Operating instructions

Function block Expert Mode RFID device IUT-F191-IO-V1 on Siemens TIA Portal

UHF RFID device IUT-F191-IO-V1

Project Name:	**UHF RFID device IUT-F191-IO-V1;** **Expert Mode function block**
Date:	**13.03.2024**
Creator:	**Karsten Reinhardt**

Version history

Version	Release date	Comment
1	**04.07.2023**	Initial Version
2	**13.10.2023**	Changeover from ICE1 to ICE11; update to 192 bytes read; change of FB number
3	**13.03.2024**	Library now only contains the 33-byte input block; adaptation of the documentation; update function block to V2.1; change of the edge counter for the input telegrams

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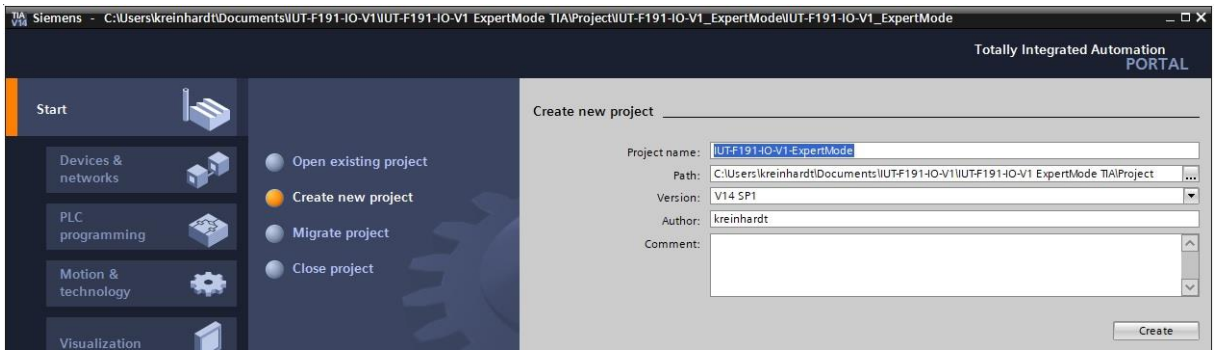
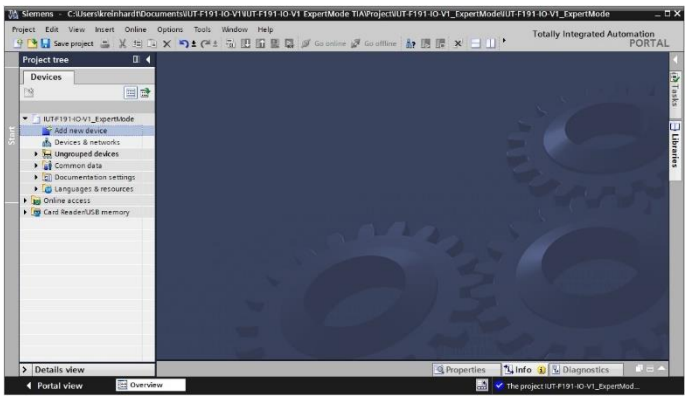
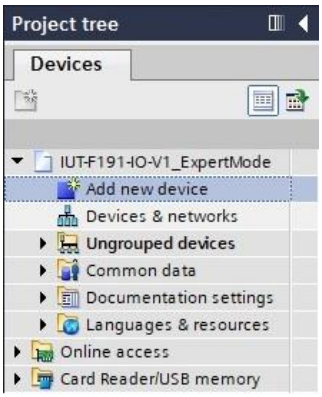
1. Basic PLC configuration

The first step is to create a new PLC project. For this purpose, a project name (e.g., "IUT-F191-IO-V1_ExpertMode") and a storage path of the project must be entered or selected.

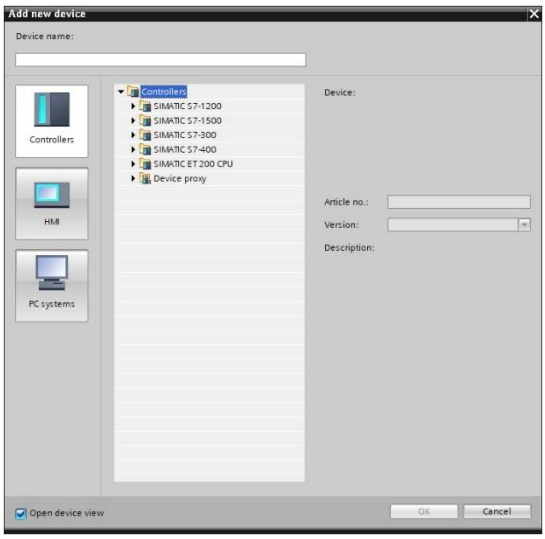


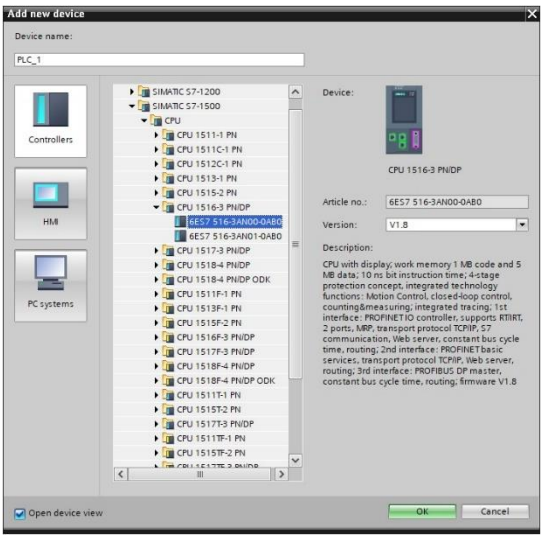
After creating the empty PLC project, switch to the project view. A selection window is called up by "Add new device" in the project navigation on the left.

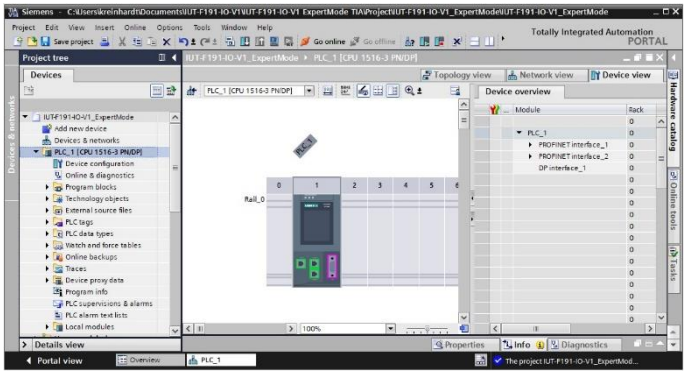




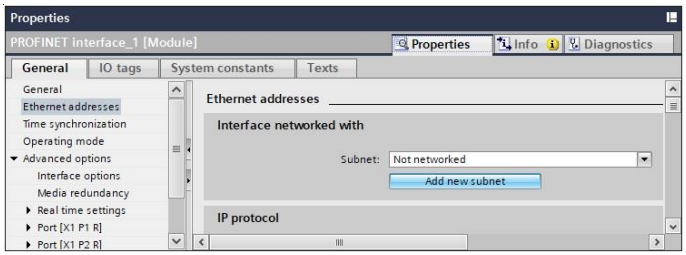
In this selection window, the appropriate PLC must be selected.



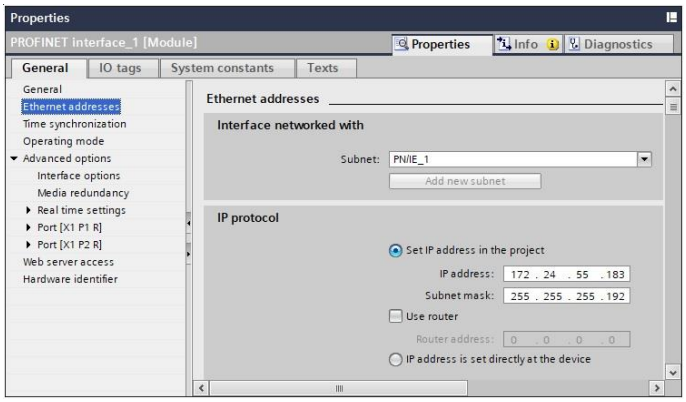




After assigning the CPU, the project view switches to the setting of the PLC parameters.

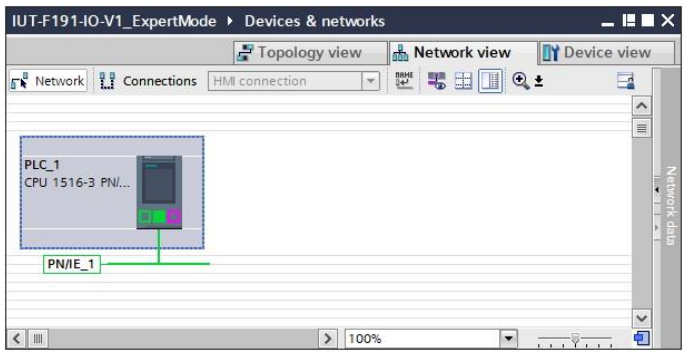


For the Profinet interface X1, a Profinet subnet must be added under the selection "Ethernet addresses" via the selection "Add new subnet". A subnet with the designation "PN/IE_1" is created.

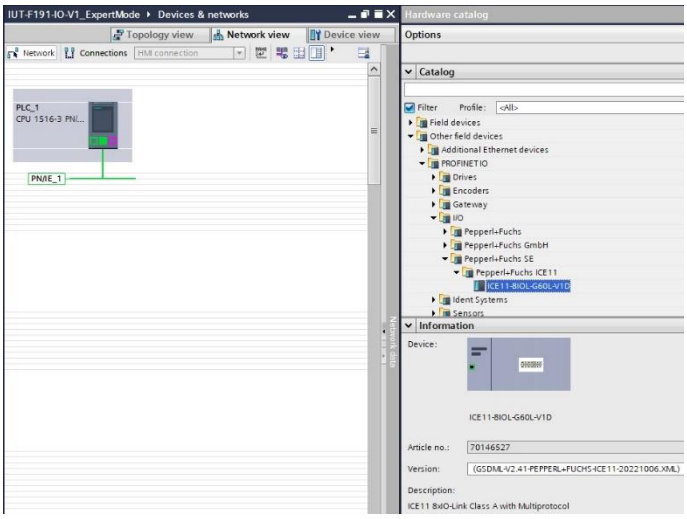


Then set the network parameters (IP address, subnet mask) of the PLC.

IP address: 172.24.55.183
Subnet mask: 255.255.255.192



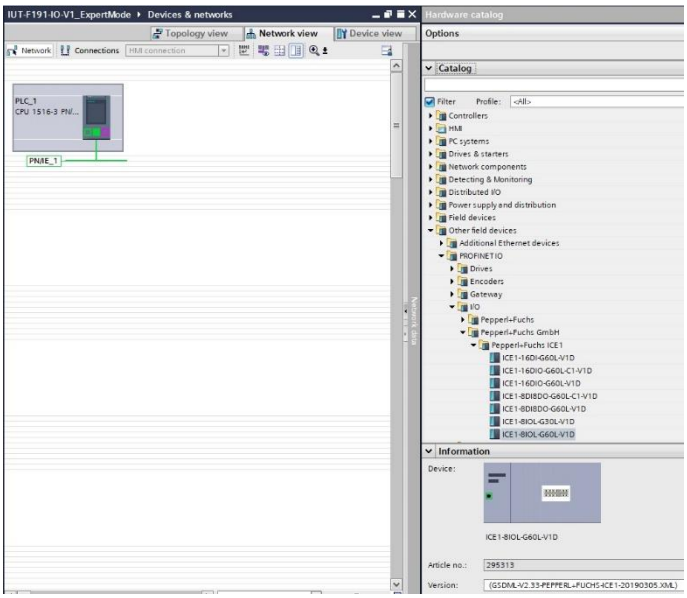
The network view symbolically shows the configured PLC. Starting from the CPU, the subnet "PN/IE_1" is located.



ICE11-8IOL-G60-V1D IO-Link Master:

On the right-hand side, call up the hardware catalog and select the GSDML file of the ICE11-8IOL-G60-V1D:
"Other field devices" → "Profinet IO" → "I/O" → "Pepperl+Fuchs SE" → "Pepperl+Fuchs ICE11" → "ICE11-8IOL-G60-V1D".

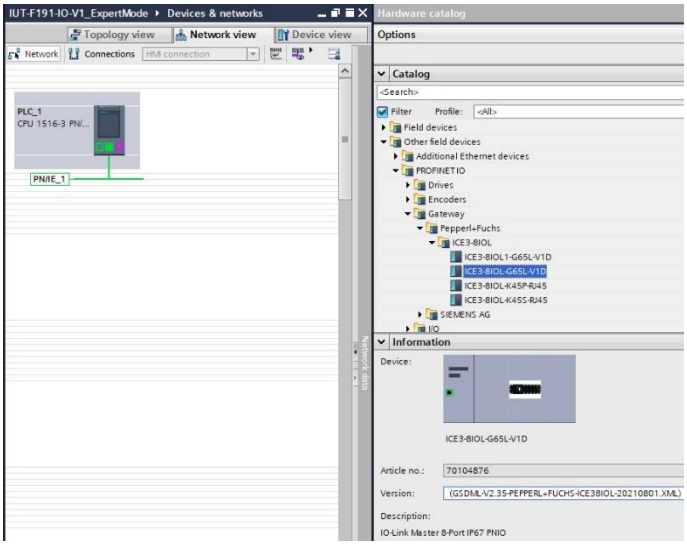
If the GSDML file is not in the catalog, it must be imported beforehand.



ICE1-8IOL-G60-V1D resp. ICE1-8IOL-G30-V1D IO-Link Master:

On the right side the hardware catalog has to be called and the GSDML file of the ICE1-8IOL-G60-V1D or ICE1-8IOL-G30-V1D has to be selected:
"Other field devices" → "Profinet IO" → "I/O" → "Pepperl+Fuchs GmbH" → "Pepperl+Fuchs ICE1" → "ICE1-8IOL-G60-V1D" resp. "ICE1-8IOL-G30-V1D"

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



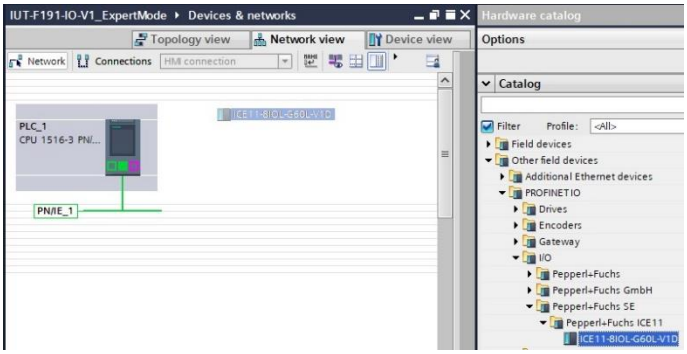
ICE3-8IOL-G65L-V1D resp. ICE3-8IOL1-G65L-V1D IO-Link Master:

On the right side the hardware catalog has to be called and the GSDML file of the ICE3-8IOL-G65L-V1D or ICE3-8IOL1-G65L-V1D has to be selected:
"Other field devices" → "Profinet IO" → "Gateway" → "Pepperl+Fuchs" → "ICE3-8IOL" → "ICE3-8IOL-G65L-V1D" or "ICE3-8IOL1-G65L-V1D".

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

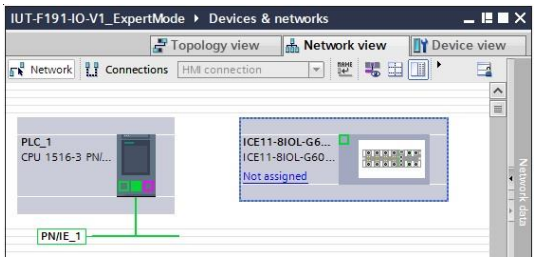
2. Hardware configuration IO-Link Master

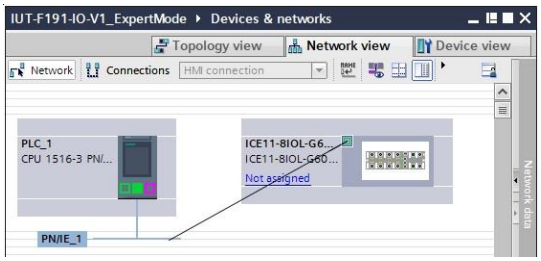
2.1 ICE11-8IOL-G60-V1D

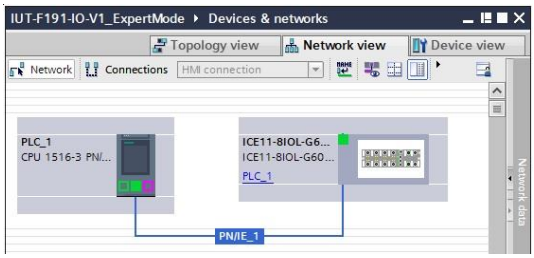


The GSDML for the IO-Link master ICE11-8IOL-G60-V1D is to be dragged over from the hardware catalog into the center window of the device view.

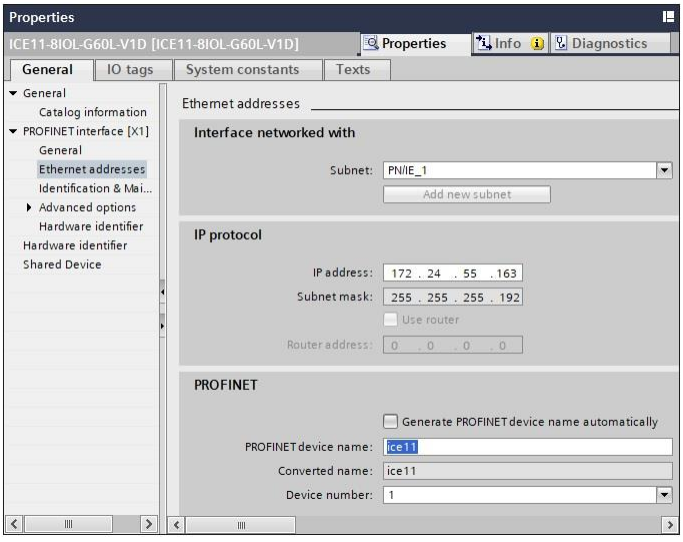
Other field devices → "Profinet IO" → "I/O" → "Pepperl+Fuchs SE" → "Pepperl+Fuchs ICE11" → "ICE11-8IOL-G60-V1D".





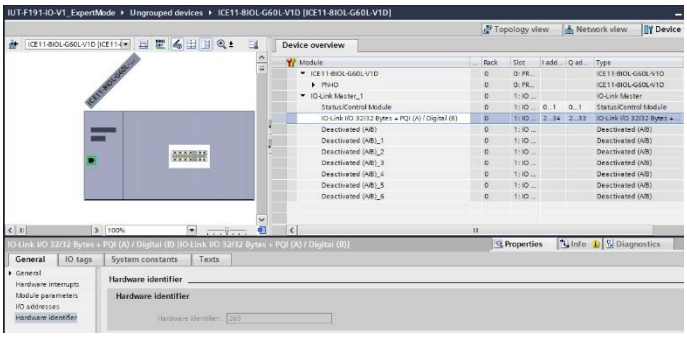


Connection IO-Link master to Profinet network PN/IE_1
The Profinet connection between ICE11-8IOL and PLC is connected manually in the network view via the mouse indicator. The IO-Link master is thus connected to the "PN/IE_1" subnet. The correct Profinet connection is displayed in green. The assignment to the CPU is visible on the ICE11-8IOL (PLC_1).



Then set the network parameters (IP address, subnet mask) and the Profinet name of the ICE11-8IOL.

IP address:	172.24.55.163
Subnet mask:	255.255.255.192
Profinet Name:	ice11

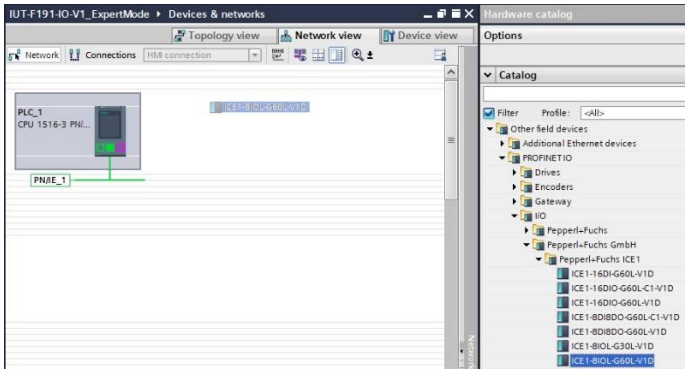


Double-click on the ICE11-8IOL icon to open the device view. The corresponding communication modules for the individual ports of the IO-Link master are to be integrated from the hardware catalog. The " IO-Link I/O 32/32 Bytes + PQI (A) / Digital (B)" module must be assigned for the port to which the IUT-F191-IO-V1 RFID station is connected. Ports that are not used must be set to inactive.

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

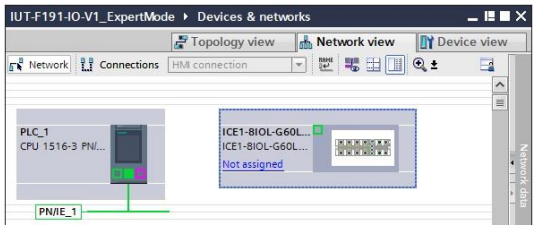
“IO-Link I/O 32/32 Bytes + PQI (A) / Digital (B)“ = 265

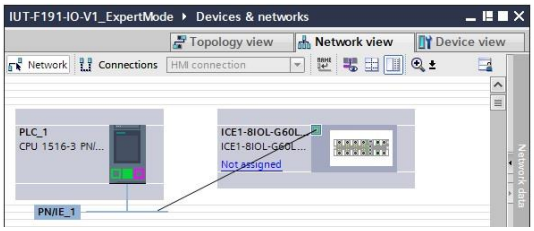
2.2 ICE1-8IOL-G60-V1D resp. ICE1-8IOL-G30-V1D

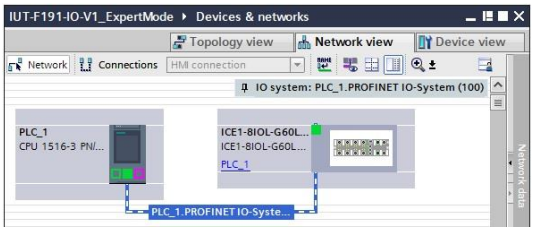


The GSDML for the IO-Link master ICE1-8IOL-G60-V1D is to be dragged over from the hardware catalog into the center window of the device view.

Other field devices → "Profinet IO" □ "I/O" → "Pepperl+Fuchs GmbH" → "Pepperl+Fuchs ICE1" → "ICE1-8IOL-G60-V1D" or “ICE1-8IOL-G30-V1D”.

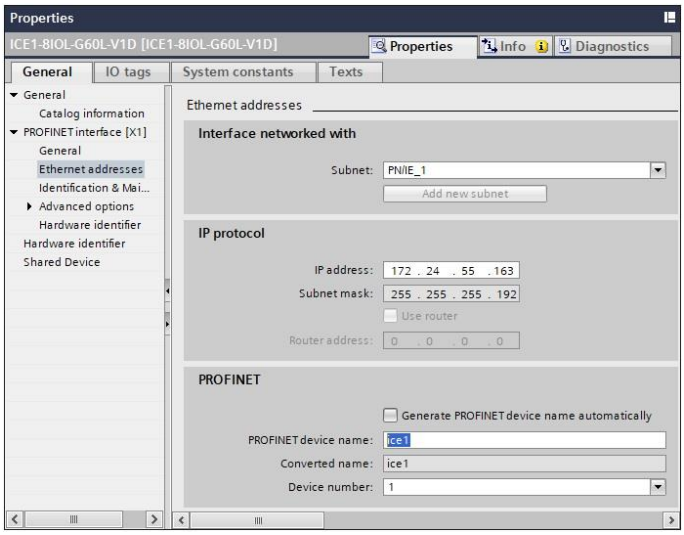






Connection of IO-Link master to Profinet network PN/IE_1

The Profinet connection between ICE1-8IOL and controller is connected manually in the network view via the mouse indicator. The IO-Link master is thereby 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.

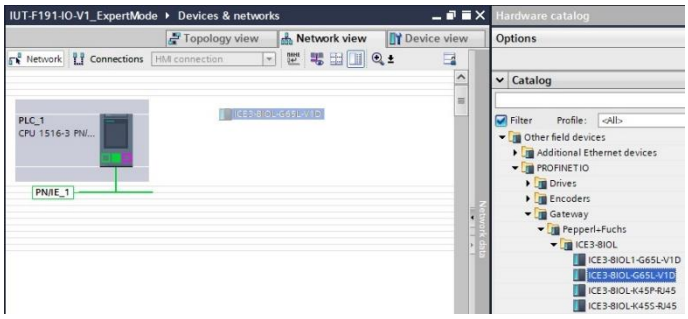
IP address: 172.24.55.163
Subnet mask: 255.255.255.192
Profinet Name: ice1

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 IUT-F191-IO-V1 RFID station is connected. Ports that are not used must be set to inactive.

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

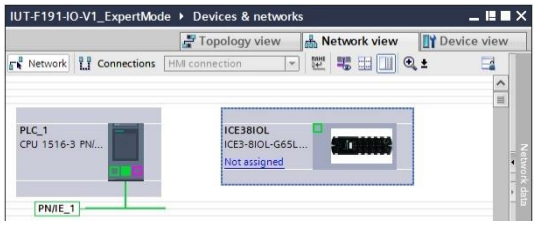
“IO-Link I/O 32/32 Bytes“ = 275

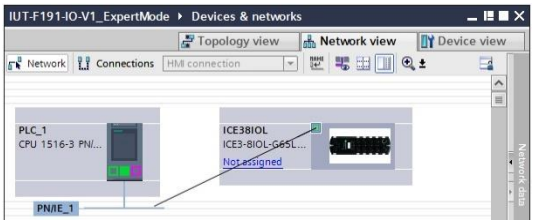
2.3 ICE3-8IOL-G65L-V1D resp. ICE3-8IOL1-G65L-V1D

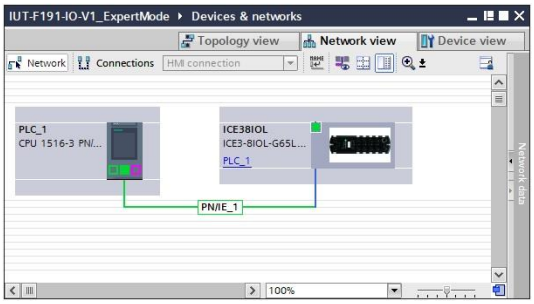


The GSDML for the IO-Link master ICE3-8IOL-G65L-V1D is to be dragged over from the hardware catalog into the center window of the device view.

Other field devices → "Profinet IO" → "Gateway" → "Pepperl+Fuchs" → "ICE3-8IOL" → "ICE3-8IOL-G65L-V1D" or "ICE3-8IOL1-G65L-V1D".

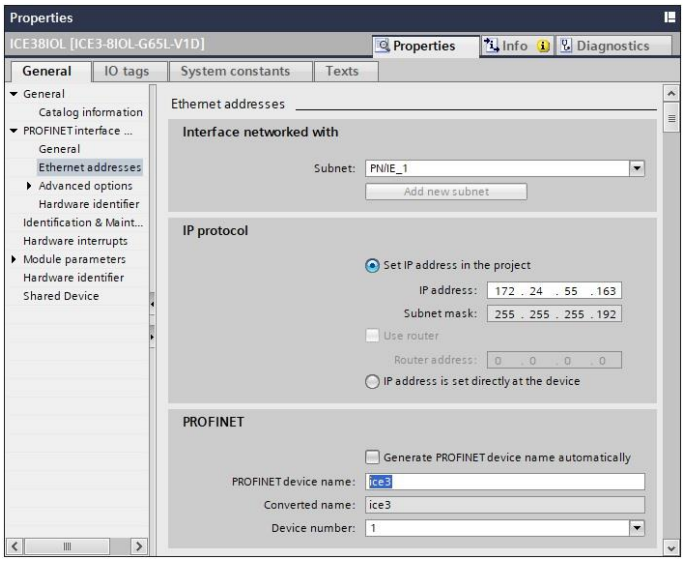






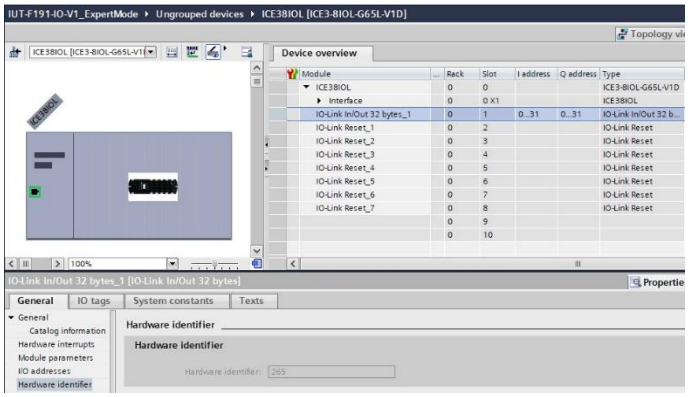
Connection of IO-Link master to Profinet network PN/IE_1

The Profinet connection between ICE3-8IOL and controller 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 ICE3-8IOL (PLC_1).



