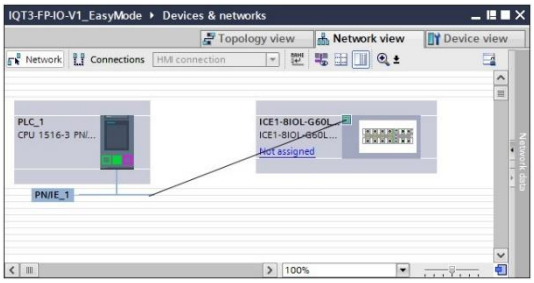
2. Hardware configuration IO-Link Master ICE1-8IOL

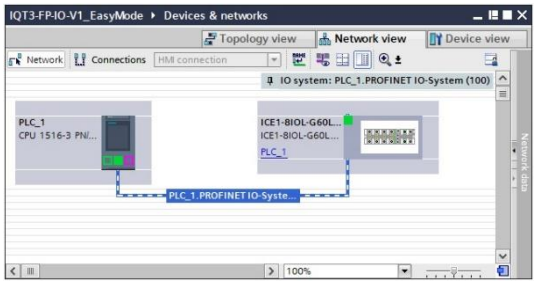


The GSDML for the IO-Link master ICE1-8IOL-G60-V1D is to be dragged over from the hardware catalog into the center window of the device view.

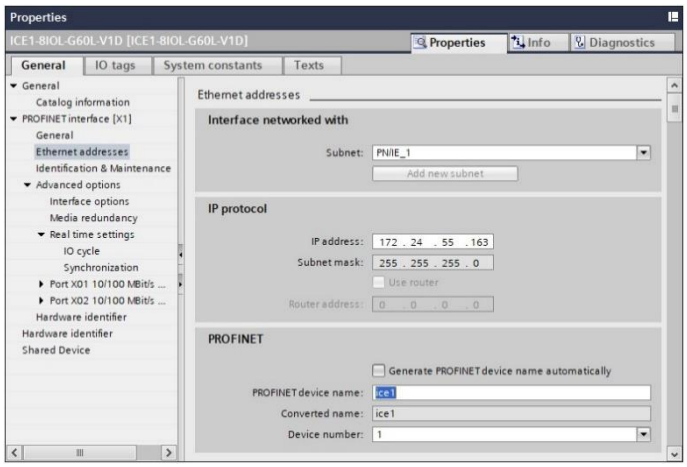
Other field devices → "Profinet IO" → "I/O" → "Pepperl+Fuchs GmbH" → "Pepperl+Fuchs ICE1" → "ICE1-8IOL-G60-V1D".





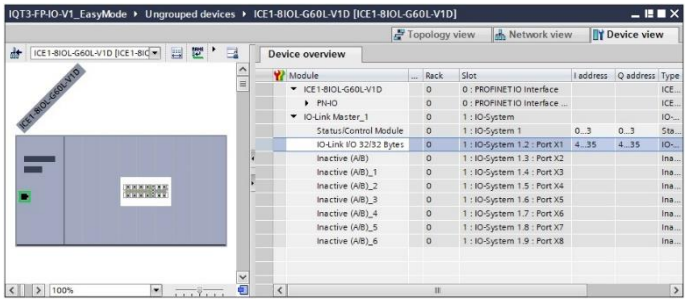


Connection IO-Link master to Profinet network PN/IE_1
The Profinet connection between ICE1-8IOL and PLC is connected manually in the network view via the mouse indicator. The IO-Link master is thus connected to the "PN/IE_1" subnet. The correct Profinet connection is displayed in green. The assignment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



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 IQT3-FP-IO-V1 RFID device is connected. Ports that are not used must be set to inactive.

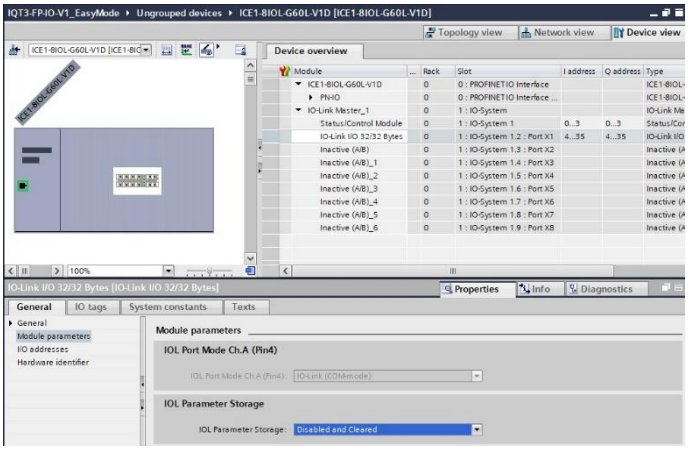
The added communication module has a hardware identifier. This identifier serves as input parameter "I_HWIO_Hardware_ID" of the function block. A symbolic addressing is possible.

„IO-Link I/O 32/32 Bytes“ = 265

2.1 Set up IO-Link Parameter Storage

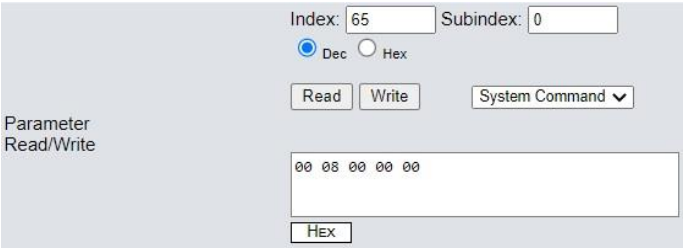
The "IO-Link Parameter Storage" function offers the option of additionally storing the IO-Link parameters of the connected device within the IO-Link master. This makes it possible to automatically transfer the previously set parameter set of the device to a replacement device. Additional parameterization 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.



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

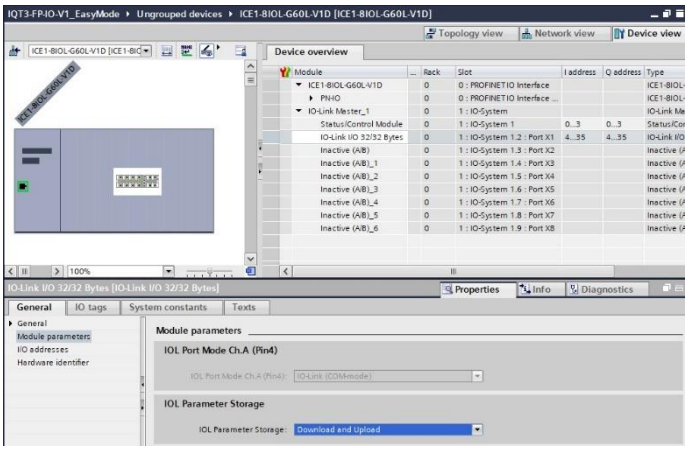
Subsequently, the IO-Link parameters can be set via the web page.



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

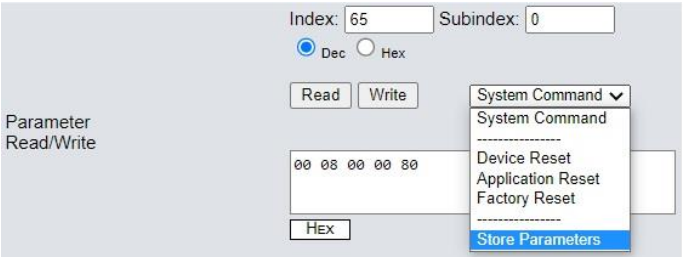
After the IO-Link parameters have been set via the web page, the "IOL Parameter Storage" module parameter must be changed to "Download and Upload". The new configuration must be transferred to the controller.



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 device IQT3-FP-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

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 IQT3-FP-IO-V1

The mode of operation of the IQT3-FP-IO-V1 RFID device can be set via various IO-Link parameters. In addition, device-specific information can be read out via the IO-Link parameters.

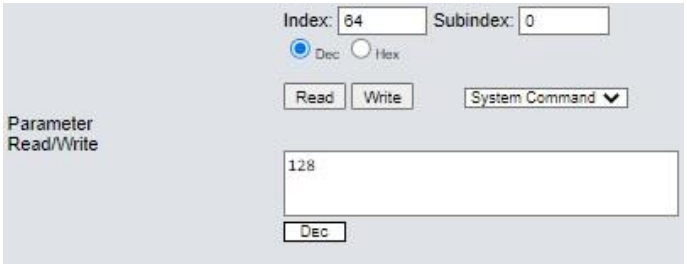
Name	Index Dec	Index Hex	Sub index	Length	Access	Value range	Default setting
Operation Mode	64	16#40	0	1 Byte	Read / Write	0 = Expert Mode 128 = Easy Mode	128 = Easy Mode
Read Task – Memory Area	65	16#41	1	1 Byte	Read / Write	0 = UID + User Memory 128 = UID	0 = UID + User Memory
Read Task – Number of 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	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 = Short Form data format
Transmission Power - PT	96	16#60	0	1 Word	Read / Write	16#0001 = Minimum 16#0002 = Eco 16#0003 = Normal 16#0004 = Maximum	16#0004 = Max-imum
Number of Tags to find - NT	97	16#61	0	1 Byte	Read / Write	1…20 255 = off	255
Tries Allowed - TA	98	16#62	0	1 Byte	Read / Write	1…10	2
Expected Number of Tags - QW	99	16#63	0	1 Byte	Read / Write	0 = 1 data carrier 1 = 2 data carriers 2 = 4 data carriers 3 = 8 data carriers 4 = 16 data carriers	0
Tag Lost Smoothing – E5	100	16#64	0	1 Byte	Read / Write	0…10	5
Tag Type - CT	106	16#6A	0	1 Byte	Read / Write	20 → Automatic (ISO/IEC 15693) 21 → ICODE SLI (NXP) 22 → Tag-it HF-I Plus (TI) 23 → my-D SRF55V02P (Infineon) 24 → my-D SRF55V10P (Infineon) 25 → LRI512 (STMicroelectronics) 27 → EM4135 (EM Microelectronic) 28 → EM4034 (EM Microelectronic) 29 → EM4035 (EM Microelectronic) 30 → LRI2K (STMicroelectronics) 31 → Tag-it HF-I Standard (TI) 32 → Tag-it HF-I Pro	20

						(TI) 33 → FRAM MB89R118 (Fujitsu) 34 → FRAM MB89R119 (Fujitsu) 35 → ICODE SLI-S (NXP) 36 → ICODE SLI-L (NXP) 37 → FRAM MB89R112 (Fujitsu) 38 → EM4233 (EM Microelectronic) 50 → ICODE SLIX2 (NXP)	
Overtemperature Handling – TO	107	16#6B	0	1 Byte	Read / Write	0 → Switch off transmitting mode 1 → reduce transmit power 2 → reduce number of access attempts	0
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 exceeded 3 = Close to lower limit 4 = Lower limit exceeded	-
Temperature Monitor – Overtemperature Operating Hours	226	16#E2	1	4 Byte	Read	0…2^32-1	-
Temperature Monitor – Overtemperature Exceeded 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 Temperature	226	16#E2	5	1 Byte	Read	-40…+125	-
Power Monitor – Power Cycles Counter	227	16#E3	1	4 Byte	Read	0…2^32-1	-
Power Monitor – Maximum Uptime	227	16#E3	2	4 Byte	Read	0…2^32-1	-
Power Monitor – Average 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	-
RFID Device Monitor – Carrier Operating Hours	230	16#E6	1	4 Byte	Read	0…2^32-1	-
RFID Device Monitor – Power Amplifier Temperature	230	16#E6	2	1 Byte	Read	-40…+125	-
RFID Device Status – Power Amplifier Overtemperature Error	231	16#E7	1	1 Bit	Read	True = Operating temperature of the amplifier has exceeded the upper limit	-
RFID Device Status – Power Amplifier Overtemperature Warning	231	16#E7	2	1 Bit	Read	True = Operating temperature of the amplifier is near the upper limit	-

RFID Device Status – Tune Limit	231	16#E7	3	1 Bit	Read	True = RFID device is detuned by surrounding metal	-
RFID Device Status – Disturbed	231	16#E7	4	1 Bit	Read	True = RFID device is disturbed	-

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 area 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.

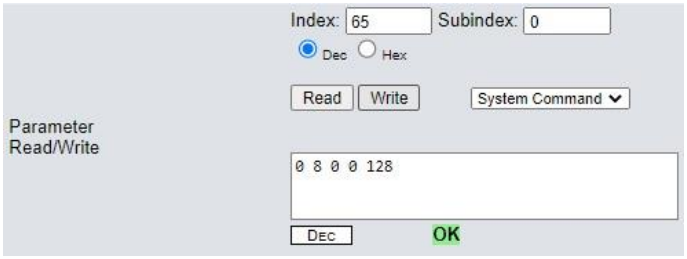
The User Memory (user data) or UID (Fixcode) can be read. Read access to other memory areas is not possible when using Easy mode.

In the factory setting of the IQT3-FP-IO-V1 RFID device, the "Short Form" data format is activated. This means that no additional length information or the associated UID of the data carrier is prefixed to the read-in data. Thus more space is available for the transmission of the data.
The data format can be changed to "Long Form". This makes it possible to identify several data carriers simultaneously and to transmit the associated data. The UID of the data carrier and additional length information are prepended to the read-in data. The UID is used to uniquely assign a data record to a specific data carrier. Switching to the "Long Form" data format reduces the space required for transferring data to be read in from the User Memory.

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

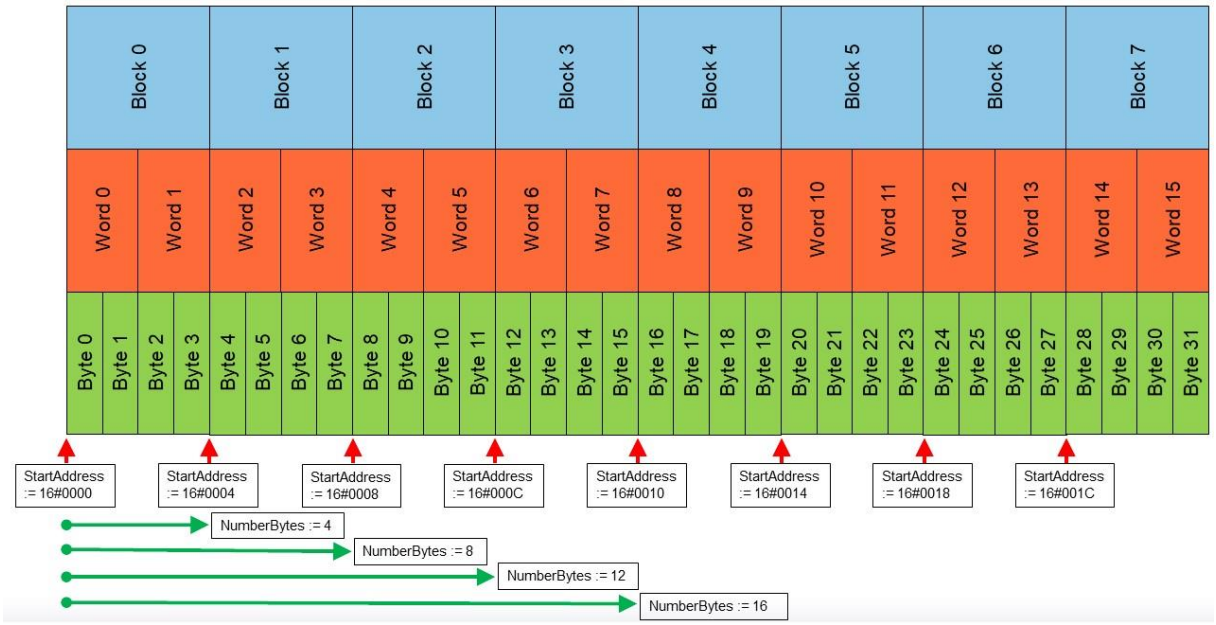
Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
65	16#41	1	1 Byte	0	16#00	Read / Write	Memory area: Read access to User Memory (user data) User Memory (short form) Length UID + UID + Length User Memory +

							User Memory (Long Form) Factory setting
65	16#41	1	1 Byte	128	16#80	Read / Write	Memory area: Read access to UID (Fixcode) UID (Short Form) Length UID + UID (Long Form)
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 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 65 (16#41) „Read Task“: Readout parameters with the factory setting;
0 → User Memory
8 → 8 Byte
00 → Start address 0
128 → Autostart on

Parameterization "Number of bytes" and "Start address" for access to User Memory (user data)



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 configures write access to the data carrier. When using the Easy mode, only the User Memory (user data) can be written. The number of bytes to be written and the start address are also defined. 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.

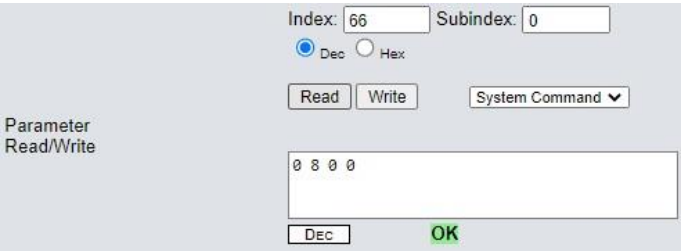
Easy mode only allows write access to the User Memory area. Easy mode does not allow write access to other memory areas.

The "Short Form" data format is activated in the factory setting of the IQT3-FP-IO-V1 RFID device. This means that the UID of the programmed data carrier is transferred to the controller via the process data in the event of a successful write access to a data carrier. When using the "Short Form" data format, the length information for the returned UID is omitted. When using the "Short Form" data format, exactly one data carrier can be accessed at the same time.

By changing to the "Long Form" data format, several data carriers can be accessed simultaneously. If write access to a data carrier is successful, the UID of the programmed data carrier and length information about the process data are transmitted to the PLC.

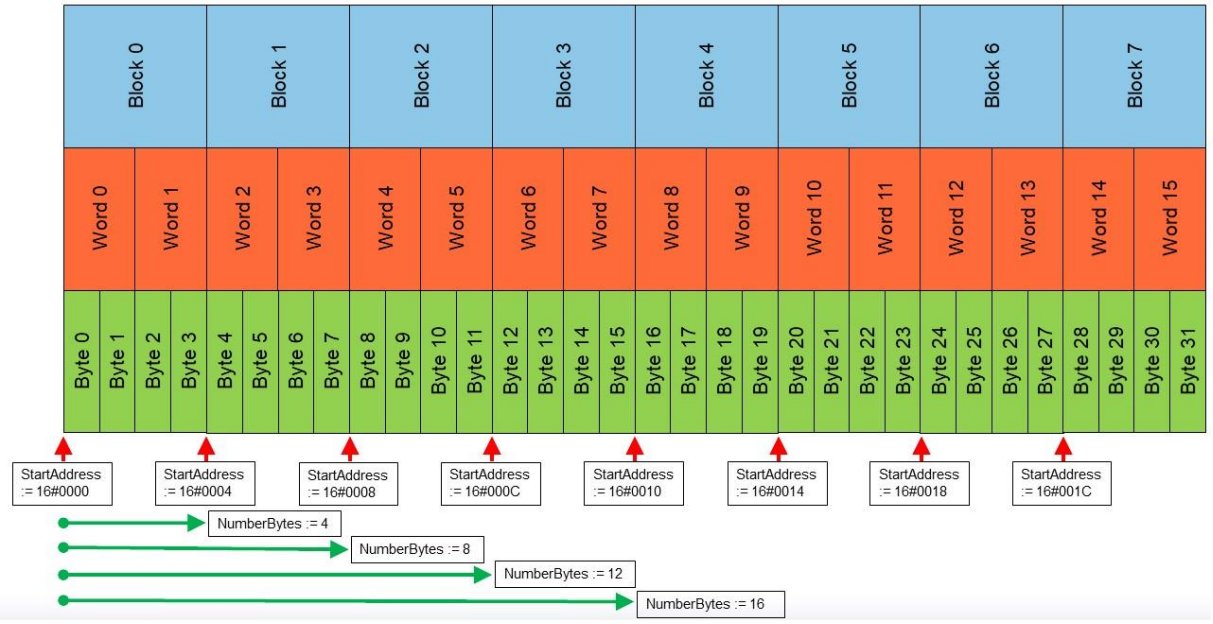
Structure Parameter 66 (16#42) “Write Task“

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 area: Write access to User Memory (user data) UID (Short Form) Length UID + UID (Long Form) Factory setting
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 Memory
66	16#42	3	2 Byte / 1 Word	0…. 65535	16#0000 … 16#FFFF	Read / Write	Start address: Start address for write access to the User Memory; factory setting 0 (16#0000)



Parameter 66 (16#42) “Write Task“: Readout parameter with the factory setting;
0 → User Memory
8 → 8 Byte
00 → Start address 0

Parameterization "Number of bytes" and "Start address" for access to User Memory (user data)



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 "Short Form" data format is used. This means that no additional length information and the UID of the associated data carrier are prefixed to the read-in data. This means that up to 28 bytes of read-in data can be transferred. The "Short Form" data format can only be used for SingleTag applications.

When using the "Long Form" data format, additional length information and the UID of the associated data carrier are prefixed to the read-in data. This is necessary in order to be able to clearly assign the read-in data set to a data carrier in MultiTag applications. However, this occupies a part of the process data that is no longer available for the read-in data.

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

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	16#00							
4	Information Byte 1							
5	Information Byte 2							
…	…							
…	Information Byte Y							
…	16#00							
31	16#00							

When using the "Short Form" data format, the prefixed UID and length information in the response are 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 "Long Form" data format:

Byte	Content							
0	0	0	0	Tag Present	Error	Active	Write Valid	Read Valid
1	Length Data (Length between “Length UID Information High Byte” and “Information Byte Y”)							
2	RSSI							
3	16#00							
4	Length UID (High Byte); 16#00							
5	Length UID (Low Byte); 16#08							
6	UID Byte 1							
7	UID Byte 2							
8	UID Byte 3							
9	UID Byte 4							
10	UID Byte 5							
11	UID Byte 6							

12	UID Byte 7
13	UID Byte 8
14	Length Information (High Byte)
15	Length Information (Low Byte)
16	Information Byte 1
17	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 more than one data carrier is identified. A disadvantage of the protocol is the necessary prefixing of the UID and the length information in the response. If only one tag is to be accessed by the RFID device, its UID and length information are not required. However, the UID and the length information occupy a partial area of the telegram in the reply. This means that not the entire telegram is available for transmission of the intended information.

Parameter 67 (16#43) „Input Representation“:
Readout of the parameter in the factory setting;
128 → Short Form data format

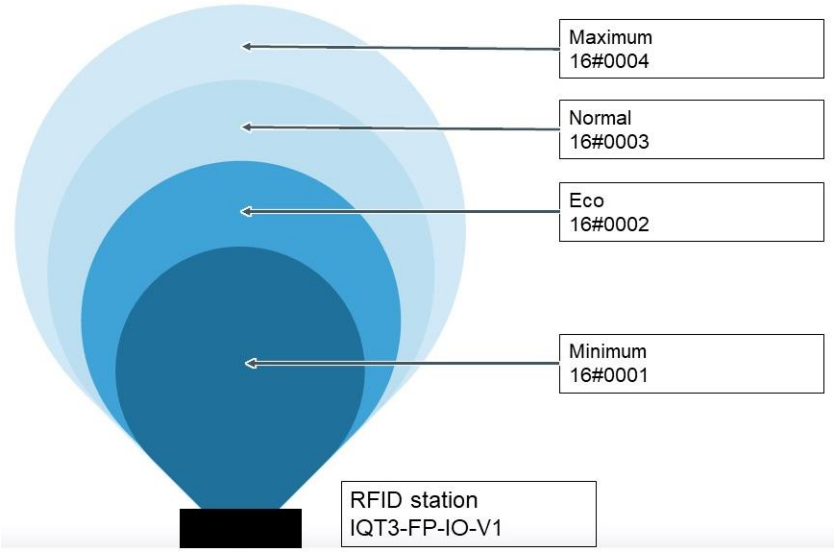
3.5 IO-Link Parameter 96 (16#60) “Transmission Power - PT“

The "Transmission Power" parameter sets the transmission power of the IQT3-FP-IO-V1 RFID device. The transmission power can be set in the range between 1 (minimum) and 4 (maximum). Only one power level can be set at a time. The factory setting is the transmit power level 4 (maximum)

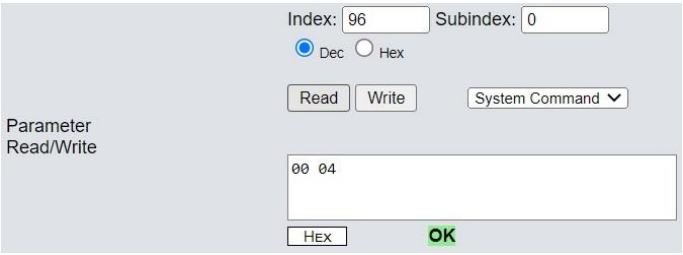
Structure Parameter 96 (16#60) “Transmission Powers“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
96	16#60	0	2 Byte / 1 Word	1…4	16#0001 … 16#0004	Read / Write	Transmission power level Transmission Power PT 1; power level 1; factory setting PT 1 = 4 (maximum)

The following power values can be set:
16#0001 → Minimum
16#0002 → Eco
16#0003 → Normal
16#0004 → Maximum



The detection range and the diameter of the detection zone can be influenced via the different power levels of the IQT3-FP-IO-V1 RFID device.



Parameter 96 (16#60) “Transmission Power“: Readout parameters with the factory setting;
16#0004 → Level 4 (Maximum)

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

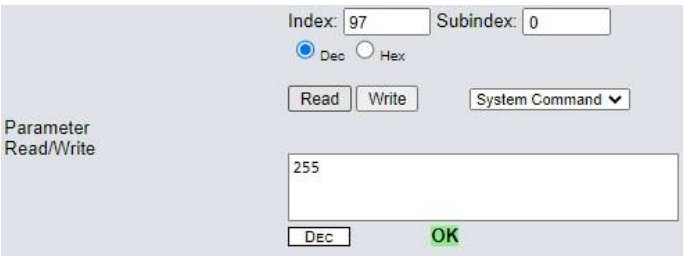
The parameter "Number of tags to find" allows the definition of a termination criterion for the automatic termination of an activated write or read command as soon as the set number of tags has been detected. In the factory setting, the parameter has the value 255 (16#FF) and no premature abort takes 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 a 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 tasks 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 connection with a Single command when using the Expert mode. If the parameterized number of data carriers is detected during the execution of the command, the Single command is automatically aborted.