Then set the network parameters (IP address, subnet mask) and the Profinet name of the ICE3-8IOL.

IP address:	172.24.55.163
Subnet mask:	255.255.255.192
Profinet Name:	ice3



Double-click on the ICE3-8IOL 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 In/Out 32 Bytes" module must be assigned for the port to which the IUT-F191-IO-V1 RFID station is connected. Ports that are not used must be set to inactive.

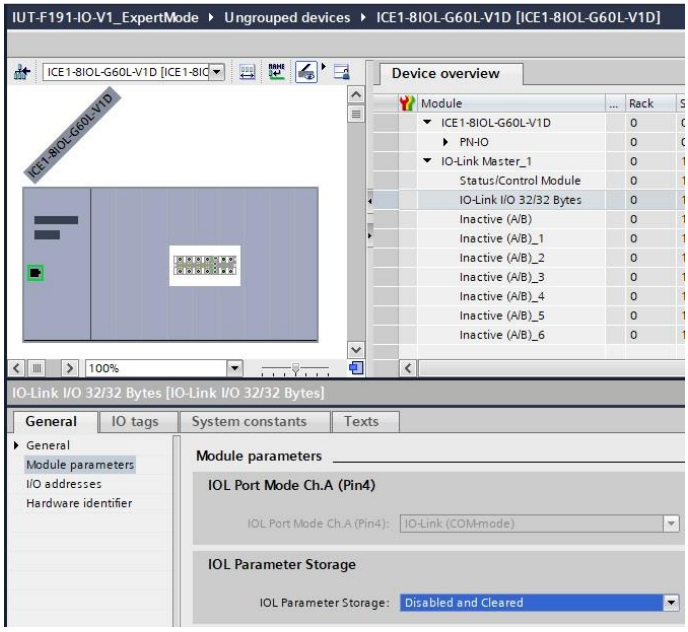
The added communication module has a hardware identifier. This identifier serves as input parameter "I_HWIO_Hardware_ID" of the function block. A symbolic addressing is possible.

“IO-Link In/Out 32 Bytes” = 265

2.4 Set up IO-Link Parameter Storage ICE1-8IOL-G60-V1D

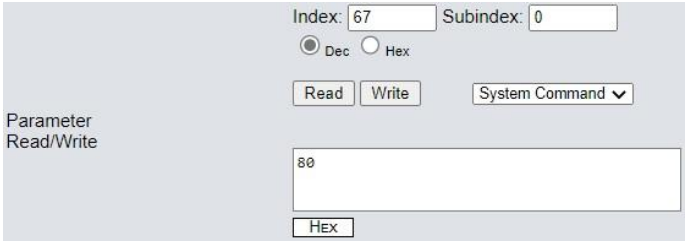
The "IO-Link Parameter Storage" function offers the option of additionally storing the IO-Link parameters of the connected device within the IO-Link master. This makes it possible to automatically transfer the previously set parameter set of the device to a replacement device. Additional parameterization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



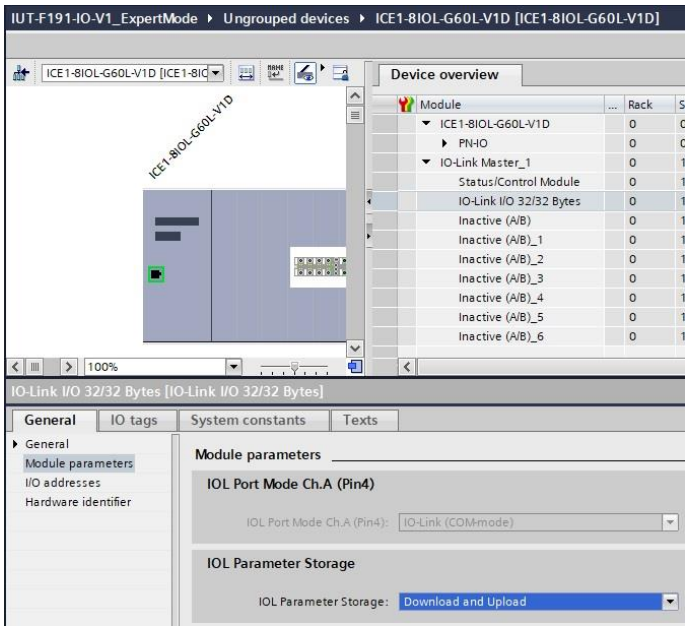
Setting the "IOL Parameter Storage" module parameter of the "IO-Link I/O 32/32 bytes" module to "Disable and Cleared".

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



Setting Parameter 67 “Input Representation”
16#80 → Short Form data format

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

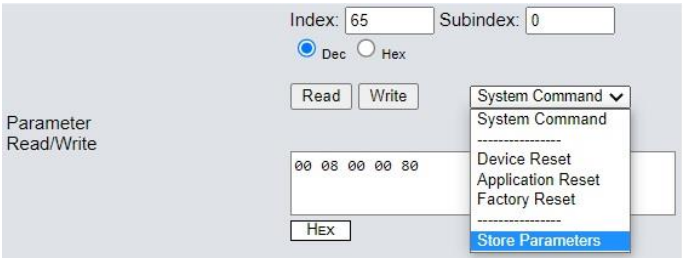


Setting the "IOL Parameter Storage" module parameter of the "IO-Link I/O 32/32 bytes" module to "Download and Upload”

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

when the IO-Link Master is replaced. Here, the IO-Link Device transfers the parameter data to the new IO-Link Master (Upload).

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



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

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

3. Parameter IUT-F191-IO-V1

The RFID station IUT-F191-IO-V1 has various module parameters for setting the device properties when using the Expert mode. The most important parameters are stored in the IODD file and can therefore be set during initial commissioning of the device.

The device parameters are set via the IODD either using the web server integrated in the IO-Link master or using another IO-Link master-specific setting program (e.g., PCT Tool).

Another possibility for accessing the device parameters is to use the "IUT-F191-FR1-01_ExpertMode_Param" function block from the library. This function block can be used to read out all the parameters stored in the IODD file by activating it once. A change of the parameters by this block is also possible.

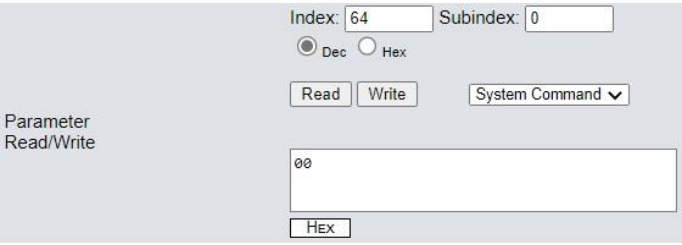
In addition, it is possible to access the device parameters via the "Special Command" function. This also allows access to parameters that are not stored in the IODD. With the help of the "Special Command" function, all available commands (e.g., read and write parameters; filters) of the RFID station can be executed.

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

The "Operation Mode" parameter can be used to switch between Easy and Expert mode. The 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. The “Expert mode" allows access to large amounts of data using a handshake procedure. This requires the use of a function block for data transfer. Expert mode must be set to use the "IUT-F191_ExpertMode_Basic" function block.

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



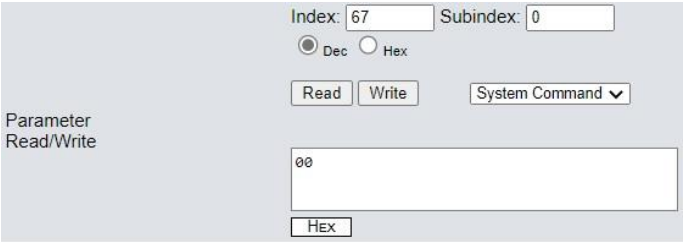
Parameter 64 (16#40) "Operation Mode": Changeover to Expert Mode; 0 (16#00) = Expert Mode activated;

3.2 IO-Link Parameter 67 (16#43) “Input Representation”

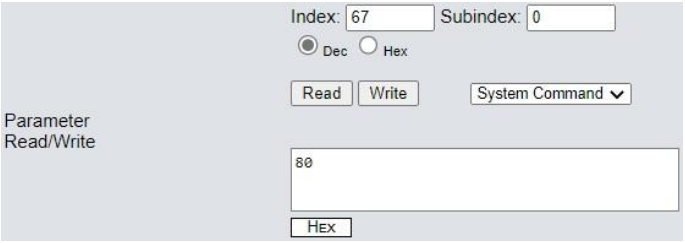
The "Input Representation" parameter can be used to influence the data format of the transmitted data. In the factory setting, the "Long Form" data format is used. This prefixes the read-in data with the UII/EPC code and length information. This is necessary in order to be able to clearly assign the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

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

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
67	16#43	0	1 Byte	0	16#00	Read / Write	Input Representation: Long Form Long Form data format; input data prefixed with UII/EPC information and length information; Multi Tag applications possible; less space for additionally read-in information: Factory setting
67	16#43	0	1 Byte	128	16#80	Read / Write	Input Representation: Short Form Short Form data format; input data without preceding UII/EPC information and length information; only Single Tag applications; more space for additional read-in information



Parameter 67 (16#43) “Input Representation”:
16#00 resp. 0→ Long Form data format



Parameter 67 (16#43) “Input Representation”:
16#80 resp. 128 → Short Form data format

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

Byte	Content				
0	Delete Slave	Update Master	Update Slave	0	Frame Length
1	Frame Length → Length between “Control Byte” and “Information Byte Y”				
2	Fragmentation Counter				
3	Telegram Length (High Byte)				
4	Telegram Length (Low Byte) → Length between “Telegram Length High Byte” and “Information Byte Y”				
5	Command				
6	Status				
7	Length UII/EPC Information (High Byte)				
8	Length UII/EPC Information (Low Byte)				
9	PC-Word (High Byte)				
10	PC-Word (Low Byte)				
11	UII/EPC Byte 1				
12	UII/EPC Byte 2				
…	….				
…	UII/EPC Byte X				
…	Length Information (High Byte)				
…	Length Information (Low Byte)				
…	Information Byte 1				
…	Information Byte 2				
…	…				
…	Information Byte Y				
…	16#00				
…	16#00				
…	…				
31	16#00				

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

Byte	Content

0	Delete Slave	Update Master	Update Slave	0	Frame Length
1	Frame Length → Length between “Control Byte” and “Information Byte Y”				
2	Fragmentation Counter				
3	Telegram Length (High Byte)				
4	Telegram Length (Low Byte) → Length between “Telegram Length High Byte” and “Information Byte Y”				
5	Command				
6	Status				
7	Information Byte 1				
8	Information Byte 2				
…	…				
…	Information Byte Y				
…	16#00				
…	16#00				
…	…				
31	16#00				

3.3 IO-Link Parameter 96 (16#60) “Transmission Powers – PT”

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

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

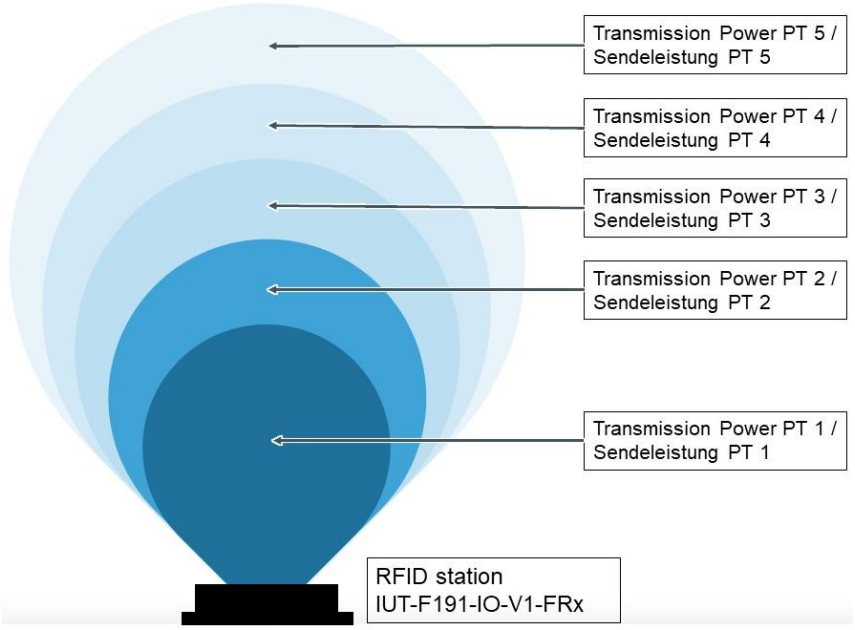
Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
96	16#60	1	2 Byte / 1 Word	3…100	16#0003 … 16#0064	Read / Write	Transmission power level 1 Transmission Power PT 1; power level 1; factory setting PT 1 = 100mW
96	16#60	2	2 Byte / 1 Word	3…100	16#0003 … 16#0064	Read / Write	Transmission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

The following power values can be set:
3mW (5dBm); 4mW (6dBm); 5mW (7dBm); 6mW (8dBm); 8mW (9dBm); 10mW (10dBm); 13mW (11dBm); 15mW (12dBm); 20mW (13dBm); 25mW (14dBm); 30mW (15dBm); 40mW (16dBm); 50mW (17dBm); 60mW (18dBm); 80mW (19dBm); 100mW (20dBm)

The RFID station IUT-F191-IO-V1 offers the possibility to set several transmit power levels (transmit power 1, transmit power 2 etc.). These power levels are run through one after the other when a write or read command is executed. Thus, it is possible to parameterize a ramp with a continuously increasing transmit power.

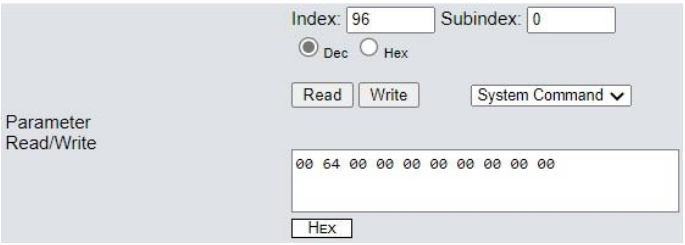
After the start of the read/write command, transmit power 1 (PT1) is used first. After all scan processes (inventory rounds) have been completed at this power level, the next power level (PT 2) is set. This process is repeated until all scan processes have been connected at the last parameterized power level (e.g., PT 5). If a Single command (one-time read or write) is executed, the command is terminated after all scan processes on the last parameterized power level have been completed. If an enhanced command (permanent reading or writing) is executed, the ramp starts again from the beginning after the last power level has been run through.

It is possible to abort the execution of a single command and thus the run of the ramp if a definable number of data carriers was detected during the command execution. For this purpose, the parameter "Number of Tags to Find - NT" must be set accordingly.

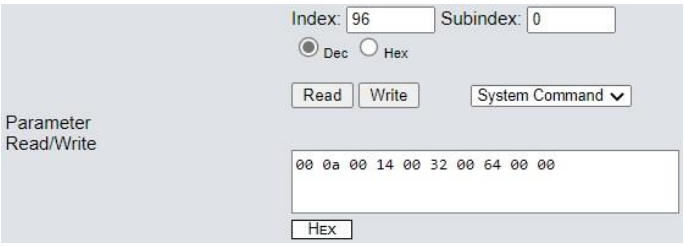


The RFID station IUT-F191-IO-V1 offers the possibility to use up to 5 power levels (PT1...PT5) simultaneously. The power stages are passed through one after the other during the execution of the read or write tasks. This allows the data carrier to be accessed with the lowest possible transmission power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

The transmission power required to access the data carrier depends on whether read access or write access is to be performed. Writing data to a data carrier requires greater power. Thus, the transmission power required for writing data is greater compared to read access to the same data carrier at an identical distance.
Thus, the range of the RFID station IUT-F191-IO-V1 for a write task with the same transmission power is smaller compared to the range when executing a read task. This must be taken into account when setting the transmission power, as this applies to both the read task and the write task.



Parameter 96 (16#60) “Transmission Powers”:
16#0064 → 100mW (PT1)
16#0000 → not parameterized (PT2)
16#0000 → not parameterized (PT3)
16#0000 → not parameterized (PT4)
16#0000 → not parameterized (PT5)



Parameter 96 (16#60) “Transmission Powers”:
PT1 = 10mW; PT2 = 20mW; PT3 = 50mW; PT4 = 100mW
16#000A → 10mW (PT1)
16#0014 → 20mW (PT2)
16#0032 → 50mW (PT3)
16#0064 → 100mW (PT4)
16#0000 → not parameterized (PT5)

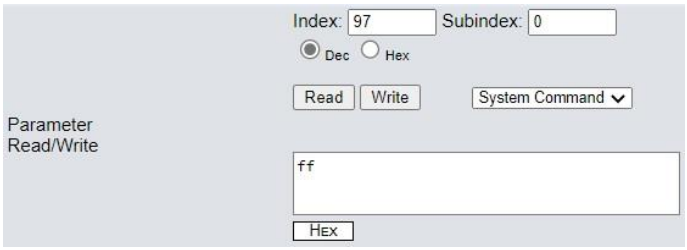
3.4 IO-Link Parameter 97 (16#61) “Number of Tags to Find – N” (Abort criterion)

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.

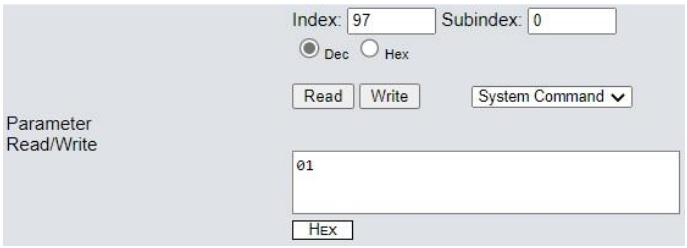
Structure Parameter 97 (16#61) “Number of Tags to find”

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
97	16#61	0	1 Byte	1…20 255	16#01 … 16#14 16#FF	Read / Write	Termination criterion; 1 = termination after identification of one data carrier; 255 = no premature termination; factory setting = 255

This parameter can be used in conjunction with a single command when using the Expert mode. In addition, a ramp for the transmit power can be set by parameterizing several power levels. In this case, the transmit power is continuously increased with the preset power levels until the parameterized number of data carriers has been identified. The Single command then terminates automatically. This makes it possible to identify a tag with the lowest possible transmit power and to avoid overreach.



Parameter 97 (16#61) “Number of Tags to find”:
16#FF resp. 255 → Abort criterion switched off



Parameter 97 (16#61) “Number of Tags to find”:
16#01 resp. 1→ Abort criterion = 1; Single command is aborted after the identification of the first data carrier

If the parameter is set to the value 1, the execution of a single command is terminated as soon as a data carrier is detected in an inventory round. If two data carriers are detected in the same inventory round, the information from both data carriers is output and the command is terminated. Further Inventory Rounds will not be executed.

3.5 IO-Link Parameter 98 (16#62) “Tries Allowed – TA” (number of retries)

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

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

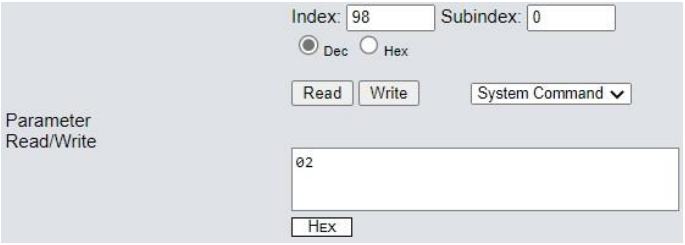
Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
98	16#62	0	1 Byte	1…10	16#01… 16#0A	Read / Write	Number of repetitions; factory setting = 2

The setting of the "Tries Allowed" parameter has a direct influence on how many scans attempts the RFID station performs at a power level. The larger the value is set; the more scan attempts are made. This increases the execution time of a single command.

If several transmission power levels are parameterized (ramp), the "Tries allowed" parameter can be used to influence the number of scan attempts that are performed for each set power level.

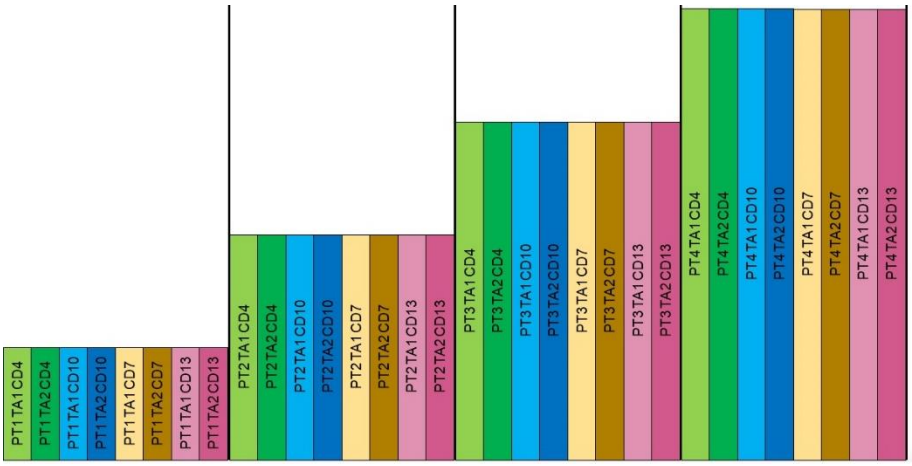
By increasing the number of access attempts, more scans are performed at one power level. As a result, the detection zone is scanned longer with one transmission power before switching to the next higher power level. This means that data carriers can be better identified even at lower power levels before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

With an increasing number of scan attempts, the execution time for the identification of more distant data carriers that have to be identified via a higher power level increase.



Parameter 98 (16#62) “Tries allowed”:
16#02 resp. 2 → Number of repetitions = 2; two access attempts are made per transmission channel at each power level

Number of scans with factory settings and 4 power levels:



PT: PT1, PT2, PT3, PT4 (4 Power levels)

TA: 2 (2 tries per transmission channel)

CD: 4, 10, 7, 13 (4 transmission channels)

For this configuration, 8 scans are performed per power level. The number of scans can be calculated as follows:
Number of scans = (Number of send channels CD) x (Number of attempts TA)
= 4 x 2
= 8
Taking into account 4 power levels, this results in 32 scan operations.

When executing a single command with a disabled abort criterion, command execution is terminated after all scans at the last power level have been completed. If, on the other hand, an enhanced command is executed, the transmit power is reduced to level 1 (PT1) again after all scans at the last power level have been completed and the ramp function starts again. This process is repeated until the Enhanced command is aborted.

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

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

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

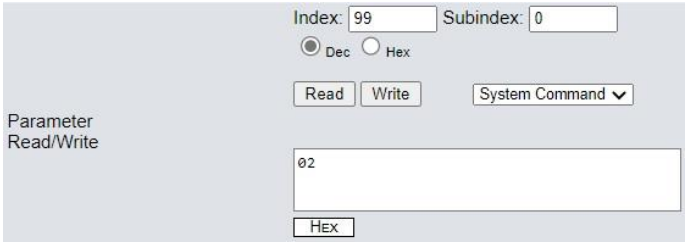
Structure Parameter 99 (16#63) “Expected Number of Tags”

Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
99	16#63	0	1 Byte	0…4	16#00 …	Read / Write	Number of expected data carriers 0 → 1 time slot or 1 data carrier

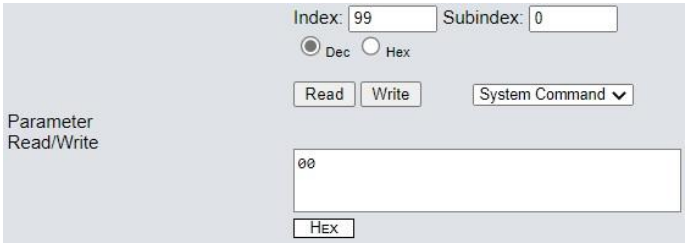
					16#04		1 → 2 time slots or 2 data carriers 2 → 4 time slots or 4 data carriers 3 → 8 time slots or 8 data carriers 4 → 16 time slots or 16 data carriers Factory setting = 2

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

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



Parameter 99 (16#63) “Expected Number of Tags”:
16#02 resp. 2 → Number of time slots = 4; 2^2



Parameter 99 (16#63) “Expected Number of Tags”:
16#00 resp. 0 → Number of time slots = 1; 2^0

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

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

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

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

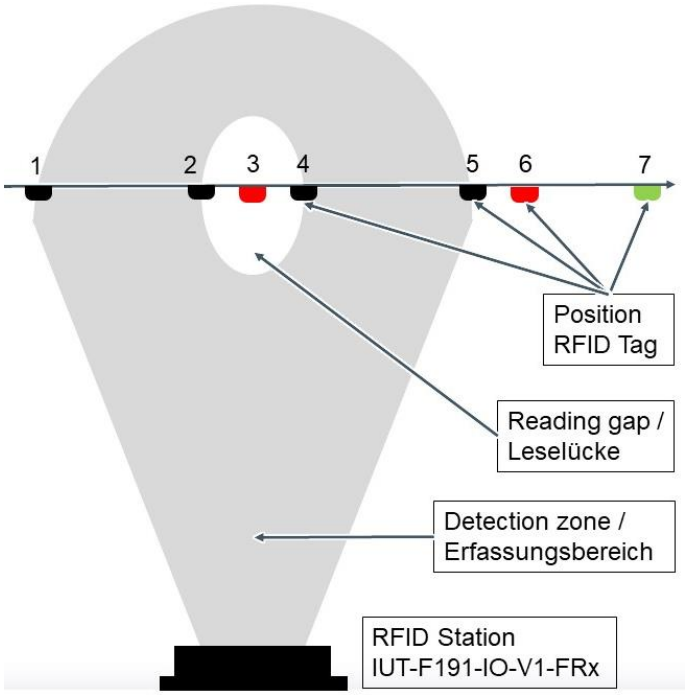
The parameter "Tag Lost Smoothing" (E5) has an influence on how fast the loss of a data carrier is reported to the PLC. The RFID station IUT-F191-IO-V1-FRx uses electromagnetic waves for the identification of data carriers. With electromagnetic waves, reflections occur on metal surfaces. This can create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

By increasing the value of the "Tag Lost Smoothing", read gaps can be bridged for moving data carriers. This means that the 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.

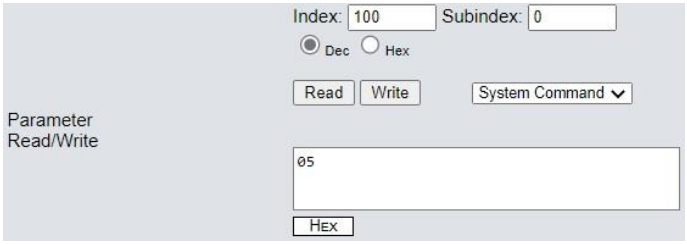
The system becomes slower with respect to these messages. The message about the exit of a data carrier from the detection zone is completely omitted if the Enhanced command was previously canceled.

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

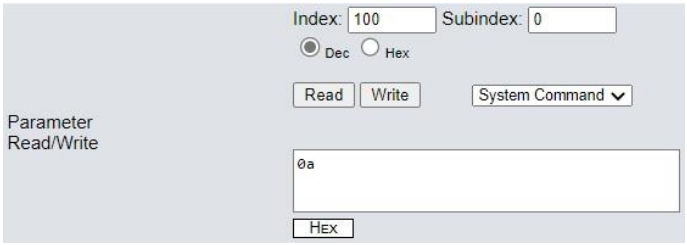
If a data carrier causes multiple changes between "read" and "not read" when passing through the detection zone, there are read gaps in the detection zone. In this case, the value of the "Tag Lost Smoothing" parameter should be increased.



1: Data carrier enters the detection zone; successful read access is immediately reported to the PLC (status 16#00 telegram with read-in data + status 16#0B telegram with access information).
2: data carrier leaves detection zone and reaches the area of a read gap; no message to the PLC
3: small value of the "Tag-Lost-Smoothing" → Exit of the data carrier from the detection zone is reported to the PLC (status 16#05 telegram)
4: data carrier re-enters the detection zone from the read gap; successful read access (status 16#00 telegram with read-in data + status 16#0B telegram with access information) is reported to the PLC
5: data carrier finally leaves detection zone; no message to the PLC
6: small value of "Tag-Lost-Smoothing" → Exit of the data carrier from the detection zone is reported to the PLC (status 16#05 telegram)
7: large value of "Tag-Lost-Smoothing" → Exit of the tag from the detection zone is reported to the PLC (status 16#05 telegram)



Parameter 100 (16#64) “Tag Lost Smoothing”: 16#05 resp. 5 → 5 unsuccessful access attempts



Parameter 100 (16#64) “Tag Lost Smoothing”: 16#0A resp. 10 → 10 unsuccessful access attempts

3.8 IO-Link Parameter 105 (16#69) “Transmission Channels – CD”

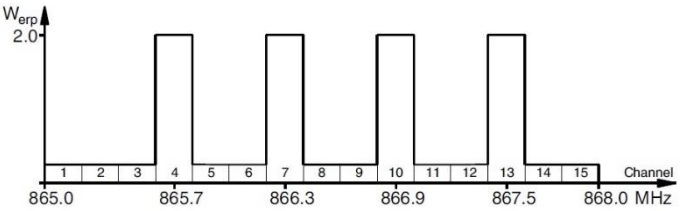
The transmission channels to be used for the device version IUT-F191-IO-V1-FR1-01 (Europe) can be parameterized via the "Transmission Channels" parameter. This device uses the Dense Reader Mode (DRM) where only channels 4, 7, 10 and 13 of the channel spectra can be used. It is possible to

change the number and the order of the channels by this parameter. In the factory setting, channels 4, 10, 7 and 13 are active in this order.

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

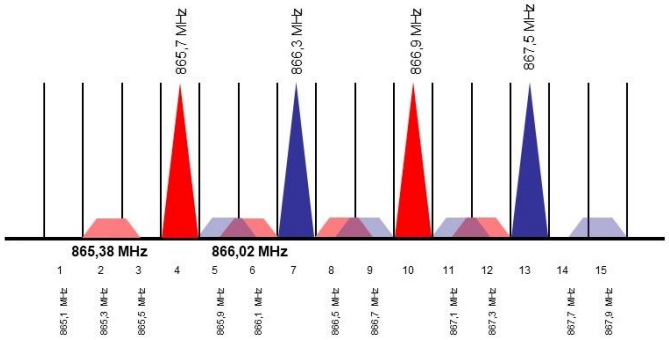
Index Dec	Index Hex	Sub index	Length	Value (Dec)	Value (Hex)	Access	Meaning
105	16#69	1	1 Byte	4; 7; 10; 13	16#04; 16#07; 16#0A; 16#0D	Read / Write	Channel 1; Factory setting channel 4
105	16#69	2	1 Byte	0; 4; 7; 10; 13	16#00; 16#04; 16#07; 16#0A; 16#0D	Read / Write	Channel 2; Factory setting channel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

IUT-F191-IO-V1-FR1-01 (Europe):
Channels 4, 7, 10 and 13 of the channel spectra can be used for this device version. The number of channels can be between 1 (minimum) and 4 (maximum). The order of the channels is adjustable.



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

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

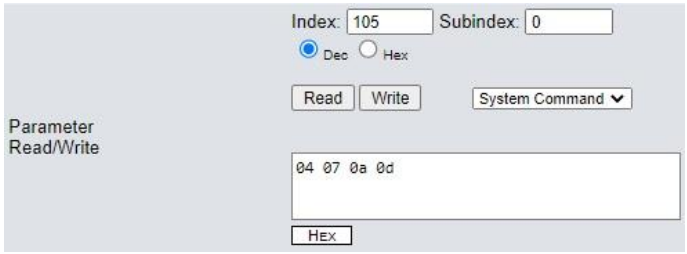


Channel spectrum IUT-F191-IO-V1-FR1-01:

Response of the data carriers in the frequency sidebands

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

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



Parameter 105 (16#69) “Transmission Channels”:
16#04 → Channel 4
16#07 → Channel 7
16#0A → Channel 10
16#0D → Channel 13

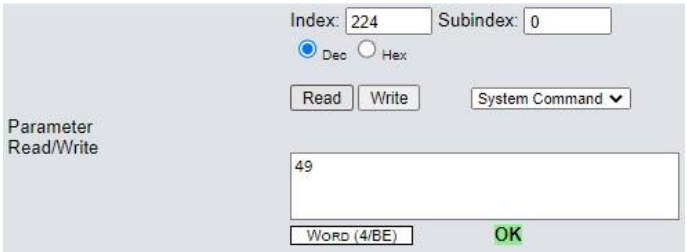
Parameter 105 (16#69) “Transmission Channels”:
16#04 → Channel 4
16#07 → Channel 7
16#00 → no channel configured
16#00 → no channel configured

3.9 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



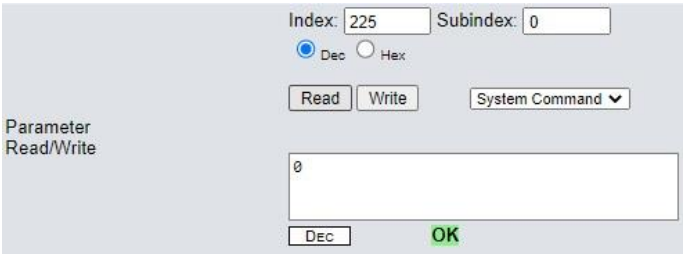
Parameter 224 (16#E0) “Operating hours”:
49 → 49 hours

3.10 IO-Link Parameter 225 (16#E1) “Temperature indicator”

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

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



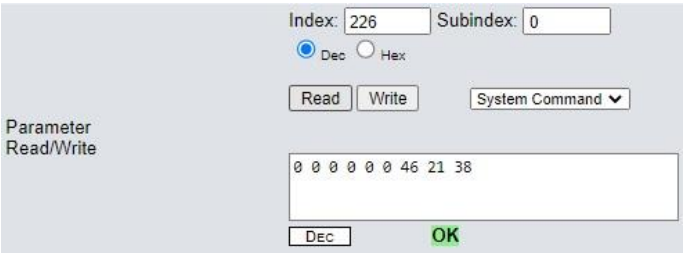
Parameter 225 (16#E1) “Temperature indicator”:
0 → Operating conditions OK

3.11 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



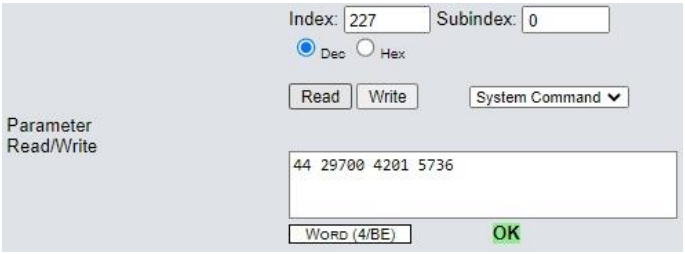
Parameter 226 (16#E2) “Temperature monitor”:
0 0 0 0 → 0 hours operation out of specification
0 0 → no transitions
46 → 46°C Maximum temperature
21 → 21°C Minimum temperature
38 → 38°C current temperature

3.12 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; specified 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”:
44 → 44 restarts
29700 → 29700 Seconds between two interrupts
4201 → 4201 Seconds between two interrupts
5736 → 5736 seconds operating time

3.13 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. The factory setting is only active after a manual voltage interruption.

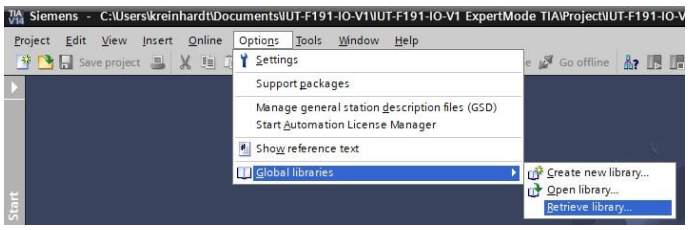
Structure Parameter 2 (16#02) “System Command”

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

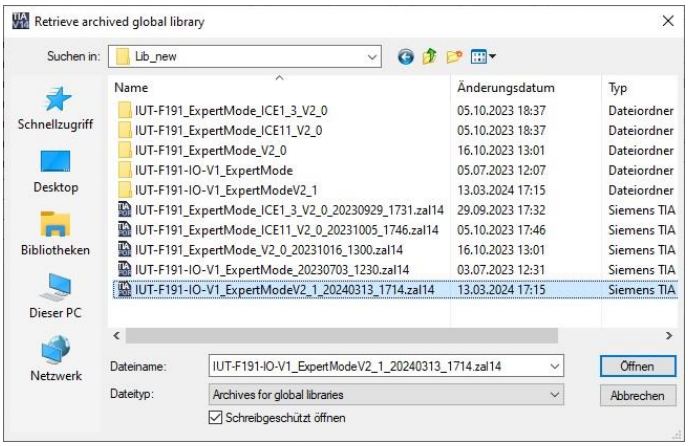
Parameter 2 (16#02) “System Command”:
129 → Reset Application

4. Import library “IUT-F191-IO-V1_ExpertMode”

The "IUT-F191-IO-V1_ExpertMode" library contains a function block for using the Expert Mode. This library must first be unpacked.



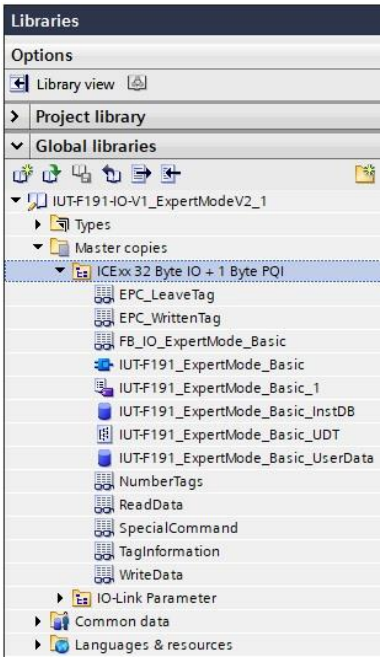
Retrieve Library:
Options → Global Libraries → Retrieve Library



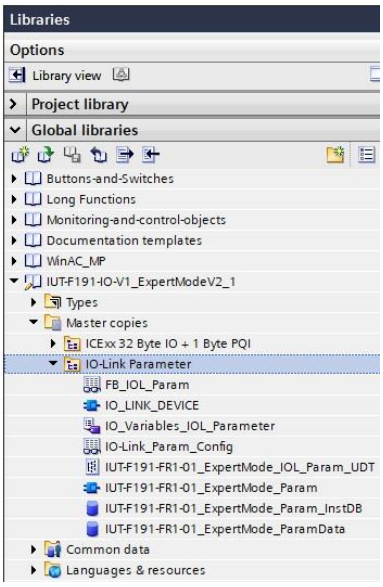
Select library

Here: IUT-F191-IO-V1_ExpertMode…...zal14

There are three different function blocks within the "Master copies" folder. The "ICE1_ICE3 32 Byte IO" folder contains a function block that is designed for a telegram length of 32 bytes of process data. This can be used, for example, to connect the RFID device to the ICE1 and ICE3 IO-Link masters. A function block is located in the "ICE11 32 byte IO + 1 byte PQI" folder for connecting the RFID device via the ICE11 IO-Link master. This function block is designed for a process data length of 33 bytes. The function block in the "IO-Link parameters" folder can be used to access the IO-Link parameters for device setting.



ICExx 32 Byte IO + 1 Byte PQI:
Basic version of the function block for Expert Mode with a telegram length of 33 bytes and 32 bytes. Write and read commands can be executed. The successful read and write accesses are counted during command execution. Valid when using the IO-Link master ICExx or IO-Link master with a telegram length of 32 or 33 bytes per IO-Link port. This module supports the transmission of the PQI byte.

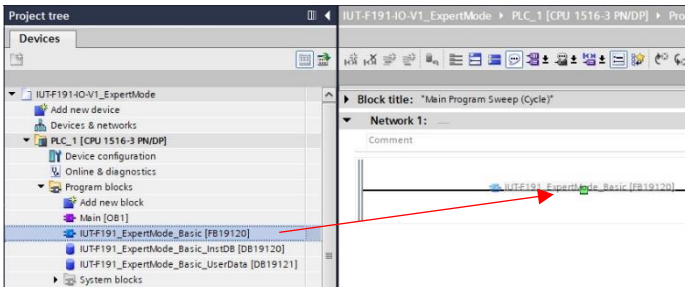


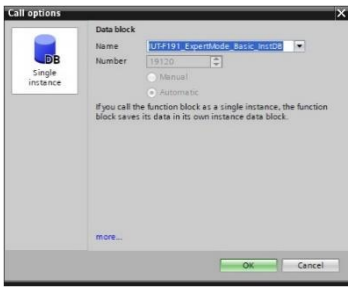
IO-Link Parameter:
Function block for optional access to the IO-Link parameters. Standard IO-Link parameters and device-specific IO-Link parameters can be read. It is also possible to write device-specific IO-Link parameters.

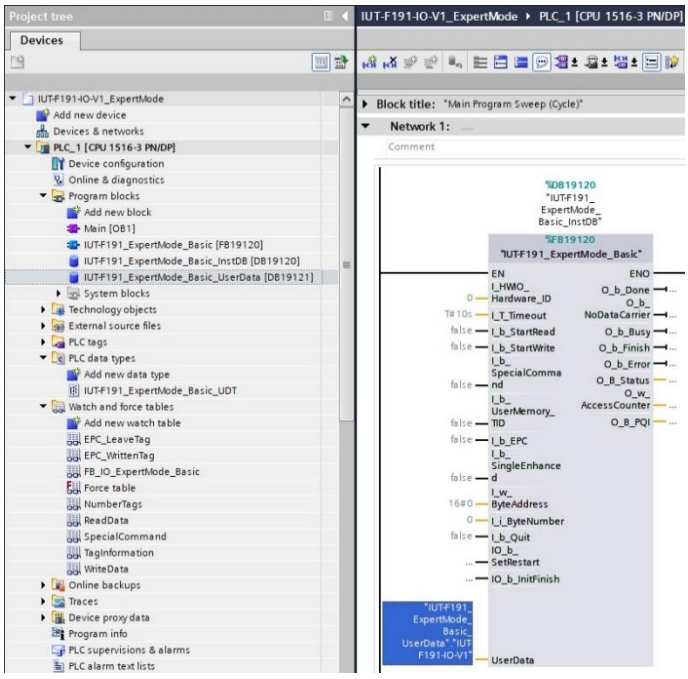
5. Function block FB19120 “IUT-F191_ExpertMode_Basic”

Functional description “IUT-F191_ExpertMode_Basic:
Basic version of a function block for using the Expert mode. Write and read commands can be executed. When executing the read/write commands, a maximum of one data carrier may be located in the detection zone. Up to 192 bytes of data can be read from the user memory. Write access is limited to a number of 22 bytes per command. With the start of a new write or read command, all internal data and the outputs are reset. The read and write data are located within the "IUT-F191_ExpertMode_Basic_UserData" data block.

Implementation of function block “IUT-F191_ExpertMode_Basic”:
Drag the function block "IUT-F191_ExpertMode_Basic" (FB19120) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F191_ExpertMode_Basic_InstDB" (DB19120) which can be used as instance data block. The instance data block can also be regenerated.

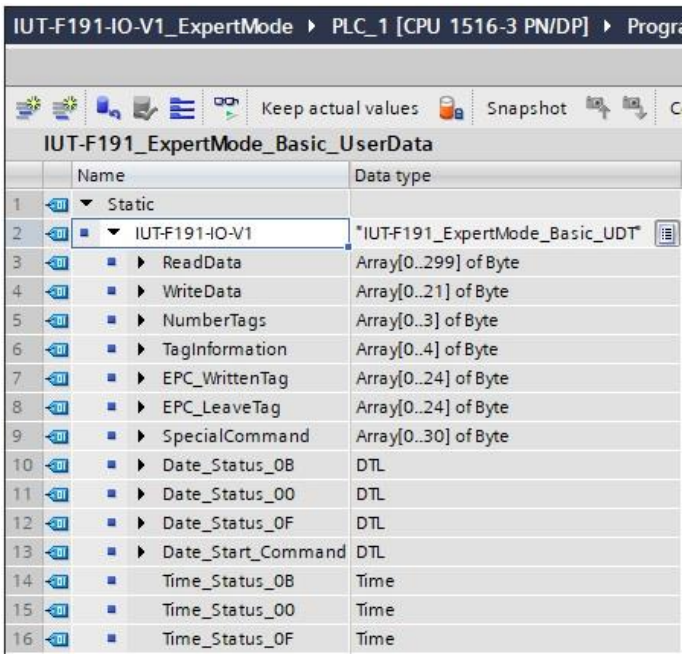






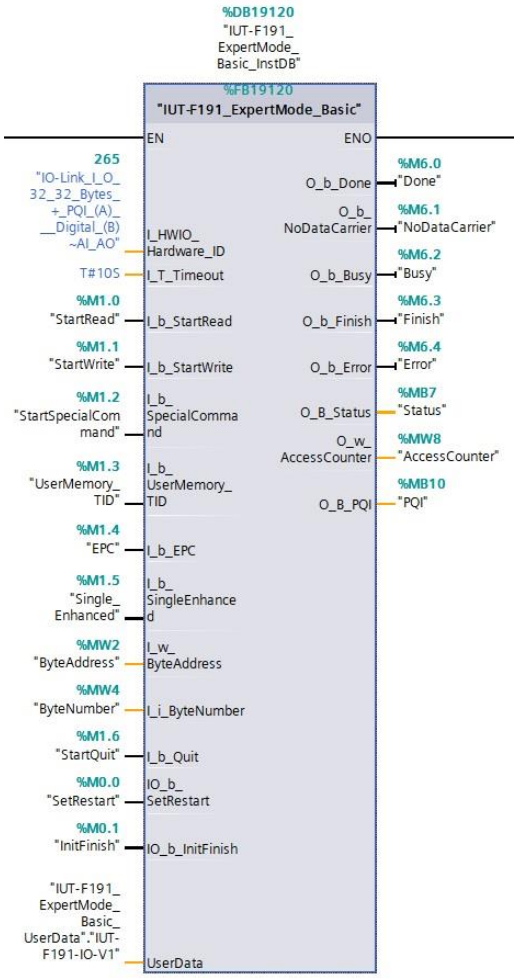
The read/write data of the function block are located in a separate data block. This is parameterized at the “UserData” input. The “IUT-F191_ExpertMode_Basic_UserData” data block (DB19121) is contained in the library and can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the "IUT-F191_Expert-Mode_Basic_UDT" data type.



The data block "IUT-F191_ExpertMode_Basic_UserData" consists of the structure "IUT-F191-IO-V1". This is divided into the following fields:

ReadData → Read data from data carrier
WriteData → Write data for data carrier
NumberTags → Number of recognized data carriers when executing Single command
TagInformation → Additional information about the data carrier access (e.g., RSSI value)
EPC_WrittenTag → UII/EPC information of the successfully written data carrier
EPC_LeaveTag → UII/EPC information of a data carrier left out of the detection zone during the execution of an enhanced command
SpecialCommand → Data field for parameterization of a "SpecialCommand" (e.g., change of transmission power)
Date_Status_0B → Date and time transmission status 16#0B telegram
Date_Status_00 → Date and time transmission status 16#00 telegram
Date_Status_0F → Date and time transmission status 16#0F telegram
Time_Status_0B → Time between start command and reception Status 16#0B telegram
Time_Status_00 → Time duration between start command and reception Status 16#00 Telegram
Time_Status_0F → Time duration between start command and receive status 16#0F telegram



Complete wiring of the "IUT-F191_ExpertMode_Basic" function block:

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

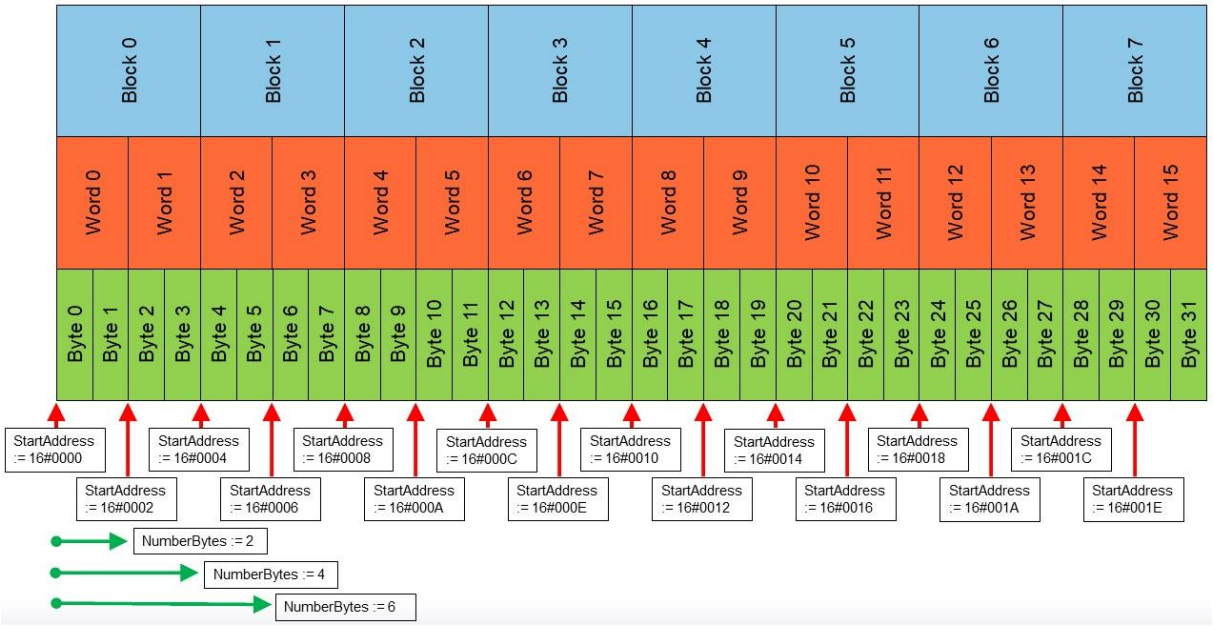
The following table shows the meaning of the input and output variables:

Name	Input / Output	Data type	Meaning
I_HWIO_Hardware_ID	Input	HW_IO	Hardware identifier of the communication module from the hardware configuration
I_T_Timeout	Input	Time	Timer for monitoring the communication; default 10 s (T#10s)
I_b_StartRead	Input	Bool	Start read command; With edge change from 0 → 1; starts execution of the configured read command; reset before starting another command
I_b_StartWrite	Input	Bool	Start write command; With edge change from 0 → 1; starts execution of the configured write command; reset before starting another command
I_b_SpecialCommand	Input	Bool	Start execution "SpecialCommand" (manually configured command). Definition of the required command parameters within the "IUT-F191_Expert Mode_Basic_UserData" data block in the "SpecialCommand" data structure With edge change from 0 → 1; transmission of the command from the Special-Command data field through the function block to the RFID station; reset before starting another command
I_b_UserMemory_TID	Input	Bool	Definition of read/write access to memory bank 0 → Access to user memory (bank 11) → Read and write 1 → Access to TID (bank 10) → Read
I_b_EPC	Input	Bool	Definition of read/write access to memory bank 0 → Access to memory bank specified by I_b_UserMemory_TID 1 → Access to UII/EPC (bank 01) → Read and write
I_b_SingleEnhanced	Input	Bool	Definition of execution type Write/read command 0 → one-time execution (read/write command is only activated for a short time) 1 → permanent execution (read/write command is permanently activated until aborted by another command)
I_w_ByteAddress	Input	Word	Start address for accessing the user memory within bank 11. Value must be a multiple of 2; 16#0000 addresses the start of the memory area; value range depends on the size of bank 11
I_i_ByteNumber	Input	Integer	Number of bytes to be read or written. Value must be a multiple of 2; the smallest amount of data is 2 bytes ("2")
I_b_Quit	Input	Bool	Start Quit command (command abort); With edge change from 0 → 1; execution of the Quit command to abort an activated Enhanced command; reset before starting another command.
IO_b_SetRestart	InOut	Bool	Start Execution Initialization: With edge change from 0 → 1; Reset of IO_b_SetRestart by function block. After a device startup or in error state, the initialization routine is to be executed; through the initialization, the internal memory of the RFID station is deleted and the Quit command is sent to cancel activated commands; after successful execution, I_b_InitFinish is set to TRUE
IO_b_InitFinish	InOut	Bool	End of initialization: With edge change from 0 → 1; initialization successfully executed; RFID station is ready for command execution
UserData	InOut	DB	Data block "UserData → IUT-F191_ExpertMode_Basic.IUT-F191-IO-V1
O_b_Done	Output	Bool	Data successfully read or written 1 → Data carrier present; data read or written
O_b_NoDataCarrier	Output	Bool	No data carrier in the detection zone or a data carrier has left the detection zone. 1 → No data carrier present; no data could be read or written; a data carrier has left the detection zone
O_b_Busy	Output	Bool	Execution write/read command active 1 → Execution write/read command activated
O_b_Error	Output	Bool	Error condition 1 → an error has occurred during the execution of a write/read command
O_B_Status	Output	Byte	Status value of the response from the RFID station 16#00 → Data read or data written 16#04 → Parameter error 16#05 → Data carrier has left detection zone 16#0A → Error; several data carriers with identical UII/EPC information detected 16#0B → Telegram with additional information (e.g., RSSI value) 16#0F → End telegram single command; contains the number of identified data carriers
O_w_AccessCounter	Output	Word	Number of successful data carrier accesses Counter for the number of successful data carrier accesses within one command execution.
O_B_PQI	Output	Byte	PQI Byte: Port Qualifier Information; additional information about the state of the connected device.

5.1 #SR - Single Read 2-Byte Words (Bank 11; User Memory)

The "Single Read 2-Byte Words" command performs a single read access to the user memory (memory bank 11). The inputs "I_b_UserMemory_TID", "I_b_EPC" and "I_b_SingleEnhanced" are set to FALSE. Before starting the command, the number of bytes to be read in (I_i_ByteNumber) and the start address (I_w_ByteAddress) must be parameterized. The Single Read 2-Byte Words command reads memory words with a size of 2 bytes each from the user memory. This means that the values of the command parameters "I_i_ByteNumber" and "I_w_ByteAddress" are always a multiple of 2. A maximum of 192 bytes can be read from the user memory per read command.

Parameterization "I_i_ByteNumber" and "I_w_ByteAddress" for access to the user memory:



Command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartRead" input must be set to 0 again for at least one cycle. The "I_b_StartRead" input must be set to FALSE before other commands (write; quit) can be triggered.

The data read from the data carrier during execution of the command are stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. The additional information (e.g., RSSI value) about the data carrier access is stored in the "TagInformation" data structure. The number of data carriers identified during the command execution are located in the "NumberTags" structure.