Parameter 97 (16#61) “Number of Tags to find“: Readout parameter with the factory setting;
255 → Abort criterion switched off

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

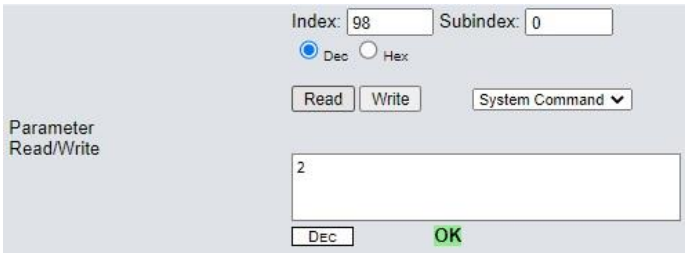
The "Tries allowed" parameter can be used to set the number of attempts to access a data carrier that are made when a read or write operation is executed. In the factory setting, the parameter has the value 2.

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 the Easy Mode, the setting of the "Tries allowed" parameter has no effect because the duration of the execution of the write or read tasks is controlled by the activation of the "Start Read" or "Start Write" bits in the process data.

This parameter can be used when using the Expert mode in conjunction with a Single command. By increasing the number of access attempts, more scans are performed during the execution of the Single command. Increasing the number of scan attempts will increase the execution time for a Single command.



Parameter 98 (16#62) “Tries allowed“: Readout parameter with the factory setting;
2 → Number of repetitions = 2

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

During the identification of one or more data carriers via the air interface, each data carrier is assigned a defined time slot for data transmission by the IQT3-FP-IO-V1 RFID device. 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 tags to be identified.

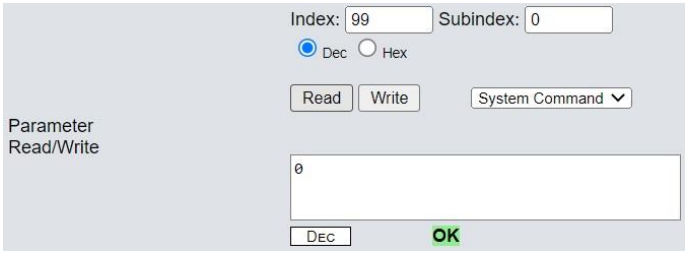
In the factory setting, the parameter has the value 0, which means that exactly 1 time slot is used for the identification of exactly one tag.

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 → exactly 1 data carrier 1 → about 2 data carriers 2 → about 4 data carriers 3 → about 8 data carriers 4 → 16about 16 data carriers Factory setting = 1

In case of an intended identification of only one data carrier, the parameter "Expected Number of Tags" can be used with the value 0 (factory setting).

With set values for "Expected Number of Tags" greater than 0, 16 time slots are always used. With larger values, however, collisions in the responses of the data carriers can be resolved.



Parameter 99 (16#63) „Expected Number of Tags“: Readout parameter in the factory setting;
0 → 1 data carrier

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

If a tag leaves the detection zone, the IQT3-FP-IO-V1 RFID device continues to make access attempts to this tag. The "Tag Lost Smoothing" parameter can be used to set how many unsuccessful access attempts are to be executed before the exit of the tag from the detection zone is reported to the PLC. In the factory setting, the parameter has the value 5.

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

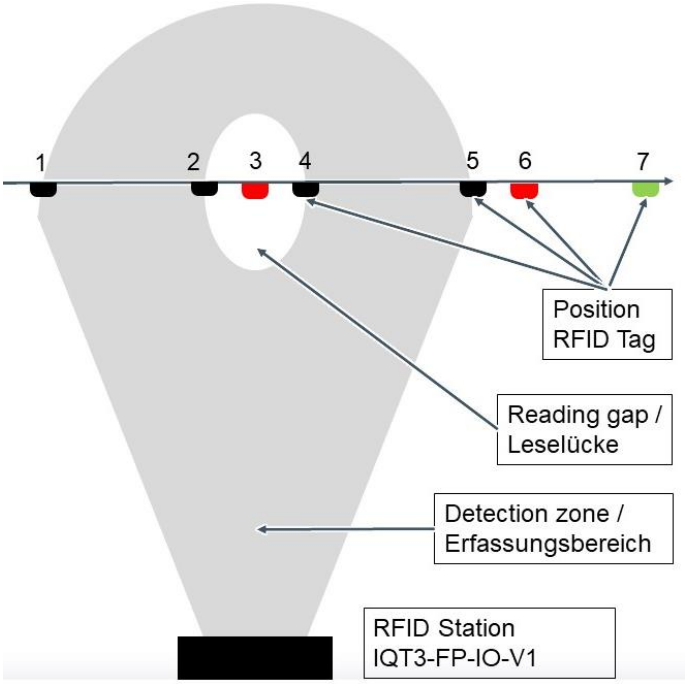
Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
100	16#64	0	1 Byte	0…10	16#00 … 16#0A	Read / Write	Number of unsuccessful read accesses before the exit of the data carrier from the detection zone is reported; factory setting = 5

Via the parameter "Tag Lost Smoothing" (E5) one has an influence on how fast the loss of a data carrier is reported to the PLC. The IQT3-FP-IO-V1 RFID device uses an inductive field to identify tags. Due to environmental influences, areas can arise in which no stable communication with the tags is possible (read gap). If a tag 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.

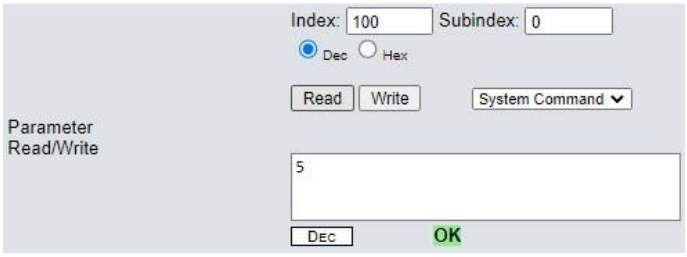
By increasing the value of the "Tag Lost Smoothing", read gaps can be bridged for moving data carriers. This means that the tags can be identified without interruption in the entire detection zone. If a tag finally leaves the detection zone, the message about the tag leaving the detection zone is delayed. The system becomes slower with respect to these messages. The message about the exit of a tag 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 tag leaves the detection zone. However, this increases the sensitivity to read gaps in the detection zone.

If a tag 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.



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 loss 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 loss smoothing" → Exit of the data carrier from the detection zone is reported to the PLC (Read valid = False)
7: Large value of "tag loss smoothing" → Exit of the tag from the detection zone is reported to the PLC (Read valid = False)



Parameter 100 (16#64) “Expected Number of Tags“: Readout parameter with factory setting; 5 → 5 repetitions

3.10 IO-Link Parameter 106 (16#6A) “Tag Type - CT“

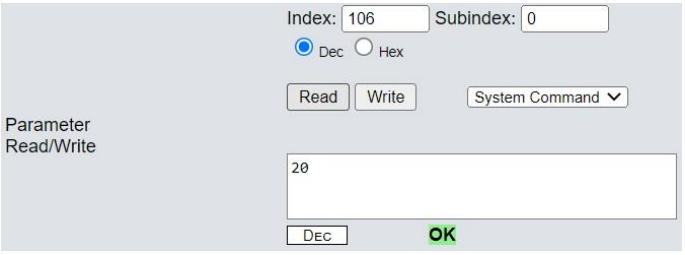
The "TagType" parameter sets the data carrier type of the RFID device. The data carrier type 20 is set in the factory setting. This means that at the start of an access attempt to a data carrier, an inventory is executed to detect the existing data carrier type. If the data carrier type was recognized correctly, the system automatically adjusts to this data carrier type. However, the execution of an inventory process means an extension of the execution time for a read/write process. Therefore, it is recommended to set the appropriate data carrier type.

Structure Parameter 106 (16#6A) “Tag Type“

Index Dec	Index Hex	Sub-index	Length	Value (Dec)	Value (Hex)	Access	Meaning
106	16#6A	0	1 Byte	20…50	16#14 … 16#32	Read / Write	Configured data carrier type 20 → Automatic (ISO/IEC 15693) 21 → ICODE SLI (NXP) 22 → Tag-it HF-I Plus (TI) 23 → my-D SRF55V02P (Infineon) 24 → my-D SRF55V10P (Infineon) 25 → LRI512 (STMicroelectronics) 27 → EM4135 (EM Microelectronic) 28 → EM4034 (EM Microelectronic) 29 → EM4035 (EM Microelectronic) 30 → LRI2K (STMicroelectronics) 31 → Tag-it HF-I Standard (TI) 32 → Tag-it HF-I Pro (TI) 33 → FRAM MB89R118 (Fujitsu) 34 → FRAM MB89R119 (Fujitsu) 35 → ICODE SLI-S (NXP) 36 → ICODE SLI-L (NXP)

							37 → FRAM MB89R112 (Fujitsu) 38 → EM4233 (EM Microelectronic) 50 → ICODE SLIX2 (NXP) Factory setting: 20

When using Expert Mode, the data carrier type can also be set using the "Change Tag" command.



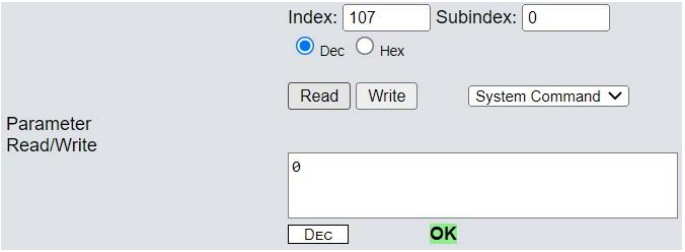
Parameter 106 (16#6A) „Tag Type“: Readout parameter in factory setting;
20 → Tag Type 20 (automatic)

3.10 IO-Link Parameter 107 (16#6B) “Overtemperature Handling - OH“

The "Overtemperature Handling" parameter sets the behavior of the IQT3-FP-IO-V1 RFID device in the event of overtemperature.

Structure Parameter 107 (16#6B) “Overtemperature Handling“

Index Dec	Index Hex	Sub-index	Length	Value (Dec)	Value (Hex)	Access	Meaning
107	16#6B	0	1 Byte	0…2	16#00 … 16#02	Read / Write	Setting behavior of IQT3-FP-IO-V1 RFID device in case of overtemperature 0 → Switch off transmitting mode 1 → Reduce transmit power 2 → Reduce number of access attempts



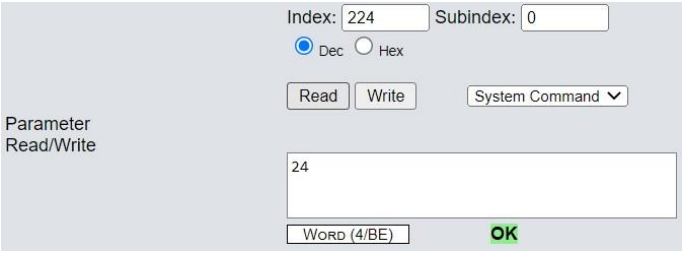
Parameter 107 (16#6B) „Overtemperature Handling“: Readout parameter with factory setting;
0 → Switch off transmitting mode

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^ 32-1		Read	Operating time



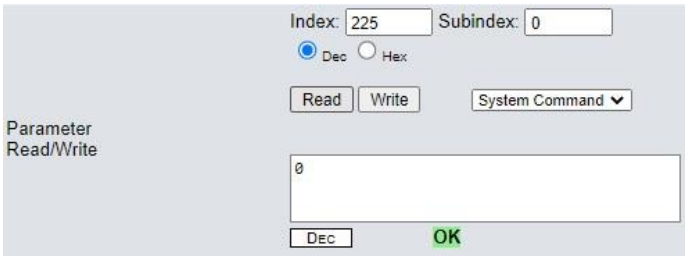
Parameter 224 (16#E0) „Operating hours“: Readout parameter;
24 → 24 hours

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

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

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



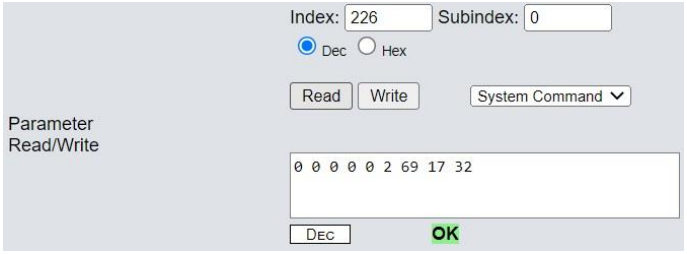
Parameter 225 (16#E1) “Temperature indicator“: Readout parameter;
0 → Operating conditions OK

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

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



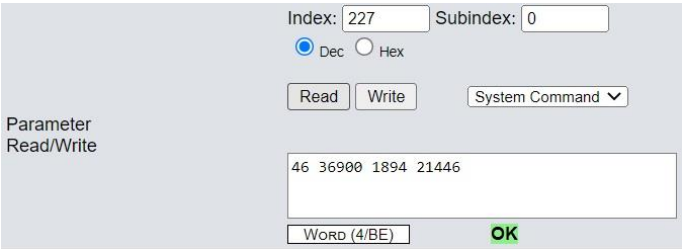
Parameter 226 (16#E2) „Temperature monitor“:
0 0 0 0 → 0 hours operation out of specification
0 2 → 2 transitions
69 → 69°C Maximum temperature
17 → 17°C Minimum temperature
32 → 32°C Current temperature

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
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 interruptions since the initial startup of the device; specification in seconds.
227	16#E3	3	4 Byte / 1 Double Word	0…2^32-1		Read	Average operating time between two interruptions 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



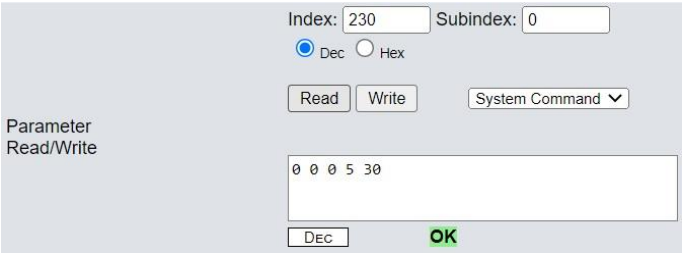
Parameter 227 (16#E3) “Power monitor“:
46 → 46 Restarts
36900 → 36900 seconds between two interrupts
1894 → 1894 seconds between two interrupts
21446 → 21446 seconds operating time

3.14 IO-Link Parameter 230 (16#E6) “RFID Device Monitor“

The "RFID Device Monitor" parameter contains information about the current and past state of the RFID device since initial startup.

Structure Parameter 230 (16#E6) “RFID Device Monitor“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
230	16#E6	1	4 Byte / 1 Double Word	0…2^32-1		Read	Operating time on the air interface since initial startup in hours
230	16#E6	2	1 Byte	-40… +125°C		Read	Display of the current operating temperature of the amplifier



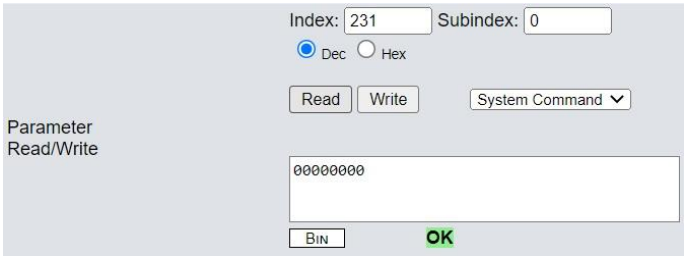
Parameter 230 (16#E6) „RFID Device Monitor“:
0 0 0 5 → 5 hours operating time on the radio interface
30 → 30°C operating temperature of the amplifier

3.14 IO-Link Parameter 231 (16#E7) “RFID Device Status“

The "RFID Device Status" parameter contains information about the current status of the IQT3-FP-IO-V1 RFID device.

Structure Parameter 231 (16#E7) “RFID Device Monitor“

Index Dec	Index Hex	Sub-index	Length	Value (Dec)	Value (Hex)	Access	Meaning
231	16#E7	1	1 Bit (Bit offset = 3)			Read	True = Operating temperature of the amplifier has exceeded the upper limit
231	16#E7	2	1 Bit (Bit offset = 2)			Read	True = Operating temperature of the amplifier is near the upper limit
231	16#E7	3	1 Bit (Bit offset = 1)			Read	True = RFID device is detuned by surrounding metal
231	16#E7	4	1 Bit (Bit offset = 0)			Read	True = RFID device is disturbed



Parameter 231 (16#E7) „RFID Device Status“:
0000_0000 → no fault

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.

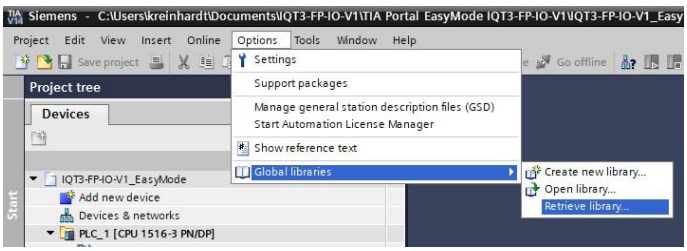
Structure Parameter 2 (16#02) “System Command“

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
2	16#02	0	1 Byte	126	16#7E	Write	Start location indicator (double flashing of all green and yellow LEDs)
2	16#02	0	1 Byte	127	16#7F	Write	End Location Indicator
2	16#02	0	1 Byte	129	16#81	Write	Application reset; the technology-specific parameters are reset; no reset of the supply voltage required
2	16#02	0	1 Byte	131	16#83	Write	Back-to-box; Reset of all parameters to factory settings; reset of supply voltage required

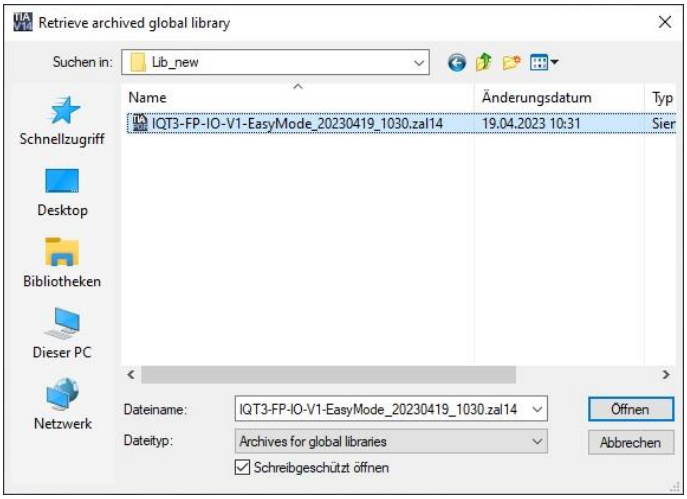
Parameter 2 (16#02) „System Command“:
129 → Reset Application

4. Import library “IQT3-FP-IO-V1_EasyMode“

The "IQT3-FP-IO-V1_EasyMode" library contains various function blocks for using the Easy Mode. This library must first be unpacked.

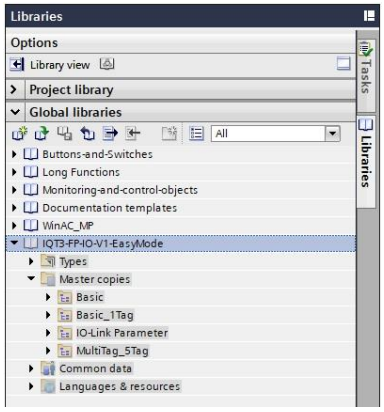


Retrieve Library:
Options → Global Libraries → Retrieve Library

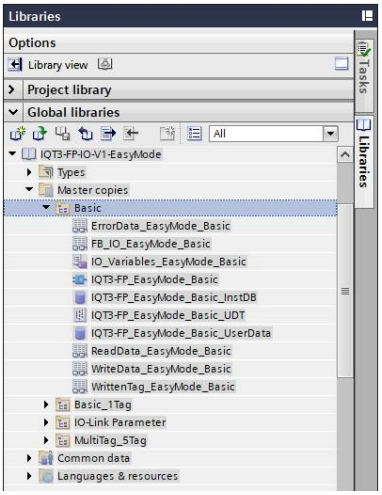


Select library:

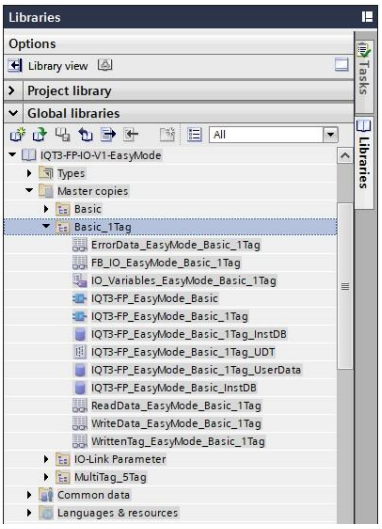
Here: IQT3-FP-IO-V1_EasyMode…...zal14



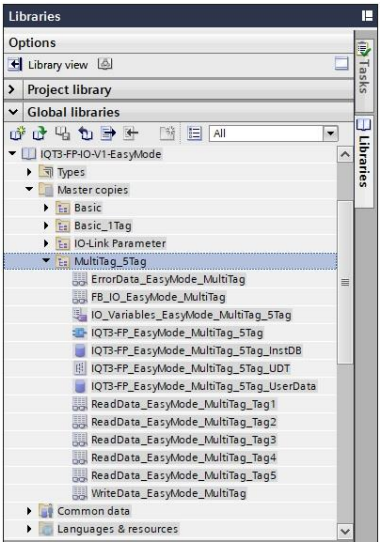
The "Master copies" folder contains 4 different function blocks. These function blocks provide different functionality based on the Easy Mode or for accessing the IO-Link parameters.



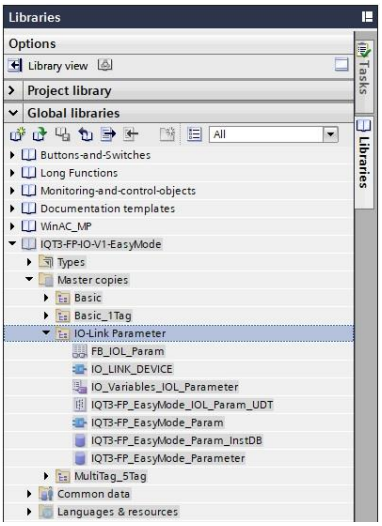
Basic:
Basic version of the function block for executing read/write tasks. The number of read and write accesses is counted and output. A task is to be started and ended by the user.



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.

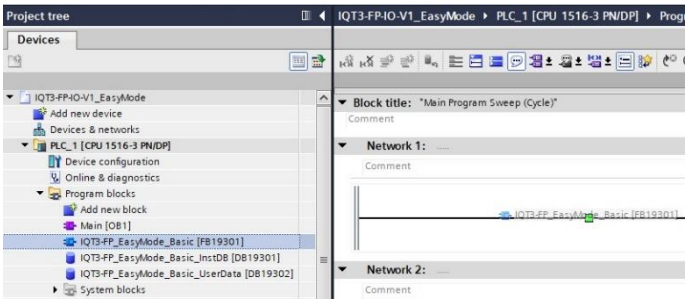


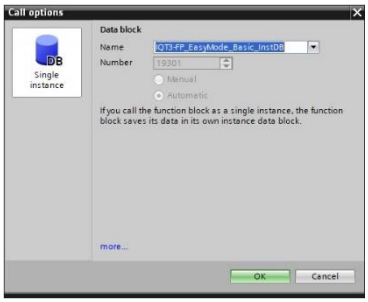
IO-Link Parameter:
Function block for optional access to the IO-Link parameters. Standard IO-Link parameters and device-specific IO-Link parameters can be read. It is also possible to write device-specific IO-Link parameters.

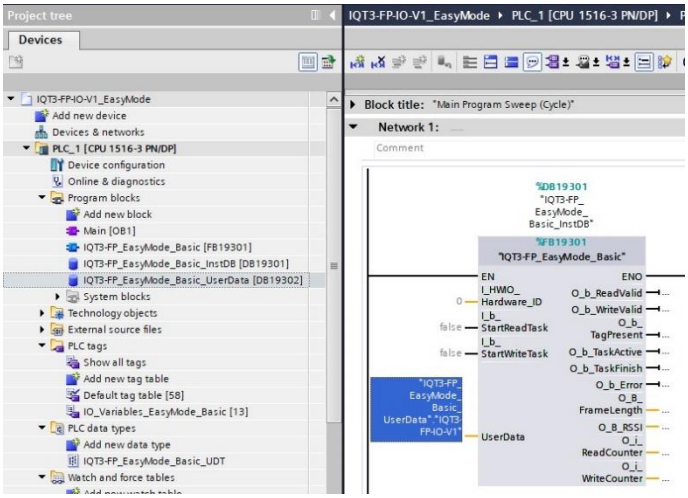
5. Function block FB19301 „IQT3-FP_EasyMode_Basic“

Functional description "IQT3-FP_EasyMode_Basic:
Basic version of a function block for using the Easy Mode. Write and read tasks 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 task 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 "IQT3-FP_EasyMode_Basic_UserData".

Implementation of the "IQT3-FP_EasyMode_Basic" function block:
Drag function block "IQT3-FP_EasyMode_Basic" (FB19301) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IQT3-FP_Easy Mode_Basic_InstDB" (DB19301) which can be used as instance data block. The instance data block can also be regenerated.