Single Read 2-Byte Words with a data carrier within the detection zone:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	0	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution
I_b_UserMemory_TID := FALSE (access to user memory)
I_b_EPC := FALSE (access to user memory)
I_b_SingleEnhanced := FALSE (single command execution)
I_w_ByteAddress := 16#0000 (start address on data carrier)
I_i_ByteNumber := 60 (60 bytes of user memory is read)

The command is started as soon as input "I_b_StartRead" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; a data carrier is read in;
O_b_Done = TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier = FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy = FALSE (changes to FALSE with the end of the command execution).
O_b_Finish = TRUE (changes to TRUE at the end of command execution)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 1 (number of data carriers read during the execution of the command.)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	FALSE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_StartRead" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#31
ReadData[5]	Byte	16#0	16#32
ReadData[6]	Byte	16#0	16#33
ReadData[7]	Byte	16#0	16#34
ReadData[8]	Byte	16#0	16#35
ReadData[9]	Byte	16#0	16#36
ReadData[10]	Byte	16#0	16#37
ReadData[11]	Byte	16#0	16#38
ReadData[12]	Byte	16#0	16#39
ReadData[13]	Byte	16#0	16#3A
ReadData[14]	Byte	16#0	16#3B
ReadData[15]	Byte	16#0	16#3C
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#3C
ReadData[18]	Byte	16#0	16#01
ReadData[19]	Byte	16#0	16#02
ReadData[20]	Byte	16#0	16#03
ReadData[21]	Byte	16#0	16#04
ReadData[22]	Byte	16#0	16#05
ReadData[23]	Byte	16#0	16#06
ReadData[24]	Byte	16#0	16#07
ReadData[25]	Byte	16#0	16#08

Read data within data block "IUT-F191_ExpertMode_Basic _UserData" in data structure "ReadData"; Long Form data format

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

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

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

ReadData[16...17]: Length of read-in user memory data
Length 2 bytes; corresponds to input parameter "I_b_ByteNumber"; 16#003C = 60 bytes

ReadData[18...77]: read user memory data
Length depends on the setting "I_b_ByteNumber"; read out partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
ReadData[66]	Byte	16#0	16#31
ReadData[67]	Byte	16#0	16#32
ReadData[68]	Byte	16#0	16#33
ReadData[69]	Byte	16#0	16#34
ReadData[70]	Byte	16#0	16#35
ReadData[71]	Byte	16#0	16#36
ReadData[72]	Byte	16#0	16#37
ReadData[73]	Byte	16#0	16#38
ReadData[74]	Byte	16#0	16#39
ReadData[75]	Byte	16#0	16#3A
ReadData[76]	Byte	16#0	16#3B
ReadData[77]	Byte	16#0	16#3C
ReadData[78]	Byte	16#0	16#00

ReadData[18...77]: read user memory data
Length depends on the setting "I_b_ByteNumber"; read out partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#01
ReadData[1]	Byte	16#0	16#02
ReadData[2]	Byte	16#0	16#03
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#05
ReadData[5]	Byte	16#0	16#06
ReadData[6]	Byte	16#0	16#07
ReadData[7]	Byte	16#0	16#08
ReadData[8]	Byte	16#0	16#09

Read data within data block "IUT-F191_Expert Mode_Basic_User Data" in data structure "ReadData"; Short Form Data Format

ReadData[0...59]: read-in user memory data
Length depends on the setting "I_b_ByteNumber"; read partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
ReadData[51]	Byte	16#0	16#34
ReadData[52]	Byte	16#0	16#35
ReadData[53]	Byte	16#0	16#36
ReadData[54]	Byte	16#0	16#37
ReadData[55]	Byte	16#0	16#38
ReadData[56]	Byte	16#0	16#39
ReadData[57]	Byte	16#0	16#3A
ReadData[58]	Byte	16#0	16#3B
ReadData[59]	Byte	16#0	16#3C
ReadData[60]	Byte	16#0	16#00

ReadData[0...59]: read-in user memory data
Length depends on the setting "I_b_ByteNumber"; read partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	*I...		
ReadData	Array...		
WriteData	Array...		
NumberTags	Array...		
TagInformation	Array...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#06
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Array...		

Additional information within data block "IUT-F191_ExpertMode_Basic_UserData" in the "TagInformation" data structure
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D
TagInformation[3...4]: Transmit power level
Length 2 bytes; level of the transmitting power on which the data carrier access took place.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	*I...		
ReadData	Array...		
WriteData	Array...		
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#31
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "NumberTags"

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-09-10:46:26.646620066
Date_Status_00	DTL	DTL#19	DTL#2023-10-09-10:46:26.586451826
Date_Status_0F	DTL	DTL#19	DTL#2023-10-09-10:46:26.785900702
Date_Start_Command	DTL	DTL#19	DTL#2023-10-09-10:46:26.463184475
Time_Status_0B	Time	T#0ms	T#183MS
Time_Status_00	Time	T#0ms	T#123MS
Time_Status_0F	Time	T#0ms	T#322MS

Timing behavior:
Receive status 16#00 telegram → after 123ms
Receive status 16#0B telegram → after 183ms
Receive status 16#0F Telegram → after 322ms

Single Read 2-Byte Words without data carrier in the detection zone or no data carrier detected:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; no data carrier detected or read in.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (no data carrier read)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	"I...		
ReadData	Array...		
WriteData	Array...		
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#30
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191 _ExpertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303030 = "0000" = 0 (no) data carrier

Command Single Read 2-Byte Words:

IUT-F191_ExpertMode_Basic_InstDB

Name	Da...	Start ..	Monito..
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#0A
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#07
OutData[5]	Byte	16#0	16#49
OutData[6]	Byte	16#0	16#00
OutData[7]	Byte	16#0	16#00
OutData[8]	Byte	16#0	16#00
OutData[9]	Byte	16#0	16#3C
OutData[10]	Byte	16#0	16#00

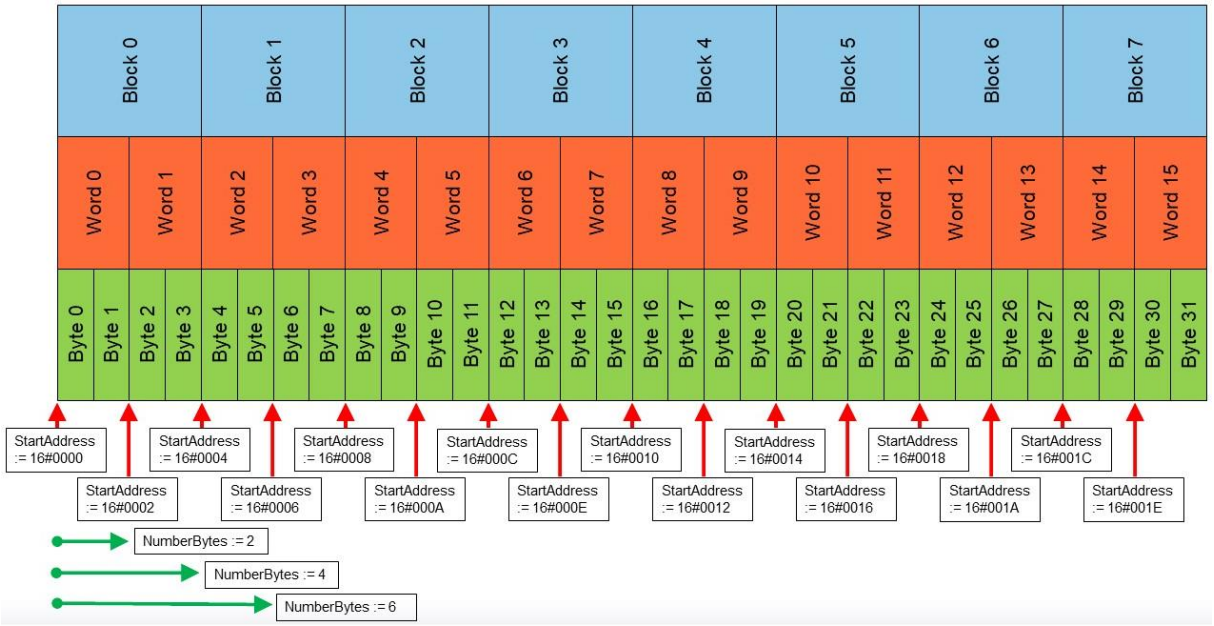
Command telegram within instance data block "IUT-F191_Expert Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0A
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0007
OutData[5]:	Command	16#49
OutData[6…7]:	Byte Address	16#0000
OutData[8…9]:	Byte Number	16#003C

5.2 #ER - Enhanced Read 2-Byte Words (Bank 11; User Memory)

The "Enhanced Read 2-Byte Words" command executes a permanent read access to the user memory (memory bank 11). The "I_b_SingleEnhanced" input must be set to TRUE for execution of the Enhanced command. The "I_b_UserMemory_TID" and "I_b_EPC" inputs are set to FALSE. Before the command is started, the number of bytes to be read in (I_i_ByteNumber) and the start address (I_w_ByteAddress) must be parameterized. The Enhanced Read 2-Byte Words command reads memory words with a size of 2 bytes each from the user memory. This means that the values of the command parameters "I_i_ByteNumber" and "I_w_ByteAddress" are always a multiple of 2. A maximum of 192 bytes can be read from the user memory per read command.

Parameterization "I_i_ByteNumber" and "I_w_ByteAddress" for access to the user memory:



Command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartRead" input must be set to 0 again for at least one cycle. The "I_b_StartRead" input must be set to FALSE before other commands (write; quit) can be triggered. The data read from the data carrier during execution of the command are stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. The additional information (e.g., RSSI value) about the data carrier access is stored in the "TagInformation" data structure. If a tag leaves the detection zone during command execution and can no longer be detected by the RFID station, the "EPC_LeaveTag" data structure contains the UII/EPC information for this tag.

Enhanced Read 2-Byte Words:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution
I_b_UserMemory_TID := FALSE (access to user memory)
I_b_EPC := FALSE (access to user memory)
I_b_SingleEnhanced := TRUE (permanent command execution)
I_w_ByteAddress := 16#0000 (start address on data carrier)
I_i_ByteNumber := 60 (60 bytes of user memory is read)

The command is started as soon as the input "I_b_StartRead" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; no data carrier.
O_b_Done = FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier = TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy = TRUE (changes to FALSE with the end of the command execution)
O_b_Finish = FALSE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 0 (number of data carriers read during the execution of the command)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; 1 data carrier read.
O_b_Done = TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier = FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy = TRUE (changes to FALSE with the end of the command execution)
O_b_Finish = FALSE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 1 (number of data carriers read during the execution of the command)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#31
ReadData[5]	Byte	16#0	16#32
ReadData[6]	Byte	16#0	16#33
ReadData[7]	Byte	16#0	16#34
ReadData[8]	Byte	16#0	16#35
ReadData[9]	Byte	16#0	16#36
ReadData[10]	Byte	16#0	16#37
ReadData[11]	Byte	16#0	16#38
ReadData[12]	Byte	16#0	16#39
ReadData[13]	Byte	16#0	16#3A
ReadData[14]	Byte	16#0	16#3B
ReadData[15]	Byte	16#0	16#3C
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#3C
ReadData[18]	Byte	16#0	16#01
ReadData[19]	Byte	16#0	16#02
ReadData[20]	Byte	16#0	16#03
ReadData[21]	Byte	16#0	16#04
ReadData[22]	Byte	16#0	16#05
ReadData[23]	Byte	16#0	16#06
ReadData[24]	Byte	16#0	16#07
ReadData[25]	Byte	16#0	16#08

Read data within data block "IUT-F191_ExpertMode_Basic _UserData" in data structure "ReadData"; Long Form data format

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

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

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

ReadData[16...17]: Length of read-in user memory data
Length 2 bytes; corresponds to input parameter "I_b_ByteNumber"; 16#003C = 60 bytes

ReadData[18...77]: read user memory data
Length depends on the setting "I_b_ByteNumber"; read out partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
ReadData[66]	Byte	16#0	16#31
ReadData[67]	Byte	16#0	16#32
ReadData[68]	Byte	16#0	16#33
ReadData[69]	Byte	16#0	16#34
ReadData[70]	Byte	16#0	16#35
ReadData[71]	Byte	16#0	16#36
ReadData[72]	Byte	16#0	16#37
ReadData[73]	Byte	16#0	16#38
ReadData[74]	Byte	16#0	16#39
ReadData[75]	Byte	16#0	16#3A
ReadData[76]	Byte	16#0	16#3B
ReadData[77]	Byte	16#0	16#3C
ReadData[78]	Byte	16#0	16#00

ReadData[18...77]: read user memory data
Length depends on the setting "I_b_ByteNumber"; read out partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#01
ReadData[1]	Byte	16#0	16#02
ReadData[2]	Byte	16#0	16#03
ReadData[3]	Byte	16#0	16#04
ReadData[4]	Byte	16#0	16#05
ReadData[5]	Byte	16#0	16#06
ReadData[6]	Byte	16#0	16#07
ReadData[7]	Byte	16#0	16#08
ReadData[8]	Byte	16#0	16#09

Read data within data block "IUT-F191_ExpertMode_Basic_User Data" in data structure "ReadData"; Short Form Data Format

ReadData[0...59]: read-in user memory data
Length depends on the setting "I_b_ByteNumber"; read partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
ReadData[51]	Byte	16#0	16#34
ReadData[52]	Byte	16#0	16#35
ReadData[53]	Byte	16#0	16#36
ReadData[54]	Byte	16#0	16#37
ReadData[55]	Byte	16#0	16#38
ReadData[56]	Byte	16#0	16#39
ReadData[57]	Byte	16#0	16#3A
ReadData[58]	Byte	16#0	16#3B
ReadData[59]	Byte	16#0	16#3C
ReadData[60]	Byte	16#0	16#00

ReadData[0...59]: read-in user memory data
Length depends on the setting "I_b_ByteNumber"; read partial area of the user memory

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
Static			
IUT-F191-IO-V1	"I...		
ReadData	Array...		
WriteData	Array...		
NumberTags	Array...		
TagInformation	Array...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#28
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Array...		

Additional information within data block "IUT-F191_ExpertMode_Basic_UserData" in the "TagInformation" data structure
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D
TagInformation[3...4]: Transmit power level
Length 2 bytes; level of the transmitting power on which the data carrier access took place.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-09-12:37:26.454731919
Date_Status_00	DTL	DTL#19	DTL#2023-10-09-12:37:26.390341702
Date_Status_0F	DTL	DTL#19	DTL#1970-01-01-00:00:00
Date_Start_Command	DTL	DTL#19	DTL#2023-10-09-12:37:16.473482822
Time_Status_0B	Time	T#0ms	T#9S_981MS
Time_Status_00	Time	T#0ms	T#9S_916MS
Time_Status_0F	Time	T#0ms	T#0MS

Timing behavior:
Receive status 16#00 telegram → after T#9S_916ms
Receive status 16#0B telegram → after T#9S_981ms

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

Command active; data carrier has left detection zone

O_b_Done	= FALSE (changes to TRUE with the reception of the read-in data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carriers read during the execution of the command)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
EPC_LeaveTag	Array...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#30
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#31
EPC_LeaveTag[5]	Byte	16#0	16#32
EPC_LeaveTag[6]	Byte	16#0	16#33
EPC_LeaveTag[7]	Byte	16#0	16#34
EPC_LeaveTag[8]	Byte	16#0	16#35
EPC_LeaveTag[9]	Byte	16#0	16#36
EPC_LeaveTag[10]	Byte	16#0	16#37
EPC_LeaveTag[11]	Byte	16#0	16#38
EPC_LeaveTag[12]	Byte	16#0	16#39
EPC_LeaveTag[13]	Byte	16#0	16#3A
EPC_LeaveTag[14]	Byte	16#0	16#3B
EPC_LeaveTag[15]	Byte	16#0	16#3C
EPC_LeaveTag[16]	Byte	16#0	16#00

UII/EPC Information of the data carrier deregistered from the RFID station.

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

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

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

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Command execution active; second data carrier read in

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carriers read during command execution)

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	FALSE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Reset input "I_b_StartRead" to FALSE

Before executing further commands, the input must be set back to FALSE.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	TRUE	TRUE
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	60	60
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Terminate command execution by Quit
The activated Enhanced command is terminated when the "I_b_Quit" input is set to TRUE. The "I_b_StartRead" input must be set back to FALSE beforehand.

O_b_Done	= TRUE (changes to TRUE with the reception of the read-in data)
O_b_NoDataCarrier	= not relevant
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carriers read during the execution of the command)

Command Enhanced Read 2-Byte Words:

IUT-F191_ExpertMode_Basic_InstDB

Name	Da...	Start ..	Monito..
OutData	Arr...		
OutData[0]	Byte	16#0	16#60
OutData[1]	Byte	16#0	16#0A
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#07
OutData[5]	Byte	16#0	16#4B
OutData[6]	Byte	16#0	16#00
OutData[7]	Byte	16#0	16#00
OutData[8]	Byte	16#0	16#00
OutData[9]	Byte	16#0	16#3C
OutData[10]	Byte	16#0	16#00

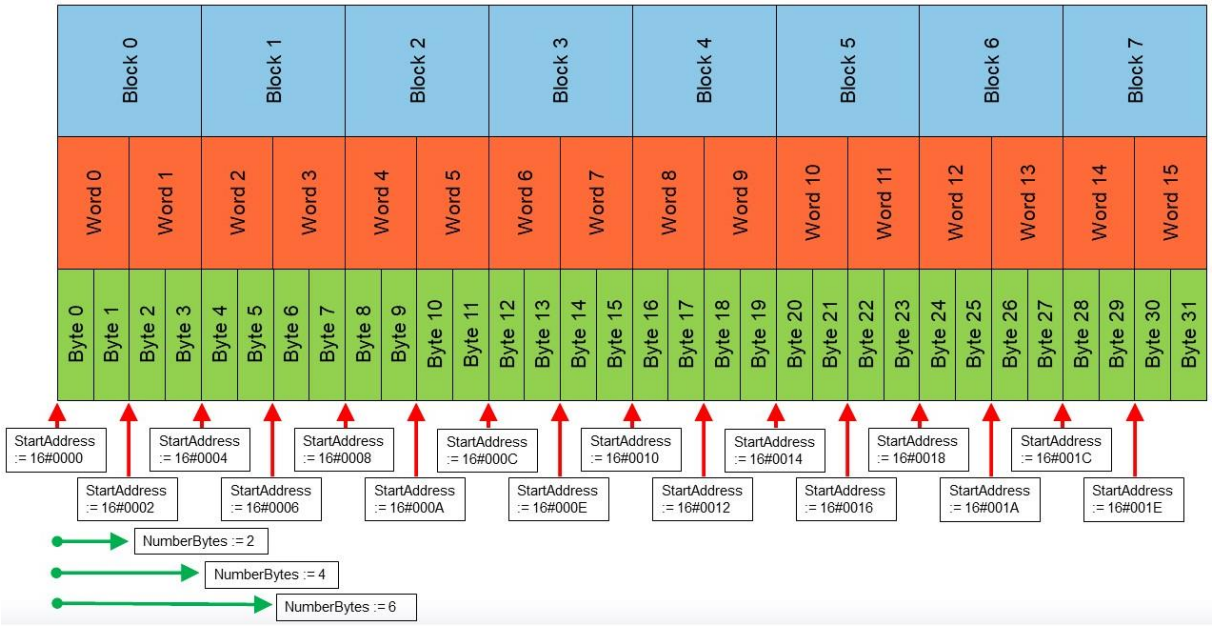
Command telegram within instance data block "IUT-F191_Expert Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0A
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0007
OutData[5]:	Command	16#4B
OutData[6…7]:	Byte Address	16#0000
OutData[8…9]:	Byte Number	16#003C

5.3 #SW - Single Write 2-Byte Words (Bank 11; User Memory)

The "Single Write 2-Byte Words" command performs a single write access to the user memory (memory bank 11). The inputs "I_b_UserMemory_TID", "I_b_EPC" and "I_b_SingleEnhanced" are set to FALSE. Before starting the command, the number of bytes to be written (I_i_ByteNumber) and the start address (I_w_ByteAddress) must be parameterized. The information to be programmed on the data carrier must be specified to the "WriteData" data structure before the command is executed. The Single Write 2-Byte Words command programs memory words with a size of 2 bytes each into the user memory. This means that the values of the command parameters "I_i_ByteNumber" and "I_w_ByteAddress" are always a multiple of 2. A maximum of 22 bytes per write command can be programmed into the user memory.

Parameterization "I_i_ByteNumber" and "I_w_ByteAddress" for access to the user memory:



The command execution is started by a positive edge at the "I_b_StartWrite" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next cycle of the PLC or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartWrite" input must be set to 0 again for at least one cycle. Before other commands (read; write; quit) can be controlled, the "I_b_StartWrite" input must be set to FALSE.

If a data carrier was successfully written during the execution of a command, the UII/EPC information of the corresponding data carrier is stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "EPC_WrittenTag" data structure. The additional information (e.g., RSSI value) about the data carrier access is stored in the "TagInformation" data structure. At the end of the command execution, the number of data carriers successfully written during the command execution is transferred. This information is located in the "NumberTags" data structure.

Single Write 2-Byte Words with a data carrier within the detection zone:

Assignment of write data in the "WriteData" data structure

Name	...	Di...	Moni..	Modif...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[0]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[1]		Hex	16#02	16#02
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[2]		Hex	16#03	16#03
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[3]		Hex	16#04	16#04
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[4]		Hex	16#05	16#05
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[5]		Hex	16#06	16#06
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[6]		Hex	16#07	16#07
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[7]		Hex	16#08	16#08
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[8]		Hex	16#00	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
WriteData	Array...		
WriteData[0]	Byte	16#0	16#01
WriteData[1]	Byte	16#0	16#02
WriteData[2]	Byte	16#0	16#03
WriteData[3]	Byte	16#0	16#04
WriteData[4]	Byte	16#0	16#05
WriteData[5]	Byte	16#0	16#06
WriteData[6]	Byte	16#0	16#07
WriteData[7]	Byte	16#0	16#08
WriteData[8]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution

I_b_UserMemory_TID	:= FALSE (access to user memory)
I_b_EPC	:= FALSE (access to user memory)
I_b_SingleEnhanced	:= FALSE (single command execution)
I_w_ByteAddress	:= 16#0000 (start address on data carrier)
I_i_ByteNumber	:= 8 (8 bytes of user memory is written)

The command is started as soon as input "I_b_StartWrite" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; a data carrier programmed

O_b_Done	= TRUE (changes to TRUE with the reception of the UII/EPC information)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carriers programmed during command execution)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	FALSE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_StartWrite" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
EPC_WrittenTag	Array...		
EPC_WrittenTag[0]	Byte	16#0	16#00
EPC_WrittenTag[1]	Byte	16#0	16#0E
EPC_WrittenTag[2]	Byte	16#0	16#30
EPC_WrittenTag[3]	Byte	16#0	16#00
EPC_WrittenTag[4]	Byte	16#0	16#31
EPC_WrittenTag[5]	Byte	16#0	16#32
EPC_WrittenTag[6]	Byte	16#0	16#33
EPC_WrittenTag[7]	Byte	16#0	16#34
EPC_WrittenTag[8]	Byte	16#0	16#35
EPC_WrittenTag[9]	Byte	16#0	16#36
EPC_WrittenTag[10]	Byte	16#0	16#37
EPC_WrittenTag[11]	Byte	16#0	16#38
EPC_WrittenTag[12]	Byte	16#0	16#39
EPC_WrittenTag[13]	Byte	16#0	16#3A
EPC_WrittenTag[14]	Byte	16#0	16#3B
EPC_WrittenTag[15]	Byte	16#0	16#3C
EPC_WrittenTag[16]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "EPC_WrittenTag"; Long form data format

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

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ...	Monit...
EPC_WrittenTag	Arra...		
EPC_WrittenTag[0]	Byte	16#0	16#30
EPC_WrittenTag[1]	Byte	16#0	16#00
EPC_WrittenTag[2]	Byte	16#0	16#31
EPC_WrittenTag[3]	Byte	16#0	16#32
EPC_WrittenTag[4]	Byte	16#0	16#33
EPC_WrittenTag[5]	Byte	16#0	16#34
EPC_WrittenTag[6]	Byte	16#0	16#35
EPC_WrittenTag[7]	Byte	16#0	16#36
EPC_WrittenTag[8]	Byte	16#0	16#37
EPC_WrittenTag[9]	Byte	16#0	16#38
EPC_WrittenTag[10]	Byte	16#0	16#39
EPC_WrittenTag[11]	Byte	16#0	16#3A
EPC_WrittenTag[12]	Byte	16#0	16#3B
EPC_WrittenTag[13]	Byte	16#0	16#3C
EPC_WrittenTag[14]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "EPC_WrittenTag"; Short form data format

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

EPC_WrittenTag [2…13]: UII/EPC-Code
Length depends on the programming of the tag; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
TagInformation	Array...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#1A
TagInformation[2]	Byte	16#0	16#0D
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Array...		

Additional information within data block "IUT-F191_ExpertMode_ Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access has been made.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#31
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191 _Ex-pertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-09-13:27:31.918589119
Date_Status_00	DTL	DTL#19	DTL#2023-10-09-13:27:31.902992368
Date_Status_0F	DTL	DTL#19	DTL#2023-10-09-13:27:32.118931693
Date_Start_Command	DTL	DTL#19	DTL#2023-10-09-13:27:31.836207208
Time_Status_0B	Time	T#0ms	T#82MS
Time_Status_00	Time	T#0ms	T#66MS
Time_Status_0F	Time	T#0ms	T#282MS

Timing behavior:
Receive status 16#00 telegram after T#66ms
Receive status 16#0B Telegram after T#82ms
Receive status 16#0F Telegram after T#282ms

Single Write 2-Byte Words without data carrier in the detection zone or no data carrier detected:

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; no data carrier detected or written.

O_b_Done	= TRUE (changes to TRUE with the receipt of the UII/EPC information)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (no data carrier detected)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#30
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191 _ExpertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303030 = "0000" = 0 (no) data carrier

Command Single Write 2-Byte Words:

IUT-F191_ExpertMode_Basic_InstDB

Name	Da...	Start ...	Monito...
OutData	Arr...		
OutData[0]	Byte	16#0	16#E0
OutData[1]	Byte	16#0	16#12
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#0F
OutData[5]	Byte	16#0	16#4A
OutData[6]	Byte	16#0	16#00
OutData[7]	Byte	16#0	16#00
OutData[8]	Byte	16#0	16#00
OutData[9]	Byte	16#0	16#08
OutData[10]	Byte	16#0	16#01
OutData[11]	Byte	16#0	16#02
OutData[12]	Byte	16#0	16#03
OutData[13]	Byte	16#0	16#04
OutData[14]	Byte	16#0	16#05
OutData[15]	Byte	16#0	16#06
OutData[16]	Byte	16#0	16#07
OutData[17]	Byte	16#0	16#08
OutData[18]	Byte	16#0	16#00

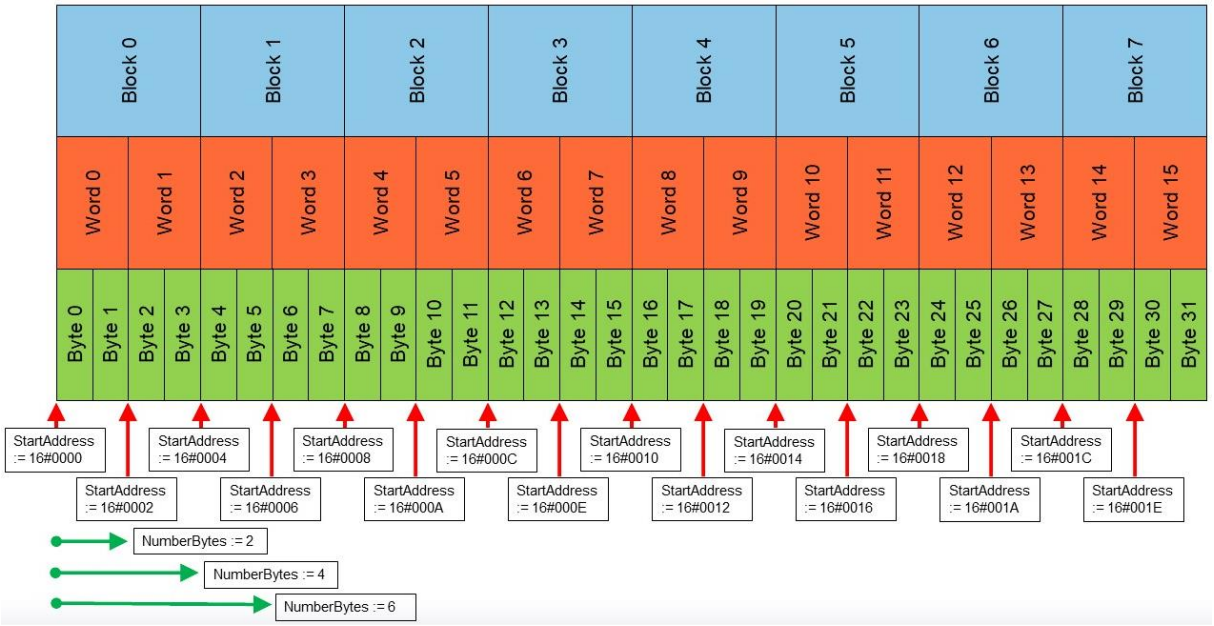
Command telegram within instance data block "IUT-F191_Expert Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#12
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#000F
OutData[5]:	Command	16#4A
OutData[6…7]:	Byte Address	16#0000
OutData[8…9]:	Byte Number	16#0008
OutData[10]:	Write data Byte 1	16#01
OutData[11]:	Write data Byte 2	16#02
OutData[12]:	Write data Byte 3	16#03
OutData[13]:	Write data Byte 4	16#04
OutData[14]:	Write data Byte 5	16#05
OutData[15]:	Write data Byte 6	16#06
OutData[16]:	Write data Byte 7	16#07
OutData[17]:	Write data Byte 8	16#08

5.4 #EW - Enhanced Write 2-Byte Words (Bank 11; User Memory)

The "Enhanced Write 2-Byte Words" command executes a permanent write access to the user memory (memory bank 11). The "I_b_SingleEnhanced" input must be set to TRUE for execution of the Enhanced command. The "I_b_UserMemory_TID" and "I_b_EPC" inputs are set to FALSE. Before starting the command, the number of bytes to be programmed on the data carrier (I_i_ByteNumber) and the start address (I_w_ByteAddress) must be parameterized. The information to be programmed on the data carrier must be specified to the "WriteData" data structure before the command is executed. The Enhanced Write 2-Byte Words command programs memory words with a size of 2 bytes each into the user memory. This means that the values of the command parameters "I_i_ByteNumber" and "I_w_ByteAddress" are always a multiple of 2. A maximum of 22 bytes per write command can be programmed into the user memory.