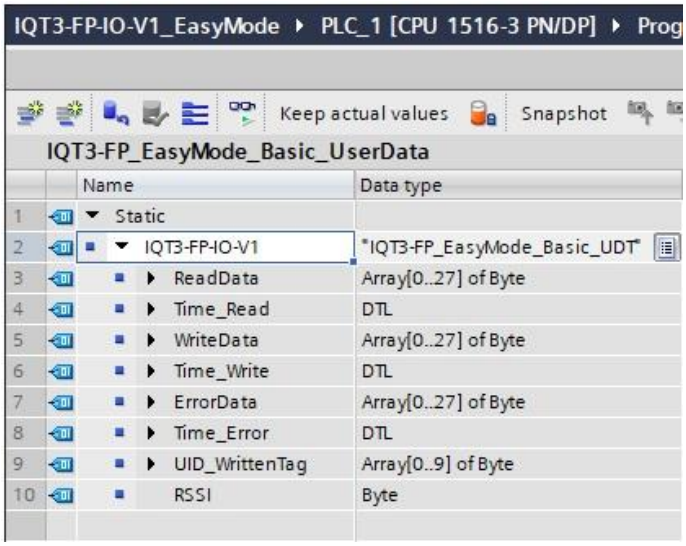






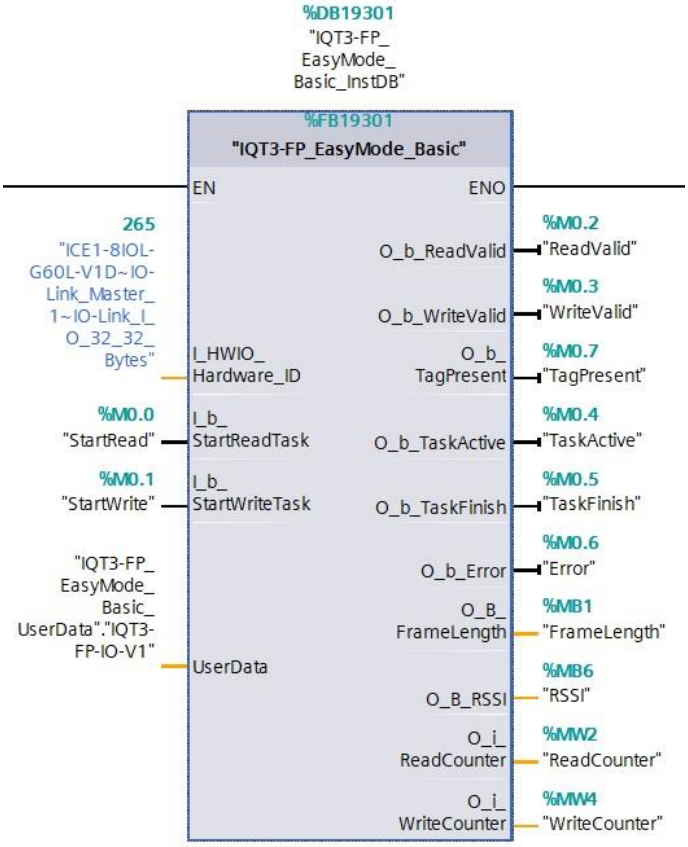
The read/write data, error information and the access times of the function block are located in a separate data block. This is parameterized at the "UserData" input. The library contains the data block "IQT3-FP_EasyMode_Basic_UserData" which can be used for this purpose.

The data block can be generated by yourself. The internal data structure is generated from the library via the data type "IQT3-FP_EasyMode_Basic_UDT".



The data block "IQT3-FP_EasyMode_Basic_UserData" consists of the structure "IQT3-FP-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
UID_WrittenTag → UID of a successfully written data carrier
RSSI → RSSI value for data carrier access



Complete wiring of the "IQT3-FP_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:

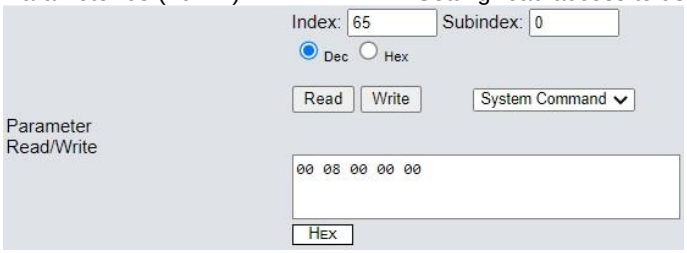
Name	Input / Output	Data type	Meaning
I_HWIO_Hardware_ID	Input	HW_IO	Hardware identifier of the communication module from the hardware configuration
I_b_StartRead	Input	Bool	Start Read Task; with signal change from 0 → 1; starts execution of read task; end read task with signal change 1 → 0;
I_b_StartWrite	Input	Bool	Start Write Task; with signal change from 0 → 1; starts execution of write task; end write task with signal change 1 → 0;
UserData	InOut	DB	Data block „UserData“ → IQT3-FP_EasyMode_Basic.IQT3-FP-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 device 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 device 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_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

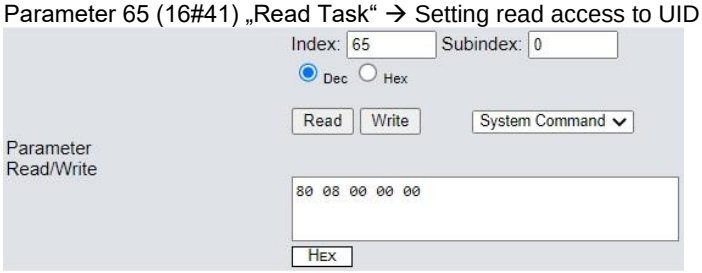
Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user memory (user data) or the UID (Fixcode) can be accessed. If the Autostart function is deactivated, the read task must be triggered via the function block. When using the "Short Form" data format, there is no length information and the corresponding UID in the returned data. When using the "Long Form" data format, the returned data is always preceded by the UID and length information for unique assignment to a data carrier.

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



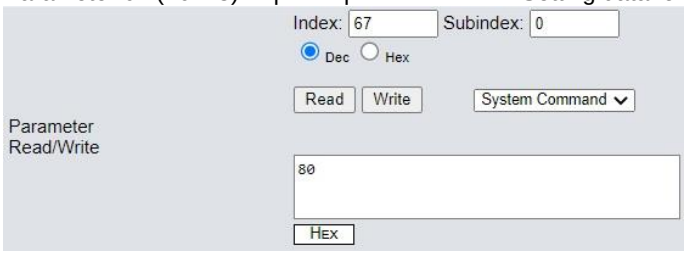
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#00 = off

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



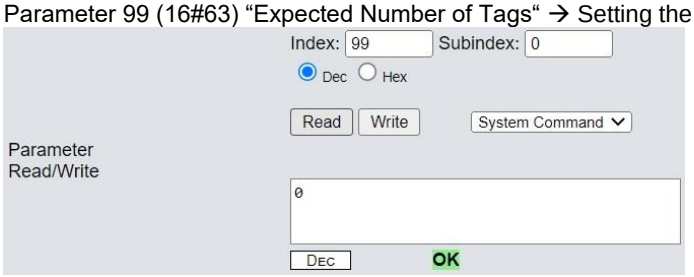
Index 1 = MemoryArea → 16#80 = UID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 0 = off

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



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

Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

The read task is not started by the RFID device itself due to the deactivated Autostart function. It is necessary to start the read task via the "I_b_StartReadTask" input on FB19301.

Example 1: Read access to the user memory (user data); readout of 8 bytes; short form data format

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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
ReadCounter = 0
The read task starts as soon as "StartRead" is set to True.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Read task active; no data carrier inside detection zone
StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	50	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

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

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 8 (depending on the length of the read in data)
RSSI = 50 (depending on the signal quality)
ReadCounter = 1

The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	50	
"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 = 50 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	42	
"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 = 8 (depending on the length of the read in data)
RSSI = 52 (depending on the signal quality)
ReadCounter = 2

The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	42	
"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 = 8 (depending on the length of the previously read in data)
RSSI = 42 (unchanged)
ReadCounter = 2

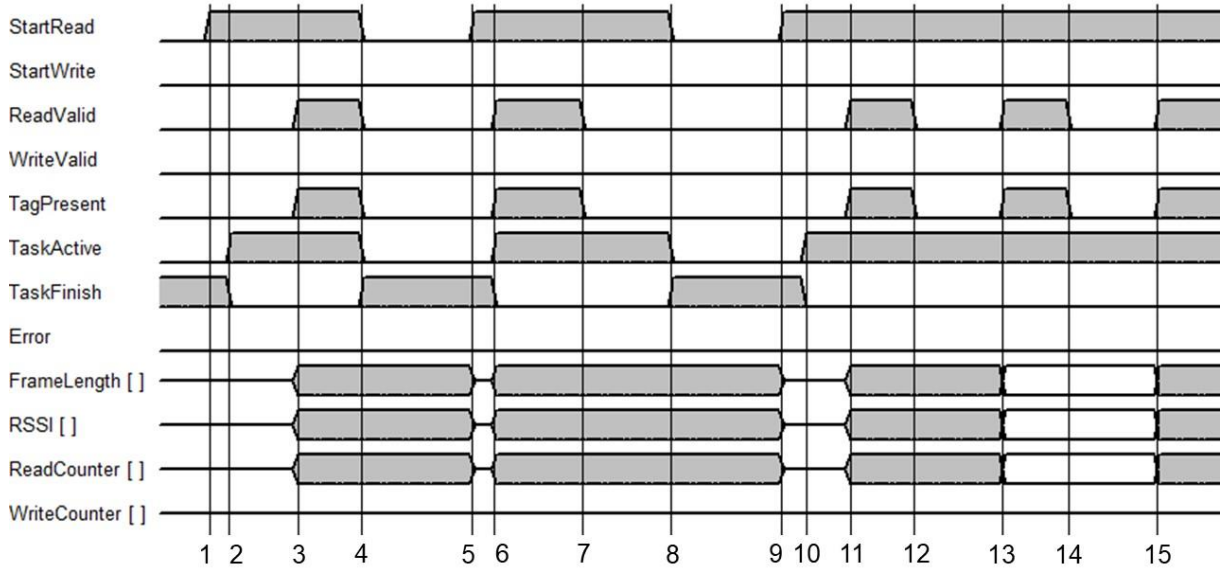
If a tag enters the detection zone and is read, a signal change from 0 to 1 occurs at the "ReadValid" and "TagPresent" outputs. The "ReadCounter" output is incremented for each new tag read. The "ReadCounter" counts the edge changes from 0 to 1 at the "ReadValid" output.
If a tag leaves the detection zone and there is no other tag in it, the signal changes from 1 to 0 at the "ReadValid" and "TagPresent" outputs. No UID is transmitted for the tag that has left the detection zone.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	42	
"ReadCounter"	%MW2	DEC	2	
"WriteCounter"	%MW4	DEC	0	

Read task stopped

StartRead	= False
ReadValid	= False
TagPresent	= False
TaskActive	= False
TaskFinish	= True
FrameLength	= 8 (depending on the length of the previously read in data)
RSSI	= 42 (unchanged)
ReadCounter	= 2

Flowchart Execution of read task without Autostart function with exactly one tag in the detection zone (short Form data format):



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; 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 = 8; RSSI = 6; ReadCounter = 1;
4	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 8; RSSI = 6; ReadCounter = 1;
5	Next read task is started StartRead := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 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 = 8; RSSI = 13; 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 = 8; RSSI = 13; ReadCounter = 1;
8	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 8; RSSI = 13; ReadCounter = 1;
9	Read task is started StartRead := True; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 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; 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 = 8; RSSI = 46; 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 = 8; RSSI = 46; ReadCounter = 1;
13	Data carrier D read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 8; RSSI = 13; 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 = 8; RSSI = 13; 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 = 8; RSSI = 23; ReadCounter = 3;

Example 2: Read access to several data carriers at the same time; readout of 8 bytes; several data carriers are inserted into the detection zone one after the other; the data carriers are then removed again in the same order; Long Form data format

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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
ReadCounter = 0
The read task starts as soon as "StartRead" is set to True.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	69	
"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	= 20 (depending on the length of the read in data)
RSSI	= 69 (depending on the signal quality)
ReadCounter	= 1

The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	40	
"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	= 20 (depending on the length of the read in data)
RSSI	= 40 (depending on the signal quality)
ReadCounter	= 2

The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	40	
"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	= 20 (depending on the length of the read in data)
RSSI	= 40 (depending on the signal quality)
ReadCounter	= 3

The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	40	
"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	= 20 (depending on the length of the previously read in data)
RSSI	= 40 (unchanged)
ReadCounter	= 3

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	40	
"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	= 20 (depending on the length of the previously read in data)
RSSI	= 40 (unchanged)
ReadCounter	= 3

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	40	
"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	= 20 (depending on the length of the previously read in data)
RSSI	= 40 (unchanged)
ReadCounter	= 3

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	40	
"ReadCounter"	%MW2	DEC	3	
"WriteCounter"	%MW4	DEC	0	

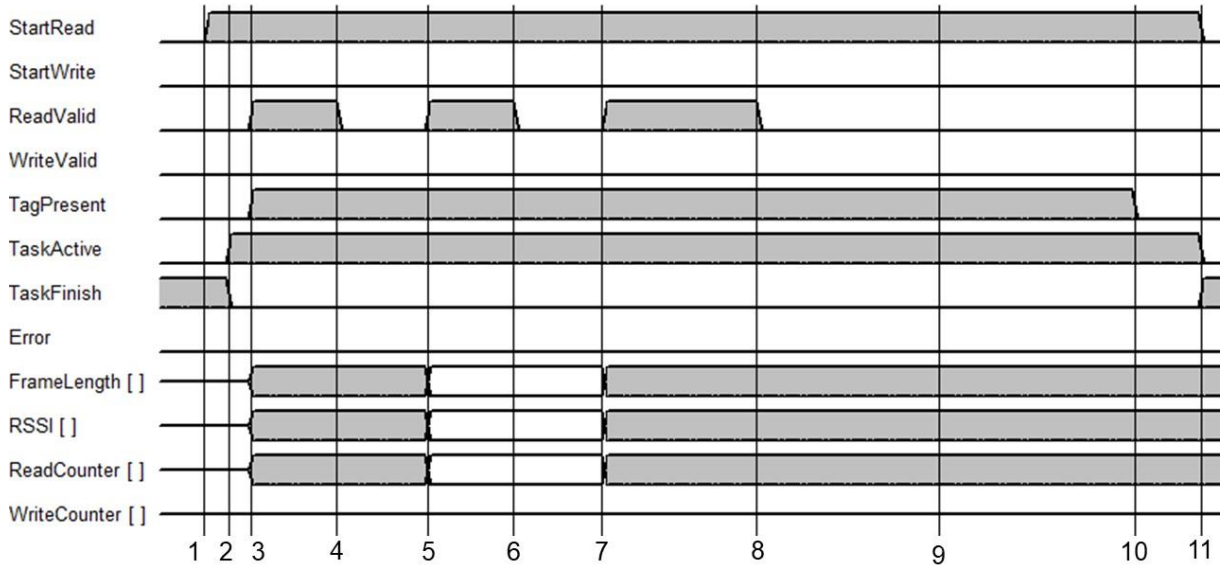
Read task finished

StartRead	= False
ReadValid	= False
TagPresent	= False
TaskActive	= False
TaskFinish	= True
FrameLength	= 20 (depending on the length of the previously read in data)
RSSI	= 40 (unchanged)
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 "Tag-Present" 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:

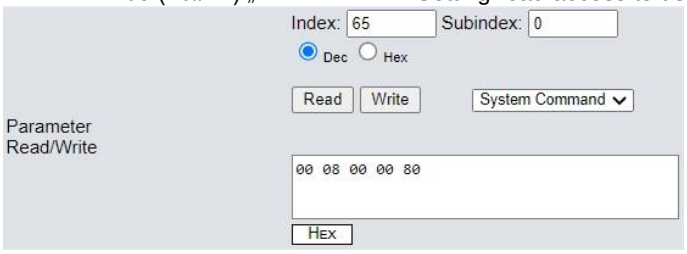


Point in Time	Meaning
1	Read task is started StartRead := True;
2	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; ReadCounter = 0;
3	Data carrier A read; 1 data carrier in the detection zone StartRead := True; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 20; RSSI = 20; 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 = 20; RSSI = 20; 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 = 20; RSSI = 13; 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 = 20; RSSI = 13; 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 = 20; RSSI = 26; ReadCounter = 3;
8	A data carrier leaves the detection zone StartRead := True; ReadValid = False; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 20; RSSI = 26; 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 = 20; RSSI = 26; 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 = 20; RSSI = 26; ReadCounter = 3;
11	Read task finished StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 20; RSSI = 26; ReadCounter = 3;

5.2 Read data carrier with Autostart function

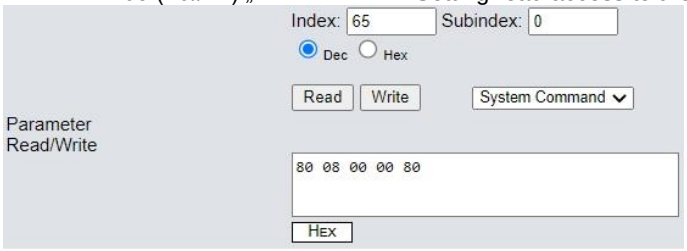
Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user memory (user data) or the UID (Fixcode) can be accessed. If the Autostart function is activated, the read task is started automatically by the RFID device. Control via the function block is therefore not necessary. When using the "Short Form" data format, no length information and the associated UID are contained in the returned data. When using the "Long Form" data format, the returned data is always preceded by the UID and length information for unique assignment to a data carrier.

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



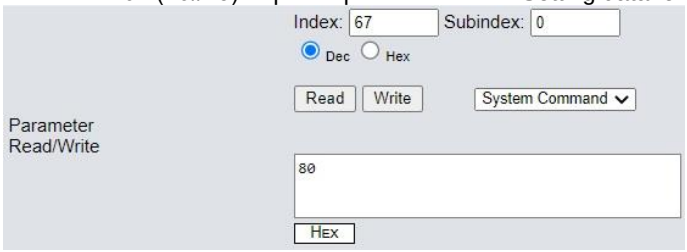
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#80 = on

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



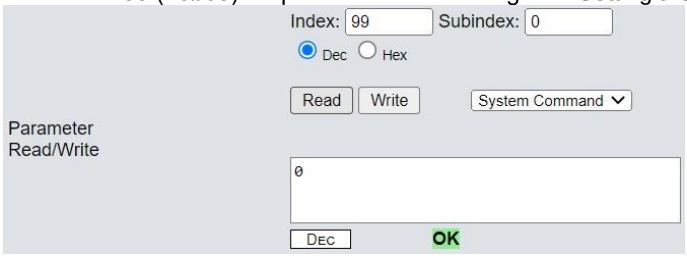
Index 1 = MemoryArea → 16#80 = UID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 16#80 = on

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



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

Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

The read task is started by the RFID device itself via the switched-on Autostart function. It is not necessary to start the read task via the "I_b_StartReadTask" input on FB19301.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	24	
"ReadCounter"	%MW2	DEC	4	
"WriteCounter"	%MW4	DEC	0	

Initial state: Read task was started by RFID device

StartRead	= False
ReadValid	= False
TagPresent	= False
TaskActive	= True
TaskFinish	= False
FrameLength	= 8 (depending on the initial state)
RSSI	= 24 (depending on the initial state)
ReadCounter	= 4 (depending on the initial state)

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	24	
"ReadCounter"	%MW2	DEC	5	
"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	= 8 (depending on the length of the read in data)
RSSI	= 24 (depending on the signal quality)
ReadCounter	= 5

The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	24	
"ReadCounter"	%MW2	DEC	5	
"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	= 24 (unchanged)
ReadCounter	= 5

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	24	
"ReadCounter"	%MW2	DEC	6	
"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	= 8 (depending on the length of the read in data)
RSSI	= 24 (depending on the signal quality)
ReadCounter	= 6

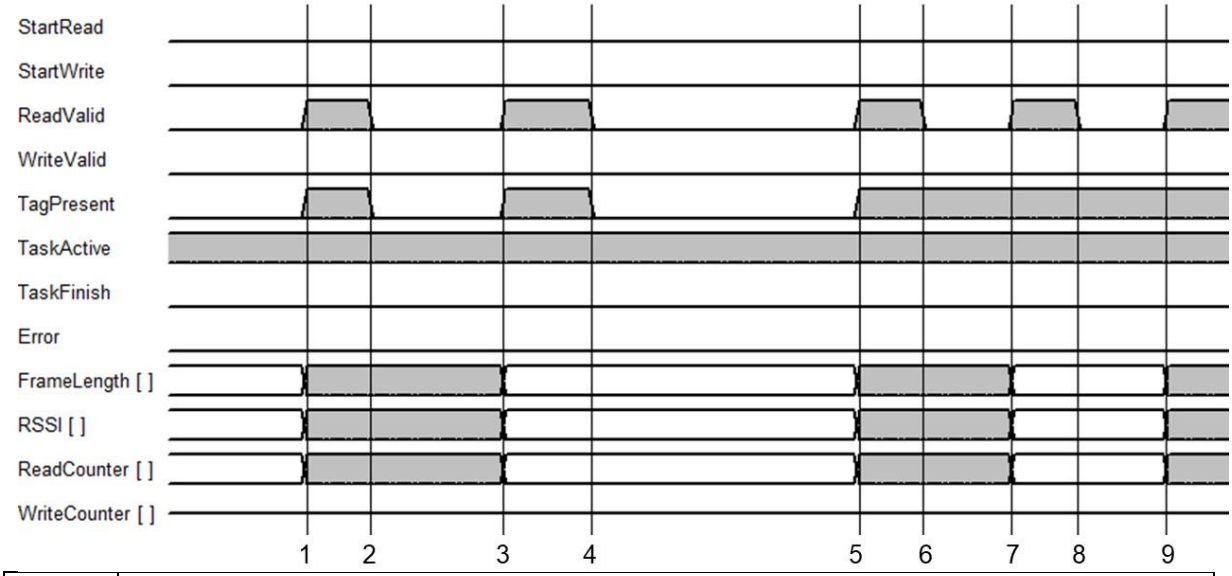
The read-in data as well as the time for the access to the data carrier are located within the data block "IQT3-FP_EasyMode_Basic_UserData".IQT3-FP-IO-V1.

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	24	
"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	= 8 (depending on the length of the previously read in data)
RSSI	= 24 (unchanged)
ReadCounter	= 6

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 = 8; RSSI = 26; 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 = 8; RSSI = 26; ReadCounter = 1;
3	Data carrier B read StartRead := False; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 8; RSSI = 16; 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 = 8; RSSI = 16; 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 = 8; RSSI = 55; 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 = 8; RSSI = 55; 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 = 8; RSSI = 18; 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 = 8; RSSI = 18; 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 = 8; RSSI = 12; ReadCounter = 5;

5.3 Data structure access to User Memory

IQT3-FP_EasyMode_Basic_UserData

Name	Data t..	Star...	Monito...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array[...		
ReadData[0]	Byte	16#0	16#31
ReadData[1]	Byte	16#0	16#32
ReadData[2]	Byte	16#0	16#33
ReadData[3]	Byte	16#0	16#34
ReadData[4]	Byte	16#0	16#35
ReadData[5]	Byte	16#0	16#36
ReadData[6]	Byte	16#0	16#37
ReadData[7]	Byte	16#0	16#38
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 UID of the identified data carrier is not prefixed to the read-in data. No length information is transmitted either.

IQT3-FP_EasyMode_Basic_UserData

Name	Data t..	Star...	Monito...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array[...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#62
ReadData[9]	Byte	16#0	16#BF
ReadData[10]	Byte	16#0	16#00
ReadData[11]	Byte	16#0	16#08
ReadData[12]	Byte	16#0	16#31
ReadData[13]	Byte	16#0	16#32
ReadData[14]	Byte	16#0	16#33
ReadData[15]	Byte	16#0	16#34
ReadData[16]	Byte	16#0	16#35
ReadData[17]	Byte	16#0	16#36
ReadData[18]	Byte	16#0	16#37
ReadData[19]	Byte	16#0	16#38
ReadData[20]	Byte	16#0	16#00

Long Form data format:

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

ReadData[10...11]: Length of read User Memory data Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[12...19]: read User Memory data
Length depends on the "Number of Bytes" setting; read subarea of the user memory

5.4 Data structure access to UID

IQT3-FP_EasyMode_Basic_UserData

Name	Data t..	Star...	Monito...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array[...		
ReadData[0]	Byte	16#0	16#E0
ReadData[1]	Byte	16#0	16#04
ReadData[2]	Byte	16#0	16#01
ReadData[3]	Byte	16#0	16#50
ReadData[4]	Byte	16#0	16#D3
ReadData[5]	Byte	16#0	16#23
ReadData[6]	Byte	16#0	16#62
ReadData[7]	Byte	16#0	16#BF
ReadData[8]	Byte	16#0	16#00

Short Form data format:

ReadData[0...7]: UID read in.

The length of the read UID is always 8 bytes.

When using the "Short Form" data format, no length information is transmitted.

IQT3-FP_EasyMode_Basic_UserData

Name	Data t..	Star...	Monito...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array[...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#62
ReadData[9]	Byte	16#0	16#BF
ReadData[10]	Byte	16#0	16#00

Long Form data format:

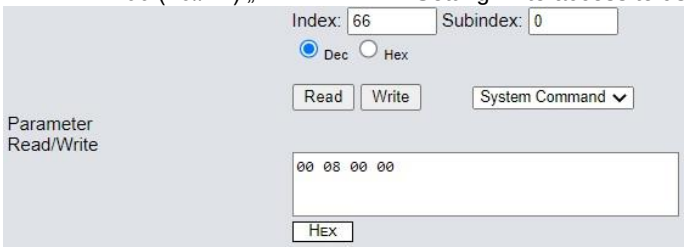
ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

5.6 Writing to data carrier

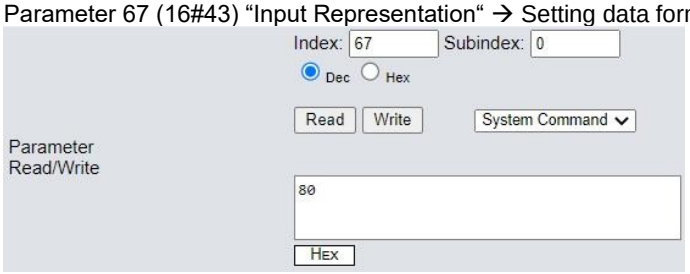
The execution of a write process of the IQT3-FP-IO-V1 RFID device is controlled via the "Start Write" bit in the process output data. The Autostart function is not supported during a write operation. The write process is set via parameter 66 "Write Task". In the delivery state, 8 bytes are written to the user memory (user data) 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.

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



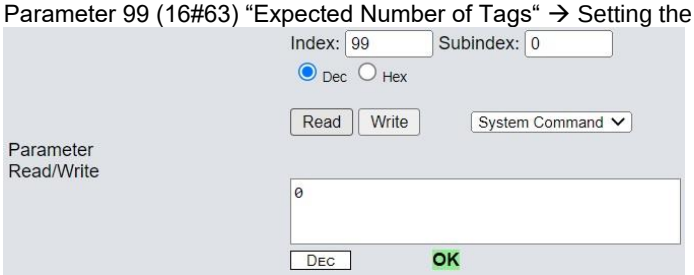
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0

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



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

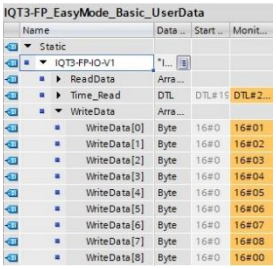
Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

Before starting the write task the write data must be transferred in the data structure "IQT3-FP_Easy Mode_ Basic_UserData.IQT3-FP-IO-V1.WriteData. The write task is started by the "I_b_StartWrite Task" input at FB319301. When a write access is successfully executed, the UID (Fixcode) of the programmed data carrier is transferred to the data structure "IQT3-FP_Easy Mode_Basic_UserData. IQT3-FP-IO-V1.UID_WrittenTag.

Name	...	Displ...	Monit...	Modify ...
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[0]		Hex	16#01	16#01
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[1]		Hex	16#02	16#02
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[2]		Hex	16#03	16#03
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[3]		Hex	16#04	16#04
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[4]		Hex	16#05	16#05
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[5]		Hex	16#06	16#06
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[6]		Hex	16#07	16#07
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[7]		Hex	16#08	16#08
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[8]		Hex	16#00	16#00



Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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
WriteCounter	= 0

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

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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
WriteCounter	= 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	58	
"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	= 8 (Length UID)
RSSI	= 58 (depending on the signal quality)
WriteCounter	= 1

IQT3-FP_EasyMode_Basic_UserData

Name	Data ..	Start ..	Monit...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Arra...		
Time_Read	DTL	DTL#19	DTL#2...
WriteData	Arra...		
Time_Write	DTL	DTL#19	DTL#2...
ErrorData	Arra...		
Time_Error	DTL	DTL#19	DTL#1...
UID_WrittenTag	Arra...		
UID_WrittenTag[0]	Byte	16#0	16#E0
UID_WrittenTag[1]	Byte	16#0	16#04
UID_WrittenTag[2]	Byte	16#0	16#01
UID_WrittenTag[3]	Byte	16#0	16#50
UID_WrittenTag[4]	Byte	16#0	16#D3
UID_WrittenTag[5]	Byte	16#0	16#23
UID_WrittenTag[6]	Byte	16#0	16#62
UID_WrittenTag[7]	Byte	16#0	16#BF
UID_WrittenTag[8]	Byte	16#0	16#00
UID_WrittenTag[9]	Byte	16#0	16#00

UID (Fixcode) of the successfully programmed data carrier within the data block "IQT3-FP_EasyMode_ Basic_User Data" in the structure "UID_WrittenTag"; Short Form Data Format

UID_WrittenTag[0...7]: UID (Fixcode)
The length of the UID (Fixcode) is always 8 bytes; when using the Short Form data format, no length information is prepended; when using the Long Form data format, a 2-byte length information is prepended (16#0008)

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	58	
"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	= 8 (Length UID; unchanged)
RSSI	= 58 (unchanged)
WriteCounter	= 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	53	
"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	= 8 (Length UID))
RSSI	= 53 (depending on the signal quality)
WriteCounter	= 2

IQT3-FP_EasyMode_Basic_UserData

Name	Data ..	Start ..	Monit...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Arra...		
Time_Read	DTL	DTL#19	DTL#2...
WriteData	Arra...		
Time_Write	DTL	DTL#19	DTL#2...
ErrorData	Arra...		
Time_Error	DTL	DTL#19	DTL#1...
UID_WrittenTag	Arra...		
UID_WrittenTag[0]	Byte	16#0	16#E0
UID_WrittenTag[1]	Byte	16#0	16#04
UID_WrittenTag[2]	Byte	16#0	16#01
UID_WrittenTag[3]	Byte	16#0	16#50
UID_WrittenTag[4]	Byte	16#0	16#D3
UID_WrittenTag[5]	Byte	16#0	16#23
UID_WrittenTag[6]	Byte	16#0	16#5D
UID_WrittenTag[7]	Byte	16#0	16#66
UID_WrittenTag[8]	Byte	16#0	16#00
UID_WrittenTag[9]	Byte	16#0	16#00

UID (Fixcode) of the successfully written data carrier within the data block "IQT3-FP_EasyMode_Basic_User Data" in the structure "UID_WrittenTag": Short Form Data Format

UID_WrittenTag[0...7]: UID (Fixcode)
The length of the UID (Fixcode) is always 8 bytes; when using the Short Form data format no length information is prepended; when using the Long Form data format a 2 byte length information is prepended (16#0008)

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	53	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	2	

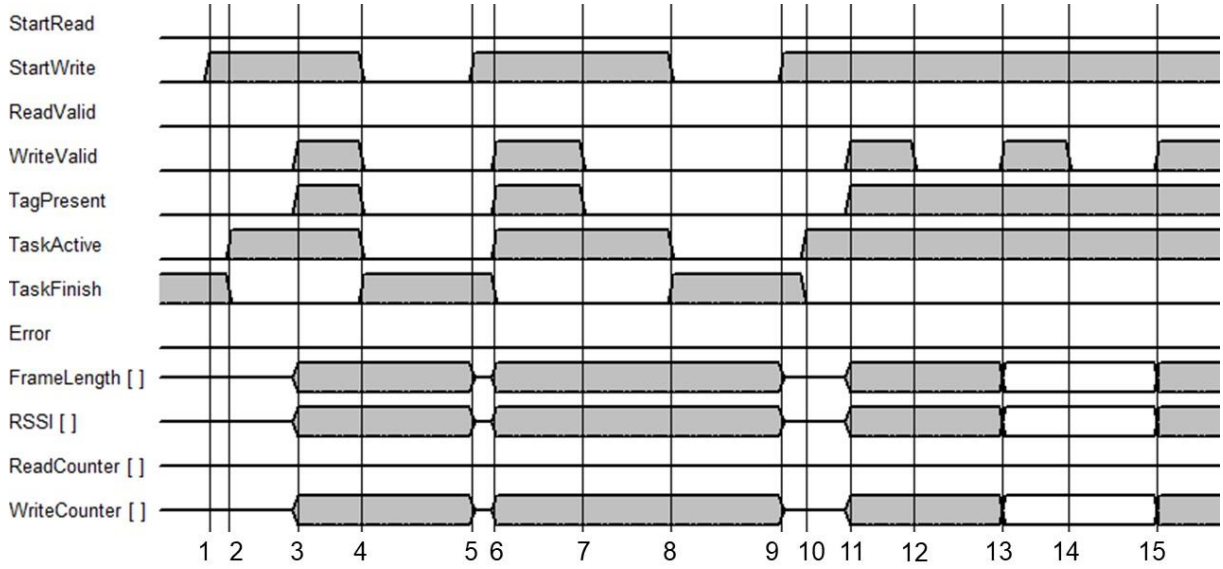
Write task active; data carrier has left the detection zone

StartWrite = True
WriteValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 8 (unchanged)
RSSI = 53 (unchanged)
WriteCounter = 2

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	FALSE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	53	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	2	

Write task finished:
StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 8 (unchanged)
RSSI = 53 (unchanged)
WriteCounter = 2

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; WriteCounter = 0;
3	Data carrier A successfully written StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 10; RSSI = 26; WriteCounter = 1;
4	Write task is finished StartWrite := False; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 10; RSSI = 46; WriteCounter = 1;
5	Next write task is started StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; WriteCounter := 0;
6	Data carrier B successfully written StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 10; RSSI = 60; WriteCounter = 1;
7	Data carrier B has left detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 10; RSSI = 60; WriteCounter = 1;
8	Write task is finished StartWrite := False; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 10; RSSI = 60; WriteCounter = 1;
9	Write task is started StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 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; WriteCounter = 0;
11	Data carrier C successfully written StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = True; TaskFinish = False; FrameLength = 10; RSSI = 26; 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 = 10; RSSI = 26; 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 = 10; RSSI = 46; 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 = 10; RSSI = 46; 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 = 10; RSSI = 16; WriteCounter = 3;

5.7 Data structure system time for data carrier access

The function block reads the local system time of the controller at certain events and stores the times within the data block "IQT3-FP_EasyMode_Basic_UserData" in corresponding structures. The system time is read at 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)

IQT3-FP_EasyMode_Basic_UserData

Name	Data ..	Start ..	Monitor value
Static			
IQT3-FP-IO-V1	"IQT...		
ReadData	Arra...		
Time_Read	DTL	DTL#19	DTL#2023-05-15-06:27:01.489708697
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	15
WEEKDAY	USInt	5	2
HOUR	USInt	0	6
MINUTE	USInt	0	27
SECOND	USInt	0	1
NANOSECOND	UDInt	0	489_708_697

Time of successful read access to a data carrier:

Data structure IQT3-FP-IO-V1.Time_Read

IQT3-FP_EasyMode_Basic_UserData

Name	Data ..	Start ..	Monitor value
Static			
IQT3-FP-IO-V1	"IQT...		
ReadData	Arra...		
Time_Read	DTL	DTL#19	DTL#2023-05-15-06:27:01.489708697
WriteData	Arra...		
Time_Write	DTL	DTL#19	DTL#2023-05-15-06:32:51.081112408
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	15
WEEKDAY	USInt	5	2
HOUR	USInt	0	6
MINUTE	USInt	0	32
SECOND	USInt	0	51
NANOSECOND	UDInt	0	81112408

Time of successful write access to a data carrier:

Data structure IQT3-FP-IO-V1.Time_Write

IQT3-FP_EasyMode_Basic_UserData

Name	Data ..	Start ..	Monitor value
Static			
IQT3-FP-IO-V1	"IQT...		
ReadData	Arra...		
Time_Read	DTL	DTL#19	DTL#2023-05-15-06:27:01.489708697
WriteData	Arra...		
Time_Write	DTL	DTL#19	DTL#2023-05-15-06:32:51.081112408
ErrorData	Arra...		
Time_Error	DTL	DTL#19	DTL#2023-05-15-07:39:37.861356702
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	15
WEEKDAY	USInt	5	2
HOUR	USInt	0	7
MINUTE	USInt	0	39
SECOND	USInt	0	37
NANOSECOND	UDInt	0	861_356_702

Time error state:

Data structure IQT3-FP-IO-V1.Time_Error

5.8 Error messages during the execution of the write/read tasks

The IQT3-FP-IO-V1 RFID device sends an error message to the controller 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

code and the error description are located in the data block "IQT3-FP_EasyMode_Basic_UserData" in the data structure "IQT3-FP-IO-V1.ErrorData". At the same time the output "O_b_Error" at FB19301 "IQT3-FP_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 device.

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	TRUE	
"FrameLength"	%MB1	DEC	19	
"RSSI"	%MB6	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Parallel trigger of read and write task:

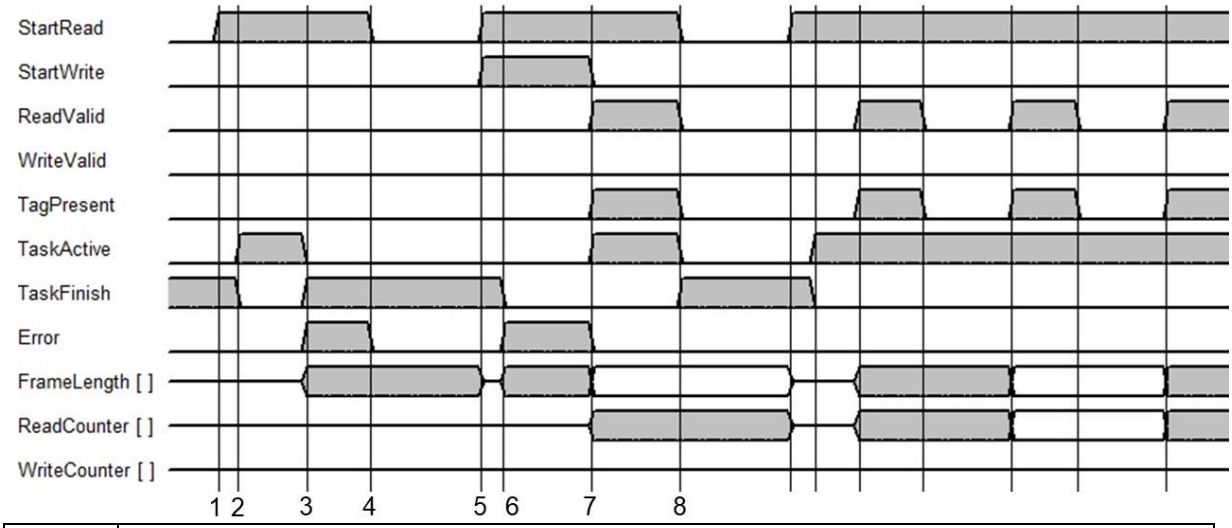
StartRead = True
StartWrite = True
Error = True
FrameLength = 19
RSSI = 0

IQT3-FP_EasyMode_Basic_UserData

Name	Data ..	Start ..	Monit...
Static			
IQT3-FP-IO-V1	"IQT...		
ReadData	Arra...		
Time_Read	DTL	DTL#19	DTL#2...
WriteData	Arra...		
Time_Write	DTL	DTL#19	DTL#2...
ErrorData	Arra...		
ErrorData[0]	Byte	16#0	16#04
ErrorData[1]	Byte	16#0	16#72
ErrorData[2]	Byte	16#0	16#65
ErrorData[3]	Byte	16#0	16#61
ErrorData[4]	Byte	16#0	16#64
ErrorData[5]	Byte	16#0	16#20
ErrorData[6]	Byte	16#0	16#41
ErrorData[7]	Byte	16#0	16#4E
ErrorData[8]	Byte	16#0	16#44
ErrorData[9]	Byte	16#0	16#20
ErrorData[10]	Byte	16#0	16#77
ErrorData[11]	Byte	16#0	16#72
ErrorData[12]	Byte	16#0	16#69
ErrorData[13]	Byte	16#0	16#74
ErrorData[14]	Byte	16#0	16#65
ErrorData[15]	Byte	16#0	16#20
ErrorData[16]	Byte	16#0	16#73
ErrorData[17]	Byte	16#0	16#65
ErrorData[18]	Byte	16#0	16#74
ErrorData[19]	Byte	16#0	16#00

Name	A...	Disp...	Monito...
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[0]		...	16#04
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[1]		Cha...	'r'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[2]		Cha...	'e'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[3]		Cha...	'a'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[4]		Cha...	'd'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[5]		Cha...	' '
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[6]		Cha...	'A'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[7]		Cha...	'N'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[8]		Cha...	'D'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[9]		Cha...	' '
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[10]		Cha...	'w'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[11]		Cha...	'r'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[12]		Cha...	'i'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[13]		Cha...	't'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[14]		Cha...	'e'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[15]		Cha...	' '
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[16]		Cha...	's'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[17]		Cha...	'e'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[18]		Cha...	't'
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".ErrorData[19]		Cha...	'$00'

Flowchart behavior RFID device in error state:

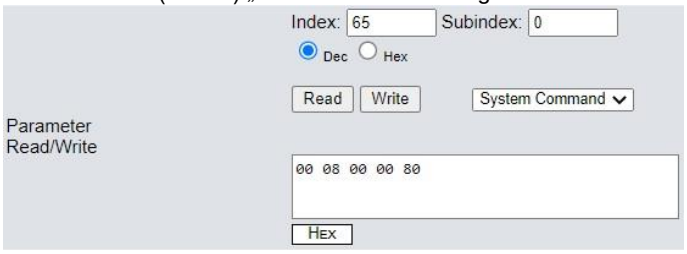


Point in Time	Meaning
1	Read task is started StartRead := True;
2	Read task is activated; no data carrier in detection zone StartRead := True; ReadValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; Error = False; FrameLength = 0; ReadCounter = 0;
3	Data carrier A (no user memory 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 (user data) with Autostart funktion

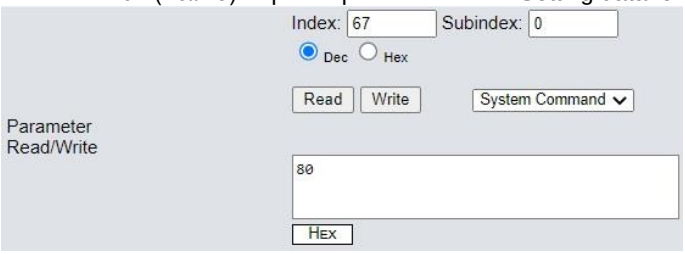
Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user memory (user data) or the UID (Fixcode) can be accessed. If the Autostart function is activated, the read task is started automatically by the RFID device. Control via the function block is therefore not necessary. When using the "Short Form" data format, no length information and the associated UID are contained in the returned data. When using the "Long Form" data format, the returned data is always preceded by the UID and length information for unique assignment to a data carrier.

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



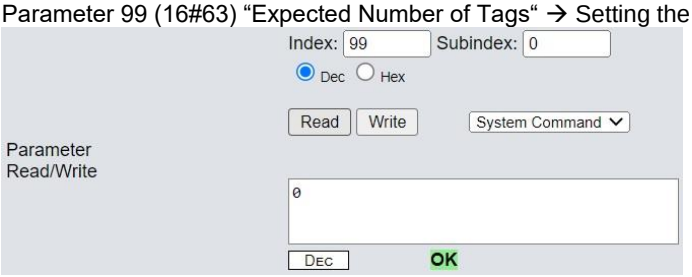
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#80 = on

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



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

Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state: Read task was started by RFID device
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	39	
"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 = 39 (depending on the signal quality)
ReadCounter = 1

IQT3-FP_EasyMode_Basic_UserData

Name	Dat..	Start ..	Monito..
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
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

Read data in DB "IQT3-FP_EasyMode_ Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data are transferred via the Short Form data format. Thereby no UID as well as additional length information are transmitted.

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

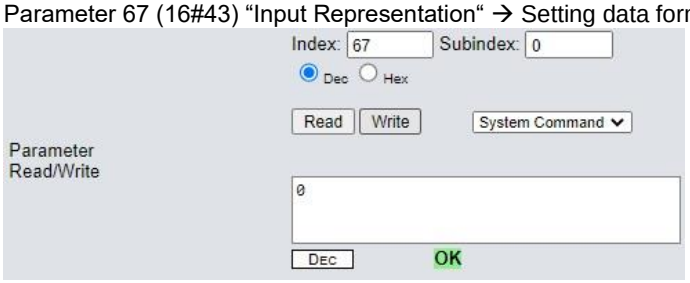
Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	39	
"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	= 8 (depending on the length of the previously read in data)
RSSI	= 39 (unchanged)
ReadCounter	= 1

In the delivery state of the IQT3-FP-IO-V1 RFID device, the short form data format is used for data transmission. Here, no associated UID (fixed code) of the read data carrier and no length information is transmitted. Due to the omission of this additional information, up to 28 bytes of user memory can be read in and transferred using the Short Form data format. The data format can be changed to "Long Form" via parameter 67 "Input Representation". In this case, additional length information and the UID of the associated data carrier are also transferred.

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



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	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	39	
"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	= 20 (depending on the length of the read in data)
RSSI	= 39 (depending on the signal quality)
ReadCounter	= 2

IQT3-FP_EasyMode_Basic_UserData

Name	Dat..	Start ..	Monito..
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#5D
ReadData[9]	Byte	16#0	16#66
ReadData[10]	Byte	16#0	16#00
ReadData[11]	Byte	16#0	16#08
ReadData[12]	Byte	16#0	16#01
ReadData[13]	Byte	16#0	16#02
ReadData[14]	Byte	16#0	16#03
ReadData[15]	Byte	16#0	16#04
ReadData[16]	Byte	16#0	16#05
ReadData[17]	Byte	16#0	16#06
ReadData[18]	Byte	16#0	16#07
ReadData[19]	Byte	16#0	16#08
ReadData[20]	Byte	16#0	16#00

Read data in DB "IQT3-FP_EasyMode_Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data is transferred via the Long Form data format. Additional length information as well as the UID of the associated data carrier are also transferred.

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

ReadData[10...11]: Length of read User Memory data Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[12...19]: read User Memory data
Length depends on the "Number of Bytes" setting; read subarea of the user memory

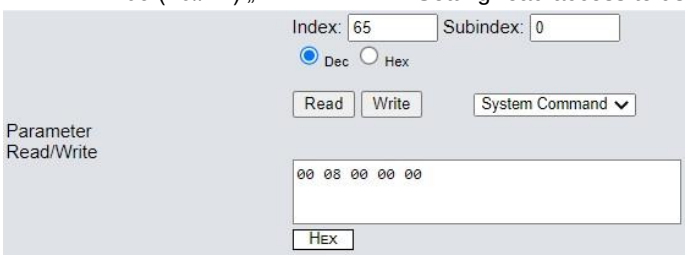
Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	39	
"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 = 20 (depending on the length of the previously read in data)
RSSI = 39 (unchanged)
ReadCounter = 2

5.10 Example: Read User Memory (user data)

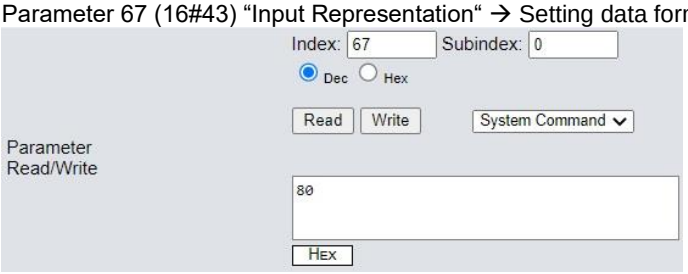
In the delivery state of the IQT3-FP-IO-V1 the Autostart function is activated and the first 8 bytes of the user memory (user data) are automatically read in starting from the start address 0. In the delivery state the short form data format is activated, i.e. no additional length information as well as the UID (Fixcode) of the corresponding data carrier are 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 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 device



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

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	39	
"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	= 8 (depending on the length of the read in data)
RSSI	= 39 (depending on the signal quality)
ReadCounter	= 1

IQT3-FP_EasyMode_Basic_UserData

Name	Dat..	Start ..	Monito..
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
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

Read-in data in DB "IQT3-FP_EasyMode_Basic_ UserData.IQT3-FP-IO-V1.ReadData".

The data are transferred via the Short Form data format. No additional length information as well as the UID of the associated data carrier are transferred.

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

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	39	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier has left the detection zone

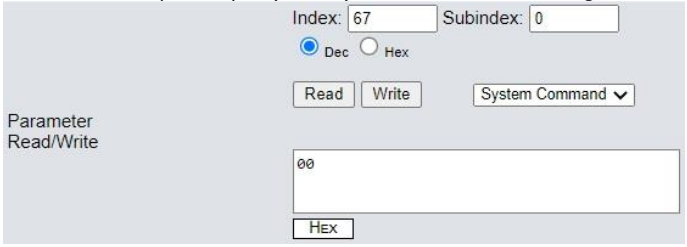
StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 8 (depending on the length of the previously read in data)
RSSI = 39 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	39	
"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 = 39 (unchanged)
ReadCounter = 1

In the delivery state of the IQT3-FP-IO-V1 RFID device, the short form data format is used for data transmission. Here, no associated UID (Fixcode) of the read data carrier and no length information is transmitted. Due to the omission of this additional information, up to 28 bytes of user memory can be read in and transferred using the Short Form data format. The data format can be changed to "Long Form" via parameter 67 "Input Representation". In this case, additional length information and the UID of the associated data carrier are also transferred.

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



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	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	91	
"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 = 20 (depending on the length of the read in data RSSI
RSSI = 91 (depending on the signal quality)
ReadCounter = 1

IQT3-FP_EasyMode_Basic_UserData

Name	Dat..	Start ..	Monito..
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#5D
ReadData[9]	Byte	16#0	16#66
ReadData[10]	Byte	16#0	16#00
ReadData[11]	Byte	16#0	16#08
ReadData[12]	Byte	16#0	16#01
ReadData[13]	Byte	16#0	16#02
ReadData[14]	Byte	16#0	16#03
ReadData[15]	Byte	16#0	16#04
ReadData[16]	Byte	16#0	16#05
ReadData[17]	Byte	16#0	16#06
ReadData[18]	Byte	16#0	16#07
ReadData[19]	Byte	16#0	16#08
ReadData[20]	Byte	16#0	16#00

Read data in DB "IQT3-FP_EasyMode_Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data is transferred via the Long Form data format. Additional length information as well as the UID of the associated data carrier are also transferred

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

ReadData[10...11]: Length of read User Memory data Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[12...19]: read User Memory data
Length depending on the "Number of Bytes" setting; read partial area of the user memory

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	91	
"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 = 20 (depending on the length of the previously read in data)
RSSI = 91 (unchanged)
ReadCounter = 1

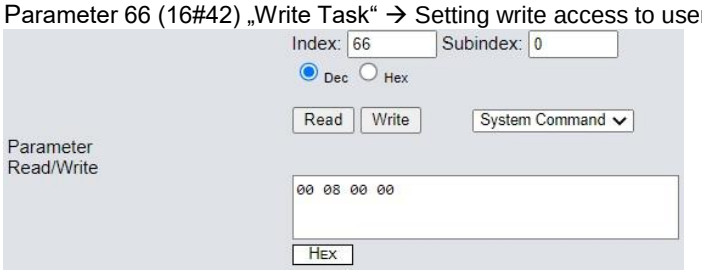
Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"RSSI"	%MB6	DEC	91	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task finished
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 20 (depending on the length of the previously read in data)
RSSI = 91 (unchanged)
ReadCounter = 1

5.11 Example: Write User Memory (user data)

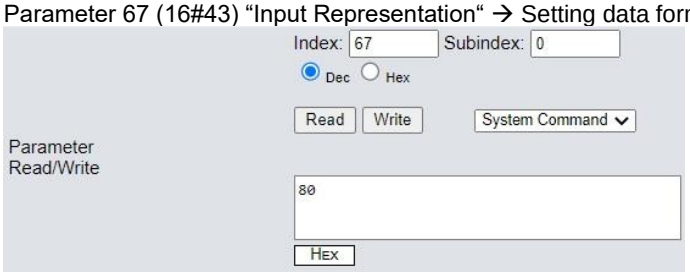
The execution of a write process of the IQT3-FP-IO-V1 RFID device is controlled via the "Start Write" bit at the function block. The Autostart function is not supported during a write process and must be switched off beforehand. The setting of the write process takes place via parameter 66 "Write Task". In the delivery state, 8 bytes are written to the user memory (user data) 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. In the factory setting, the Short Form data format is activated. This returns the UID (Fixcode) of the successfully programmed data carrier. When changing to the Long Form data format, length information of the UID of the programmed data carrier is returned in addition to the UID (Fixcode).