Parameterization "I_i_ByteNumber" and "I_w_ByteAddress" for access to the user memory:



The command execution is started by a positive edge at the "I_b_StartWrite" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next cycle of the PLC or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartWrite" input must be set to 0 again for at least one cycle. Before other commands (read; write; quit) can be controlled, the "I_b_StartWrite" input must be set to FALSE.

Within the data block "IUT-F191_ExpertMode_Basic_UserData" in the data structure "EPC_Written Tag" the UII/EPC information of the data carriers successfully programmed during the command execution is stored. The additional information (e.g., RSSI value) about the tag access is stored in the "TagInformation" data structure. If a tag leaves the detection zone during command execution and can no longer be detected by the RFID station, the "EPC_LeaveTag" data structure contains the UII/EPC information of this tag.

Enhanced Write 2-Byte Words:

Assignment of write data in the "WriteData" data structure

Name	...	Di...	Moni..	Modif...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[0]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[1]		Hex	16#02	16#02
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[2]		Hex	16#03	16#03
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[3]		Hex	16#04	16#04
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[4]		Hex	16#05	16#05
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[5]		Hex	16#06	16#06
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[6]		Hex	16#07	16#07
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[7]		Hex	16#08	16#08
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[8]		Hex	16#00	16#00

"IUT-F191_ExpertMode_Basic_UserData"

Name	Data ...	Start ...	Monito...
WriteData	Array...		
WriteData[0]	Byte	16#0	16#01
WriteData[1]	Byte	16#0	16#02
WriteData[2]	Byte	16#0	16#03
WriteData[3]	Byte	16#0	16#04
WriteData[4]	Byte	16#0	16#05
WriteData[5]	Byte	16#0	16#06
WriteData[6]	Byte	16#0	16#07
WriteData[7]	Byte	16#0	16#08
WriteData[8]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution

I_b_UserMemory_TID	:= FALSE (access to user memory)
I_b_EPC	:= FALSE (access to user memory)
I_b_SingleEnhanced	:= TRUE (permanent command execution)
I_w_ByteAddress	:= 16#0000 (start address on data carrier)
I_i_ByteNumber	:= 8 (8 bytes of user memory is written)

The command is started as soon as input "I_b_StartWrite" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; no data carrier.

O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (number of data carriers programmed during command execution)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; 1 data carrier programmed.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carriers programmed during command execution)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
EPC_WrittenTag	Array...		
EPC_WrittenTag[0]	Byte	16#0	16#00
EPC_WrittenTag[1]	Byte	16#0	16#0E
EPC_WrittenTag[2]	Byte	16#0	16#30
EPC_WrittenTag[3]	Byte	16#0	16#00
EPC_WrittenTag[4]	Byte	16#0	16#31
EPC_WrittenTag[5]	Byte	16#0	16#32
EPC_WrittenTag[6]	Byte	16#0	16#33
EPC_WrittenTag[7]	Byte	16#0	16#34
EPC_WrittenTag[8]	Byte	16#0	16#35
EPC_WrittenTag[9]	Byte	16#0	16#36
EPC_WrittenTag[10]	Byte	16#0	16#37
EPC_WrittenTag[11]	Byte	16#0	16#38
EPC_WrittenTag[12]	Byte	16#0	16#39
EPC_WrittenTag[13]	Byte	16#0	16#3A
EPC_WrittenTag[14]	Byte	16#0	16#3B
EPC_WrittenTag[15]	Byte	16#0	16#3C
EPC_WrittenTag[16]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F191_ExpertMode_Basic_UserData" in the data structure "EPC_WrittenTag"; Long form data format

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

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
EPC_WrittenTag	Arra...		
EPC_WrittenTag[0]	Byte	16#0	16#30
EPC_WrittenTag[1]	Byte	16#0	16#00
EPC_WrittenTag[2]	Byte	16#0	16#31
EPC_WrittenTag[3]	Byte	16#0	16#32
EPC_WrittenTag[4]	Byte	16#0	16#33
EPC_WrittenTag[5]	Byte	16#0	16#34
EPC_WrittenTag[6]	Byte	16#0	16#35
EPC_WrittenTag[7]	Byte	16#0	16#36
EPC_WrittenTag[8]	Byte	16#0	16#37
EPC_WrittenTag[9]	Byte	16#0	16#38
EPC_WrittenTag[10]	Byte	16#0	16#39
EPC_WrittenTag[11]	Byte	16#0	16#3A
EPC_WrittenTag[12]	Byte	16#0	16#3B
EPC_WrittenTag[13]	Byte	16#0	16#3C
EPC_WrittenTag[14]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F191_ExpertMode_Basic_UserData" in the data structure "EPC_WrittenTag"; Short form data format

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

EPC_WrittenTag [2…13]: UII/EPC-Code
Length depends on the programming of the tag; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
TagInformation	Array...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#06
TagInformation[2]	Byte	16#0	16#07
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Array...		

Additional information within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access has been made.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-09-16:13:47.670411582
Date_Status_00	DTL	DTL#19	DTL#2023-10-09-16:13:47.649047195
Date_Status_0F	DTL	DTL#19	DTL#1970-01-01-00:00:00
Date_Start_Command	DTL	DTL#19	DTL#2023-10-09-16:12:48.589546693
Time_Status_0B	Time	T#0ms	T#59S_80MS
Time_Status_00	Time	T#0ms	T#59S_59MS
Time_Status_0F	Time	T#0ms	T#0MS

Timing behavior:
Receive status 16#00 telegram → after T#59S_59ms
Receive status 16#0B telegram → after T#59S_80ms

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

Command active; data carrier has left the detection zone
O_b_Done = FALSE (changes to TRUE with the reception of the read-in data)
O_b_NoDataCarrier = TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy = TRUE (changes to FALSE with the end of the command execution)
O_b_Finish = FALSE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 1 (number of data carriers programmed during command execution)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
EPC_LeaveTag	Array...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#30
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#31
EPC_LeaveTag[5]	Byte	16#0	16#32
EPC_LeaveTag[6]	Byte	16#0	16#33
EPC_LeaveTag[7]	Byte	16#0	16#34
EPC_LeaveTag[8]	Byte	16#0	16#35
EPC_LeaveTag[9]	Byte	16#0	16#36
EPC_LeaveTag[10]	Byte	16#0	16#37
EPC_LeaveTag[11]	Byte	16#0	16#38
EPC_LeaveTag[12]	Byte	16#0	16#39
EPC_LeaveTag[13]	Byte	16#0	16#3A
EPC_LeaveTag[14]	Byte	16#0	16#3B
EPC_LeaveTag[15]	Byte	16#0	16#3C
EPC_LeaveTag[16]	Byte	16#0	16#00

UII/EPC Information of the data carrier deregistered from the RFID station.

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

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

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

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Command execution active; second data carrier programmed

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carriers programmed during command execution)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	FALSE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Reset input "I_b_StartWrite" to FALSE

The input must be set back to FALSE before further commands are executed.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	TRUE	TRUE
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	0
"ByteNumber"	%MW4	DEC	8	8
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

End command execution by Quit
The activated Enhanced command is terminated when the "I_b_Quit" input is set to TRUE. The "I_b_StartWrite" input must be set back to FALSE beforehand.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= not relevant
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carriers programmed during command execution)

Command Enhanced Write 2-Byte Words:

IUT-F191_ExpertMode_Basic_InstDB

	Name	Da...	Start ..	Monito..
	OutData	Arr...		
	OutData[0]	Byte	16#0	16#60
	OutData[1]	Byte	16#0	16#12
	OutData[2]	Byte	16#0	16#00
	OutData[3]	Byte	16#0	16#00
	OutData[4]	Byte	16#0	16#0F
	OutData[5]	Byte	16#0	16#4C
	OutData[6]	Byte	16#0	16#00
	OutData[7]	Byte	16#0	16#00
	OutData[8]	Byte	16#0	16#00
	OutData[9]	Byte	16#0	16#08
	OutData[10]	Byte	16#0	16#01
	OutData[11]	Byte	16#0	16#02
	OutData[12]	Byte	16#0	16#03
	OutData[13]	Byte	16#0	16#04
	OutData[14]	Byte	16#0	16#05
	OutData[15]	Byte	16#0	16#06
	OutData[16]	Byte	16#0	16#07
	OutData[17]	Byte	16#0	16#08
	OutData[18]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191_Expert Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#12
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#000F
OutData[5]:	Command	16#4C
OutData[6…7]:	Byte Address	16#0000
OutData[8…9]:	Byte Number	16#0008
OutData[10]:	Write data Byte 1	16#01
OutData[11]:	Write data Byte 2	16#02
OutData[12]:	Write data Byte 3	16#03
OutData[13]:	Write data Byte 4	16#04
OutData[14]:	Write data Byte 5	16#05
OutData[15]:	Write data Byte 6	16#06
OutData[16]:	Write data Byte 7	16#07
OutData[17]:	Write data Byte 8	16#08

5.5 SF - Single Read Fixcode (Bank 10; TID)

The "Single Read Fixcode" command executes a single read access to the TID (memory bank 10). The "I_b_UserMemory_TID" input must be set to TRUE before the command execution is started. The "I_b_EPC" and "I_b_SingleEnhanced" inputs must be set to FALSE.

Command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartRead" input must be set to 0 again for at least one cycle. The "I_b_StartRead" input must be set to FALSE before other commands (read; write; quit) can be triggered.

The data read from the data carrier during execution of the command are stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. The additional information (e.g., RSSI value) about the volume access is stored in the "TagInformation" data structure. The number of volumes identified during the command execution are located in the "NumberTags" structure.

Single Read Fixcode with a data carrier within the detection zone:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution

I_b_UserMemory_TID	:= TRUE (access to the TID)
I_b_EPC	:= FALSE (not relevant)
I_b_SingleEnhanced	:= FALSE (single command execution)
I_w_ByteAddress	:= 16#0000 (not relevant)
I_i_ByteNumber	:= 0 (not relevant)

The command is started as soon as the input "I_b_StartRead" is set to TRUE.

All outputs are initially reset to FALSE. Active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; a data carrier read in

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carriers read during the execution of the command)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	FALSE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_StartRead" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#31
ReadData[5]	Byte	16#0	16#32
ReadData[6]	Byte	16#0	16#33
ReadData[7]	Byte	16#0	16#34
ReadData[8]	Byte	16#0	16#35
ReadData[9]	Byte	16#0	16#36
ReadData[10]	Byte	16#0	16#37
ReadData[11]	Byte	16#0	16#38
ReadData[12]	Byte	16#0	16#39
ReadData[13]	Byte	16#0	16#3A
ReadData[14]	Byte	16#0	16#3B
ReadData[15]	Byte	16#0	16#3C
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#0C
ReadData[18]	Byte	16#0	16#E2
ReadData[19]	Byte	16#0	16#80
ReadData[20]	Byte	16#0	16#6F
ReadData[21]	Byte	16#0	16#12
ReadData[22]	Byte	16#0	16#20
ReadData[23]	Byte	16#0	16#00
ReadData[24]	Byte	16#0	16#74
ReadData[25]	Byte	16#0	16#02
ReadData[26]	Byte	16#0	16#1F
ReadData[27]	Byte	16#0	16#B9
ReadData[28]	Byte	16#0	16#9F
ReadData[29]	Byte	16#0	16#BF
ReadData[30]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic_ UserData" in data structure "ReadData"; Long Form Data Format

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

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

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

ReadData[16…17]: Length read-in TID
Length 2 Byte; Length depends on used Chip Type; 16#000C = 12 Bytes

ReadData[18…29]: read-in TID
Length depends on the data carrier used; leading byte of the TID is always 16#E2

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#E2
ReadData[1]	Byte	16#0	16#80
ReadData[2]	Byte	16#0	16#6F
ReadData[3]	Byte	16#0	16#12
ReadData[4]	Byte	16#0	16#20
ReadData[5]	Byte	16#0	16#00
ReadData[6]	Byte	16#0	16#74
ReadData[7]	Byte	16#0	16#02
ReadData[8]	Byte	16#0	16#1F
ReadData[9]	Byte	16#0	16#B9
ReadData[10]	Byte	16#0	16#9F
ReadData[11]	Byte	16#0	16#BF
ReadData[12]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic_ UserData" in data structure "ReadData"; Short Form Data Format

ReadData[0...11]: read-in TID
Length depends on the data carrier used; leading byte of the TID is always 16#E2

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#2E
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Arra...		

Additional information within data block "IUT-F191_ExpertMode_ Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access has been made.

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#31
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-11-10:24:31.422383462
Date_Status_00	DTL	DTL#19	DTL#2023-10-11-10:24:31.387818408
Date_Status_0F	DTL	DTL#19	DTL#2023-10-11-10:24:31.595783333
Date_Start_Command	DTL	DTL#19	DTL#2023-10-11-10:24:31.315797266
Time_Status_0B	Time	T#0ms	T#106MS
Time_Status_00	Time	T#0ms	T#72MS
Time_Status_0F	Time	T#0ms	T#279MS

Timing behavior:
Receive status 16#00 telegram → after 72ms
Receive status 16#0B telegram → after 106ms
Receive status 16#0F Telegram → after 279ms

Single Read Fixcode without data carrier in the detection zone or no data carrier detected:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; no data carrier detected or read in.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (no data carrier read)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#30
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191 _ExpertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303030 = "0000" = 0 (no) data carrier

Command Single Read Fixcode:

IUT-F191_ExpertMode_Basic_InstDB

Name	Da...	Star..	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#E0
OutData[1]	Byte	16#0	16#06
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#03
OutData[5]	Byte	16#0	16#01
OutData[6]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _ExpertMode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#06
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0003
OutData[5]:	Command	16#01

5.6 EF - Enhanced Read Fixcode (Bank 10; TID)

The "Enhanced Read Fixcode" command executes a permanent read access to the TID (memory bank 10). The "I_b_UserMemory_TID" and "I_b_SingleEnhanced" inputs must be set to TRUE before the command is executed. The "I_b_EPC" input is to be set to FALSE.

Command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartRead" input must be set to 0 again for at least one cycle. The "I_b_StartRead" input must be set to FALSE before other commands (write; quit) can be triggered.

The data read from the data carrier during execution of the command are stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. The additional information (e.g., RSSI value) about the data carrier access is stored in the "TagInformation" data structure. If a tag leaves the detection zone during command execution and can no longer be detected by the RFID station, the "EPC_LeaveTag" data structure contains the UII/EPC information for this tag.

Enhanced Read Fixcode:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution

I_b_UserMemory_TID	:= TRUE (access to TID)
I_b_EPC	:= FALSE (access to User Memory)
I_b_SingleEnhanced	:= TRUE (permanent command execution)
I_w_ByteAddress	:= 16#0000 (not relevant)
I_i_ByteNumber	:= 0 (not relevant)

The command is started as soon as the input "I_b_StartRead" is set to TRUE.

All outputs are initially reset to FALSE. Active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; no data carrier

O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (number of data carriers read during the execution of the command)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; 1 data carrier read

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carriers read during the execution of the command)

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#31
ReadData[5]	Byte	16#0	16#32
ReadData[6]	Byte	16#0	16#33
ReadData[7]	Byte	16#0	16#34
ReadData[8]	Byte	16#0	16#35
ReadData[9]	Byte	16#0	16#36
ReadData[10]	Byte	16#0	16#37
ReadData[11]	Byte	16#0	16#38
ReadData[12]	Byte	16#0	16#39
ReadData[13]	Byte	16#0	16#3A
ReadData[14]	Byte	16#0	16#3B
ReadData[15]	Byte	16#0	16#3C
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#0C
ReadData[18]	Byte	16#0	16#E2
ReadData[19]	Byte	16#0	16#80
ReadData[20]	Byte	16#0	16#6F
ReadData[21]	Byte	16#0	16#12
ReadData[22]	Byte	16#0	16#20
ReadData[23]	Byte	16#0	16#00
ReadData[24]	Byte	16#0	16#74
ReadData[25]	Byte	16#0	16#02
ReadData[26]	Byte	16#0	16#1F
ReadData[27]	Byte	16#0	16#B9
ReadData[28]	Byte	16#0	16#9F
ReadData[29]	Byte	16#0	16#BF
ReadData[30]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic_ UserData" in data structure "ReadData"; Long Form Data Format

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

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

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

ReadData[16…17]: Length read-in TID
Length 2 Byte; Length depends on used Chip Type; 16#000C = 12 Bytes

ReadData[18…29]: read-in TID
Length depends on the data carrier used; leading byte of the TID is always 16#E2

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#E2
ReadData[1]	Byte	16#0	16#80
ReadData[2]	Byte	16#0	16#6F
ReadData[3]	Byte	16#0	16#12
ReadData[4]	Byte	16#0	16#20
ReadData[5]	Byte	16#0	16#00
ReadData[6]	Byte	16#0	16#74
ReadData[7]	Byte	16#0	16#02
ReadData[8]	Byte	16#0	16#1F
ReadData[9]	Byte	16#0	16#B9
ReadData[10]	Byte	16#0	16#9F
ReadData[11]	Byte	16#0	16#BF
ReadData[12]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic_ UserData" in data structure "ReadData"; Short Form Data Format

ReadData[0...11]: read-in TID
Length depends on the data carrier used; leading byte of the TID is always 16#E2

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#1A
TagInformation[2]	Byte	16#0	16#07
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Arra...		

Additional information within data block "IUT-F191_ExpertMode_ Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access has been made.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-11-10:53:03.917569506
Date_Status_00	DTL	DTL#19	DTL#2023-10-11-10:53:03.883351573
Date_Status_0F	DTL	DTL#19	DTL#1970-01-01-00:00:00
Date_Start_Command	DTL	DTL#19	DTL#2023-10-11-10:52:12.421737008
Time_Status_0B	Time	T#0ms	T#51S_495MS
Time_Status_00	Time	T#0ms	T#51S_461MS
Time_Status_0F	Time	T#0ms	T#0MS

Timing behavior:
Receive status 16#00 telegram → after T#51S_461ms
Receive status 16#0B telegram → after T#51S_495ms

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

Command active; data carrier has left detection zone

O_b_Done	= FALSE (changes to TRUE with the reception of the read-in data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carrier read during the execution of the command)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
EPC_LeaveTag	Array...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#30
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#31
EPC_LeaveTag[5]	Byte	16#0	16#32
EPC_LeaveTag[6]	Byte	16#0	16#33
EPC_LeaveTag[7]	Byte	16#0	16#34
EPC_LeaveTag[8]	Byte	16#0	16#35
EPC_LeaveTag[9]	Byte	16#0	16#36
EPC_LeaveTag[10]	Byte	16#0	16#37
EPC_LeaveTag[11]	Byte	16#0	16#38
EPC_LeaveTag[12]	Byte	16#0	16#39
EPC_LeaveTag[13]	Byte	16#0	16#3A
EPC_LeaveTag[14]	Byte	16#0	16#3B
EPC_LeaveTag[15]	Byte	16#0	16#3C
EPC_LeaveTag[16]	Byte	16#0	16#00

UII/EPC Information of the data carrier deregistered from the RFID station.

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

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

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

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Command execution active; second data carrier read in

O_b_Done = TRUE (changes to TRUE with the receipt of the read-in data)

O_b_NoDataCarrier = FALSE (changes to TRUE if no data carrier could be identified)

O_b_Busy = TRUE (changes to FALSE with the end of the command execution)

O_b_Finish = FALSE (changes with the end of the command execution to TRUE)

O_b_Error = FALSE (changes to TRUE if an error occurred)

O_B_Status = 16#0B (status value of the last telegram received from the RFID station)

O_w_AccessCounter = 2 (number of data carriers read during command execution)

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	FALSE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Reset input "I_b_StartRead" to FALSE

Before executing further commands, the input must be set back to FALSE.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	TRUE	TRUE
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	TRUE	TRUE
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

End command execution by Quit
The activated Enhanced command is terminated when the "I_b_Quit" input is set to TRUE. The "I_b_StartRead" input must be set back to FALSE beforehand.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= not relevant
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the instruction execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carrier read during the execution of the command)

Command Enhanced Read Fixcode:

IUT-F191_ExpertMode_Basic_InstDB

Name	Da...	Star..	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#80
OutData[1]	Byte	16#0	16#06
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#03
OutData[5]	Byte	16#0	16#1D
OutData[6]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191_Expert Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#06
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0003
OutData[5]:	Command	16#1D

5.7 SN - Single Read UII/EPC (Bank 01; UII/EPC)

The "Single Read UII/EPC" command executes a single read access to the UII/EPC (memory bank 01). The "I_b_EPC" input must be set to TRUE before the command execution is started. The "I_b_UserMemory_TID" and "I_b_SingleEnhanced" inputs must be set to FALSE.

Command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_StartRead" input must be set to 0 again for at least one cycle. The "I_b_StartRead" input must be set to FALSE before other commands (read; write; quit) can be triggered.

The data read from the data carrier during execution of the command are stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. The additional information (e.g., RSSI value) about the volume access is stored in the "TagInformation" data structure. The number of volumes identified during the command execution are located in the "NumberTags" structure.

Single Read UII/EPC with a data carrier in the detection zone:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution
I_b_UserMemory_TID := FALSE (access to the UII/EPC)
I_b_EPC := TRUE (access to UII/EPC)
I_b_SingleEnhanced := FALSE (single command execution)
I_w_ByteAddress := 16#0000 (not relevant)
I_i_ByteNumber := 0 (not relevant)

The command is started as soon as the input "I_b_StartRead" is set to TRUE.

All outputs are initially reset to FALSE. Active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; a data carrier read in
O_b_Done = TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier = FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy = FALSE (changes to FALSE with the end of the command execution)
O_b_Finish = TRUE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 1 (number of data carrier read during the execution of the command)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	FALSE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_StartRead" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#31
ReadData[5]	Byte	16#0	16#32
ReadData[6]	Byte	16#0	16#33
ReadData[7]	Byte	16#0	16#34
ReadData[8]	Byte	16#0	16#35
ReadData[9]	Byte	16#0	16#36
ReadData[10]	Byte	16#0	16#37
ReadData[11]	Byte	16#0	16#38
ReadData[12]	Byte	16#0	16#39
ReadData[13]	Byte	16#0	16#3A
ReadData[14]	Byte	16#0	16#3B
ReadData[15]	Byte	16#0	16#3C
ReadData[16]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode _Basic_ UserData" in data structure "ReadData"; Long form data format

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

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monito..
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#30
ReadData[1]	Byte	16#0	16#00
ReadData[2]	Byte	16#0	16#31
ReadData[3]	Byte	16#0	16#32
ReadData[4]	Byte	16#0	16#33
ReadData[5]	Byte	16#0	16#34
ReadData[6]	Byte	16#0	16#35
ReadData[7]	Byte	16#0	16#36
ReadData[8]	Byte	16#0	16#37
ReadData[9]	Byte	16#0	16#38
ReadData[10]	Byte	16#0	16#39
ReadData[11]	Byte	16#0	16#3A
ReadData[12]	Byte	16#0	16#3B
ReadData[13]	Byte	16#0	16#3C
ReadData[14]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic_ UserData" in data structure "ReadData"; Short Form Data Format

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#1A
TagInformation[2]	Byte	16#0	16#07
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Arra...		

Additional information within data block "IUT-F191_ Expert-Mode_Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access was made

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#31
TagInformation	Array...		

Number of identified data carrier within data block "IUT-F191_Expert Mode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-11-13:17:35.548433088
Date_Status_00	DTL	DTL#19	DTL#2023-10-11-13:17:35.532834382
Date_Status_0F	DTL	DTL#19	DTL#2023-10-11-13:17:35.748872986
Date_Start_Command	DTL	DTL#19	DTL#2023-10-11-13:17:35.493632706
Time_Status_0B	Time	T#0ms	T#54MS
Time_Status_00	Time	T#0ms	T#39MS
Time_Status_0F	Time	T#0ms	T#255MS

Timing behavior:
Receive status 16#00 telegram → after T#39ms
Receive status 16#0B telegram → after T#54ms
Receive status 16#0F Telegram → after T#255ms

Single Read UII/EPC without data carrier in the detection zone or no data carrier detected:

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; no data carrier detected or read in.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (no data carrier read)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#30
TagInformation	Array...		

Number of identified data carriers within data block "IUT-F191_ ExpertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303030 = "0000" = 0 (no) data carrier

Command Single Read UII/EPC:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat...	Star...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#06
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#03
OutData[5]	Byte	16#0	16#D2
OutData[6]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191_ Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#06
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0003
OutData[5]:	Command	16#D2

5.8 EN - Enhanced Read UII/EPC (Bank 01; UII/EPC)

The "Enhanced Read UII/EPC" command executes a permanent read access to the UII/EPC information (memory bank 01). The "I_b_EPC" and "I_b_SingleEnhanced" inputs must be set to TRUE before the command is executed. The "I_b_UserMemory_TID" input must be set to FALSE.

Command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the

one-time signal change. Before starting a new command execution, the "I_b_StartRead" input must be set to 0 again for at least one cycle. The "I_b_StartRead" input must be set to FALSE before other commands (read; write; quit) can be triggered.

The data read from the data carrier during execution of the command are stored within the "IUT-F191_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. The additional information (e.g., RSSI value) about the volume access is stored in the "TagInformation" data structure. If a tag leaves the detection zone during command execution and can no longer be detected by the RFID station, the "EPC_LeaveTag" data structure contains the UII/EPC information for this tag.

Enhanced Read UII/EPC:

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution
I_b_UserMemory_TID := FALSE (not relevant)
I_b_EPC := TRUE (access to UII/EPC)
I_b_SingleEnhanced := TRUE (permanent command execution)
I_w_ByteAddress := 16#0000 (not relevant)
I_i_ByteNumber := 0 (not relevant)

The command is started as soon as the input "I_b_StartRead" is set to TRUE.

All outputs are initially reset to FALSE. Active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; no data carrier.
O_b_Done = FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier = TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy = TRUE (changes to FALSE with the end of the command execution)
O_b_Finish = FALSE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 0 (number of data carrier read during the execution of the command)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the start of the command execution; 1 data carrier read.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carrier read during the execution of the command)

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#31
ReadData[5]	Byte	16#0	16#32
ReadData[6]	Byte	16#0	16#33
ReadData[7]	Byte	16#0	16#34
ReadData[8]	Byte	16#0	16#35
ReadData[9]	Byte	16#0	16#36
ReadData[10]	Byte	16#0	16#37
ReadData[11]	Byte	16#0	16#38
ReadData[12]	Byte	16#0	16#39
ReadData[13]	Byte	16#0	16#3A
ReadData[14]	Byte	16#0	16#3B
ReadData[15]	Byte	16#0	16#3C
ReadData[16]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode _Basic_ UserData" in data structure "ReadData"; Long form data format

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

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monito..
Static			
IUT-F191-IO-V1	*...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#30
ReadData[1]	Byte	16#0	16#00
ReadData[2]	Byte	16#0	16#31
ReadData[3]	Byte	16#0	16#32
ReadData[4]	Byte	16#0	16#33
ReadData[5]	Byte	16#0	16#34
ReadData[6]	Byte	16#0	16#35
ReadData[7]	Byte	16#0	16#36
ReadData[8]	Byte	16#0	16#37
ReadData[9]	Byte	16#0	16#38
ReadData[10]	Byte	16#0	16#39
ReadData[11]	Byte	16#0	16#3A
ReadData[12]	Byte	16#0	16#3B
ReadData[13]	Byte	16#0	16#3C
ReadData[14]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic_ UserData" in data structure "ReadData"; Short Form Data Format

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
TagInformation	Array...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#1A
TagInformation[2]	Byte	16#0	16#0D
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Array...		