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



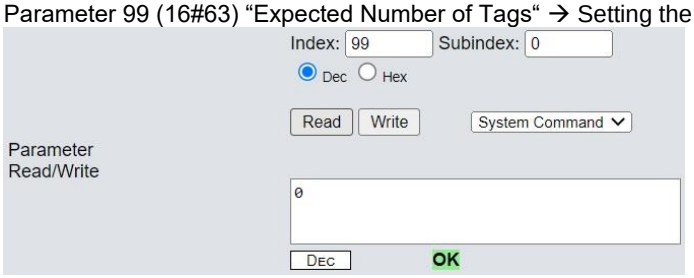
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0

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



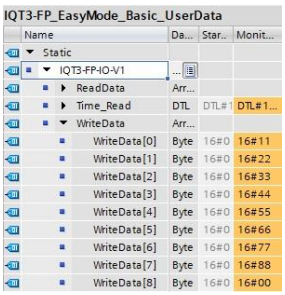
Index 1 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Short Form → Identification of only one data carrier
Long Form → Identification of one or more data carriers

Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

Name	...	Displ...	Monit...	Modify ...
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[0]		Hex	16#11	16#11
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[1]		Hex	16#22	16#22
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[2]		Hex	16#33	16#33
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[3]		Hex	16#44	16#44
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[4]		Hex	16#55	16#55
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[5]		Hex	16#66	16#66
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[6]		Hex	16#77	16#77
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[7]		Hex	16#88	16#88
"IQT3-FP_EasyMode_Basic_UserData"."IQT3-FP-IO-V1".WriteData[8]		Hex	16#00	16#00



Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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
WriteCounter	= 0

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	41	
"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	= 8 (UID always has a length of 8 bytes)
RSSI	= 41 (depending on the signal quality)
WriteCounter	= 1

IQT3-FP_EasyMode_Basic_UserData

Name	Da...	Star..	Monit...
Static			
IQT3-FP-IO-V1			
ReadData	Arr...		
Time_Read	DTL	DTL#1	DTL#1...
WriteData	Arr...		
Time_Write	DTL	DTL#1	DTL#2...
ErrorData	Arr...		
Time_Error	DTL	DTL#1	DTL#1...
UID_WrittenTag	Arr...		
UID_WrittenTag[0]	Byte	16#0	16#E0
UID_WrittenTag[1]	Byte	16#0	16#04
UID_WrittenTag[2]	Byte	16#0	16#01
UID_WrittenTag[3]	Byte	16#0	16#50
UID_WrittenTag[4]	Byte	16#0	16#D3
UID_WrittenTag[5]	Byte	16#0	16#23
UID_WrittenTag[6]	Byte	16#0	16#5D
UID_WrittenTag[7]	Byte	16#0	16#66
UID_WrittenTag[8]	Byte	16#0	16#00
UID_WrittenTag[9]	Byte	16#0	16#00

UID (Fixcode) of the successfully programmed data carrier within the data block "IQT3-FP_EasyMode_ Basic_User Data" in the structure "UID_WrittenTag"; Short Form Data Format

UID_WrittenTag[0...7]: UID (Fixcode)
The length of the UID (Fixcode) is always 8 bytes; when using the Short Form data format, no length information is prepended; when using the Long Form data format, a 2-byte length information is prepended (16#0008)

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	41	
"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	= 8 (unchanged)
RSSI	= 41 (unchanged)
WriteCounter	= 1

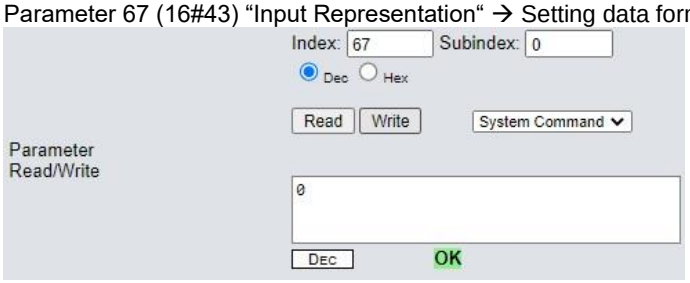
Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	FALSE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	41	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task finished:

StartWrite	= False
WriteValid	= False
TagPresent	= False
TaskActive	= False
TaskFinish	= True
FrameLength	= 8 (unchanged)
RSSI	= 41 (unchanged)
WriteCounter	= 1

In the delivery state of the IQT3-FP-IO-V1 RFID device, the short form data format is used for data transmission. This means that only UID (Fixcode) without length information of the successfully programmed data carrier is returned in case of a successful write access to a data carrier. The parameter 67 "Input Representation" can be used to change the data format to Long Form. In this case, in addition to the UID (Fixcode), a length specification of the UID is also returned in the response.

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



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	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	41	
"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	= 10 (8 Byte UID + 2 Byte length information)
RSSI	= 41 (depending on the signal quality)
WriteCounter	= 1

IQT3-FP_EasyMode_Basic_UserData

Name	Da...	Star..	Monit...
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
Time_Read	DTL	DTL#1	DTL#1...
WriteData	Arr...		
Time_Write	DTL	DTL#1	DTL#2...
ErrorData	Arr...		
Time_Error	DTL	DTL#1	DTL#1...
UID_WrittenTag	Arr...		
UID_WrittenTag[0]	Byte	16#0	16#00
UID_WrittenTag[1]	Byte	16#0	16#08
UID_WrittenTag[2]	Byte	16#0	16#E0
UID_WrittenTag[3]	Byte	16#0	16#04
UID_WrittenTag[4]	Byte	16#0	16#01
UID_WrittenTag[5]	Byte	16#0	16#50
UID_WrittenTag[6]	Byte	16#0	16#D3
UID_WrittenTag[7]	Byte	16#0	16#23
UID_WrittenTag[8]	Byte	16#0	16#5D
UID_WrittenTag[9]	Byte	16#0	16#66

UID (Fixcode) of the successfully written data carrier within the data block "IQT3-FP_EasyMode_Basic_User Data" in the structure "UID_WrittenTag": Long Form Data Format

UID_WrittenTag[0...1]: Length information
2 bytes long; 16#0008 = length of UID; UID is always 8 bytes long

UID_WrittenTag[2...9]: UID (Fixcode)
Length of UID (Fixcode) is always 8 bytes; if Short Form data format is used, no length information is prepended; if Long Form data format is used, 2 bytes length information is prepended (16#0008)

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	41	
"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 = 10 (unchanged)
RSSI = 41 (unchanged)
WriteCounter = 1

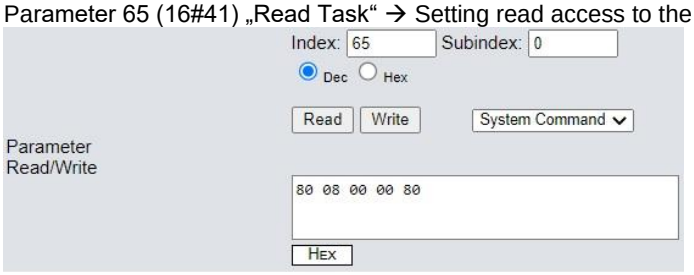
Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	FALSE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	41	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	

Write task finished:
StartWrite = False
WriteValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 10 (unchanged)
RSSI = 41 (unchanged)
WriteCounter = 1

5.12 Example: Read UID (Fixcode) with Autostart function

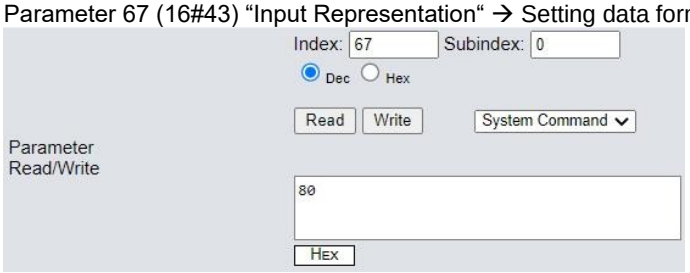
For an access to the UID (Fixcode) the delivery state of the IQT3-FP-IO-V1 must be changed. For this purpose the memory area within parameter 65 "Read Task" has to be changed.

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



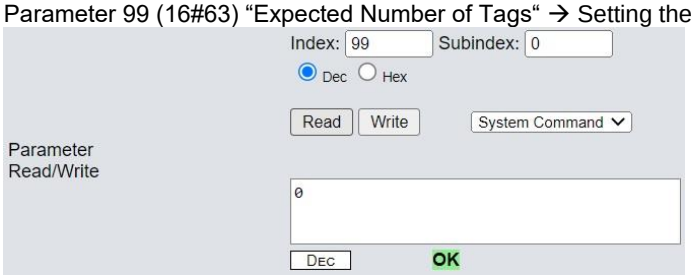
Index 1 = MemoryArea → 16#80 = UID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 16#80 = on

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

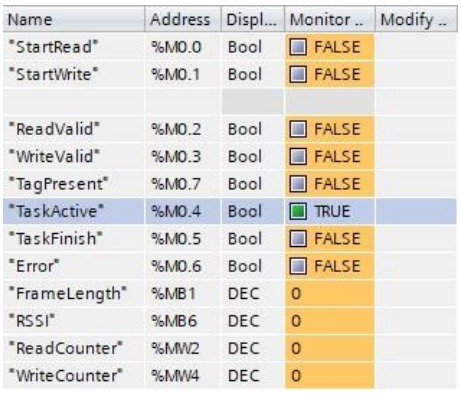


Index 1 = Input Representation → 16#80 = Short Form data format
16#00 = Long Form data format
Short Form → Identification of only one data carrier
Long Form → Identification of one or more data carriers

Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers



Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	

Initial state: Read task was started by RFID device
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
ReadCounter = 0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	34	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in the detection zone and data read in
StartRead = False
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 8 (Length UID always 8 Byte)
RSSI = 34 (depending on the signal quality)
ReadCounter = 1

IQT3-FP_EasyMode_Basic_UserData

Name	Da...	Star..	Monit...
Static			
IQT3-FP-IO-V1			
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#E0
ReadData[1]	Byte	16#0	16#04
ReadData[2]	Byte	16#0	16#01
ReadData[3]	Byte	16#0	16#50
ReadData[4]	Byte	16#0	16#D3
ReadData[5]	Byte	16#0	16#23
ReadData[6]	Byte	16#0	16#5D
ReadData[7]	Byte	16#0	16#66
ReadData[8]	Byte	16#0	16#00

Read data in DB "IQT3-FP_EasyMode_Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data are transferred via the Short Form data format. Thus the length specification for the UID is omitted.

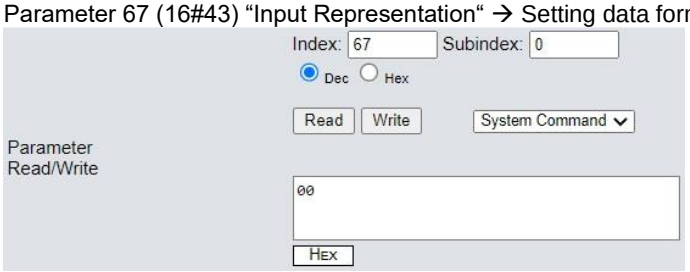
ReadData[0...7]: read UID
Length always 8 bytes;

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	34	
"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 = 8 (unchanged)
RSSI = 34 (unchanged)
ReadCounter = 1

In the delivery state of the IQT3-FP-IO-V1 RFID device, the short form data format is used to transmit the data. In this case, no additional length information is transmitted in the response data via the UID (Fixcode). The data format can be changed to Long Form by parameter 67 "Input Representation". Length information about the UID and the UID (Fixcode) of the data carrier is then transmitted in the response data.

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



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	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	41	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

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

StartRead	= False
ReadValid	= True
TagPresent	= True
TaskActive	= True
TaskFinish	= False
FrameLength	= 10 (2 Byte length information + 8 Byte UID)
RSSI	= 41 (depending on the signal quality)
ReadCounter	= 1

IQT3-FP_EasyMode_Basic_UserData

Name	Dat..	Star...	Monit...
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#5D
ReadData[9]	Byte	16#0	16#66
ReadData[10]	Byte	16#0	16#00

Read data in DB "IQT3-FP_EasyMode_Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data is transferred via the Long Form data format. Thereby a length information is prefixed to the UID (Fixcode).

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	41	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

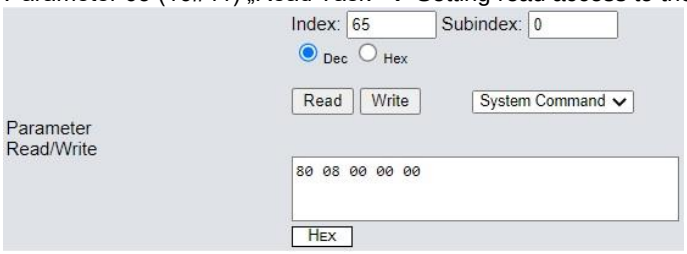
Read task active; data carrier has left the detection zone

StartRead	= False
ReadValid	= False
TagPresent	= False
TaskActive	= True
TaskFinish	= False
FrameLength	= 10 (unchanged)
RSSI	= 41 (unchanged)
ReadCounter	= 1

5.16 Example: Read UID (Fixcode)

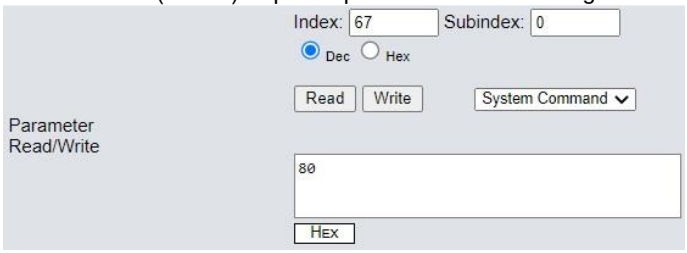
In the delivery state of the IQT3-FP-IO-V1, the Autostart function is activated and the first 8 bytes of the user memory (user data) are read in automatically starting from start address 0. A start of the read task by the process output data is not necessary. In the delivery state, the short form data format is activated, i.e. no additional length information is 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 UID (Fixcode).

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



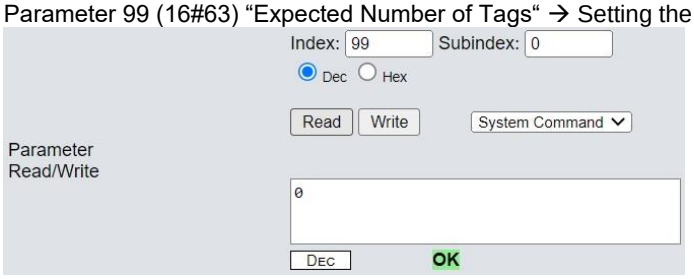
Index 1 = MemoryArea → 16#80 = UID
Index 2 = Number Of Bytes → not relevant
Index 3 = StartAddress → not relevant
Index 4 = Autostart → 16#00 = off

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



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

Parameter 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB6	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
ReadCounter = 0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	13	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

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

StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 8 (8 Byte UID)
RSSI = 13 (depending on the signal quality)
ReadCounter = 1

IQT3-FP_EasyMode_Basic_UserData

Name	Dat..	Star...	Monit...
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#E0
ReadData[1]	Byte	16#0	16#04
ReadData[2]	Byte	16#0	16#01
ReadData[3]	Byte	16#0	16#50
ReadData[4]	Byte	16#0	16#D3
ReadData[5]	Byte	16#0	16#23
ReadData[6]	Byte	16#0	16#5D
ReadData[7]	Byte	16#0	16#66
ReadData[8]	Byte	16#0	16#00

Read data in DB "IQT3-FP_EasyMode_Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data are transferred via the Short Form data format. No length information is transferred with it

ReadData[0...7]: read UID (Fixcode)
Length of the UID always 8 bytes; always starts with 16#E0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	13	
"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(unchanged)
RSSI = 13 (unchanged)
ReadCounter = 1

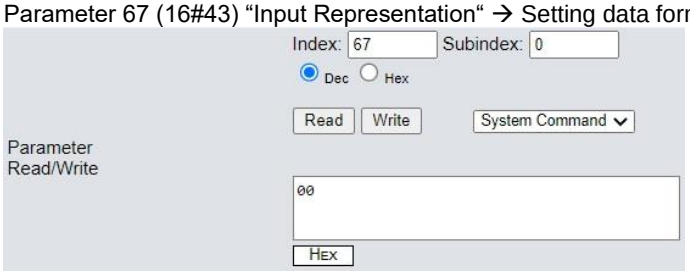
Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB6	DEC	13	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task finished
StartRead = False
ReadValid = False
TagPresent = False
TaskActive = False
TaskFinish = True
FrameLength = 8 (unchanged)
RSSI = 13 (unchanged)
ReadCounter = 1

In the delivery state of the IQT3-FP-IO-V1 RFID device, the short form data format is used to transmit the data. In this case, no additional length information is transmitted in the response data via the UID (Fixcode). The data format can be changed to Long Form by parameter 67 "Input Representation".

Length information about the UID and the UID (Fixcode) of the data carrier is then transmitted in the response data.

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



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	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	10	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task active; data carrier in the detection zone and data read in
StartRead = True
ReadValid = True
TagPresent = True
TaskActive = True
TaskFinish = False
FrameLength = 10 (2 Byte length information + 8 Byte UID)
RSSI = 10 (depending on the signal quality)
ReadCounter = 1

IQT3-FP_EasyMode_Basic_UserData

Name	Dat...	Star...	Monit...
Static			
IQT3-FP-IO-V1	...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#5D
ReadData[9]	Byte	16#0	16#66
ReadData[10]	Byte	16#0	16#00

Read data in DB "IQT3-FP_EasyMode_Basic_UserData.IQT3-FP-IO-V1.ReadData".

The data is transferred via the Long Form data format. Thereby a length information is prefixed to the UID (Fixcode).

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

Name	Address	Displ...	Monitor ..	Modify ..
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	10	
"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 = 10 (unchanged)
RSSI = 10 (unchanged)
ReadCounter = 1

Name	Address	Displ...	Monitor ...	Modify ...
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB6	DEC	10	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	

Read task finished

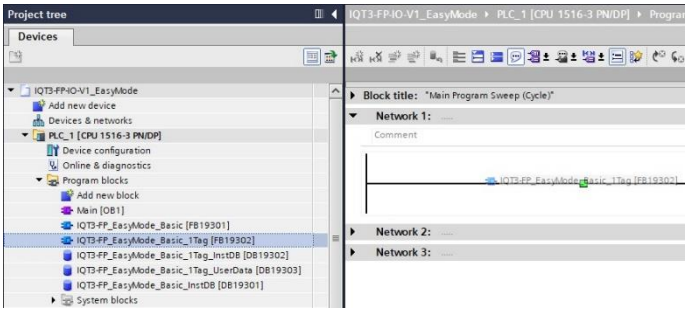
StartRead	= False
ReadValid	= False
TagPresent	= False
TaskActive	= False
TaskFinish	= True
FrameLength	= 10 (unchanged)
RSSI	= 10 (unchanged)
ReadCounter	= 1

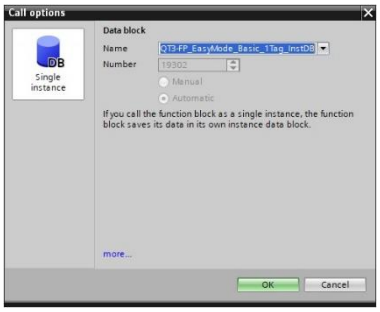
6. Function block FB19302 “IQT3-FP_EasyMode_Basic_1Tag“

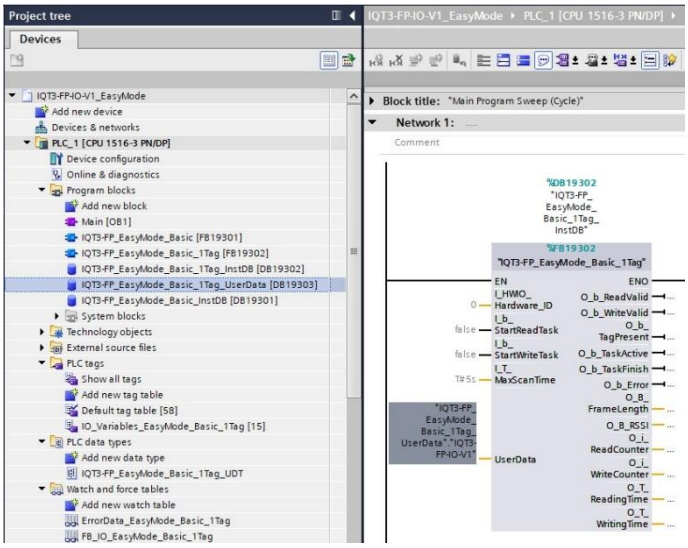
Functional description "IQT3-FP_EasyMode_Basic_1Tag:
This function block can be used to start a read or write task. The task is automatically terminated as soon as exactly one data carrier has been read or written. If no data carrier is detected within a configurable time, the active read or write task 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.

Within the function block "IQT3-FP_EasyMode_Basic_1Tag" the function block "IQT3-FP_Easy Mode_Basic" with associated instance data block "IQT3-FP_EasyMode_Basic_InstDB" is called. With the start of a new write or read task all internal data and the outputs are reset. The read and write data are located within the data block "IQT3-FP_EasyMode_Basic_1Tag_UserData".

Implementation of the "IQT3-FP_EasyMode_Basic_1Tag" function block:
Drag function block "IQT3-FP_EasyMode_Basic_1Tag" (FB19302) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IQT3-FP_EasyMode_Basic_1Tag_InstDB" (DB19302) which can be used as instance data block. The instance data block can also be newly generated.

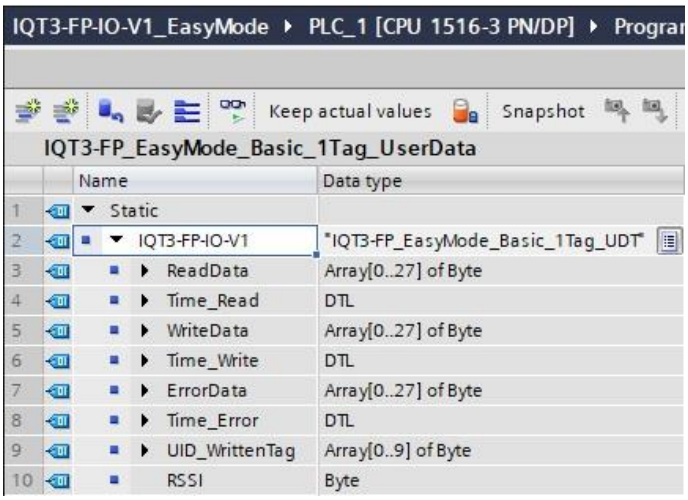






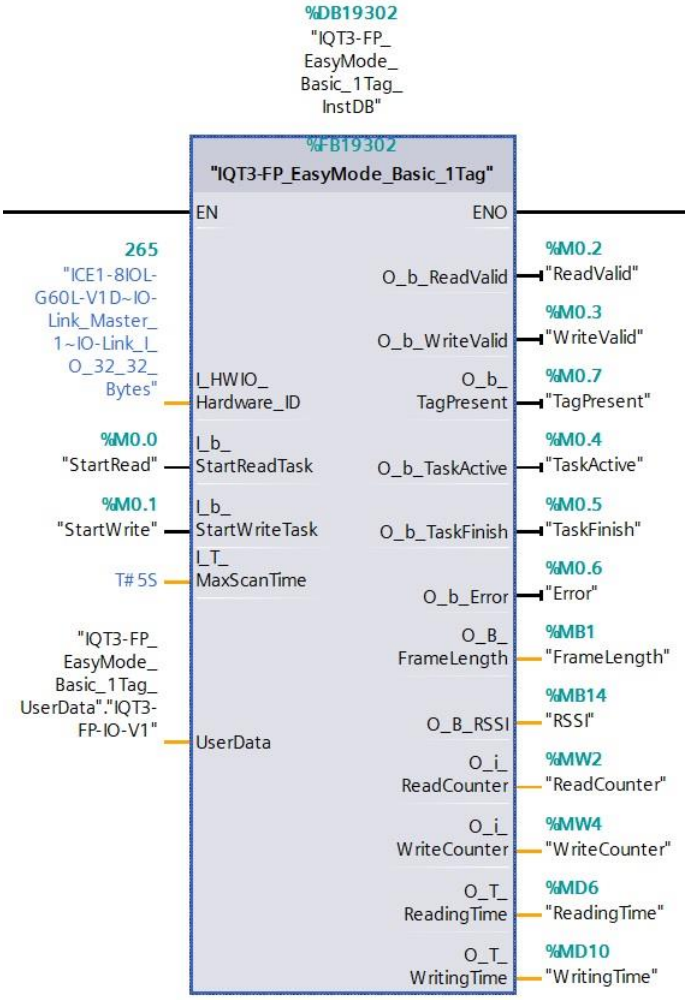
The read/write data of the function block are located in a separate data block. This is parameterized at the "UserData" input. The "IQT3-FP_EasyMode_ Basic_1Tag_UserData" data block is contained in the library and can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the data type "IQT3-FP_EasyMode_Basic_ 1Tag_UDT".



The data block "IQT3-FP_EasyMode_ Basic_1Tag_UserData" consists of the structure "IQT3-FP-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
UID_WrittenTag → UID of a successfully written data carrier
RSSI → RSSI value for volume access



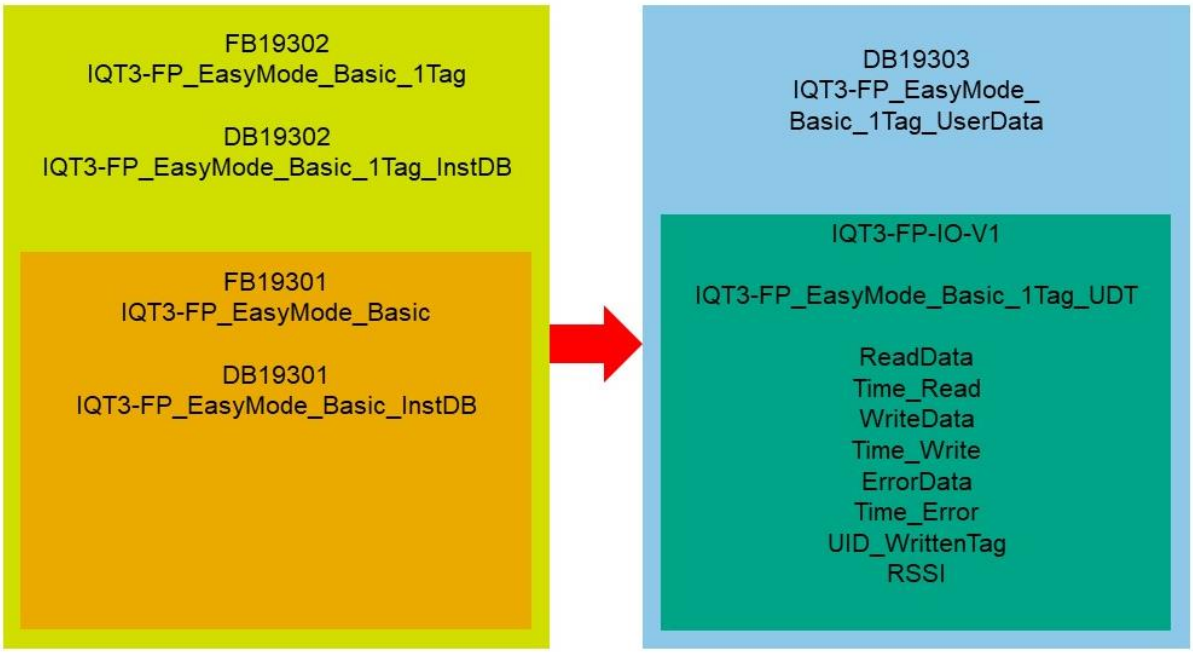
Complete wiring of the "IQT3-FP_EasyMode_ Basic_1Tag" function block:

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_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;

I_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;
I_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 → „IQT3-FP_EasyMode_Basic_1Tag_UserData“.“IQT3-FP-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 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
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_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

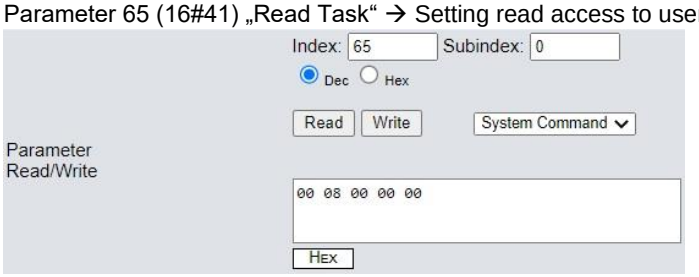


6.1 Execution read task

Read access to the data carrier must be set via IO-Link parameter 65 (16#41) "Read Task". The user memory (user data) or the UID (Fixcode) 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.
In the delivery state, the "Short Form" data format is activated. This means that no additional length information and the associated UID (Fixcode) of the data carrier are transmitted. This means that a larger amount of user data can be transferred. By changing to the "Long Form" data format, additional length information and the UID of the data carrier are also transmitted. This ensures that the data record can be uniquely assigned to a data carrier.