Additional information within data block "IUT-F191_ Expert-Mode_Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access was made

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-11-13:38:16.496303319
Date_Status_00	DTL	DTL#19	DTL#2023-10-11-13:38:16.480116622
Date_Status_0F	DTL	DTL#19	DTL#1970-01-01-00:00:00
Date_Start_Command	DTL	DTL#19	DTL#2023-10-11-13:38:08.670758404
Time_Status_0B	Time	T#0ms	T#7S_825MS
Time_Status_00	Time	T#0ms	T#7S_809MS
Time_Status_0F	Time	T#0ms	T#0MS

Timing behavior:
Receive status 16#00 telegram → after T#7S_809ms
Receive status 16#0B telegram → after T#7S_825ms

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

Command active; data carrier has left detection zone
O_b_Done = FALSE (changes to TRUE with the reception of the read-in data)
O_b_NoDataCarrier = TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy = TRUE (changes to FALSE with the end of the command execution)
O_b_Finish = FALSE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#05 (status value of the last telegram received from the RFID station)
O_w_AccessCounter = 1 (number of data carrier read during the execution of the command)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
EPC_LeaveTag	Array...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#30
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#31
EPC_LeaveTag[5]	Byte	16#0	16#32
EPC_LeaveTag[6]	Byte	16#0	16#33
EPC_LeaveTag[7]	Byte	16#0	16#34
EPC_LeaveTag[8]	Byte	16#0	16#35
EPC_LeaveTag[9]	Byte	16#0	16#36
EPC_LeaveTag[10]	Byte	16#0	16#37
EPC_LeaveTag[11]	Byte	16#0	16#38
EPC_LeaveTag[12]	Byte	16#0	16#39
EPC_LeaveTag[13]	Byte	16#0	16#3A
EPC_LeaveTag[14]	Byte	16#0	16#3B
EPC_LeaveTag[15]	Byte	16#0	16#3C
EPC_LeaveTag[16]	Byte	16#0	16#00

UII/EPC Information of the data carrier logged off from the RFID station.

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

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

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

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	TRUE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Command execution active; second data carrier read in

O_b_Done	= TRUE (changes to TRUE with the receipt of the read-in data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0B (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carriers read during command execution)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	FALSE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

Reset input "I_b_StartRead" to FALSE

Before executing further commands, the input must be set back to FALSE.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	TRUE	TRUE
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	2	
"PQI"	%MB10	Hex	16#B0	

End command execution by Quit
The activated Enhanced command is terminated when the "I_b_Quit" input is set to TRUE. The "I_b_StartRead" input must be set back to FALSE beforehand.

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= not relevant
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 2 (number of data carrier read during the execution of the command)

Command Enhanced Read UII/EPC:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat...	Star...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#06
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#03
OutData[5]	Byte	16#0	16#D3
OutData[6]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191_ Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#06
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0003
OutData[5]:	Command	16#D3

5.9 #SU - Single Write UII/EPC (Bank 01; UII/EPC)

The "Single Write UII/EPC" command performs a single write access to the UII/EPC (memory bank 11). The "I_b_UserMemory_TID" and "I_b_SingleEnhanced" inputs are set to FALSE. The "I_b_EPC" input is set to TRUE. Before starting the command, the length of the UII/EPC information (PC word + UII/EPC code) must be passed to the input parameter "I_i_ByteNumber". The start address (I_w_ByteAddress) for this command always has the value 16#0000. The information to be programmed on the data carrier must be specified in the "WriteData" data structure before the command is executed.

The UII/EPC information to be programmed on the data carrier consists of the PC-Word and the actual UII/EPC code. The PC word has a length of 2 bytes and, in addition to length information about the UII/EPC code, also contains additional information about the code. Depending on the length of the UII/EPC code to be programmed, the value of the PC word to be used for programming thus changes.

Length UII resp. EPC Code	PC Word EPC	PC Word UII	„I_i_ByteNumber“	Example for EPC Code
2	16#0800	16#0900	4	16#0800_0102
4	16#1000	16#1100	6	16#1000_0102_0304
6	16#1800	16#1900	8	16#1800_0102_0304_0506
8	16#2000	16#2100	10	16#2000_0102_0304_0506_0708
10	16#2800	16#2900	12	16#2800_0102_0304_0506_0708_090A
12	16#3000	16#3100	14	16#3000_0102_0304_0506_0708_090A_0B0C
14	16#3800	16#3900	16	16#3800_0102_0304_0506_0708_090A_0B0C_0D0E
16	16#4000	16#4100	18	16#4000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00
18	16#4800	16#4900	20	16#4800_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102
20	16#5000	16#5100	22	16#5000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304
22	16#5800	16#5900	24	16#5800_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506

Single Write UII/EPC with a data carrier in the detection zone: Write EPC code with a length of 12 bytes (2 bytes PC word + 12 bytes UII/EPC code)

Assignment of write data in the "WriteData" data structure

Name	...	Di...	Moni..	Modif...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[0]		Hex	16#30	16#30
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[2]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[3]		Hex	16#02	16#02
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[4]		Hex	16#03	16#03
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[5]		Hex	16#04	16#04
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[6]		Hex	16#05	16#05
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[7]		Hex	16#06	16#06
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[8]		Hex	16#07	16#07
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[9]		Hex	16#08	16#08
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[10]		Hex	16#09	16#09
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[11]		Hex	16#0A	16#0A
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[12]		Hex	16#0B	16#0B
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[13]		Hex	16#0C	16#0C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".WriteData[14]		Hex	16#00	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monito...
WriteData	Arra...		
WriteData[0]	Byte	16#0	16#30
WriteData[1]	Byte	16#0	16#00
WriteData[2]	Byte	16#0	16#01
WriteData[3]	Byte	16#0	16#02
WriteData[4]	Byte	16#0	16#03
WriteData[5]	Byte	16#0	16#04
WriteData[6]	Byte	16#0	16#05
WriteData[7]	Byte	16#0	16#06
WriteData[8]	Byte	16#0	16#07
WriteData[9]	Byte	16#0	16#08
WriteData[10]	Byte	16#0	16#09
WriteData[11]	Byte	16#0	16#0A
WriteData[12]	Byte	16#0	16#0B
WriteData[13]	Byte	16#0	16#0C
WriteData[14]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	14	14
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution

I_b_UserMemory_TID	:= FALSE (not relevant)
I_b_EPC	:= TRUE (access to UII/EPC)
I_b_SingleEnhanced	:= FALSE (single command execution)
I_w_ByteAddress	:= 16#0000 (start address on data carrier)
I_i_ByteNumber	:= 14 (a UII/EPC information of 14 bytes is written)

The command is started as soon as input "I_b_StartWrite" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	14	14
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; a data carrier programmed

O_b_Done	= TRUE (changes to TRUE with the reception of the UII/EPC information)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 1 (number of data carriers programmed during command execution)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	FALSE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	14	14
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	1	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_StartWrite" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monito...
EPC_WrittenTag	Arra...		
EPC_WrittenTag[0]	Byte	16#0	16#00
EPC_WrittenTag[1]	Byte	16#0	16#0E
EPC_WrittenTag[2]	Byte	16#0	16#30
EPC_WrittenTag[3]	Byte	16#0	16#00
EPC_WrittenTag[4]	Byte	16#0	16#01
EPC_WrittenTag[5]	Byte	16#0	16#02
EPC_WrittenTag[6]	Byte	16#0	16#03
EPC_WrittenTag[7]	Byte	16#0	16#04
EPC_WrittenTag[8]	Byte	16#0	16#05
EPC_WrittenTag[9]	Byte	16#0	16#06
EPC_WrittenTag[10]	Byte	16#0	16#07
EPC_WrittenTag[11]	Byte	16#0	16#08
EPC_WrittenTag[12]	Byte	16#0	16#09
EPC_WrittenTag[13]	Byte	16#0	16#0A
EPC_WrittenTag[14]	Byte	16#0	16#0B
EPC_WrittenTag[15]	Byte	16#0	16#0C
EPC_WrittenTag[16]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "EPC_WrittenTag"; Long form data format

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

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

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

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
EPC_WrittenTag	Arra...		
EPC_WrittenTag[0]	Byte	16#0	16#30
EPC_WrittenTag[1]	Byte	16#0	16#00
EPC_WrittenTag[2]	Byte	16#0	16#01
EPC_WrittenTag[3]	Byte	16#0	16#02
EPC_WrittenTag[4]	Byte	16#0	16#03
EPC_WrittenTag[5]	Byte	16#0	16#04
EPC_WrittenTag[6]	Byte	16#0	16#05
EPC_WrittenTag[7]	Byte	16#0	16#06
EPC_WrittenTag[8]	Byte	16#0	16#07
EPC_WrittenTag[9]	Byte	16#0	16#08
EPC_WrittenTag[10]	Byte	16#0	16#09
EPC_WrittenTag[11]	Byte	16#0	16#0A
EPC_WrittenTag[12]	Byte	16#0	16#0B
EPC_WrittenTag[13]	Byte	16#0	16#0C
EPC_WrittenTag[14]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F191_ExpertMode_Basic_UserData" in data structure "EPC_WrittenTag"; Short form data format

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

EPC_WrittenTag [2…13]: UII/EPC-Code
Length depends on the programming of the tag; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
TagInformation	Array...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#1A
TagInformation[2]	Byte	16#0	16#0D
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#64
EPC_WrittenTag	Array...		

Additional information within data block "IUT-F191_ Expert-Mode_Basic_UserData" in data structure "TagInformation
TagInformation[0]: Information type
Length 1 byte; always 16#01
TagInformation[1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation[2]: Send channel
Length 1 byte; send channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D

TagInformation[3...4]: Transmit power
Length 2 bytes; transmit power on which the data carrier access was made

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monito...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#31
TagInformation	Array...		

Number of identified data carrier within data block "IUT-F191 _Ex-pertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ...	Monitor value
Date_Status_0B	DTL	DTL#19	DTL#2023-10-11-17:17:11.878364879
Date_Status_00	DTL	DTL#19	DTL#2023-10-11-17:17:11.862310622
Date_Status_0F	DTL	DTL#19	DTL#2023-10-11-17:17:12.070430453
Date_Start_Command	DTL	DTL#19	DTL#2023-10-11-17:17:11.781340693
Time_Status_0B	Time	T#0ms	T#97MS
Time_Status_00	Time	T#0ms	T#80MS
Time_Status_0F	Time	T#0ms	T#289MS

Timing behavior:
Receive status 16#00 telegram → after T#80ms
Receive status 16#0B telegram → after T#97ms
Receive status 16#0F Telegram → after T#289ms

Single Write UII/EPC without data carrier in the detection zone or no data carrier detected

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	TRUE	TRUE
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	14	14
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#80	

After the end of the command execution; no data carrier detected or written.

O_b_Done	= TRUE (changes to TRUE with the receipt of the UII/EPC information)
O_b_NoDataCarrier	= TRUE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#0F (status value of the last telegram received from the RFID station)
O_w_AccessCounter	= 0 (no data carrier detected)

IUT-F191_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monit...
NumberTags	Array...		
NumberTags[0]	Byte	16#0	16#30
NumberTags[1]	Byte	16#0	16#30
NumberTags[2]	Byte	16#0	16#30
NumberTags[3]	Byte	16#0	16#30
TagInformation	Array...		

Number of identified data carrier within data block "IUT-F191 _Ex-pertMode_Basic_UserData" in data structure "NumberTags

NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303030 = "0000" = 0 (no) data carrier

Command Single Write UII/EPC:

IUT-F191_ExpertMode_Basic_InstDB

	Name	Dat...	Start...	Monit...
	OutData	Arr...		
	OutData[0]	Byte	16#0	16#20
	OutData[1]	Byte	16#0	16#15
	OutData[2]	Byte	16#0	16#00
	OutData[3]	Byte	16#0	16#00
	OutData[4]	Byte	16#0	16#12
	OutData[5]	Byte	16#0	16#CE
	OutData[6]	Byte	16#0	16#0E
	OutData[7]	Byte	16#0	16#30
	OutData[8]	Byte	16#0	16#00
	OutData[9]	Byte	16#0	16#01
	OutData[10]	Byte	16#0	16#02
	OutData[11]	Byte	16#0	16#03
	OutData[12]	Byte	16#0	16#04
	OutData[13]	Byte	16#0	16#05
	OutData[14]	Byte	16#0	16#06
	OutData[15]	Byte	16#0	16#07
	OutData[16]	Byte	16#0	16#08
	OutData[17]	Byte	16#0	16#09
	OutData[18]	Byte	16#0	16#0A
	OutData[19]	Byte	16#0	16#0B
	OutData[20]	Byte	16#0	16#0C
	OutData[21]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#15
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0012
OutData[5]:	Command	16#CE
OutData[6]:	Length UII/EPC inform.	16#0E
OutData[7…8]:	PC Word	16#3000
OutData[9]:	UII/EPC Byte 1	16#01
OutData[10]:	UII/EPC Byte 2	16#02
OutData[11]:	UII/EPC Byte 3	16#03
OutData[12]:	UII/EPC Byte 4	16#04
OutData[13]:	UII/EPC Byte 5	16#05
OutData[14]:	UII/EPC Byte 6	16#06
OutData[15]:	UII/EPC Byte 7	16#07
OutData[16]:	UII/EPC Byte 8	16#08
OutData[17]:	UII/EPC Byte 9	16#09
OutData[18]:	UII/EPC Byte 10	16#0A
OutData[19]:	UII/EPC Byte 11	16#0B
OutData[20]:	UII/EPC Byte 12	16#0C

5.10 Special Command

The "Special Command" function can be used to execute all commands that cannot be executed via the input parameters of the function block. This includes, for example, the "Read Parameter" and "Write Parameter" commands by which the UHF parameters can be read or changed via the process data. The "Special Command" function allows all permissible commands of the RFID station to be executed.

Before executing a "Special Command", the command telegram must be transferred to the "Special-Command" data field of the "IUT-F191_ExpertMode_Basic_UserData" data block. Command execution is started by a positive edge at the "I_b_SpecialCommand" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next cycle of the PLC or remain TRUE. The command execution is triggered exactly once by the one-time signal change. Before starting a new command execution, the "I_b_SpecialCommand" input must be set to 0 again for at least one cycle. Before other commands (read; write; quit) can be controlled, the "I_b_SpecialCommand" input must be set to FALSE.

The "I_b_UserMemory_TID", "I_b_EPC" and "I_b_SingleEnhanced" inputs are not relevant for the execution of a "SpecialCommand" and can be set to FALSE. Likewise, the input parameters "I_i_ByteNumber" and "I_w_ByteAddress" have no meaning for the command execution and are to be set to 0.

5.10.1 Read Parameter MB (“Memory Bank”)

Assignment of command telegram in "SpecialCommand" data structure

Name	A...	Dis...	Monit...	Modify ...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Cha...	'M'	'M'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Cha...	'B'	'B'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#00	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ...	Monit...
SpecialCommand	Arra...		
SpecialCommand[0]	Byte	16#0	16#0B
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#08
SpecialCommand[4]	Byte	16#0	16#BE
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#4D
SpecialCommand[7]	Byte	16#0	16#42
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

SpecialCommand[0]: Frame Length 16#0B
SpecialCommand[1]: Fragmentation Counter 16#00
SpecialCommand[2…3]: Telegram Length 16#0008
SpecialCommand[4]: Command 16#BE
SpecialCommand[5]: SystemCode „U“ 16#55
SpecialCommand[6]: Parameter High Byte „M“ 16#4D
SpecialCommand[7]: Parameter Low Byte „B“ 16#42
SpecialCommand[8]: Parameter Length High 16#00
SpecialCommand[9]: Parameter Length Low 16#00

Name	Address	Displ...	Monitor ...	Mod...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution
I_b_UserMemory_TID := FALSE (not relevant)
I_b_EPC := FALSE (not relevant))
I_b_SingleEnhanced := FALSE (not relevant))
I_w_ByteAddress := 16#0000 (not relevant))
I_i_ByteNumber := 0 (not relevant))

The command is started as soon as the input "I_b_SpecialCommand" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	FALSE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_Special-Command" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	"...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#03
ReadData[1]	Byte	16#0	16#00
ReadData[2]	Byte	16#0	16#00
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#00

Read data within data block "IUT-F191_Expert Mode_Basic _UserData" in data structure "ReadData

ReadData[0]: Read-in value Parameter MB
Length depends on the parameter read in; 16#03 = Memory Bank 11 = User Memory

Command Read Parameter for access to parameter MB (Memory Bank):

IUT-F191_ExpertMode_Basic_InstDB

Name	Da...	Star..	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#0B
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#08
OutData[5]	Byte	16#0	16#BE
OutData[6]	Byte	16#0	16#55
OutData[7]	Byte	16#0	16#4D
OutData[8]	Byte	16#0	16#42
OutData[9]	Byte	16#0	16#00
OutData[10]	Byte	16#0	16#00
OutData[11]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0B
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0008
OutData[5]:	Command	16#BE
OutData[6]:	SystemCode „U“	16#55
OutData[7]:	Parameter High Byte „M“	16#4D
OutData[8]:	Parameter Low Byte „B“	16#42
OutData[9]:	Length High Byte	16#00
OutData[10]:	Length Low Byte	16#00

5.10.2 Write Parameter MB (“Memory Bank”)

Example: Change parameter MB ("Memory Bank") to the value 16#01

Name	A...	Dis...	Monit...	Modify ...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Cha...	'M'	'M'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Cha...	'B'	'B'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[11]		Hex	16#00	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
SpecialCommand	Arra...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#4D
SpecialCommand[7]	Byte	16#0	16#42
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#01
SpecialCommand[11]	Byte	16#0	16#00

SpecialCommand[0]:	Frame Length	16#0C
SpecialCommand[1]:	Fragmentation Counter	16#00
SpecialCommand[2…3]:	Telegram Length	16#0009
SpecialCommand[4]:	Command	16#BF
SpecialCommand[5]:	SystemCode „U“	16#55
SpecialCommand[6]:	Parameter High Byte „M“	16#4D
SpecialCommand[7]:	Parameter Low Byte „B“	16#42
SpecialCommand[8]:	Parameter Length High	16#00
SpecialCommand[9]:	Parameter Length Low	16#01
SpecialCommand[10]:	Parameter Value	16#01

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution

I_b_UserMemory_TID	:= FALSE (not relevant)
I_b_EPC	:= FALSE (not relevant))
I_b_SingleEnhanced	:= FALSE (not relevant))
I_w_ByteAddress	:= 16#0000 (not relevant))
I_i_ByteNumber	:= 0 (not relevant))

The command is started as soon as the input "I_b_SpecialCommand" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	FALSE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_SpecialCommand" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	S...	Monitor ...
Static			
IUT-F191-IO-V1	"IUT...		
ReadData	Arr...		
ReadData[0]	Byte	16#	16#00
ReadData[1]	Byte	16#	16#00
ReadData[2]	Byte	16#	16#00
ReadData[3]	Byte	16#	16#00
ReadData[4]	Byte	16#	16#00
ReadData[5]	Byte	16#	16#00
ReadData[6]	Byte	16#	16#00
ReadData[7]	Byte	16#	16#00

Read data within data block "IUT-F191_ExpertMode_Basic _UserData" in data structure "ReadData

No data is transferred when the "Write Parameter" command is executed.

Command Write Parameter for a change of the parameter MB (Memory Bank) to the value 16#01:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat...	Start...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#C0
OutData[1]	Byte	16#0	16#0C
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#09
OutData[5]	Byte	16#0	16#BF
OutData[6]	Byte	16#0	16#55
OutData[7]	Byte	16#0	16#4D
OutData[8]	Byte	16#0	16#42
OutData[9]	Byte	16#0	16#00
OutData[10]	Byte	16#0	16#01
OutData[11]	Byte	16#0	16#01
OutData[12]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0C
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0009
OutData[5]:	Command	16#BF
OutData[6]:	SystemCode “U”	16#55
OutData[7]:	Parameter High Byte “M”	16#4D
OutData[8]:	Parameter Low Byte “B”	16#42
OutData[9]:	Length High Byte	16#00
OutData[10]:	Length Low Byte	16#01
OutData[11]:	Parameter Value	16#01

5.10.3 Read Parameter FL (“Filter”)

Assignment of command telegram in "SpecialCommand" data structure

Name	A...	Dis...	Monit...	Modify ...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0		...	16#0C	16#0C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Cha...	'F'	'F'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Cha...	'L'	'L'
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[11]		Hex	16#00	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Da...	Star..	Monit...
SpecialCommand	Arr...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BE
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#46
SpecialCommand[7]	Byte	16#0	16#4C
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#00
SpecialCommand[11]	Byte	16#0	16#00

SpecialCommand[0]: Frame Length 16#0C
SpecialCommand[1]: Fragmentation Counter 16#00
SpecialCommand[2…3]: Telegram Length 16#0009
SpecialCommand[4]: Command 16#BE
SpecialCommand[5]: SystemCode “U” 16#55
SpecialCommand[6]: Parameter High Byte “F” 16#46
SpecialCommand[7]: Parameter Low Byte “L” 16#4C
SpecialCommand[8]: Parameter Length High 16#00
SpecialCommand[9]: Parameter Length Low 16#01
SpecialCommand[10]: Filter Number 16#00

The following filters are available:
Filter 0 → Filter Number := 16#00
Filter 1 → Filter Number := 16#01
Filter 2 → Filter Number := 16#02

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

Before starting the command execution
I_b_UserMemory_TID := FALSE (not relevant)
I_b_EPC := FALSE (not relevant))
I_b_SingleEnhanced := FALSE (not relevant))
I_w_ByteAddress := 16#0000 (not relevant))
I_i_ByteNumber := 0 (not relevant))

The command is started as soon as the input "I_b_SpecialCommand" is set to TRUE.

All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed.
O_b_Done = TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier = FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy = FALSE (changes to FALSE with the end of the command execution)
O_b_Finish = TRUE (changes with the end of the command execution to TRUE)
O_b_Error = FALSE (changes to TRUE if an error occurred)
O_B_Status = 16#00 (status value of the last telegram received from the RFID station)

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	FALSE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; reset input "I_b_Special-Command" to FALSE

Before executing further commands, the input must be set back to FALSE.

IUT-F191_ExpertMode_Basic_UserData

Name	Dat...	Start ..	Monit...
Static			
IUT-F191-IO-V1	"...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#30
ReadData[1]	Byte	16#0	16#30
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#30
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#30
ReadData[6]	Byte	16#0	16#30
ReadData[7]	Byte	16#0	16#30
ReadData[8]	Byte	16#0	16#30
ReadData[9]	Byte	16#0	16#30
ReadData[10]	Byte	16#0	16#00

Read data within data block "IUT-F191_ExpertMode_Basic _UserData" in data structure "ReadData

ReadData[0]:	Memory Bank	16#30
ReadData[1]:	Negation	16#30
ReadData[2]:	Logical Operation	16#30
ReadData[3]:	Truncation	16#30
ReadData[4]:	unused	16#30
ReadData[5]:	unused	16#30
ReadData[6…7]:	Bit address	16#3030 = „00“
ReadData[8…9]:	Bit length	16#3030 = „00“

Command Read Parameter for access to parameter FL (Filter):

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat...	Start..	Monit...
OutData	...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#0C
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#09
OutData[5]	Byte	16#0	16#BE
OutData[6]	Byte	16#0	16#55
OutData[7]	Byte	16#0	16#46
OutData[8]	Byte	16#0	16#4C
OutData[9]	Byte	16#0	16#00
OutData[10]	Byte	16#0	16#01
OutData[11]	Byte	16#0	16#00
OutData[12]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0C
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0009
OutData[5]:	Command	16#BE
OutData[6]:	SystemCode “U”	16#55
OutData[7]:	Parameter High Byte “F”	16#46
OutData[8]:	Parameter Low Byte “L”	16#4C
OutData[9]:	Length High Byte	16#00
OutData[10]:	Length Low Byte	16#01
OutData[11]:	Filter Number	16#00

The following filters are available:
Filter 0 → Filter Number := 16#00
Filter 1 → Filter Number := 16#01
Filter 2 → Filter Number := 16#02

5.10.4 Setting Filter to User Memory (Bank 11)

Assignment of command telegram in "SpecialCommand" data structure

Name	A...	Dis...	Monit...	Modify ...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#0D	16#0D
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#0A	16#0A
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#CA	16#CA
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Hex	16#18	16#18
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#08	16#08
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[11]		Hex	16#31	16#31
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[12]		Hex	16#00	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Da...	Star..	Monit...
SpecialCommand	Arr...		
SpecialCommand[0]	Byte	16#0	16#0D
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#0A
SpecialCommand[4]	Byte	16#0	16#CA
SpecialCommand[5]	Byte	16#0	16#00
SpecialCommand[6]	Byte	16#0	16#18
SpecialCommand[7]	Byte	16#0	16#00
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#08
SpecialCommand[11]	Byte	16#0	16#31
SpecialCommand[12]	Byte	16#0	16#00

SpecialCommand[0]:	Frame Length	16#0D
SpecialCommand[1]:	Fragmentation Counter	16#00
SpecialCommand[2…3]:	Telegram Length	16#000A
SpecialCommand[4]:	Command	16#CA
SpecialCommand[5]:	Filter Number	16#00
SpecialCommand[6]:	Filter Byte	16#18
SpecialCommand[7…8]:	Bit Address	16#0000
SpecialCommand[9…10]:	Bit Length Mask	16#0008
SpecialCommand[11]:	Mask data	16#31

Structure Filter Byte:

7	6	5	4	3	2	1	0	
0	0	0	Memory Bank		Negation	Logical opera-tion	Trunca-tion	
			1	1	0	0	0	16#18

Memory Bank
- 00 = Reserved Memory Bank; Memory Bank 00; kill and Access password
- 01 = UII/EPC Memory Bank; Memory Bank 01; UII/EPC Code
- 10 = TID Memory Bank; Memory Bank 10; TID
- 11 = User Memory Bank; Memory Bank 11; User Memory

Negation
- 0 = not negated
- 1 = negated

Logical operation
- 0 = “or”
- 1 = “and”

Truncation
- 0 = send all
- 1 = send only this part of the UII/EPC Code which followed the filter mask

Name	Address	Displ...	Monitor ..	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed

O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution).
O_b_Finish	= TRUE (changes to TRUE at the end of command execution)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)

Set Filter command for setting the filter mask:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat..	St...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#0D
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#0A
OutData[5]	Byte	16#0	16#CA
OutData[6]	Byte	16#0	16#00
OutData[7]	Byte	16#0	16#18
OutData[8]	Byte	16#0	16#00
OutData[9]	Byte	16#0	16#00
OutData[10]	Byte	16#0	16#00
OutData[11]	Byte	16#0	16#08
OutData[12]	Byte	16#0	16#31
OutData[13]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB"

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0D
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#000A
OutData[5]:	Command	16#CA
OutData[6]:	Filter Number	16#00
OutData[7]:	Filter Byte	16#18
OutData[8…9]:	Bit Address	16#0000
OutData[10…11]:	Bit Length Mask	16#0008
OutData[12]:	Mask data	16#31

Reading the filter mask:

Name	A...	Dis...	Monit...	Modify...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Hex	16#55	16#55
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Hex	16#46	16#46
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Hex	16#4C	16#4C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[11]		Hex	16#00	16#00

SpecialCommand	...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BE
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#46
SpecialCommand[7]	Byte	16#0	16#4C
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#00
SpecialCommand[11]	Byte	16#0	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Dat..	Star..	Monit...
Static			
IUT-F191-IO-V1	"IU...		
ReadData	...		
ReadData[0]	Byte	16#0	16#33
ReadData[1]	Byte	16#0	16#30
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#30
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#30
ReadData[6]	Byte	16#0	16#30
ReadData[7]	Byte	16#0	16#30
ReadData[8]	Byte	16#0	16#30
ReadData[9]	Byte	16#0	16#38
ReadData[10]	Byte	16#0	16#31
ReadData[11]	Byte	16#0	16#00

Read data within data block "IUT-F191_Expert Mode_Basic _UserData" in data structure "ReadData

ReadData[0]:	Memory Bank	16#33 = User Memory
ReadData[1]:	Negation	16#30
ReadData[2]:	Logical Operation	16#30
ReadData[3]:	Truncation	16#30
ReadData[4]:	unused	16#30
ReadData[5]:	unused	16#30
ReadData[6…7]:	Bit address	16#3030 = „00“
ReadData[8…9]:	Bit length	16#3038 = „08“ = 8 Bit
ReadData[10]:	Mask Data	16#31

Activation of the filter:

Name	A...	Dis...	Monit...	Modify...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#07	16#07
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#04	16#04
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#CB	16#CB
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Hex	16#00	16#00

SpecialCommand	...		
SpecialCommand[0]	Byte	16#0	16#07
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#04
SpecialCommand[4]	Byte	16#0	16#CB
SpecialCommand[5]	Byte	16#0	16#01
SpecialCommand[6]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ...	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed.

O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes to TRUE at the end of command execution)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)

Activate Filter command to activate the filter function:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat..	St...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#07
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#04
OutData[5]	Byte	16#0	16#CB
OutData[6]	Byte	16#0	16#01
OutData[7]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#07
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0004
OutData[5]:	Command	16#CB
OutData[6]:	Filter Mode	16#01

5.10.5 Setting Filter to UII/EPC (Bank 01)

Assignment of command telegram in "SpecialCommand" data structure

Name	A...	Dis...	Monit...	Modify...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#0E	16#0E
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#0B	16#0B
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#CA	16#CA
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Hex	16#08	16#08
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#20	16#20
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#10	16#10
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[11]		Hex	16#30	16#30
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[12]		Hex	16#14	16#14
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[13]		Hex	16#00	16#00

SpecialCommand	...		
SpecialCommand[0]	Byte	16#0	16#0E
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#0B
SpecialCommand[4]	Byte	16#0	16#CA
SpecialCommand[5]	Byte	16#0	16#00
SpecialCommand[6]	Byte	16#0	16#08
SpecialCommand[7]	Byte	16#0	16#00
SpecialCommand[8]	Byte	16#0	16#20
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#10
SpecialCommand[11]	Byte	16#0	16#30
SpecialCommand[12]	Byte	16#0	16#14
SpecialCommand[13]	Byte	16#0	16#00

SpecialCommand[0]:	Frame Length	16#0E
SpecialCommand[1]:	Fragmentation Counter	16#00
SpecialCommand[2…3]:	Telegram Length	16#000B
SpecialCommand[4]:	Command	16#CA
SpecialCommand[5]:	Filter Number	16#00
SpecialCommand[6]:	Filter Byte	16#08
SpecialCommand[7…8]:	Bit Address	16#0020
SpecialCommand[9…10]:	Bit Length Mask	16#0010
SpecialCommand[11]:	Mask data	16#30
SpecialCommand[12]:	Mask data	16#14

Structure Filter Byte:

7	6	5	4	3	2	1	0	
0	0	0	Memory Bank		Negation	Logical opera-tion	Trunca-tion	
			0	1	0	0	0	16#08

Memory Bank
- 00 = Reserved Memory Bank; Memory Bank 00; kill and Access password
- 01 = UII/EPC Memory Bank; Memory Bank 01; UII/EPC Code
- 10 = TID Memory Bank; Memory Bank 10; TID
- 11 = User Memory Bank; Memory Bank 11; User Memory

Negation
- 0 = not negated
- 1 = negated

Logical operation
- 0 = “or”
- 1 = “and”

Truncation
- 0 = send all
- 1 = send only this part of the UII/EPC Code which followed the filter mask

Name	Address	Displ...	Monitor ...	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)

Set Filter command for setting the filter mask:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat..	St...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#C0
OutData[1]	Byte	16#0	16#0E
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#0B
OutData[5]	Byte	16#0	16#CA
OutData[6]	Byte	16#0	16#00
OutData[7]	Byte	16#0	16#08
OutData[8]	Byte	16#0	16#00
OutData[9]	Byte	16#0	16#20
OutData[10]	Byte	16#0	16#00
OutData[11]	Byte	16#0	16#10
OutData[12]	Byte	16#0	16#30
OutData[13]	Byte	16#0	16#14
OutData[14]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB".

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#0E
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#000B
OutData[5]:	Command	16#CA
OutData[6]:	Filter Number	16#00
OutData[7]:	Filter Byte	16#08
OutData[8…9]:	Bit Address	16#0020
OutData[10…11]:	Bit Length Mask	16#0010
OutData[12]:	Mask data	16#30
OutData[13]:	Mask data	16#14

Reading the filter mask:

Name	A...	Dis...	Monit...	Modify...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Hex	16#55	16#55
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Hex	16#46	16#46
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[7]		Hex	16#4C	16#4C
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[10]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[11]		Hex	16#00	16#00

SpecialCommand	...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BE
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#46
SpecialCommand[7]	Byte	16#0	16#4C
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#00
SpecialCommand[11]	Byte	16#0	16#00

IUT-F191_ExpertMode_Basic_UserData

Name	Dat..	Star..	Monit...
Static			
IUT-F191-IO-V1	"IU...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#31
ReadData[1]	Byte	16#0	16#30
ReadData[2]	Byte	16#0	16#30
ReadData[3]	Byte	16#0	16#30
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#30
ReadData[6]	Byte	16#0	16#32
ReadData[7]	Byte	16#0	16#30
ReadData[8]	Byte	16#0	16#31
ReadData[9]	Byte	16#0	16#30
ReadData[10]	Byte	16#0	16#30
ReadData[11]	Byte	16#0	16#14
ReadData[12]	Byte	16#0	16#00

Read data within data block "IUT-F191_Expert Mode_Basic _UserData" in data structure "ReadData

ReadData[0]:	Memory Bank	16#31 = UII/EPC (Bank 01)
ReadData[1]:	Negation	16#30
ReadData[2]:	Logical Operation	16#30
ReadData[3]:	Truncation	16#30
ReadData[4]:	unused	16#30
ReadData[5]:	unused	16#30
ReadData[6…7]:	Bit address	16#3230 = „20“ (hex) = 32
ReadData[8…9]:	Bit length	16#3130 = „10“ (hex) = 16 Bit
ReadData[10]:	Mask Data	16#30
ReadData[11]:	Mask Data	16#14

Activation of the filter:

Name	A...	Dis...	Monit...	Modify...
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[0]		Hex	16#07	16#07
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[3]		Hex	16#04	16#04
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[4]		Hex	16#CB	16#CB
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[5]		Hex	16#01	16#01
"IUT-F191_ExpertMode_Basic_UserData"."IUT-F191-IO-V1".SpecialCommand[6]		Hex	16#00	16#00

SpecialCommand	...		
SpecialCommand[0]	Byte	16#0	16#07
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#04
SpecialCommand[4]	Byte	16#0	16#CB
SpecialCommand[5]	Byte	16#0	16#01
SpecialCommand[6]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ...	Mod..
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	TRUE	TRUE
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	DEC	0	
"ByteNumber"	%MW4	DEC	0	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	Bool	FALSE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#00	
"AccessCounter"	%MW8	DEC+/-	0	
"PQI"	%MB10	Hex	16#B0	

After the end of the command execution; command successfully executed

O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= FALSE (changes to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command execution)
O_b_Finish	= TRUE (changes with the end of the command execution to TRUE)
O_b_Error	= FALSE (changes to TRUE if an error occurred)
O_B_Status	= 16#00 (status value of the last telegram received from the RFID station)

Activate Filter command to activate the filter function:

IUT-F191_ExpertMode_Basic_InstDB

Name	Dat..	St...	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
OutData[1]	Byte	16#0	16#07
OutData[2]	Byte	16#0	16#00
OutData[3]	Byte	16#0	16#00
OutData[4]	Byte	16#0	16#04
OutData[5]	Byte	16#0	16#CB
OutData[6]	Byte	16#0	16#01
OutData[7]	Byte	16#0	16#00

Command telegram within instance data block "IUT-F191 _Expert-Mode_Basic_InstDB"

OutData[0]:	Control byte	
OutData[1]:	Frame Length	16#07
OutData[2]:	Fragmentation Counter	16#00
OutData[3…4]:	Telegram Length	16#0004
OutData[5]:	Command	16#CB
OutData[6]:	Filter Mode	16#01

6. Function block FB19117 “IUT-F191-FR1-01_ExpertMode_Param”

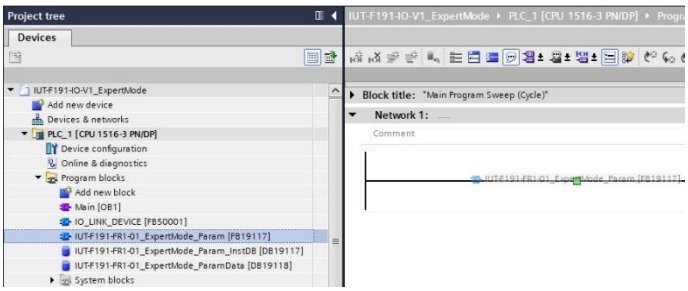
Functional description “IUT-F191-FR1-01_ExpertMode_Param”:
Function block for reading and changing the IO-Link parameters of the IUT-F191-IO-V1-FR1-01 RFID station (Europe). Read access is made on the one hand to the IO-Link standard parameters (e.g., vendor name) and on the other hand to the device-specific IO-Link parameters. Write access for a parameter change, on the other hand, is only performed on the device-specific IO-Link parameters.

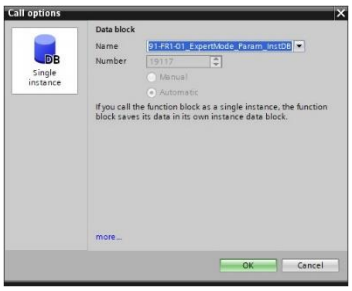
When executing write access to the device-specific IO-Link parameters, it should be noted that the number of possible write operations is limited by the storage of the parameter data in an EEPROM. It is therefore recommended that write access only be performed when a device has been newly installed.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

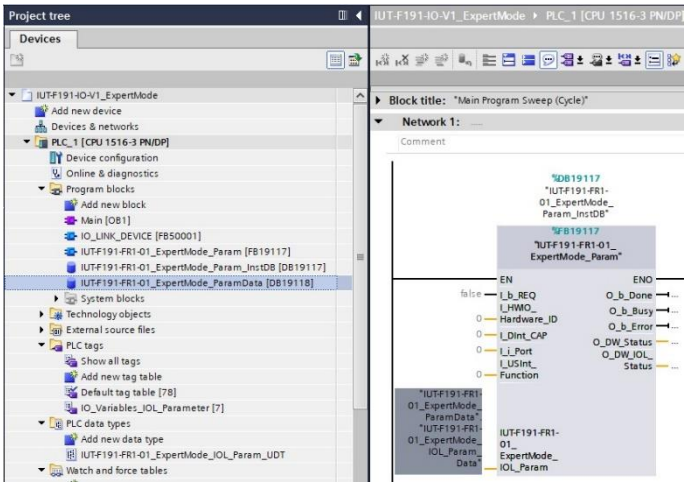
The DB19118 "IUT-F191_ParamData" data block contains the data structures for the IO-Link parameters read in. The data structures for changing the IO-Link parameters are preset with values identical to the factory setting of the RFID station.

Within the function block FB19117 "IUT-F191-FR1-01_ExpertMode_Param" the standard function block FB50001 "IO_LINK_DEVICE" is called. This function block carries out the actual transfer of the parameter data. This function block must also be copied into the project.

Implementation of function block "IUT-F191-FR1-01_ExpertMode_Param":
Drag function block "IUT-F191-FR1-01_ExpertMode_Param" (FB19117) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F191-FR1-01_ExpertMode_Param_InstDB" (DB19117) which can be used as instance data block. The instance data block can also be regenerated.

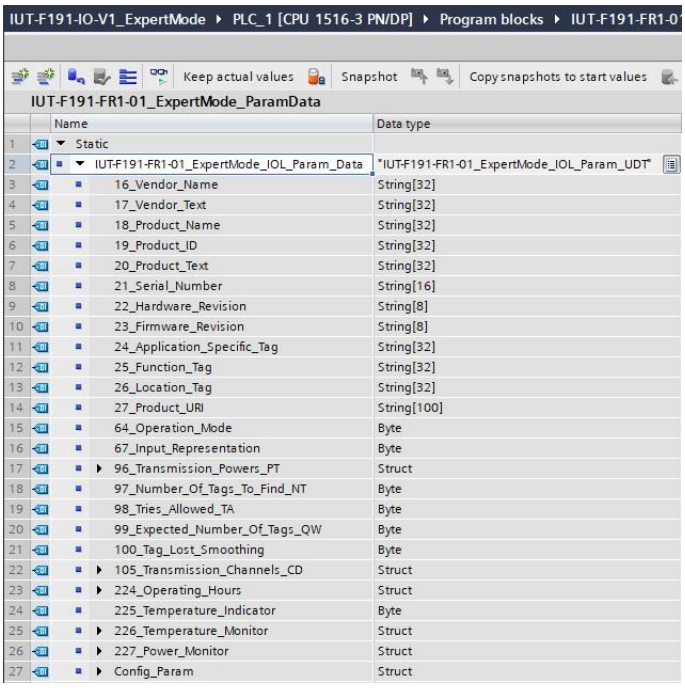






The IO-Link parameters read in are located in a separate data block. This is parameterized at the "IUT-F191-FR1-01_ExpertMode_IOL_Param" input. The library contains the data block DB19118 "IUT-F191-FR1-01_Expert Mode_ParamData" which can be used for this purpose.

The data block can be generated by the user. The internal data structure is generated from the library via the "IUT-F191-FR1-01_Expert Mode_IOL_Param_UDT" data type.

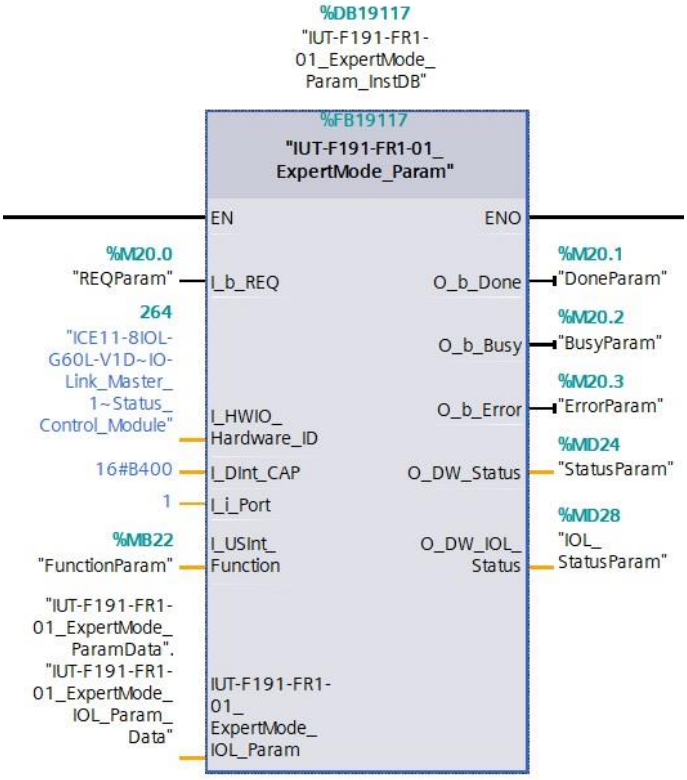


The "IUT-F191-FR1-01_ExpertMode_Param Data" data block consists of the "IUT-F191-FR1-01_ExpertMode _IOL_Param_Data" structure. This structure is formed from the "IUT-F191-FR1-01_ExpertMode _IOL_Param_UDT" UDT.

Overview IO-Link parameters

Name	Index Dec	Length	Access	Value range	Default setting
16_Venor_Name	16	String[32]	Read		'Pepperl+Fuchs'
17_Venor_Name	17	String[32]	Read		'www.pepperl-fuchs.com/io-link'
18_Product_Name	18	String[32]	Read		'IUT-F191-IO-V1-FR1-01'
19_Product_ID	19	String[32]	Read		'70113810'
20_Product_Text	20	String[32]	Read		'RFID read/write station'
21_Serial_Number	21	String[16]	Read		'xxxxxxxxxxxxx'
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/xxxxxxxxxxxx'
64_Operation_Mode	64	Byte	Read / Write	0 (16#00) = Expert Mode; 128 (16#80) = Easy Mode	128 (16#80) = Easy Mode
67_Input_Representation	67	Byte	Read / Write	0 = Long Form data format; 128 = Short Form data format	0 = Long Form data format
96_Transmission_Powers_PT	96	Struct	Read / Write		
96_Transmission_Powers_PT. 1_Power_1	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100	100 = 100mW
96_Transmission_Powers_PT. 2_Power_2	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
96_Transmission_Powers_PT. 3_Power_3	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
96_Transmission_Powers_PT. 4_Power_4	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
96_Transmission_Powers_PT. 5_Power_5	96	Int	Read / Write	3; 4; 5; 8; 10; 13; 15; 20; 25; 30; 40; 50; 60; 80; 100; 0	0 = off
97_Number_Of_Tags_To_Find_NT	97	Byte	Read / Write	1…20; 255 = off	255
98_Tries Allowed_TA	98	Byte	Read / Write	1…10	2
99_Expected_Number_Of_Tags_QW	99	Byte	Read / Write	0…4	2
100_Tag_Lost_Smoothing_E5	100	Byte	Read / Write	0…10	5

105_Transmission_Channels_CD	105	Struct	Read / Write		
105_Transmission_Channels_CD. 1_Channel_1	105	Byte	Read / Write	4, 7, 10, 13	4
105_Transmission_Channels_CD. 2_Channel_2	105	Byte	Read / Write	4, 7, 10, 13; 0 (= off)	7
105_Transmission_Channels_CD. 3_Channel_3	105	Byte	Read / Write	4, 7, 10, 13; 0 (= off)	10
105_Transmission_Channels_CD. 4_Channel_4	105	Byte	Read / Write	4, 7, 10, 13; 0 (= off)	13
224_Operating_Hours	224	Struct	Read		
224_Operating_Hours.Operating_Hours	224	DInt	Read	0…2^32-1	
225_Temperature_Indicator	225	Byte	Read	0 = Operating condition OK; 1 = Close to upper limit; 2 = Upper limit exceeded; 3 = Close to lower limit; 4 = Lower limit exceeded	
226_Temperature_Monitor	226	Struct	Read		
226_Temperature_Monitor. 1_Overtemperature_Operating_Hours	226	DInt	Read	0…2^32-1	
226_Temperature_Monitor. 2_Overtemperature_Exceeded_Counter	226	Int	Read	0…65535	
226_Temperature_Monitor. 3_Maximum_Operating_Temperature	226	Byte	Read	-40…+125	
226_Temperature_Monitor. 4_Minimum_Operating_Temperature	226	Byte	Read	-40…+125	
226_Temperature_Monitor. 5_Device_Operating_Temperature	226	Byte	Read	-40…+125	
227_Power_Monitor	227	Struct	Read		
227_Power_Monitor.1_Power_Cycles	227	DInt	Read	0…2^32-1	
227_Power_Monitor.2_Maximum_Uptime_s	227	DInt	Read	0…2^32-1	
227_Power_Monitor.3_Average_Uptime_s	227	DInt	Read	0…2^32-1	
227_Power_Monitor.4_Uptime_s	227	DInt	Read	0…2^32-1	



Complete wiring of the function block FB19117 "IUT-F191-FR1-01_ExpertMode_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 16#B400
I_i_Port	Input	Integer	Number of the port to which the RFID station is connected to the IO-Link master
I_USInt_Function	Input	USInt	Definition whether parameters are read (16#00) or written (16#01)
IUT-F191-FR1-01_Expert-Mode_IOL_Param	InOut	DB	Data area for the IO-Link parameters → "IUT-F191_Parameter". "IUT-F191_IOL_Param_Data"
O_b_Done	Output	Bool	Access to IO-Link parameters terminated
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

6.1 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 ...
"REQParam"	%M20.0	Bool	FALSE	TRUE
"FunctionParam"	%MB22	DEC	0	0
"DoneParam"	%M20.1	Bool	TRUE	
"BusyParam"	%M20.2	Bool	FALSE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	Hex	16#0000_0000	

Initial state before the start of the read process:
REQ = False
Function = 0 (read access)
Done = True (depending on the previous state)
Busy = False
ErrorParam = False
Status = 16#0000_0000
IOL_Status = 16#0000_0000
The read process starts as soon as "REQ" is set to True.

Name	Address	Displ...	Monitor value	Modify ...
"REQParam"	%M20.0	Bool	TRUE	TRUE
"FunctionParam"	%MB22	D...	0	0
"DoneParam"	%M20.1	Bool	FALSE	
"BusyParam"	%M20.2	Bool	TRUE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	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 ...
"REQParam"	%M20.0	Bool	TRUE	TRUE
"FunctionParam"	%MB22	DEC	0	0
"DoneParam"	%M20.1	Bool	TRUE	
"BusyParam"	%M20.2	Bool	FALSE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	Hex	16#0000_0000	

Execution Read access to IO-Link parameter 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 ...
"REQParam"	%M20.0	Bool	FALSE	FALSE
"FunctionParam"	%MB22	DEC	0	0
"DoneParam"	%M20.1	Bool	TRUE	
"BusyParam"	%M20.2	Bool	FALSE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	Hex	16#0000_0000	

Trigger for execution read access reset
REQ = False
Function = 0 (read access)
Done = True
Busy = False
ErrorParam = False
Status = 16#0000_0000
IOL_Status = 16#0000_0000

The IO-Link parameters read in are stored within the DB19118 "IUT-F191-FR1-01_ExpertMode_ ParamData" data block in the "IUT-F191-FR1-01_ExpertMode_IOL_Param_Data" data structure.

IUT-F191-FR1-01_ExpertMode_ParamData

Name	Data type	Star..	Monitor value
Static			
IUT-F191-FR1-01_ExpertMode_IOL_Param_Data	"IUT-F1...		
16_Vendor_Name	String[3...	''	'Pepperl+Fuchs'
17_Vendor_Text	String[3...	''	'www.pepperl-fuchs.com/io-link'
18_Product_Name	String[3...	''	'IUT-F191-IO-V1-FR1-01'
19_Product_ID	String[3...	''	'70113810'
20_Product_Text	String[3...	''	'RFID read/write station'
21_Serial_Number	String[1...	''	'xxxxxxxxxxxxx'
22_Hardware_Revision	String[8]	''	'HW01.00'
23_Firmware_Revision	String[8]	''	'FW01.00'
24_Application_Specific_Tag	String[3...	''	'Your automation, our passion.'
25_Function_Tag	String[3...	''	'***'
26_Location_Tag	String[3...	''	'***'
27_Product_URI	String[1...	''	'https://pefu.de/xxxxxxxxxxxxx'

Read-in standard IO-Link parameters

IUT-F191-FR1-01_ExpertMode_ParamData

Name	Data type	Star..	Monitor value
64_Operation_Mode	Byte	16#0	16#00
67_Input_Representation	Byte	16#0	16#00
96_Transmission_Powers_PT	Struct		
1_Power_1	Int	0	100
2_Power_2	Int	0	0
3_Power_3	Int	0	0
4_Power_4	Int	0	0
5_Power_5	Int	0	0
97_Number_Of_Tags_To_Find_NT	Byte	16#0	16#FF
98_Tries_Allowed_TA	Byte	16#0	16#02
99_Expected_Number_Of_Tags_QW	Byte	16#0	16#02
100_Tag_Lost_Smoothing	Byte	16#0	16#05
105_Transmission_Channels_CD	Struct		
1_Channel_1	Byte	16#0	16#04
2_Channel_2	Byte	16#0	16#07
3_Channel_3	Byte	16#0	16#0A
4_Channel_4	Byte	16#0	16#0D

Read-in device-specific IO-Link parameters for setting the read/write functionality and the UHF interface

IUT-F191-FR1-01_ExpertMode_ParamData

Name	Data type	Star..	Monitor value
224_Operating_Hours	Struct		
Operating_Hours	DInt	0	409
Operating_Days	DInt	0	17
225_Temperature_Indicator	Byte	16#0	16#00
226_Temperature_Monitor	Struct		
1_Overtemperature_Operating_Hours	DInt	0	0
2_Overtemperature_Exceeded_Counter	Int	0	0
3_Maximum_Operating_Temperature	Byte	16#0	16#2E
4_Minimum_Operating_Temperature	Byte	16#0	16#10
5_Device_Operating_Temperature	Byte	16#0	16#22
Max_Op_Temp_°C	Int	0	46
Min_Op_Temp_°C	Int	0	16
Device_Op_Temp_°C	Int	0	34
227_Power_Monitor	Struct		
1_Power_Cycles	DInt	0	329
2_Maximum_Uptime_s	DInt	0	36000
3_Average_Uptime_s	DInt	0	4482
4_Uptime_s	DInt	0	26404
Max_Uptime_min	DInt	0	600
Max_Uptime_h	DInt	0	10
Max_Uptime_d	DInt	0	0
Ave_Uptime_min	DInt	0	74
Ave_Uptime_h	DInt	0	1
Ave_Uptime_d	DInt	0	0
Uptime_min	DInt	0	440
Uptime_h	DInt	0	7
Uptime_d	DInt	0	0

Read-in IO-Link parameters with additional device information

6.2 Write IO-Link Parameter

Before starting write access to the IO-Link parameters, the new parameter values must be transferred to the data block DB19118 "IUT-F191-FR1-01_ExpertMode_ParamData" in the "ConfigParam" data structure via a variable table.

Name	Ad...	Displ...	Monitor ...	Modify...
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."64_Operation_Mode".Operation_Mode		Hex	16#00	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."67_Input_Representation".Input_Representation		Hex	16#00	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."1_Power_1"		DEC	10	10
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."2_Power_2"		DEC	20	20
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."3_Power_3"		DEC	50	50
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."4_Power_4"		DEC	100	100
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."96_Transmission_Powers_PT"."5_Power_5"		DEC+/-	0	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."97_Number_Of_Tags_To_Find_NT".Number_Of_Tags_To_Find		Hex	16#FF	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."98_Tries_Allowed_TA".Tries_Allowed		Hex	16#02	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."99_Expected_Number_Of_Tags_QW".Expected_Number_Of_Tags		Hex	16#02	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."100_Tag_Lost_Smoothing_E5".Tag_Lost_Smoothing		Hex	16#05	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."105_Transmission_Channels_CD"."1_Channel_1"		Hex	16#04	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."105_Transmission_Channels_CD"."2_Channel_2"		Hex	16#0A	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."105_Transmission_Channels_CD"."3_Channel_3"		Hex	16#07	
"IUT-F191-FR1-01_ExpertMode_ParamData"."IUT-F191-FR1-01_ExpertMode_IOL_Param_Data".Config_Param."105_Transmission_Channels_CD"."4_Channel_4"		Hex	16#0D	

IUT-F191-FR1-01_ExpertMode_ParamData

Name	Data type	Star..	Monitor
Config_Param	Struct		
64_Operation_Mode	Struct		
67_Input_Representation	Struct		
96_Transmission_Powers_PT	Struct		
Length	Int	10	10
1_Power_1	Int	100	10
2_Power_2	Int	0	20
3_Power_3	Int	0	50
4_Power_4	Int	0	100
5_Power_5	Int	0	0
97_Number_Of_Tags_To_Find_NT	Struct		
98_Tries_Allowed_TA	Struct		
99_Expected_Number_Of_Tags_QW	Struct		
100_Tag_Lost_Smoothing_E5	Struct		
105_Transmission_Channels_CD	Struct		

96_Transmission_Powers_PT
96_Transmission_Powers_PT.Length := 10
96_Transmission_Powers_PT.1_Power_1 := 10
96_Transmission_Powers_PT.2_Power_2 := 20
96_Transmission_Powers_PT.3_Power_3 := 50
96_Transmission_Powers_PT.4_Power_4 := 100
96_Transmission_Powers_PT.5_Power_5 := 0

Name	Address	Displ...	Monitor value	Modify ...
"REQParam"	%M20.0	Bool	FALSE	TRUE
"FunctionParam"	%MB22	DEC	1	1
"DoneParam"	%M20.1	Bool	TRUE	
"BusyParam"	%M20.2	Bool	FALSE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	Hex	16#0000_0000	

Initial state before the start of the write access:
REQ = False
Function = 1 (write access)
Done = True (depending on the 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 ...
"REQParam"	%M20.0	Bool	TRUE	TRUE
"FunctionParam"	%MB22	DEC	1	1
"DoneParam"	%M20.1	Bool	FALSE	
"BusyParam"	%M20.2	Bool	TRUE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	Hex	16#0000_0000	

Execution Write access to IO-Link parameters enabled:
REQ = True
Function = 1 (write 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 ...
"REQParam"	%M20.0	Bool	TRUE	TRUE
"FunctionParam"	%MB22	DEC	1	1
"DoneParam"	%M20.1	Bool	TRUE	
"BusyParam"	%M20.2	Bool	FALSE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	Hex	16#0000_0000	

Execution Write access to IO-Link parameter 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 ...
"REQParam"	%M20.0	Bool	FALSE	FALSE
"FunctionParam"	%MB22	DEC	1	1
"DoneParam"	%M20.1	Bool	TRUE	
"BusyParam"	%M20.2	Bool	FALSE	
"ErrorParam"	%M20.3	Bool	FALSE	
"StatusParam"	%MD24	Hex	16#0000_0000	
"IOL_StatusParam"	%MD28	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

7. Expert-Mode – Structure process data

The process data fields are used to transfer the process data between the IUT-F191-IO-V1 RFID station and a controller. There is a process data field for input data, i.e., from the direction of the station to the controller, and a process data field for output data, i.e., from the direction of the controller to the RFID station. Both process data fields have a fixed length of 32 bytes. This length is constant and is permanently set in the hardware configuration of the control.