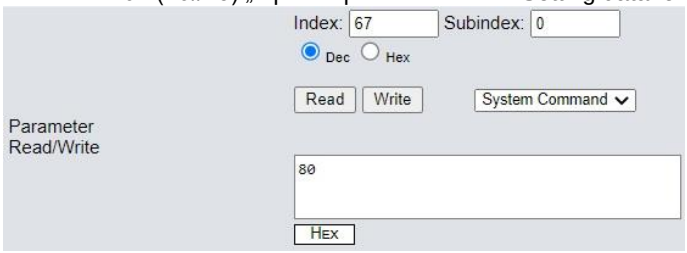
The following example shows the parameterization for executing a read access to the user memory (user data).

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



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 device



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

The read task is started by the "I_b_StartReadTask" input at FB19302.

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	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
ReadCounter = depending on previous state
ReadingTime = depending on previous state
The read task starts as soon as "StartRead" is set to True.

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#0MS	

Read task active; detection zone is scanned
StartRead = True
ReadValid = False
TagPresent = False
TaskActive = True
TaskFinish = False
FrameLength = 0
RSSI = 0
ReadCounter = 0
ReadingTime = T#0MS
The read task is activated. The detection zone is scanned. No data carrier has been detected yet.

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB14	DEC	57	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#2S_604MS	
"WritingTime"	%MD10	Time	T#0MS	

Data carrier read in; read task completed
StartRead = True
ReadValid = True
TagPresent = True
TaskActive = False
TaskFinish = True
FrameLength = 8 (depending on data length)
RSSI = 57 (depending on signal quality)
ReadCounter = 1
ReadingTime = Reading time (depending on the task duration)

The read-in data are located within the data block "IQT3-FP_EasyMode_Basic_ 1Tag_UserData". "IQT3-FP-IO-V1" in the data structure "ReadData".

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB14	DEC	57	
"ReadCounter"	%MW2	DEC	1	
"WriteCounter"	%MW4	DEC	0	
"ReadingTime"	%MD6	Time	T#2S_604MS	
"WritingTime"	%MD10	Time	T#0MS	

Trigger for read task reset
StartRead = False
ReadValid = True
TagPresent = True
TaskActive = False
TaskFinish = True
FrameLength = 8 (depending on data length)
RSSI = 57 (unchanged)
ReadCounter = 1
ReadingTime = Reading time (depending on the task duration)

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	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
ReadCounter = 0
ReadingTime = 0ms

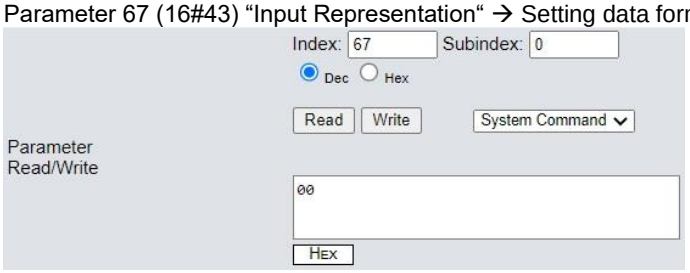
IQT3-FP_EasyMode_Basic_1Tag_UserData

Name	Dat...	Start ...	Monito..
Static			
IQT3-FP-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#11
ReadData[1]	Byte	16#0	16#22
ReadData[2]	Byte	16#0	16#33
ReadData[3]	Byte	16#0	16#44
ReadData[4]	Byte	16#0	16#55
ReadData[5]	Byte	16#0	16#66
ReadData[6]	Byte	16#0	16#77
ReadData[7]	Byte	16#0	16#88
ReadData[8]	Byte	16#0	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

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



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

IQT3-FP_EasyMode_Basic_1Tag_UserData

Name	Data..	Start ...	Monit...
Static			
IQT3-FP-IO-V1	*I...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#08
ReadData[2]	Byte	16#0	16#E0
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#01
ReadData[5]	Byte	16#0	16#50
ReadData[6]	Byte	16#0	16#D3
ReadData[7]	Byte	16#0	16#23
ReadData[8]	Byte	16#0	16#5D
ReadData[9]	Byte	16#0	16#66
ReadData[10]	Byte	16#0	16#00
ReadData[11]	Byte	16#0	16#08
ReadData[12]	Byte	16#0	16#11
ReadData[13]	Byte	16#0	16#22
ReadData[14]	Byte	16#0	16#33
ReadData[15]	Byte	16#0	16#44
ReadData[16]	Byte	16#0	16#55
ReadData[17]	Byte	16#0	16#66
ReadData[18]	Byte	16#0	16#77
ReadData[19]	Byte	16#0	16#88
ReadData[20]	Byte	16#0	16#00

Data structure of read data when accessing the user memory using the "Long Form" data format:

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

ReadData[10...11]: Length of read User Memory data Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[12...19]: read User Memory data
Length depends on the "Number of Bytes" setting; read partial area of the user memory

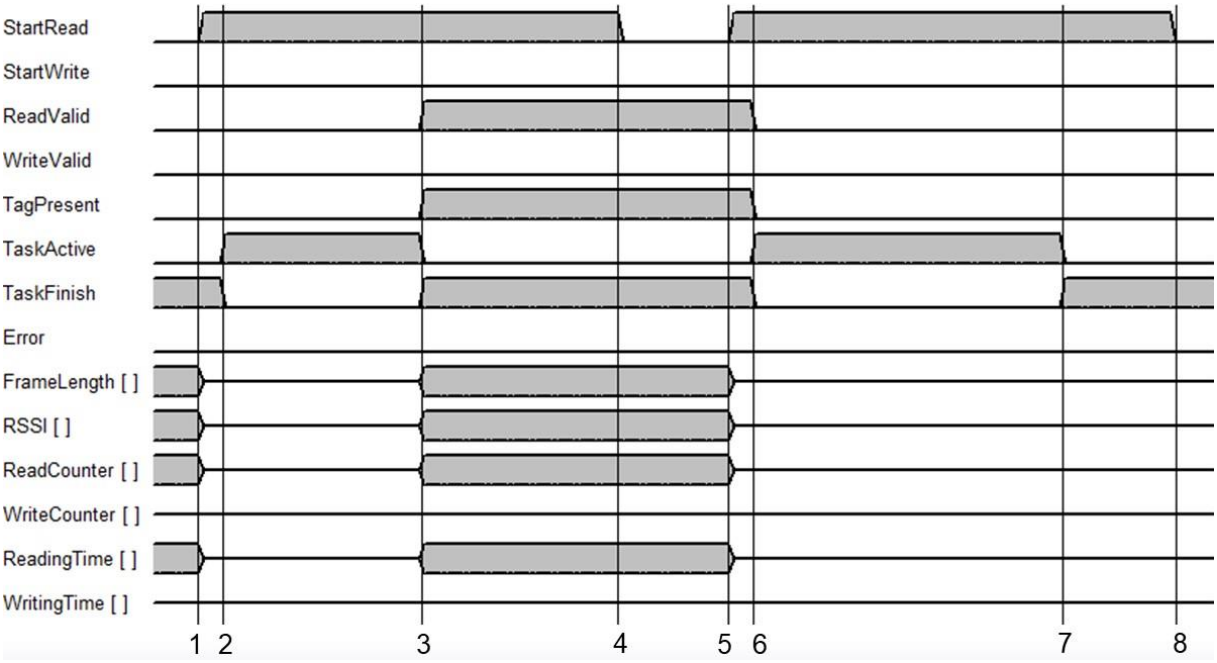
IQT3-FP_EasyMode_Basic_1Tag_UserData

Name	Data ...	Start ...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array...		
Time_Read	DTL	DTL#19	DTL#2023-05-22-10:07:34.393552884
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	22
WEEKDAY	USInt	5	2
HOUR	USInt	0	10
MINUTE	USInt	0	7
SECOND	USInt	0	34
NANOSECOND	UDInt	0	393_552_884
WriteData	Array...		
Time_Write	DTL	DTL#19	DTL#1970-01-01-00:00:00
ErrorData	Array...		
Time_Error	DTL	DTL#19	DTL#1970-01-01-00:00:00
UID_WrittenTag	Array...		
RSSI	Byte	16#0	16#39

Time of successful read access to a data carrier:

Data structure IQT3-FP_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; 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; ReadCounter = 0; ReadingTime = 0ms
3	Data carrier read and read task completed StartRead := True; ReadValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 8; RSSI = 33; 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 = 8; RSSI = 33; 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; 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; FrameLength = 0; RSSI = 0; ReadCounter = 0; ReadingTime = 0ms

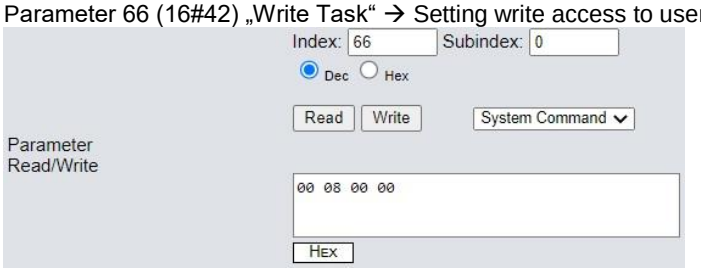
7	Read task finished after timer expires StartRead := True; ReadValid = True; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; ReadCounter = 0; ReadingTime = 0ms
8	Trigger for start read task is reset StartRead := False; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; 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 the Easy mode, the user memory (user data) can be written.
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".
The "Short Form" data format is activated in the delivery state. The UID (Fixcode) of the successfully programmed data carrier is reported back. No additional length information is transmitted via the UID. By changing to the "Long Form" data format, the UID (Fixcode) of the successfully programmed data carrier as well as additional length information is returned.

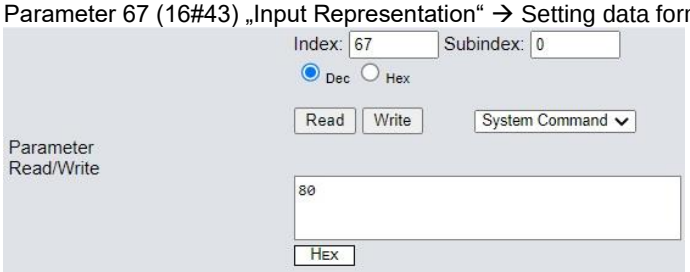
The following example shows the parameterization for the execution of a write access to the user memory (user data).

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



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 device



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

Before starting a write task, the write data must first be defined. These are located in the data block "IQT3-FP_EasyMode_Basic_1Tag_UserData.IQT3-FP-IO-V" in the data structure "WriteData".

Name	...	Displ...	Monit...	Modify ...
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[0]		Hex	16#31	16#31
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[1]		Hex	16#32	16#32
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[2]		Hex	16#33	16#33
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[3]		Hex	16#34	16#34
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[4]		Hex	16#35	16#35
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[5]		Hex	16#36	16#36
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[6]		Hex	16#37	16#37
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[7]		Hex	16#38	16#38
"IQT3-FP_EasyMode_Basic_1Tag_UserData"."IQT3-FP-IO-V1".WriteData[8]		Hex	16#00	16#00

IQT3-FP_EasyMode_Basic_1Tag_UserData

Name	Data ...	Sta...	Monito...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array...		
Time_Read	DTL	DTL#	DTL#1...
WriteData	Array...		
WriteData[0]	Byte	16#0	16#31
WriteData[1]	Byte	16#0	16#32
WriteData[2]	Byte	16#0	16#33
WriteData[3]	Byte	16#0	16#34
WriteData[4]	Byte	16#0	16#35
WriteData[5]	Byte	16#0	16#36
WriteData[6]	Byte	16#0	16#37
WriteData[7]	Byte	16#0	16#38
WriteData[8]	Byte	16#0	16#00

The write task is started by the input "I_b_StartWriteTask" at FB19302.

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	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
WriteCounter = depending on previous state
The write task starts as soon as "StartWrite" is set to True.

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	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
WriteCounter = 0
The write task is activated. The detection zone is scanned. No data carrier has been detected yet.

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB14	DEC	61	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#2S_80MS	

Data carrier written; write task completed
StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = False
TaskFinish = True
FrameLength = 8 (8 Byte UID; Short Form data format)
RSSI = 61 (depending on signal quality)
WriteCounter = 1
WritingTime = Writing time (depending on the task duration)

The UID (Fixcode) of the described data carrier is located within the data block "IQT3-FP_EasyMode_Basic_1Tag_UserData.IQT3-FP-IO-V" in the data structure "UID_WrittenTag".

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	FALSE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	8	
"RSSI"	%MB14	DEC	61	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#2S_80MS	

Trigger for write task reset
StartWrite = False
WriteValid = True (depending on previous state)
TagPresent = True (depending on previous state)
TaskActive = False
TaskFinish = True
FrameLength = 8 (unchanged)
RSSI = 61 (unchanged)
WriteCounter = 1 (unchanged)
WritingTime = Writing time (depending on the task duration)

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"RSSI"	%MB14	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
WriteCounter	= 0
WritingTime	= 0ms

IQT3-FP_EasyMode_Basic_1Tag_UserData

Name	Data ...	Sta...	Monito...
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array...		
Time_Read	DTL	DTL#	DTL#1...
WriteData	Array...		
Time_Write	DTL	DTL#	DTL#2...
ErrorData	Array...		
Time_Error	DTL	DTL#	DTL#1...
UID_WrittenTag	Array...		
UID_WrittenTag[0]	Byte	16#0	16#E0
UID_WrittenTag[1]	Byte	16#0	16#04
UID_WrittenTag[2]	Byte	16#0	16#01
UID_WrittenTag[3]	Byte	16#0	16#50
UID_WrittenTag[4]	Byte	16#0	16#D3
UID_WrittenTag[5]	Byte	16#0	16#23
UID_WrittenTag[6]	Byte	16#0	16#6B
UID_WrittenTag[7]	Byte	16#0	16#D7
UID_WrittenTag[8]	Byte	16#0	16#00
UID_WrittenTag[9]	Byte	16#0	16#00
RSSI	Byte	16#0	16#3D

UID (Fixcode) of the successfully programmed data carrier within the data block "IQT3-FP_EasyMode_ Basic_User Data" in the structure "UID_WrittenTag"; Short Form Data Format

UID_WrittenTag[0...7]: UID (Fixcode)
The length of the UID (Fixcode) is always 8 bytes; when using the Short Form data format no length information is prepended; when using the Long Form data format a 2 byte length information is prepended (16#0008)

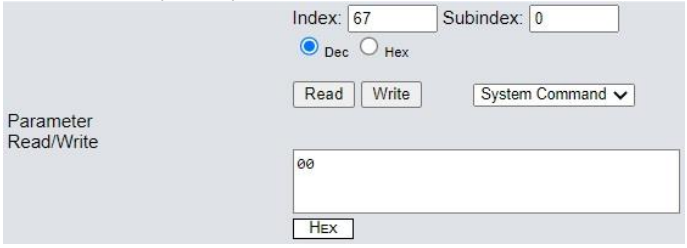
IQT3-FP_EasyMode_Basic_1Tag_UserData

Name	Data ...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
ReadData	Array...		
Time_Read	DTL	DTL#	DTL#1970-01-01-00:00:00
WriteData	Array...		
Time_Write	DTL	DTL#	DTL#2023-05-23-19:40:05.838477062
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	23
WEEKDAY	USInt	5	3
HOUR	USInt	0	19
MINUTE	USInt	0	40
SECOND	USInt	0	5
NANOSECOND	UDInt	0	838_477_062
ErrorData	Array...		
Time_Error	DTL	DTL#	DTL#1970-01-01-00:00:00
UID_WrittenTag	Array...		
RSSI	Byte	16#0	16#3D

Time of successful write access to a data carrier:

Data structure IQT3-FP_EasyMode_Basic _1Tag_UserData.Time_Write

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



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

Name	Address	Displ..	Monitor value	Modify ...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"RSSI"	%MB14	DEC	53	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	1	
"ReadingTime"	%MD6	Time	T#0MS	
"WritingTime"	%MD10	Time	T#3S_909MS	

Data carrier written; write task completed
StartWrite = True
WriteValid = True
TagPresent = True
TaskActive = False
TaskFinish = True
FrameLength = 10 (2 Byte length information + 8 Byte UID; Long Form data format)
RSSI = 53 (depending on signal quality
WriteCounter = 1
WritingTime = Writing time (depending on the task duration)

IQT3-FP_EasyMode_Basic_1Tag_UserData

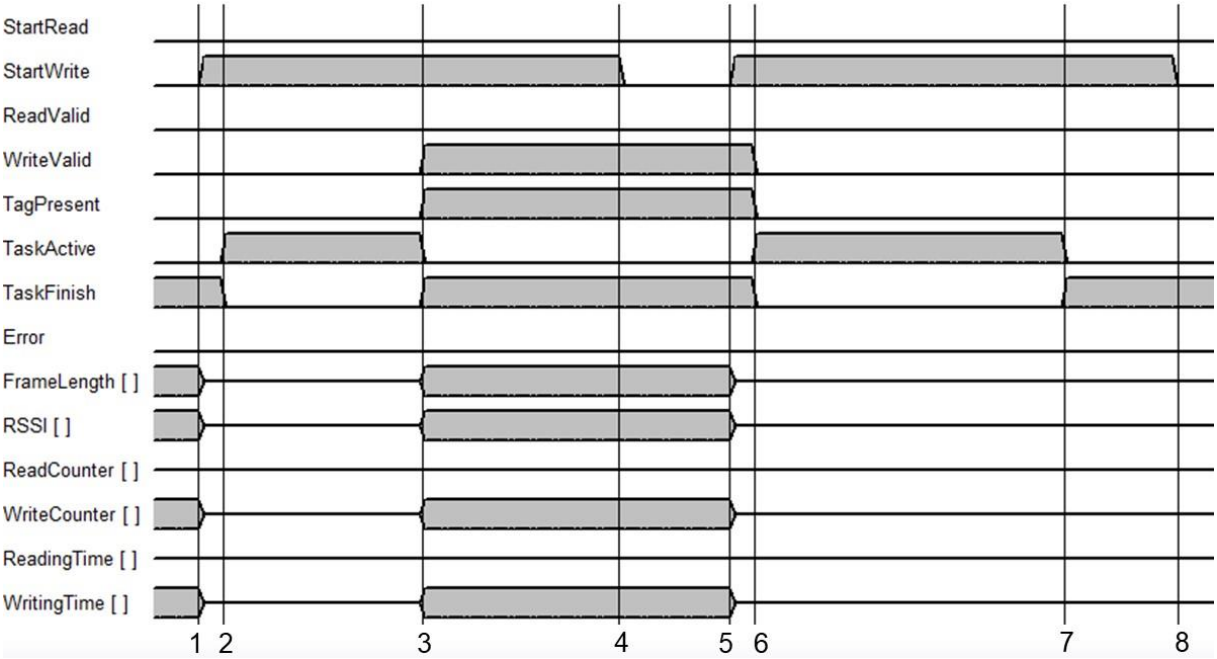
Name	Dat...	Star..	Monit...
Static			
IQT3-FP-IO-V1	"...		
ReadData	Arra...		
Time_Read	DTL	DTL#1	DTL#1...
WriteData	Arra...		
Time_Write	DTL	DTL#1	DTL#2...
ErrorData	Arra...		
Time_Error	DTL	DTL#1	DTL#1...
UID_WrittenTag	Arra...		
UID_WrittenTag[0]	Byte	16#0	16#00
UID_WrittenTag[1]	Byte	16#0	16#08
UID_WrittenTag[2]	Byte	16#0	16#E0
UID_WrittenTag[3]	Byte	16#0	16#04
UID_WrittenTag[4]	Byte	16#0	16#01
UID_WrittenTag[5]	Byte	16#0	16#50
UID_WrittenTag[6]	Byte	16#0	16#D3
UID_WrittenTag[7]	Byte	16#0	16#23
UID_WrittenTag[8]	Byte	16#0	16#6B
UID_WrittenTag[9]	Byte	16#0	16#D7
RSSI	Byte	16#0	16#35

UID (Fixcode) of the successfully written data carrier within the data block "IQT3-FP_EasyMode_Basic_User Data" in the structure "UID_WrittenTag": Long Form Data Format

UID_WrittenTag[0...1]: Length information
2 bytes long; 16#0008 = length of UID; UID is always 8 bytes long

UID_WrittenTag[2...9]: UID (Fixcode)
The length of the UID (Fixcode) is always 8 bytes; when using the Short Form data format, no length information is prepended; when using the Long Form data format, a 2-byte length information is prepended (16#0008)

Flowchart execution write task:

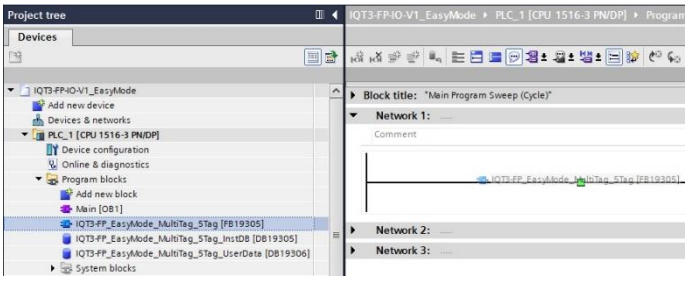


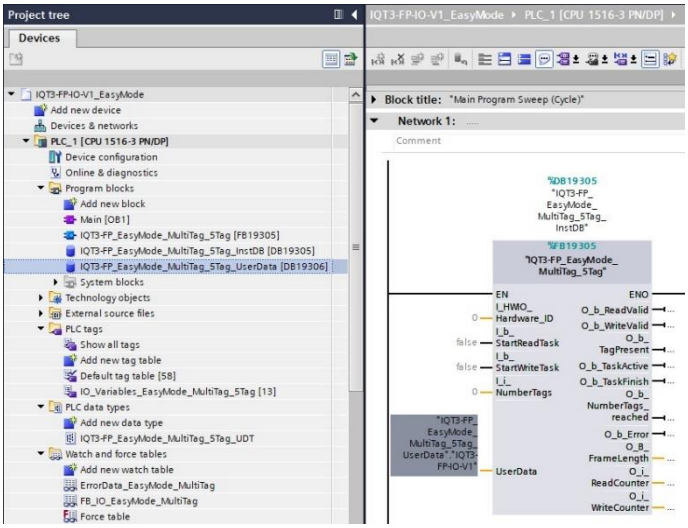
Point of Time	Meaning
1	Write task is started StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 0; WriteCounter = 0; WritingTime = 0ms
2	Write task is activated; no data carrier in detection zone StartWrite := True; WriteValid = False; TagPresent = False; TaskActive = True; TaskFinish = False; FrameLength = 0; RSSI = 0; WriteCounter = 0; WritingTime = 0ms
3	Data carrier written and write task completed StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 8; RSSI = 46; 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 = 8; RSSI = 46; WriteCounter = 1; WritingTime = T#4s_6ms
5	Write task is started StartWrite := True; WriteValid = True; TagPresent = True; TaskActive = False; TaskFinish = True; FrameLength = 0; RSSI = 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; 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; 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; WriteCounter = 0; WritingTime = 0ms

7. Function block FB19305 “IQT3-FP_EasyMode_MultiTag_5Tag“

Functional description "IQT3-FP_EasyMode_Multitag_5Tag":
With the help of the function block, up to 5 data carriers can be identified simultaneously via a read task. The information read in from the data carriers is stored in separate structures within the "IQT3-FP_EasyMode_MultiTag_5Tag_UserData" data block.
By increasing the parameter E5 it is possible to suppress multiple readings of a data carrier. This is necessary if there are read 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 into the user data in all data carriers. For the unique assignment of the programmed data carriers, the UID (Fixcode) 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.