Structure Output data:

Byte	Content				
0	Delete_Slave	Update_Master	Update_Slave	0	Frame Length
1	Frame Length				
2	Fragmentation Counter				
3	Telegram Length (High Byte)				
4	Telegram Length (Low Byte)				
5	Command				
6	Data / Parameter				
….	Data / Parameter				
31	Data / Parameter				

Structure Input data:

Byte	Content				
0	Delete_Slave	Update_Master	Update_Slave	0	Frame Length
1	Frame Length				
2	Fragmentation Counter				
3	Telegram Length (High Byte)				
4	Telegram Length (Low Byte)				
5	Command				
6	Status				
7	Data / Parameter				
…	Data / Parameter				
31	Data / Parameter				

<Delete_Slave>: 1 Bit
Inverting the bit deletes all data present in the FIFO memory of the IUT-F191-IO-V1.

<Update_Master>: 1 Bit
By inverting the bit, the controller signals the validity of a new command or telegram in the output data field. The RFID station reflects this bit back in inverted form and thus confirms receipt. Only then can the PLC send a new command or telegram.

<Update_Slave>: 1 Bit
Inverting the bit by the RFID station signals that a new telegram is present in the input data field of the PLC. The PLC reflects the bit back in inverted form and thus confirms receipt of the telegram. Only then can the RFID station send a new telegram to the PLC.

<Frame Length>: 12 Bit
Number of valid bytes within a fragment. The length specification starts at byte 0 and ends with the last byte which still contains information from the RFID station.

<Fragmentation Counter>: 1 Byte
Number of telegram fragments still to be transmitted. If the command or response telegram is smaller than the Profinet telegram length, no subdivision into fragments (i.e., fragmentation) takes place. The value of the "Fragmentation Counter" is therefore always 16#00.

<Telegram Length>: 2 Byte

Length of the complete telegram over all fragments. If the command or response telegram can be transmitted within a fragment, the value of "TelegramLength" is 3 less than the value of "FrameLength"

<Command>: 1 Byte
Command code of the command to be executed. The response following the command contains the identical command code. This allows the response to be assigned to the original command

<Data/Parameter>: x Byte
Area for optionally required data or parameters for the command execution. The number and the meaning depend on the command to be executed

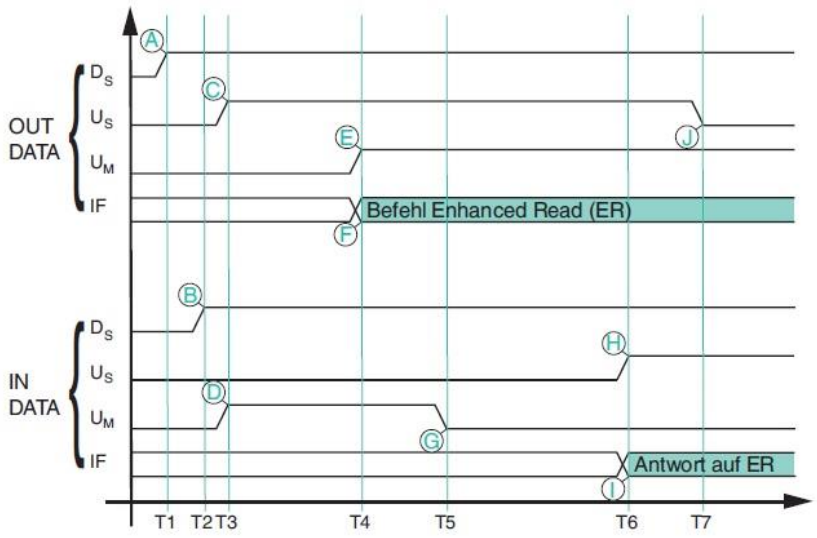
<Status>: 1 Byte
The status in the response signals the result or the outcome of the command. This is used, for example, to output error states in the execution of the command

The data flow between the controller and the RFID station IUT-F191-IO-V1 is synchronized via a handshake procedure. For the execution of the handshake procedure, 3 control bits each are available in the input and output data fields

D → Delete bit (Delete_Slave); when inverting the bit, all data accumulated in the FIFO memory of the IUT-F191-IO-V1 are deleted.

UM → Updatebit - Master (Update_Master); if the master inverts this bit, it signals the validity of a new telegram in the output data field. The slave mirrors back this bit inverted and confirms the reception. Only then the control may send new data

US → Updatebit - Slave (Update_Slave); If the IUT-F191-IO-V1 inverts this bit, the head thus signals the validity of a new telegram in the input data field. The master mirrors this bit back inverted and thus confirms the reception. Only then the slave may send new data



Index	Description
T1	The PLC inverts the delete bit to 1 in the output data field of the controller (A). This deletes the internal memory of the IUT-F191-IO-V1. This procedure must be executed after device startup or in the event of an error condition.
T2	The RFID station IUT-F191-IO-V1 changes the delete bit to 1 in the input data field of the controller (B) in response to event T1.
T3	The controller changes the update bit - slave in the output data field to 1 (D). This is the inverted signal state of the update bit slave from the input data field of the controller. The IUT-F191-IO-V1 station changes the update bit - master in the input data field of the controller to 1 (D). This is the inverted signal state of the update bit master from the output data field of the controller. Thus, both communication participants signal the readiness to receive telegrams or to execute commands.

T4	The PLC places the command parameters in the output data field of the controller (F). At the same time, the control inverts the signal state of the update bit master of the input data field (0) and sets the update bit master in the output data field to 1 (E). This signals the validity of the command telegram to the IUT-F191-IO-V1 station.
T5	The IUT-F191-IO-V1 station mirrors the inverted signal state of the update bit master from the output data field (1) and sets the update bit master in the input data field of the PLC to 0 (G). In this way, the IUT-F191-IO-V1 signals the receipt of the command telegram to the PLC.
T6	The IUT-F191-IO-V1 station has processed the command and enters the response telegram into the input data field of the controller (I). At the same time the head mirrors the signal state of the update bit - slave of the output data field (1) into the update bit - slave of the input data field of the control (H).
T7	The controller has received the changed update bit - slave in the input data field (1) and mirrors the inverted signal state in the update bit - slave (0) of the output data field (J). Afterwards the station IUT-F191-IO-V1 can send a new telegram.

7.1 Example 1: #SR - Single Read 2-Byte Words (Memory Bank 11 → User Memory)

The Single Read 2-Byte Words command performs a single read access to a definable number of 2-byte long data words of the data carrier. The command code is 16#49.

Long Form data format

Output data field: one-time reading of 2-byte data words; 16 (16#10) bytes are read in 2-byte data words starting from memory address 0

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0A	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#07	
5	Command					16#49	
6	ByteAddress (High Byte)					16#00	
7	ByteAddress (Low Byte)					16#00	
8	Number of Bytes (High Byte)					16#00	
9	Number of Bytes (Low Byte)					16#10	
10	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 1; fragment 1; UII/EPC code and subarea of user memory read; UII/EPC information has a length of 14 bytes; UII/EPC code has a length of 12 bytes; length of the subarea of user memory read is 16 bytes

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#20	
2	Fragmentation Counter					16#01	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#26	
5	Command					16#49	
6	Status					16#00	
7	Length EPC Information (High Byte)					16#00	
8	Length EPC Information (Low Byte)					16#0E	
9	PC-Word (High Byte)					16#34	
10	PC-Word (Low Byte)					16#00	
11	EPC/UII Byte 1					16#30	
12	EPC/UII Byte 2					16#14	
…	…					…	
22	EPC/UII Byte 12					16#83	
23	Length User Memory Information (High Byte)					16#00	
24	Length User Memory Information (Low Byte)					16#10	
25	User Memory Byte 1					16#11	
26	User Memory Byte 2					16#11	

…	…	…
30	User Memory Byte 6	16#06
31	User Memory Byte 7	16#07

Input data field: response telegram 2; fragment 2; UII/EPC code and subarea of user memory read; UII/EPC information has a length of 14 bytes; UII/EPC code has a length of 12 bytes; length of the subarea of user memory read is 16 bytes

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	User Memory Byte 8					16#08	
4	User Memory Byte 9					16#31	
5	User Memory Byte 10					16#32	
6	User Memory Byte 11					16#33	
7	User Memory Byte 12					16#34	
8	User Memory Byte 13					16#31	
9	User Memory Byte 14					16#32	
10	User Memory Byte 15					16#33	
11	User Memory Byte 16					16#34	
12	Not relevant					16#00	
…	…					…	
31	Not relevant					16#00	

Input data field: response telegram 3; RSSI value = 16#5D (93%); transmit channel = 16#0D; data carrier was read with a transmit power of 16#0064 (100mW)

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#09	
5	Command					16#49	
6	Status					16#0B	
7	Information Type					16#01	
8	RSSI					16#5D	
9	Transmission Channel CD					16#0D	
10	Transmission Power PT (High Byte)					16#00	
11	Transmission Power PT (Low Byte)					16#64	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 4; exactly 1 data carrier was identified during the execution of the Single command.

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0B	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#08	
5	Command					16#49	
6	Status					16#0F	
7	Number of Tags Byte 1					16#30	
8	Number of Tags Byte 2					16#30	
9	Number of Tags Byte 3					16#30	
10	Number of Tags Byte 4					16#31	
11	Not relevant					16#00	
…	Not relevant					16#00	

31	Not relevant	16#00

Short Form data format

Output data field: one-time reading of 2-byte data words; 16 (16#10) bytes are read in 2-byte data words starting from memory address 0

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0A	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#07	
5	Command					16#49	
6	ByteAddress (High Byte)					16#00	
7	ByteAddress (Low Byte)					16#00	
8	Number of Bytes (High Byte)					16#00	
9	Number of Bytes (Low Byte)					16#10	
10	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 1; user memory read; UII/EPC information and length information are not transmitted; length of the read subarea of the user memory is 16 bytes.

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#20	
2	Fragmentation Counter					16#01	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#26	
5	Command					16#49	
6	Status					16#00	
7	User Memory Byte 1					16#11	
8	User Memory Byte 2					16#11	
9	User Memory Byte 3					16#22	
…	…					…	
21	User Memory Byte 15					16#33	
22	User Memory Byte 16					16#34	
23	Not relevant					16#00	
24	Not relevant					16#00	
…	…					…	
31	Not relevant					16#00	

Input data field: response telegram 2; RSSI value = 16#5D (93%); transmit channel = 16#0D; data carrier was read with a transmit power of 16#0064 (100mW)

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#09	
5	Command					16#49	
6	Status					16#0B	
7	Information Type					16#01	
8	RSSI					16#5D	
9	Transmission Channel CD					16#0D	
10	Transmission Power PT (High Byte)					16#00	
11	Transmission Power PT (Low Byte)					16#64	
…	Not relevant					16#00	

31	Not relevant	16#00

Input data field: response telegram 3; exactly 1 data carrier was identified during the execution of the Single command.

Byte	Content					Single Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0B	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#08	
5	Command					16#49	
6	Status					16#0F	
7	Number of Tags Byte 1					16#30	
8	Number of Tags Byte 2					16#30	
9	Number of Tags Byte 3					16#30	
10	Number of Tags Byte 4					16#31	
11	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

7.2 Example 2: #SW - Single Write 2-Byte Words (Memory Bank 11 → User Memory)

The Single Write 2-Byte Words command performs a single write access to a definable number of 2-byte long data words of the data carrier. The command code is 16#4A.

Long Form data format

Output data field: one-time writing of 2-byte data words; 6 (16#06) bytes are written in 2-byte data words starting from memory address 0

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#10	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#0D	
5	Command					16#4A	
6	ByteAddress (High Byte)					16#00	
7	ByteAddress (Low Byte)					16#00	
8	Number of Bytes (High Byte)					16#00	
9	Number of Bytes (Low Byte)					16#06	
10	Write Data Byte 1					16#31	
11	Write Data Byte 2					16#32	
…	….					…	
…	Write Data Byte 5					16#35	
…	Write Data Byte 6					16#36	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 1; user memory programmed; UII/EPC information has a length of 14 bytes; UII/EPC code a length of 12 bytes

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#17	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#14	
5	Command					16#4A	
6	Status					16#00	

7	Length EPC Information (High Byte)	16#00
8	Length EPC Information (Low Byte)	16#0E
9	PC-Word (High Byte)	16#34
10	PC-Word (Low Byte)	16#00
11	EPC/UII Byte 1	16#30
12	EPC/UII Byte 2	16#14
…	…	…
21	EPC/UII Byte 11	16#74
22	EPC/UII Byte 12	16#83
23	Not relevant	16#00
…	Not relevant	16#00
31	Not relevant	16#00

Input data field: response telegram 2; RSSI value = 16#64 (100%); transmit channel = 16#0D; data carrier was programmed with a transmit power of 16#0064 (100mW)

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#09	
5	Command					16#4A	
6	Status					16#0B	
7	Information Type					16#01	
8	RSSI					16#64	
9	Transmission Channel CD					16#0D	
10	Transmission Power PT (High Byte)					16#00	
11	Transmission Power PT (Low Byte)					16#64	
12	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 3; exactly 1 data carrier was identified during the execution of the Single command.

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0B	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#08	
5	Command					16#4A	
6	Status					16#0F	
7	Number of Tags Byte 1					16#30	
8	Number of Tags Byte 2					16#30	
9	Number of Tags Byte 3					16#30	
10	Number of Tags Byte 4					16#31	
11	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Short Form data format

Output data field: one-time writing of 2-byte data words; 6 (16#06) bytes are written in 2-byte data words starting from memory address 0

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#10	
2	Fragmentation Counter					16#00	

3	Telegram Length (High Byte)	16#00
4	Telegram Length (Low Byte)	16#0D
5	Command	16#4A
6	ByteAddress (High Byte)	16#00
7	ByteAddress (Low Byte)	16#00
8	Number of Bytes (High Byte)	16#00
9	Number of Bytes (Low Byte)	16#06
10	Write Data Byte 1	16#31
11	Write Data Byte 2	16#32
…	….	…
…	Write Data Byte 5	16#35
…	Write Data Byte 6	16#36
…	Not relevant	16#00
31	Not relevant	16#00

Input data field: response telegram 1; user memory programmed; UII/EPC information has a length of 14 bytes; UII/EPC code a length of 12 bytes

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#17	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#14	
5	Command					16#4A	
6	Status					16#00	
7	PC-Word (High Byte)					16#34	
8	PC-Word (Low Byte)					16#00	
9	EPC/UII Byte 1					16#30	
10	EPC/UII Byte 2					16#14	
…	…					…	
19	EPC/UII Byte 11					16#74	
20	EPC/UII Byte 12					16#83	
21	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 2; RSSI value = 16#64 (100%); transmit channel = 16#0D; data carrier was programmed with a transmit power of 16#0064 (100mW)

Byte	Content					Single Write 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#09	
5	Command					16#4A	
6	Status					16#0B	
7	Information Type					16#01	
8	RSSI					16#64	
9	Transmission Channel CD					16#0D	
10	Transmission Power PT (High Byte)					16#00	
11	Transmission Power PT (Low Byte)					16#64	
12	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 3; exactly 1 data carrier was identified during the execution of the Single command.

Byte	Content	Single Write 2-Byte Words

0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0B	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#08	
5	Command					16#4A	
6	Status					16#0F	
7	Number of Tags Byte 1					16#30	
8	Number of Tags Byte 2					16#30	
9	Number of Tags Byte 3					16#30	
10	Number of Tags Byte 4					16#31	
11	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

7.3 Example 3: #ER - Enhanced Read 2-Byte Words (Memory Bank 11 → User Memory)

The Enhanced Read 2-Byte Words command performs a permanent read access to a definable number of 2-byte long data words of the data carrier. The command code is 16#4B.

Long Form data format

Output data field: permanent reading of 2-byte data words; 16 (16#10) bytes are read in 2-byte data words starting from memory address 0

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	0
1	Frame Length					16#0A	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#07	
5	Command					16#4B	
6	ByteAddress (High Byte)					16#00	
7	ByteAddress (Low Byte)					16#00	
8	Number of Bytes (High Byte)					16#00	
9	Number of Bytes (Low Byte)					16#10	
10	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 1; fragment 1; UII/EPC code and subarea of user memory read; UII/EPC information has a length of 14 bytes; UII/EPC code has a length of 12 bytes; length of the subarea of user memory read is 16 bytes

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#20	
2	Fragmentation Counter					16#01	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#26	
5	Command					16#4B	
6	Status					16#00	
7	Length EPC Information (High Byte)					16#00	
8	Length EPC Information (Low Byte)					16#0E	
9	PC-Word (High Byte)					16#34	
10	PC-Word (Low Byte)					16#00	
11	EPC/UII Byte 1					16#30	
12	EPC/UII Byte 2					16#14	
…	…					…	
22	EPC/UII Byte 12					16#83	

23	Length User Memory Information (High Byte)	16#00
24	Length User Memory Information (Low Byte)	16#10
25	User Memory Byte 1	16#11
26	User Memory Byte 2	16#11
…	…	…
30	User Memory Byte 6	16#06
31	User Memory Byte 7	16#07

Input data field: response telegram 2; fragment 2; UII/EPC code and subarea of user memory read; UII/EPC information has a length of 14 bytes; UII/EPC code has a length of 12 bytes; length of the subarea of user memory read is 16 bytes

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	User Memory Byte 8					16#08	
4	User Memory Byte 9					16#31	
5	User Memory Byte 10					16#32	
6	User Memory Byte 11					16#33	
7	User Memory Byte 12					16#34	
8	User Memory Byte 13					16#31	
9	User Memory Byte 14					16#32	
10	User Memory Byte 15					16#33	
11	User Memory Byte 16					16#34	
12	Not relevant					16#00	
…	…					…	
31	Not relevant					16#00	

Input data field: response telegram 3; RSSI value = 16#0D (13%); transmit channel = 16#0D; data carrier was read with a transmit power of 16#0064 (100mW)

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#09	
5	Command					16#4B	
6	Status					16#0B	
7	Information Type					16#01	
8	RSSI					16#0D	
9	Transmission Channel CD					16#0D	
10	Transmission Power PT (High Byte)					16#00	
11	Transmission Power PT (Low Byte)					16#64	
12	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 4; data carrier has left detection range

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#17	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#14	
5	Command					16#4B	
6	Status					16#05	
7	Length EPC Information (High Byte)					16#00	
8	Length EPC Information (Low Byte)					16#0E	

9	PC-Word (High Byte)	16#34
10	PC-Word (Low Byte)	16#00
11	EPC/UII Byte 1	16#30
12	EPC/UII Byte 2	16#14
…	…	…
21	EPC/UII Byte 11	16#74
22	EPC/UII Byte 12	16#83
23	Not relevant	16#00
…	Not relevant	16#00
31	Not relevant	16#00

Short Form data format

Output data field: permanent reading of 2-byte data words; 16 (16#10) bytes are read in 2-byte data words starting from memory address 0

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	0
1	Frame Length					16#0A	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#07	
5	Command					16#4B	
6	ByteAddress (High Byte)					16#00	
7	ByteAddress (Low Byte)					16#00	
8	Number of Bytes (High Byte)					16#00	
9	Number of Bytes (Low Byte)					16#10	
10	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field: response telegram 1; user memory read; UII/EPC information and length information are not transmitted; length of the read subarea of the user memory is 16 bytes.

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#20	
2	Fragmentation Counter					16#01	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#26	
5	Command					16#4B	
6	Status					16#00	
7	User Memory Byte 1					16#11	
8	User Memory Byte 2					16#11	
9	User Memory Byte 3					16#22	
…	…					…	
21	User Memory Byte 15					16#33	
22	User Memory Byte 16					16#34	
23	Not relevant					16#00	
24	Not relevant					16#00	
…	…					…	
31	Not relevant					16#00	

Input data field: response telegram 2; RSSI value = 16#0D (13%); transmit channel = 16#0D; data carrier was read with a transmit power of 16#0064 (100mW)

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0C	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	

4	Telegram Length (Low Byte)	16#09
5	Command	16#4B
6	Status	16#0B
7	Information Type	16#01
8	RSSI	16#0D
9	Transmission Channel CD	16#0D
10	Transmission Power PT (High Byte)	16#00
11	Transmission Power PT (Low Byte)	16#64
12	Not relevant	16#00
…	Not relevant	16#00
31	Not relevant	16#00

Input data field: response telegram 4; data carrier has left detection zone

Byte	Content					Enhanced Read 2-Byte Words	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#17	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#14	
5	Command					16#4B	
6	Status					16#05	
7	Length EPC Information (High Byte)					16#00	
8	Length EPC Information (Low Byte)					16#0E	
9	PC-Word (High Byte)					16#34	
10	PC-Word (Low Byte)					16#00	
11	EPC/UII Byte 1					16#30	
12	EPC/UII Byte 2					16#14	
…	…					…	
21	EPC/UII Byte 11					16#74	
22	EPC/UII Byte 12					16#83	
23	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

7.4 Example 4: Read Parameter

This command reads out an antenna parameter of the RFID station. The command requires several parameters for this purpose, such as the system code ("U" for System IU) and the identifier of the antenna parameter to be read (e.g., "PT" for the transmitting power). If additional data must be transferred during a read access to a parameter, length information must be set.

Output data field with command to read the parameter PT:

Byte	Content					Read Parameter	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0B	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#08	
5	Command					16#BE	
6	SystemCode					16#55 „U“	
7	UHF Parameter (High Byte)					16#50 “P”	
8	UHF Parameter (Low Byte)					16#54 “T”	
9	Length Parameter (High Byte)					16#00	
10	Length Parameter (Low Byte)					16#00	
11	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field with status 16#00 Response → Antenna parameters read in

Byte	Content					Read Parameter	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#09	
2	Fragmentation Counter					0x00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#06	
5	Command					16#BE	
6	Status					16#00	
7	Parameter Byte 1 → PT1 High Byte					16#00	
8	Parameter Byte 2 → PT1 Low Byte					16#32	
9	Parameter Byte 3 → PT2 High Byte (optional)					16#00	
10	Parameter Byte 4 → PT2 Low Byte (optional)					16#00	
11	Parameter Byte 5 → PT3 High Byte (optional)					16#00	
12	Parameter Byte 6 → PT3 Low Byte (optional)					16#00	
13	Parameter Byte 7 → PT4 High Byte (optional)					16#00	
14	Parameter Byte 8 → PT4 Low Byte (optional)					16#00	
15	Parameter Byte 9 → PT5 High Byte (optional)					16#00	
16	Parameter Byte 10 → PT5 Low Byte (optional)					16#00	
17	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

7.5 Example 5: Write Parameter

This command sets or changes an antenna parameter of the RFID station. The command requires several parameters for this, such as the system code ("U" for System IU) and the identifier of the antenna parameter to be read (e.g., "PT" for the transmit power). With a write access to the parameter, an additional length specification and a data record with the new parameter setting are transferred.

Output data field with command to write the parameter PT:

Byte	Content					Write Parameter	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#0D	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#0A	
5	Command					16#BF	
6	SystemCode					16#55 „U“	
7	UHF Parameter (High Byte)					16#50 “P”	
8	UHF Parameter (Low Byte)					16#54 “T”	
9	Length Parameter (High Byte)					16#00	
10	Length Parameter (Low Byte)					16#02	
11	Parameter Byte 1 → PT1 High Byte					16#00	
12	Parameter Byte 2 → PT1 Low Byte					16#32	
13	Parameter Byte 3 → PT2 High Byte (optional)					16#00	
14	Parameter Byte 4 → PT2 Low Byte (optional)					16#00	
15	Parameter Byte 5 → PT3 High Byte (optional)					16#00	
16	Parameter Byte 6 → PT3 Low Byte (optional)					16#00	
17	Parameter Byte 7 → PT4 High Byte (optional)					16#00	
18	Parameter Byte 8 → PT4 Low Byte (optional)					16#00	
19	Parameter Byte 9 → PT5 High Byte (optional)					16#00	
20	Parameter Byte 10 → PT5 Low Byte (optional)					16#00	
21	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

Input data field with status 16#00 Response → Antenna parameters changed

Byte	Content					Write Parameter	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#07	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#04	
5	Command					16#BF	
6	Status					16#00	
7	Not relevant					16#00	
…	Not relevant					16#00	
31	Not relevant					16#00	

8. Trouble shooting

Index	Description	Fixing
1	Profinet communication does not work	1. Check whether the setting of the Profinet name in the device and in the controller 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 Expert Mode are 16#00	1. control of the initialization by "IO_b_SetRestart" → check if input data have a change 2. check if input parameter "I_HWIO_Hardware_ID" is parameterized with the same submodule from hardware configuration
3	The EPC information has a different length than described in the documentation	1. An EPC code can have a different length and depends on the delivery status of the transponder. 2. in the majority the EPC has a length of 12 bytes 3. The length of the EPC information results from the length of the EPC plus the PC word (2 bytes).
4	The AccessCounter constantly increased when the presence of a data carrier remains unchanged (standstill)	1. The counter for successful reading or writing are incremented for each access to a data carrier. 2. Data carrier is constantly re-read → unstable communication between RFID station and data carrier. 3. Increase of parameter E5 (tag loss smoothing). As a result, the logoff of the data carrier from the RFID station is delayed.
5	An error message with the status value 16#0A appears.	1. Check whether "Long Form" or "Short Form" data format is activated (Input Representation parameter in the IODD). 2. Long form: there are at least 2 data carriers with the same UII/EPC information in the detection zone → not permitted; only data carriers with different UII/EPC information 3. Short form: there are at least 2 data carriers in the detection zone → not permitted; only one data carrier can be in the detection zone
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 within the data carrier.
7	Read command is active (blue LED on), but the data carrier can only be read at a small distance	1. Check the mounting requirements of the data carrier (on metal or on plastic or non-conductive substrate). 2. If there is an "-M-" in the P+F specific designation (e.g., IUC76-F157-M-FRx), the data carrier is optimized for mounting on metal. The range is optimal with appropriate mounting 3. If there is no "-M-" in the P+F specific designation (e.g., IUC77-25L110), the mounting can be done on non-conductive surfaces. 4. Increase of the transmitting power by the parameter PT in the IODD file
8	If a write command is active, the orange LED lights up only briefly on successful write access	1. Correct. When a write access is successful, the orange LED lights up only briefly. Afterwards, the LED is off until the next successful write access is made to the same or another data carrier. 2. 2. When a read command is executed, the orange LED lights up for as long as a data carrier is in the detection zone and can be read.
10	Several data carriers are identified at the same time	1. Reading from several data carriers is possible, as it is a radio system. 2. Parameterization a ramp function for the transmitting power (parameter PT) with ascending power values as well as increase of the number of access attempts (parameter TA).