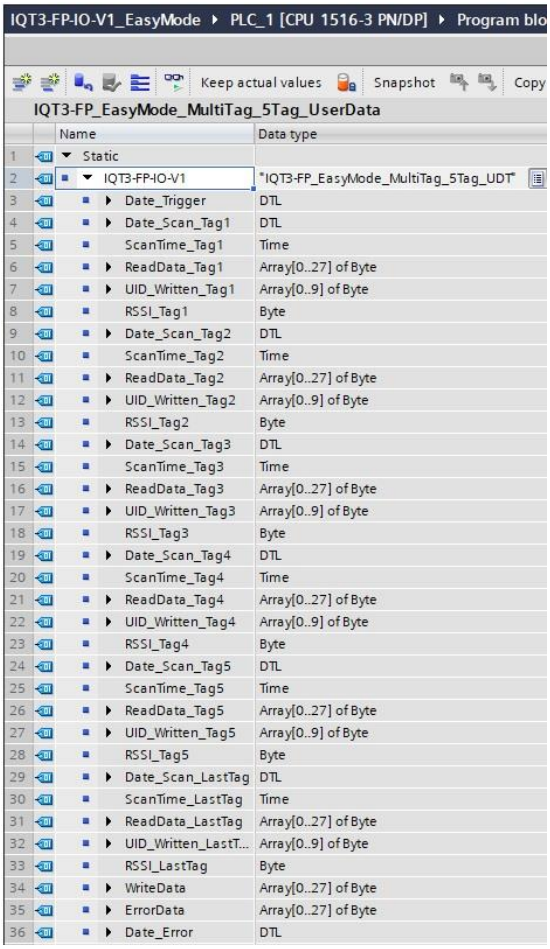
Implementation of function block "IQT3-FP_EasyMode_MultiTag_5Tag":
Drag function block "IQT3-FP_EasyMode_MultiTag_5Tag" (FB19305) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IQT3-FP_EasyMode_MultiTag_5Tag_InstDB" (DB19305) which can be used as an instance data block. However, the instance data block can also be regenerated.





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 "IQT3-FP_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 via the data type "IQT3-FP_EasyMode_Multi Tag_ 5Tag_UDT" from the library.



The data block "IQT3-FP_EasyMode_ MultiTag_5Tag" consists of the structure "IQT3-FP-IO-V1". This structure is formed from the UDT "IQT3-FP_EasyMode_MultiTag_ 5Tag_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

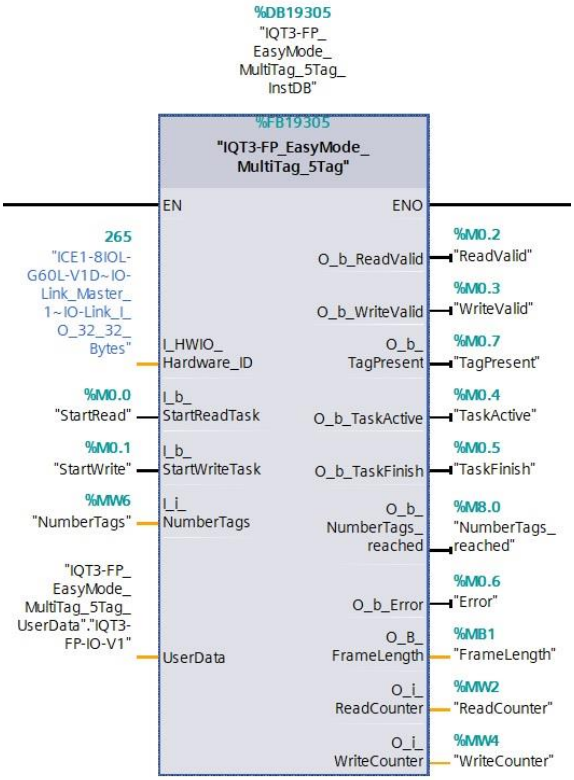
UID_Written_Tag1/2/3/4/5 → UID (Fixcode) of the success-fully written data carrier 1/2/3/4/5

RSSI_Tag1/2/3/4/5 → RSSI value for data carrier access

WriteData → User data for write access to a data carrier

ErrorData → Error information

Date_Error → System time Error status



Complete wiring of the "IQT3-FP_EasyMode_Multi Tag_5Tag" function block:

The input parameter "I_HWIO_Hardware_ID" corre-sponds to the identifier of the communication module from the hardware configuration.

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

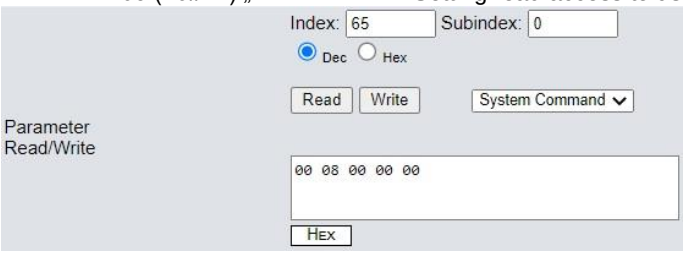
Name	Input / Output	Data types	Meaning
I_i_HardwareID	Input	HW_IO	Hardware identifier of the communication module in the hardware configuration
I_b_StartRead	Input	Bool	Start read task; with signal change from 0 → 1; starts execution of read task; end read task with signal change 1 → 0
I_b_StartWrite	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 → „IQT3-FP_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.
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 memory (user data) or the UID (Fixcode) can be accessed. The Autostart function must be switched off when using this function block, because the read or write task is terminated via the function block. When using the "Long Form" data format, the UID (Fixcode) is always prefixed to the read data set in the returned data for unique assignment to a data carrier. The use of the "Short Form" data format for the identification of several data carriers is not possible. By increasing parameter E5, the RFID device can be set to be more tolerant of reading gaps.

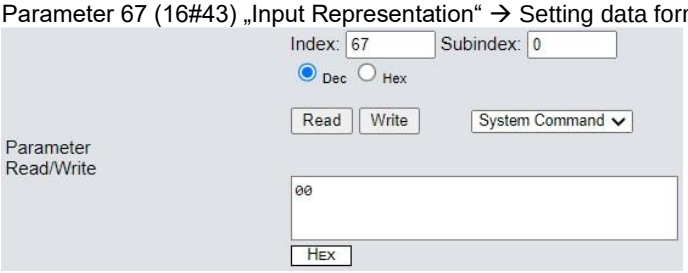
The following example shows the parameterization for executing a read access to the user memory (user data).

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



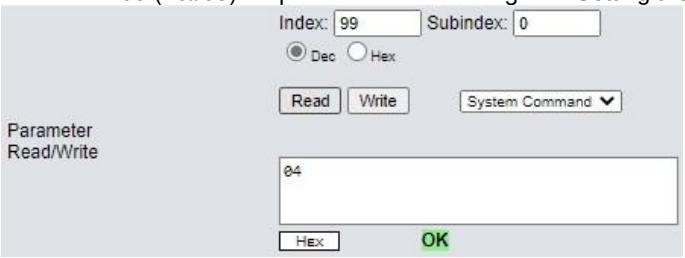
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0
Index 4 = Autostart → 16#00 = off

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



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 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

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 device, 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 0 = E5 → 16#0A = 10 unsuccessful access attempts

The read task is started by the "I_b_StartRead" input at FB19305.

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%M0.0	Bool	FALSE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%M0.6	Bool	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	TRUE	TRUE
"StartWrite"	%M0.1	Bool	FALSE	
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	TRUE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	20	
"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	= 20 (depending on 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.

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%M0.0	Bool	FALSE	FALSE
"StartWrite"	%M0.1	Bool	FALSE	
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%M0.6	Bool	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 are located within the data block "IQT3-FP_EasyMode_MultiTag_5Tag_User Data.IQT3-FP-IO-V1.ReadData_Tag1/2/3.

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monit...
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2...
Date_Scan_Tag1	DTL	DTL#	DTL#2...
ScanTime_Tag1	Time	T#0m	T#187...
ReadData_Tag1	Arra...		
ReadData_Tag1[0]	Byte	16#0	16#00
ReadData_Tag1[1]	Byte	16#0	16#08
ReadData_Tag1[2]	Byte	16#0	16#E0
ReadData_Tag1[3]	Byte	16#0	16#04
ReadData_Tag1[4]	Byte	16#0	16#01
ReadData_Tag1[5]	Byte	16#0	16#50
ReadData_Tag1[6]	Byte	16#0	16#D3
ReadData_Tag1[7]	Byte	16#0	16#23
ReadData_Tag1[8]	Byte	16#0	16#5D
ReadData_Tag1[9]	Byte	16#0	16#66
ReadData_Tag1[10]	Byte	16#0	16#00
ReadData_Tag1[11]	Byte	16#0	16#08
ReadData_Tag1[12]	Byte	16#0	16#11
ReadData_Tag1[13]	Byte	16#0	16#22
ReadData_Tag1[14]	Byte	16#0	16#33
ReadData_Tag1[15]	Byte	16#0	16#44
ReadData_Tag1[16]	Byte	16#0	16#55
ReadData_Tag1[17]	Byte	16#0	16#66
ReadData_Tag1[18]	Byte	16#0	16#77
ReadData_Tag1[19]	Byte	16#0	16#88
ReadData_Tag1[20]	Byte	16#0	16#00

Data carrier 1: ReadData_Tag1

Long form data format

ReadData[0...1]: Length UID
Length 2 bytes; 16#0008 = 8 bytes;

ReadData[2...9]: UID
Length 8 bytes; UID always starts with 16#E0

ReadData[10...11]: Length of read User Memory data Length 2 bytes; corresponds to "Number of Bytes" from parameter 65 "Read Task"; 16#0008 = 8 bytes

ReadData[12...19]: read 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.

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-13:45:00.080922595
Date_Scan_Tag1	DTL	DTL#	DTL#2023-05-24-13:45:00.268044137
ScanTime_Tag1	Time	T#0m	T#187MS
ReadData_Tag1	Arra...		
UID_Written_Tag1	Arra...		
RSSI_Tag1	Byte	16#0	16#5A
Date_Scan_Tag2	DTL	DTL#	DTL#2023-05-24-13:45:00.362087337
ScanTime_Tag2	Time	T#0m	T#281MS
ReadData_Tag2	Arra...		
UID_Written_Tag2	Arra...		
RSSI_Tag2	Byte	16#0	16#5B
Date_Scan_Tag3	DTL	DTL#	DTL#2023-05-24-13:45:00.456084991
ScanTime_Tag3	Time	T#0m	T#375MS
ReadData_Tag3	Arra...		
UID_Written_Tag3	Arra...		
RSSI_Tag3	Byte	16#0	16#58
Date_Scan_Tag4	DTL	DTL#	DTL#1970-01-01-00:00:00
ScanTime_Tag4	Time	T#0m	T#0MS
ReadData_Tag4	Arra...		
UID_Written_Tag4	Arra...		
RSSI_Tag4	Byte	16#0	16#00
Date_Scan_Tag5	DTL	DTL#	DTL#1970-01-01-00:00:00
ScanTime_Tag5	Time	T#0m	T#0MS
ReadData_Tag5	Arra...		
UID_Written_Tag5	Arra...		
RSSI_Tag5	Byte	16#0	16#00
Date_Scan_LastTag	DTL	DTL#	DTL#2023-05-24-13:45:00.456084991
ScanTime_LastTag	Time	T#0m	T#375MS
ReadData_LastTag	Arra...		
UID_Written_LastTag	Arra...		
RSSI_LastTag	Byte	16#0	16#58
WriteData	Arra...		
ErrorData	Arra...		
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 task
DTL#2023-05-24-13:45:00.080922595

Date_Scan_Tag1 → local system time (date) of the PLC at the time of read access to data carrier 1
DTL#2023-05-24-13:45:00.268044137

ScanTime_Tag1 → Read time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1".
T#187ms

RSSI_Tag1 → RSSI value for access to data carrier 1 (16#5A)

Date_Scan_Tag2 → local system time (date) of the PLC at the time of read access to data carrier 2
DTL#2023-05-24-13:45:00.362087337

ScanTime_Tag2 → Read time for data carrier 2; difference of "Date_Trigger" and "Date_Scan_Tag2".
T#281ms

RSSI_Tag2 → RSSI value for access to data carrier 2 (16#5B)

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-13:45:00.080922595
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	24
WEEKDAY	USInt	5	4
HOUR	USInt	0	13
MINUTE	USInt	0	45
SECOND	USInt	0	0
NANOSECOND	UDInt	0	80922595

Date_Trigger → local system time (date) of the PLC at the time of start read task
DTL#2023-05-24-13:45:00.080922595
YEAR → 2023
MONTH → 05
DAY → 24
WEEKDAY → 4
HOUR → 13
MINUTE → 45
SECOND → 0
NANOSECOND → 80922595

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-13:45:00.080922595
Date_Scan_Tag1	DTL	DTL#	DTL#2023-05-24-13:45:00.268044137
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	24
WEEKDAY	USInt	5	4
HOUR	USInt	0	13
MINUTE	USInt	0	45
SECOND	USInt	0	0
NANOSECOND	UDInt	0	268_044_137

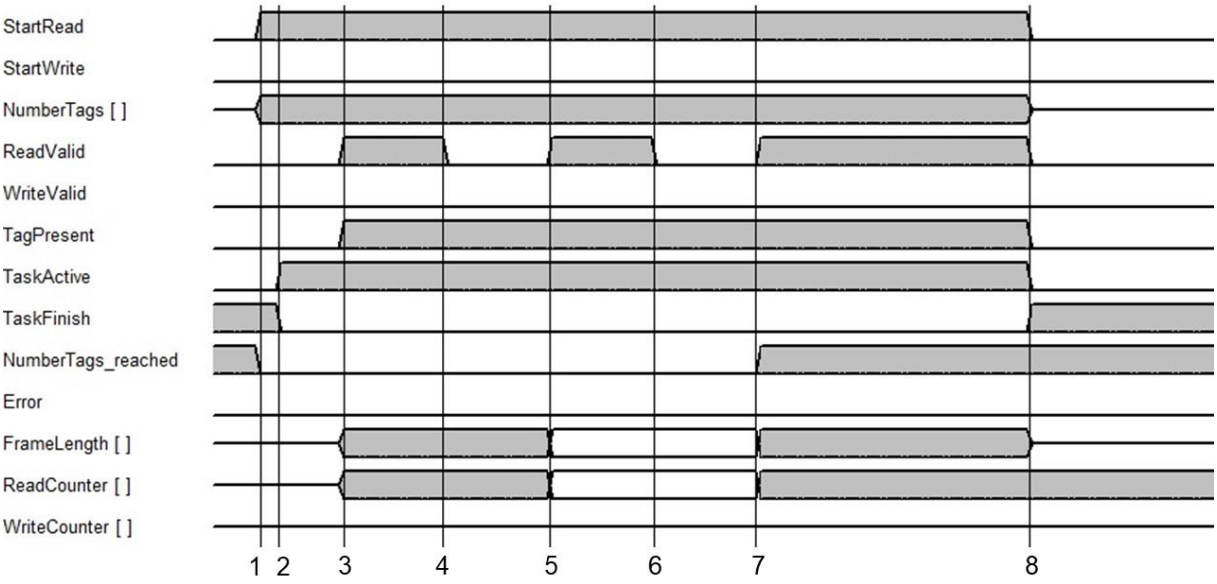
Date_Scan_Tag1 → local system time (date) of the PLC at the time of read access to data carrier 1
DTL#2023-05-24-13:45:00.268044137
YEAR → 2023
MONTH → 5
DAY → 24
WEEKDAY → 4
HOUR → 13
MINUTE → 45
SECOND → 0
NANOSECOND → 268_044_137

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"IQT...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-13:45:00.080922595
Date_Scan_Tag1	DTL	DTL#	DTL#2023-05-24-13:45:00.268044137
ScanTime_Tag1	Time	T#0m	T#187MS
ReadData_Tag1	Arra...		

ScanTime_Tag1 → Read time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1".
T#187ms

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 = 10; 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 = 10; 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 = 10; 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 = 10; ReadCounter = 2
7	Data carrier C read in; ReadValid is set again after 50ms StartRead := True; NumberTags := 3; ReadValid = True; TagPresent = True; TaskActive = True; TaskFinish =

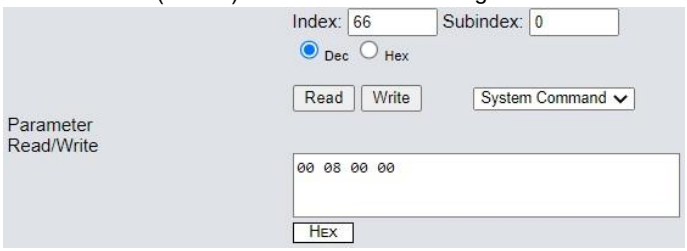
	False; NumberTags_reached = True; FrameLength = 10; ReadCounter = 3
8	Trigger for start read task is reset; read task ended StartRead := False; NumberTags := 0; ReadValid = False; TagPresent = False; TaskActive = False; TaskFinish = True; NumberTags_reached = True; FrameLength = 0; ReadCounter = 3

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 (user data). The Autostart function is not supported when executing a write task. The Autostart function must be deactivated within the "Read Task" in order to use the function block.
When using the "Long Form" data format, the UID (Fixcode) of the data carrier that was successfully written is always transmitted in the data returned by the RFID device. This ensures that write access to a data carrier is uniquely assigned. The use of the "Short Form" data format is not possible with Multi Tag applications.

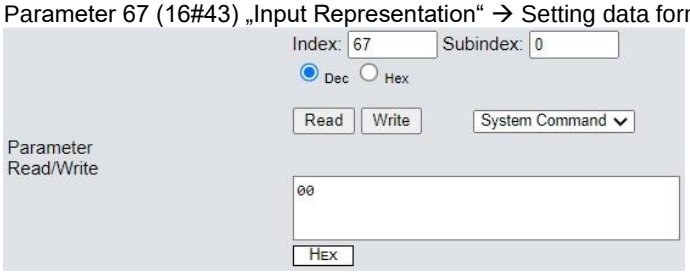
The following example shows the parameterization for the execution of a write access to the user memory (user data).

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



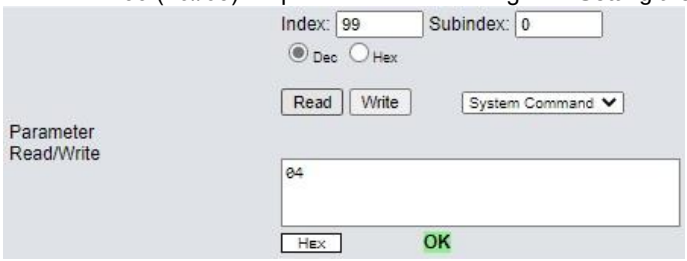
Index 1 = MemoryArea → 16#00 = User Memory
Index 2 = Number Of Bytes → 16#08 = Access to 8 Byte
Index 3 = StartAddress → 16#0000 = Start address 0

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



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 99 (16#63) “Expected Number of Tags“ → Setting the expected number of data carriers



Index 1 = number of expected data carriers
0 → exactly 1 data carrier
1 → about 2 data carriers
2 → about 4 data carriers
3 → about 8 data carriers
4 → about 16 data carriers

The function block does not check for multiple write access to a tag. If a tag is identified multiple times by the RFID device, the new write access is treated as a write access to a new tag. To reduce the probability of multiple identifications, the E5 parameter can be increased.

Parameter 100 (16#64) „Tag Lost Smoothing“ → Number of unsuccessful access attempts

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 "IQT3-FP_EasyMode_MultiTag_5Tag_UserData" in the data structure "IQT3-FP-IO-V1"."WriteData".

Name	A...	Dis...	Moni...	Modify ...
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[0]		Hex	16#01	16#01
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[1]		Hex	16#02	16#02
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[2]		Hex	16#03	16#03
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[3]		Hex	16#04	16#04
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[4]		Hex	16#05	16#05
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[5]		Hex	16#06	16#06
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[6]		Hex	16#07	16#07
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[7]		Hex	16#08	16#08
"IQT3-FP_EasyMode_MultiTag_5Tag_UserData"."IQT3-FP-IO-V1".WriteData[8]		Hex	16#00	16#00

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monit...
WriteData	Arra...		
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

The read task is started by the "I_b_StartWrite" input at FB19305.

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	TRUE
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	0	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	3	

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.

Name	Addr...	Dis...	Monitor...	Mod...
"StartRead"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	TRUE	TRUE
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	TRUE	
"TagPresent"	%M0.7	Bool	TRUE	
"TaskActive"	%M0.4	Bool	TRUE	
"TaskFinish"	%M0.5	Bool	FALSE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%M0.6	Bool	FALSE	
"FrameLength"	%MB1	DEC	10	
"ReadCounter"	%MW2	DEC	0	
"WriteCounter"	%MW4	DEC	3	

Write task active; 3 data carriers have been written successfully

StartWrite	= True
NumberTags	= 3
WriteValid	= True
TagPresent	= True
TaskActive	= True
TaskFinish	= False
NumberTags_reached	= True
FrameLength	= 10 (2 Byte length information + 8 Byte UID)
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"	%M0.0	Bool	FALSE	
"StartWrite"	%M0.1	Bool	FALSE	FALSE
"NumberTags"	%MW6	DE...	3	3
"ReadValid"	%M0.2	Bool	FALSE	
"WriteValid"	%M0.3	Bool	FALSE	
"TagPresent"	%M0.7	Bool	FALSE	
"TaskActive"	%M0.4	Bool	FALSE	
"TaskFinish"	%M0.5	Bool	TRUE	
"NumberTags_reached"	%M8.0	Bool	TRUE	
"Error"	%M0.6	Bool	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 "IQT3-FP_EasyMode_MultiTag_5Tag_UserData" the UID (fixcode) of the successfully written data carriers are located in the structures "UID_Written_Tag1/2/3".

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monit...
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#...
Date_Scan_Tag1	DTL	DTL#	DTL#...
ScanTime_Tag1	Time	T#0ms	T#17...
ReadData_Tag1	Arra...		
UID_Written_Tag1	Arra...		
UID_Written_Tag1[0]	Byte	16#0	16#00
UID_Written_Tag1[1]	Byte	16#0	16#08
UID_Written_Tag1[2]	Byte	16#0	16#E0
UID_Written_Tag1[3]	Byte	16#0	16#04
UID_Written_Tag1[4]	Byte	16#0	16#01
UID_Written_Tag1[5]	Byte	16#0	16#50
UID_Written_Tag1[6]	Byte	16#0	16#D3
UID_Written_Tag1[7]	Byte	16#0	16#23
UID_Written_Tag1[8]	Byte	16#0	16#5D
UID_Written_Tag1[9]	Byte	16#0	16#66

Data carrier 1: UID_Written_Tag1

UID (Fixcode) of the successfully written data carrier within the data block "IQT3-FP_EasyMode_Basic_User Data" in the structure "UID_WrittenTag": Long Form Data format

UID_WrittenTag[0...1]: Length information
2 bytes long; 16#0008 = length of UID; UID is always 8 bytes long

UID_WrittenTag[2...9]: UID (Fixcode)
Length of UID (Fixcode) is always 8 bytes; if Short Form data format is used, no length information is prepended; if Long Form data format is used, 2 bytes length information is prepended (16#0008)

The UID (Fixcode) for the programmed data carrier is located in the data structure UID_Written_Tag2 and the UID (Fixcode) for the programmed data carrier 3 is located in the data structure UID_Written_Tag3. The structure of the data sets is analogous to data carrier 1.

In addition to the UID for each successfully programmed data carrier, system times for data carrier access are also stored within the data block.

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-15:46:34.017941795
Date_Scan_Tag1	DTL	DTL#	DTL#2023-05-24-15:46:34.197863271
ScanTime_Tag1	Time	T#0m	T#179MS
ReadData_Tag1	Arra...		
UID_Written_Tag1	Arra...		
RSSI_Tag1	Byte	16#0	16#5A
Date_Scan_Tag2	DTL	DTL#	DTL#2023-05-24-15:46:34.294078417
ScanTime_Tag2	Time	T#0m	T#276MS
ReadData_Tag2	Arra...		
UID_Written_Tag2	Arra...		
RSSI_Tag2	Byte	16#0	16#57
Date_Scan_Tag3	DTL	DTL#	DTL#2023-05-24-15:46:34.391629262
ScanTime_Tag3	Time	T#0m	T#373MS
ReadData_Tag3	Arra...		
UID_Written_Tag3	Arra...		
RSSI_Tag3	Byte	16#0	16#5B
Date_Scan_Tag4	DTL	DTL#	DTL#1970-01-01-00:00:00
ScanTime_Tag4	Time	T#0m	T#0MS
ReadData_Tag4	Arra...		
UID_Written_Tag4	Arra...		
RSSI_Tag4	Byte	16#0	16#00
Date_Scan_Tag5	DTL	DTL#	DTL#1970-01-01-00:00:00
ScanTime_Tag5	Time	T#0m	T#0MS
ReadData_Tag5	Arra...		
UID_Written_Tag5	Arra...		
RSSI_Tag5	Byte	16#0	16#00
Date_Scan_LastTag	DTL	DTL#	DTL#2023-05-24-15:46:34.391629262
ScanTime_LastTag	Time	T#0m	T#373MS
ReadData_LastTag	Arra...		
UID_Written_LastTag	Arra...		
RSSI_LastTag	Byte	16#0	16#5B
WriteData	Arra...		
ErrorData	Arra...		
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#2023-05-24-15:46:34.017941795

Date_Scan_Tag1 → local system time (date) of the PLC at the time of write access to data carrier 1
DTL#2023-05-24-15:46:34.197863271

ScanTime_Tag1 → Write time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1".
T#179ms

RSSI_Tag1 → RSSI value for access to data carrier 1 (16#5A)

Date_Scan_Tag2 → local system time (date) of the PLC at the time of write access to data carrier 2
DTL#2023-05-24-15:46:34.294078417

ScanTime_Tag2 → Read time for data carrier 2; difference of "Date_Trigger" and "Date_Scan_Tag2".
T#276ms

RSSI_Tag2 → RSSI value for accessing data carrier 2 (16#57)

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-15:46:34.017941795
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	24
WEEKDAY	USInt	5	4
HOUR	USInt	0	15
MINUTE	USInt	0	46
SECOND	USInt	0	34
NANOSECOND	UDInt	0	17941795

Date_Trigger → local system time (date) of the PLC at the time of start write task
DTL#2023-05-24-15:46:34.017941795
YEAR → 2023
MONTH → 5
DAY → 24
WEEKDAY → 4
HOUR → 15
MINUTE → 46
SECOND → 34
NANOSECOND → 179417795

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

Name	Data...	Sta...	Monitor value
Static			
IQT3-FP-IO-V1	"I...		
Date_Trigger	DTL	DTL#	DTL#2023-05-24-15:46:34.017941795
Date_Scan_Tag1	DTL	DTL#	DTL#2023-05-24-15:46:34.197863271
YEAR	UInt	1970	2023
MONTH	USInt	1	5
DAY	USInt	1	24
WEEKDAY	USInt	5	4
HOUR	USInt	0	15
MINUTE	USInt	0	46
SECOND	USInt	0	34
NANOSECOND	UDInt	0	197_863_271

Date_Scan_Tag1 → local system time (date) of the PLC at the time of write access to data carrier 1
DTL#2023-05-24-15:46:34.197863271
YEAR → 2023
MONTH → 5
DAY → 24
WEEKDAY → 4
HOUR → 15
MINUTE → 46
SECOND → 34
NANOSECOND → 197_863_271

IQT3-FP_EasyMode_MultiTag_5Tag_UserData

	Name	Data...	Sta...	Monitor value
	Static			
	IQT3-FP-IO-V1	"IQT...		
	Date_Trigger	DTL	DTL#	DTL#2023-05-24-15:46:34.017941795
	Date_Scan_Tag1	DTL	DTL#	DTL#2023-05-24-15:46:34.197863271
	ScanTime_Tag1	Time	T#0m	T#179MS
	ReadData_Tag1	Arra...		

ScanTime_Tag1 → Write time for data carrier 1; difference of "Date_Trigger" and "Date_Scan_Tag1".
T#179ms

8. Function block FB19307 “IQT3-FP_EasyMode_Param“

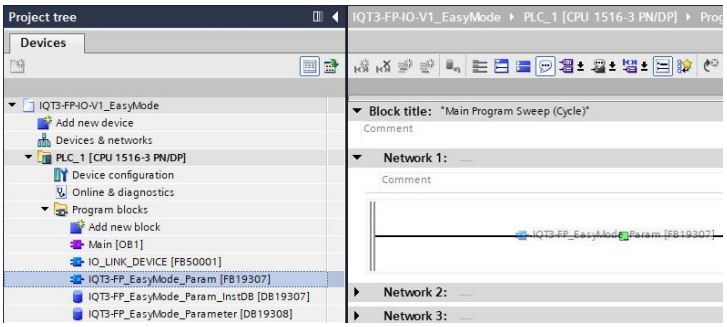
Functional description "IQT3-FP_EasyMode_Param":
Function block for reading and changing the IO-Link parameters of the IQT3-FP-IO-V1 RFID device. Read access is performed on the one hand to the IO-Link standard parameters (e.g. vendor name) and on the other hand to the device-specific IO-Link parameters. Write access for a parameter change, on the other hand, is only performed on the device-specific IO-Link parameters.

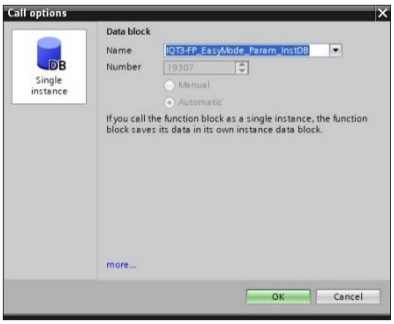
When executing write access to the device-specific IO-Link parameters, it should be noted that the number of possible write operations is limited by the storage of the parameter data in an EEPROM. It is therefore recommended that write access is only performed when a device has been newly installed. The device-specific IO-Link parameters are stored in non-volatile memory.

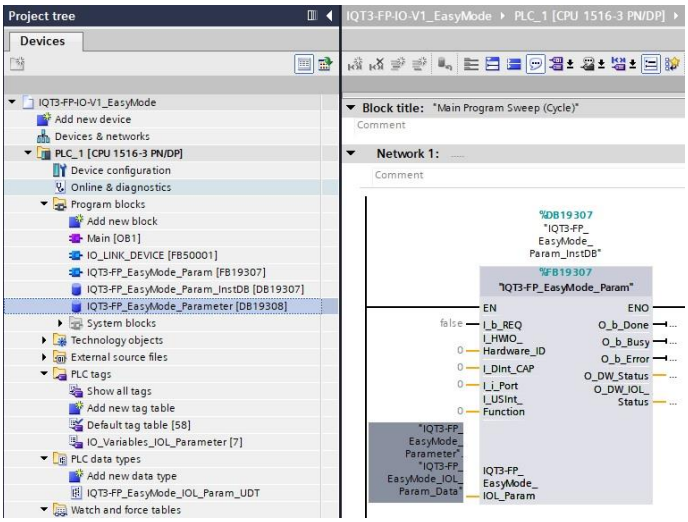
The data structures for the read-in IO-Link parameters are located within the DB19308 "IQT3-FP_ Parameter" data block. The data structures for changing the IO-Link parameters are preset with values identical to the factory setting of the RFID device.

Within the function block FB19307 "IQT3-FP_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 "IQT3-FP_EasyMode_Param":
Drag function block "IQT3-FP_EasyMode_Param" (FB19307) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IQT3-FP_Easy Mode_Param_InstDB" (DB19307) which can be used as instance data block. The instance data block can also be regenerated.

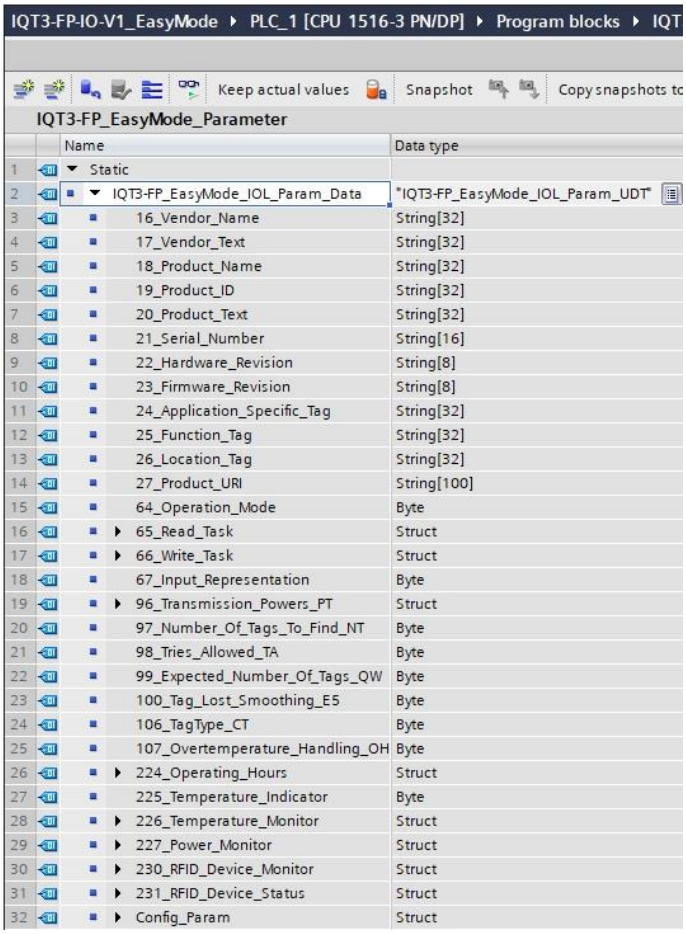






The IO-Link parameters read in are located in a separate data block. This is parameterized at the "IQT3-FP_EasyMode_IOL_Param" input. The DB19308 "IQT3-FP_EasyMode_Parameter" data block is contained in the library and can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the "IQT3-FP_EasyMode_IOL_ Param_UDT" data type.



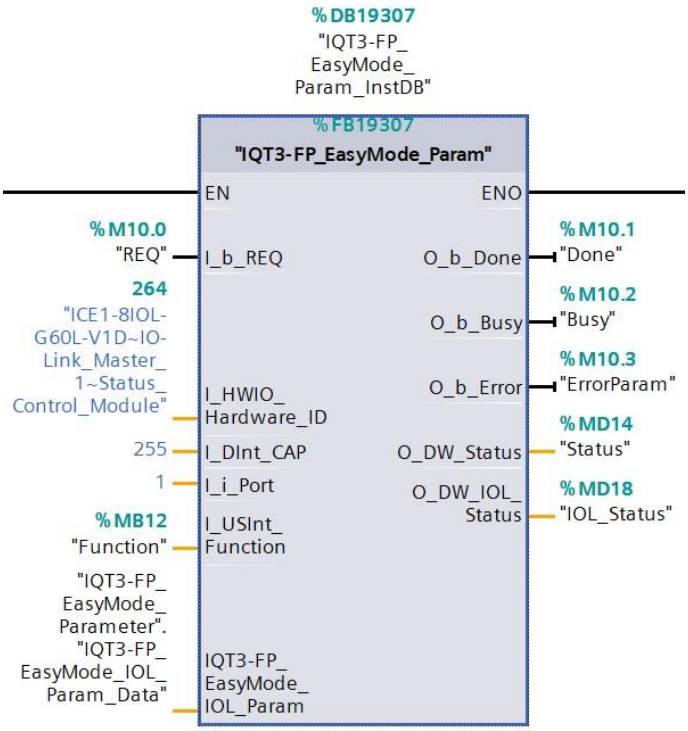
	Name	Data type
1	Static	
2	IQT3-FP_EasyMode_IOL_Param_Data	"IQT3-FP_EasyMode_IOL_Param_UDT"
3	16_Vendor_Name	String[32]
4	17_Vendor_Text	String[32]
5	18_Product_Name	String[32]
6	19_Product_ID	String[32]
7	20_Product_Text	String[32]
8	21_Serial_Number	String[16]
9	22_Hardware_Revision	String[8]
10	23_Firmware_Revision	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_E5	Byte
24	106_TagType_CT	Byte
25	107_Overtemperature_Handling_OH	Byte
26	224_Operating_Hours	Struct
27	225_Temperature_Indicator	Byte
28	226_Temperature_Monitor	Struct
29	227_Power_Monitor	Struct
30	230_RFID_Device_Monitor	Struct
31	231_RFID_Device_Status	Struct
32	Config_Param	Struct

The data block "IQT3-FP_EasyMode_ Parameter" consists of the structure "IQT3-FP_Easy Mode_IOL_Param_Data". This structure is formed from the "IQT3-FP_EasyMode_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		'IQT3-FP-IO-V1'
19_Product_ID	19	String[32]	Read		''70134031'
20_Product_Text	20	String[32]	Read		'RFID read/write station'
21_Serial_Number	21	String[16]	Read		'40000137339431'
22_Hardware_Revision	22	String[8]	Read		'HW01.00'
23_Firmware_Revision	23	String[8]	Read		'FW01.00'
24_Application_Specific_Tag	24	String[32]	Read		'Your automation, our passion.'
25_Function_Tag	25	String[32]	Read		'***'
26_Location_Tag	26	String[32]	Read		'***'
27_Product_URI	27	String[100]	Read		'https://pefu.de/40000137339431'
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 = UID + User Memory; 128 = UID	0 = UID + User Memory
65_Read_Task. 2_NumberOfBytes	65	Byte	Read / Write	1…28	8
65_Read_Task. 3_StartAddress	65	Int	Read / Write	16#0000…16#FFFF	16#0000
65_Read_Task. 4_Autostart	65	Byte	Read / Write	0 = off; 128 = on	128 = on
66_Write_Task	66	Struct	Read / Write		
66_Write_Task. 1_MemoryArea	66	Byte	Read / Write	0 = User Memory	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	128 = Short Form data format
96_Transmission_Power_PT	96	Int	Read / Write	1; 2; 3; 4	4 = max
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	0
100_Tag_Lost_Smoothing_E5	100	Byte	Read / Write	0…10	5
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	
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	
230_RFID_Device_Monitor	230	Struct	Read		
230_RFID_Device_Monitor.CarrierOperatingHours	230	DInt	Read	0…2^32-1	
230_RFID_Device_Monitor.PowerAmplifierTemperature	230	Byte	Read	-40…+125	
231_RFID_Device_Status	231	Struct	Read		
231_RFID_Device_Status.3_PowerAmplifierOvertemperatureError	231	Bool	Read	False = no error; True = Error	
231_RFID_Device_Status.2_PowerAmplifierOvertemperatureWarning	231	Bool	Read	False = no warning; True = warning	
231_RFID_Device_Status.1_TuneLimit	231	Bool	Read	False = Tune limit not reached; True = Tune limit reached	
231_RFID_Device_Status.0_Disturbed	231	Bool	Read	False = device not disturbed; True = device disturbed	



Complete wiring of the function block FB19307 "IQT3-FP_EasyMode_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 device is connected to the IO-Link master
I_USInt_Function	Input	USInt	Definition whether parameters are read (16#00) or written (16#01)
IQT3-FP_IOL_Param	InOut	DB	Data area for the IO-Link parameters → „IQT3-FP_EasyMode_Parameter“.“IQT3-FP_EasyMode_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

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	FALSE	TRUE
"Function"	%MB12	DEC	0	0
"Done"	%M10.1	Bool	TRUE	
"Busy"	%M10.2	Bool	FALSE	
"ErrorParam"	%M10.3	Bool	FALSE	
"Status"	%MD14	Hex	16#0000_0000	
"IOL_Status"	%MD18	Hex	16#0000_0000	

Initial state before the start of the read request:
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	TRUE	TRUE
"Function"	%MB12	DEC	0	0
"Done"	%M10.1	Bool	FALSE	
"Busy"	%M10.2	Bool	TRUE	
"ErrorParam"	%M10.3	Bool	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	TRUE	TRUE
"Function"	%MB12	DEC	0	0
"Done"	%M10.1	Bool	TRUE	
"Busy"	%M10.2	Bool	FALSE	
"ErrorParam"	%M10.3	Bool	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	FALSE	FALSE
"Function"	%MB12	DEC	0	0
"Done"	%M10.1	Bool	TRUE	
"Busy"	%M10.2	Bool	FALSE	
"ErrorParam"	%M10.3	Bool	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 read-in IO-Link parameters are stored within the data block DB19308 "IQT3-FP_Easy Mode_Parameter" in the data structure "IQT3-FP_EasyMode_IOL_Param_Data".

IQT3-FP_EasyMode_Parameter

Name	Dat...	Sta...	Monitor value
Static			
IQT3-FP_EasyMode_IOL_Param_Data	"IQ...		
16_Vendor_Name	Stri...	''	'Pepperl+Fuchs'
17_Vendor_Text	Stri...	''	'www.pepperl-fuchs.com/io-link'
18_Product_Name	Stri...	''	'IQT3-FP-IO-V1'
19_Product_ID	Stri...	''	'70134031'
20_Product_Text	Stri...	''	'RFID read/write station'
21_Serial_Number	Stri...	''	'40000137339431'
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/40000137339431'

Read-in standard IO-Link parameters.

IQT3-FP_EasyMode_Parameter

Name	Dat...	Sta...	Monitor value
64_Operation_Mode	Byte	16#0	16#80
65_Read_Task	Stru...		
1_MemoryArea	Byte	16#0	16#00
2_NumberOfBytes	Byte	16#0	16#08
3_StartAddress	Int	0	0
4_Autostart	Byte	16#0	16#80
66_Write_Task	Stru...		
1_MemoryArea	Byte	16#0	16#00
2_NumberOfBytes	Byte	16#0	16#08
3_StartAddress	Int	0	0
67_Input_Representation	Byte	16#0	16#80

Read-in device-specific IO-Link parameters for setting the read/write functionality.

IQT3-FP_EasyMode_Parameter

Name	Dat...	Sta...	Monitor value
96_Transmission_Powers_PT	Stru...		
1_Power_1	Int	0	4
97_Number_Of_Tags_To_Find_NT	Byte	16#0	16#FF
98_Tries_Allowed_TA	Byte	16#0	16#02
99_Expected_Number_Of_Tags_QW	Byte	16#0	16#00
100_Tag_Lost_Smoothing_E5	Byte	16#0	16#05
106_TagType_CT	Byte	16#0	16#14
107_Overtemperature_Handling_OH	Byte	16#0	16#00

Read-in device-specific IO-Link parameters for setting the HF functionality.

IQT3-FP_EasyMode_Parameter

Name	Dat...	Sta...	Monitor value
224_Operating_Hours	Stru...		
Operating_Hours	DInt	0	103
Operating_Days	DInt	0	4
225_Temperature_Indicator	Byte	16#0	16#00
226_Temperature_Monitor	Stru...		
1_Overtemperature_Operating_Hours	DInt	0	0
2_Overtemperature_Exceeded_Counter	Int	0	2
3_Maximum_Operating_Temperature	Byte	16#0	16#45
4_Minimum_Operating_Temperature	Byte	16#0	16#11
5_Device_Operating_Temperature	Byte	16#0	16#27
Max_Op_Temp_°C	Int	0	69
Min_Op_Temp_°C	Int	0	17
Device_Op_Temp_°C	Int	0	39
227_Power_Monitor	Stru...		
1_Power_Cycles	DInt	0	89
2_Maximum_Uptime_s	DInt	0	36900
3_Average_Uptime_s	DInt	0	4191
4_Uptime_s	DInt	0	1272
Max_Uptime_min	DInt	0	615
Max_Uptime_h	DInt	0	10
Max_Uptime_d	DInt	0	0
Ave_Uptime_min	DInt	0	69
Ave_Uptime_h	DInt	0	1
Ave_Uptime_d	DInt	0	0
Uptime_min	DInt	0	21
Uptime_h	DInt	0	0
Uptime_d	DInt	0	0
230_RFID_Device_Monitor	Stru...		
CarrierOperatingHours	DInt	0	24
PowerAmplifierTemperature	Byte	16#0	16#26
231_RFID_Device_Status	Stru...		
7_NotUsed	Bool	false	FALSE
6_NotUsed	Bool	false	FALSE
5_NotUsed	Bool	false	FALSE
4_NotUsed	Bool	false	FALSE
3_PowerAmplifierOvertemperatureError	Bool	false	FALSE
2_PowerAmplifierOvertemperatureWarning	Bool	false	FALSE
1_TuneLimit	Bool	false	FALSE
0_Disturbed	Bool	false	FALSE

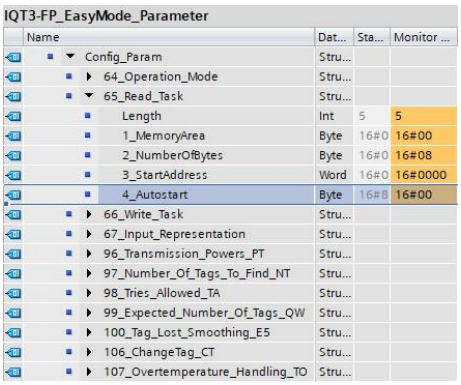
Read-in IO-Link parameters with additional device information.

8.2 Write IO-Link Parameter

Before starting write access to the IO-Link parameters, the new parameter values must be transferred to the DB19308 "IQT3-FP_EasyMode_Parameter" data block in the "Config_Param" data structure via a variable table.

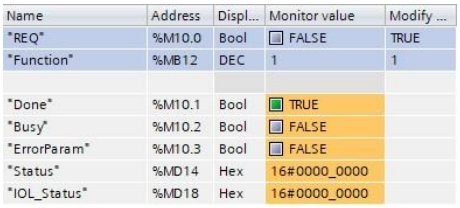
// Write Parameters

"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."64_Operation_Mode".Operation_Mode		Hex	16#80	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."65_Read_Task"."1_MemoryArea"		Hex	16#00	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."65_Read_Task"."2_NumberOfBytes"		Hex	16#08	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."65_Read_Task"."3_StartAddress"		Hex	16#0000	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."65_Read_Task"."4_Autostart"		Hex	16#00	16#00
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."66_Write_Task"."1_MemoryArea"		DEC	0	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."66_Write_Task"."2_NumberOfBytes"		DEC	8	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."66_Write_Task"."3_StartAddress"		Hex	16#0000	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."67_Input_Representation".Input_Representation		Hex	16#80	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."1_Power_1"		DEC+/-	4	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."97_Number_Of_Tags_To_Find_NT".Number_Of_Tags_To_Find		Hex	16#FF	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."98_Tries_Allowed_TA".Tries_Allowed		Hex	16#02	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."99_Expected_Number_Of_Tags_QW".Expected_Number_Of_Tags		Hex	16#00	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."100_Tag_Lost_Smoothing_E5".Tag_Lost_Smoothing		Hex	16#05	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."106_ChangeTag_CT"."1_ChangeTag_CT"		Hex	16#14	
"IQT3-FP_EasyMode_Parameter"."IQT3-FP_EasyMode_IOL_Param_Data".Config_Param."107_Overtemperature_Handling_TO".Overtemperature_Handling		Hex	16#00	



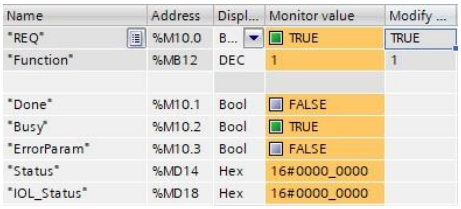
IQT3-FP_EasyMode_Parameter

Name	Dat...	Sta...	Monitor ...
Config_Param	Stru...		
64_Operation_Mode	Stru...		
65_Read_Task	Stru...		
Length	Int	5	5
1_MemoryArea	Byte	16#0	16#00
2_NumberOfBytes	Byte	16#0	16#08
3_StartAddress	Word	16#0	16#0000
4_Autostart	Byte	16#8	16#00
66_Write_Task	Stru...		
67_Input_Representation	Stru...		
96_Transmission_Powers_PT	Stru...		
97_Number_Of_Tags_To_Find_NT	Stru...		
98_Tries_Allowed_TA	Stru...		
99_Expected_Number_Of_Tags_QW	Stru...		
100_Tag_Lost_Smoothing_E5	Stru...		
106_ChangeTag_CT	Stru...		
107_Overtemperature_Handling_TO	Stru...		



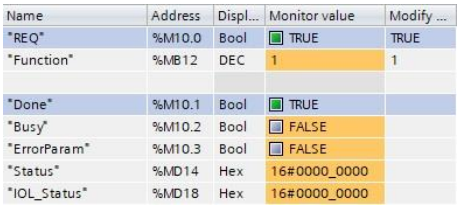
Name	Address	Displ...	Monitor value	Modify ...
"REQ"	%M10.0	Bool	FALSE	TRUE
"Function"	%MB12	DEC	1	1
"Done"	%M10.1	Bool	TRUE	
"Busy"	%M10.2	Bool	FALSE	
"ErrorParam"	%M10.3	Bool	FALSE	
"Status"	%MD14	Hex	16#0000_0000	
"IOL_Status"	%MD18	Hex	16#0000_0000	

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.



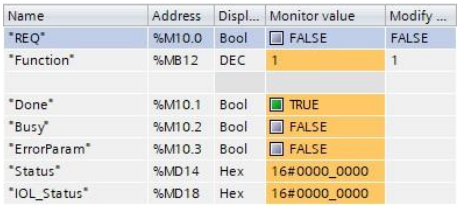
Name	Address	Displ...	Monitor value	Modify ...
"REQ"	%M10.0	B...	TRUE	TRUE
"Function"	%MB12	DEC	1	1
"Done"	%M10.1	Bool	FALSE	
"Busy"	%M10.2	Bool	TRUE	
"ErrorParam"	%M10.3	Bool	FALSE	
"Status"	%MD14	Hex	16#0000_0000	
"IOL_Status"	%MD18	Hex	16#0000_0000	

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	TRUE	TRUE
"Function"	%MB12	DEC	1	1
"Done"	%M10.1	Bool	TRUE	
"Busy"	%M10.2	Bool	FALSE	
"ErrorParam"	%M10.3	Bool	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	FALSE	FALSE
"Function"	%MB12	DEC	1	1
"Done"	%M10.1	Bool	TRUE	
"Busy"	%M10.2	Bool	FALSE	
"ErrorParam"	%M10.3	Bool	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 IQT3-FP-IO-V1 RFID device and a controller. There is a process data field for input data, i.e. from the direction of the device to the controller, and a process data field for output data, i.e. from the direction of the controller to the RFID device. 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 controller.

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
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 device 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 data format of the response can be set via IO-Link parameter 67 (16#43) "Input Representation". The "Short Form" data format is set by default. This means that the UID (Fixcode) and additional length specifications are not prefixed. After changing to the "Long Form" data format, the UID and length information will be prepended in the reply. This enables a clear assignment of the read-in data to a data carrier.

The following table shows the structure of the process data field for the input data when using the "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	16#00							
4	Information Byte 1							
5	Information Byte 2							
…	…							
…	Information Byte Y							

…	16#00
31	16#00

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	Tag Pre-sent	Error	Active	Write Valid	Read Valid
1	Length Data (Length between “Length UID High Byte” and “Information Byte Y”)							
2	RSSI							
3	16#00							
4	Length UID (High Byte); 16#00							
5	Length UID (Low Byte); 16#08							
6	UID Byte 1							
7	UID Byte 2							
8	UID Byte 3							
9	UID Byte 4							
10	UID Byte 5							
11	UID Byte 6							
12	UID Byte 7							
13	UID Byte 8							
14	Length Information (High Byte)							
15	Length Information (Low Byte)							
16	Information Byte 1							
17	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 task 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 not reset until the data carrier leaves the detection range.

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 tag in the detection zone is signaled via the "TagPresent" bit. If there are no more tags in the detection zone, this bit is reset.

When several tags are identified simultaneously, successful read or write access is indicated by a positive edge change (0 → 1) at the "Read Valid" or "Write Valid" bits. If a new tag enters the detection zone, the "Read Valid" or "Write Valid" 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 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 device.

For an unambiguous assignment of the transmitted data to a transponder, the UID (Fixcode) must be specified. The length of the UID is first transmitted in bytes 4 and 5. The length of the UID is always 8 bytes. Starting from byte 6, the UID is transmitted when using the "Long Form" data format.

This is followed in bytes 14 and 15 by a length specification of the number of read-in data of the user memory (user data). The length depends on the parameter definition within parameter 65 "Read Task". Starting at byte 16, the read-in data is transferred from the user memory.

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							

10. Troubleshooting

Index	Description	Correction
1	Profinet communication does not work	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	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	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 device (blue LED on the device is on) and the device 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	Writing the UID is not possible	1. The UID cannot be changed; it has a length of 8 bytes and is specified during production; it is a unique number
5	ReadCounter or WriteCounter are constantly increased when the presence of a data carrier remains unchanged (standstill)	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 device 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 device is delayed.
6	An error message with the status value 16#04 appears when a data carrier enters the detection zone	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.
7	A fault message is reported about an overtemperature of the RFID device	1. Fault message is possible if the ambient temperature is too high for the set transmitting power. 2. Reduction of the transmitting power to a lower value 3. Avoidance of execution of permanent executed operations 4. Adjustment of the setting of the "Overtemperature Handling - OH" parameter
8	Red LED on the RFID device flashes	1. Red LED flashing on the RFID device indicates that the RFID device is being too strongly influenced by surrounding metal. 2. IO-Link parameter 231 "RFID Device Status".TuneLimit is set 3. removal of the metal from the environment
9	Red LED on the device lights up constantly	1. Red LED constantly lit on the RFID device signals a fault in the RFID device. 2. IO-Link parameter 231 "RFID Device Status".disturbed is set. 3. 3. check which interference is caused by the environment
10	Reset to factory setting	1. write the value 16#83 "Back to Box" via IO-Link parameter 2 "System Command 2. via web page with direct access to the IO-Link parameters 3. reset the supply voltage afterwards