Operating instruction

Function block Expert Mode RFID-Station IUT-F190-B40-2V1D at Siemens TIA Portal

UHF RFID-Station IUT-F190-B40-2V1D

Project Name:	**UHF RFID-Station IUT-F190-B40-2V1D;** **Expert Mode Function block**
Date:	**06.05.2021**
Creator:	**Karsten Reinhardt**

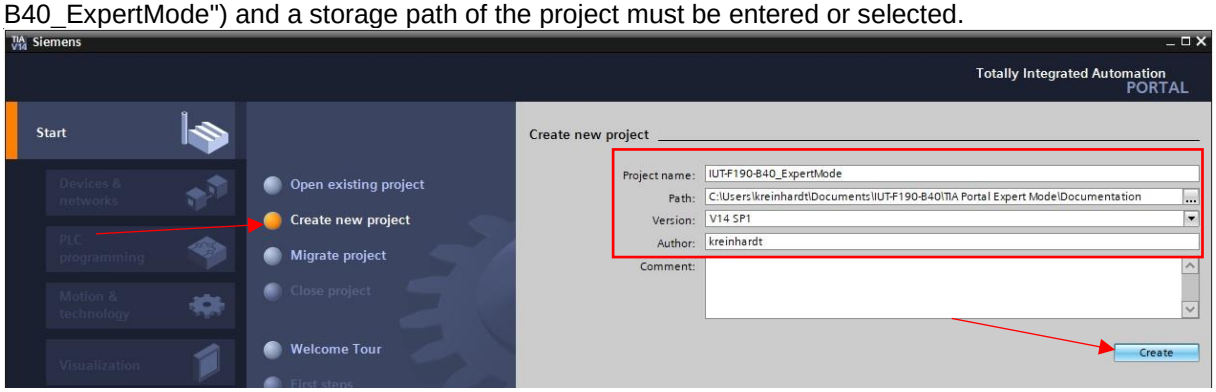
Version history

Version	Release data	Comment
1	**06.05.2921**	Initial Version

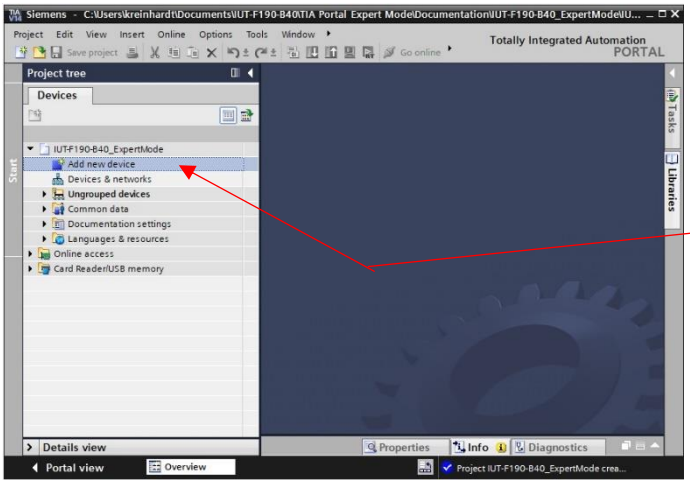
Table of content

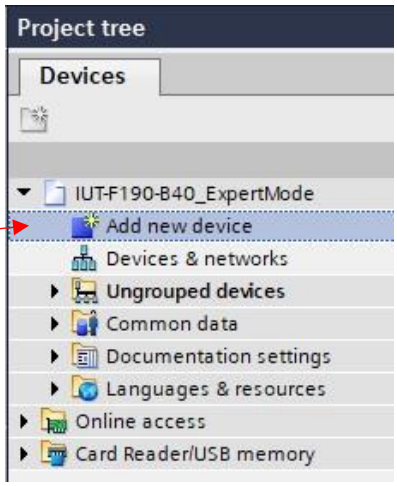
1. Basic PLC configuration

The first step is to create a new PLC project. For this purpose, a project name (e.g. "IUT-F190-B40_ExpertMode") and a storage path of the project must be entered or selected.

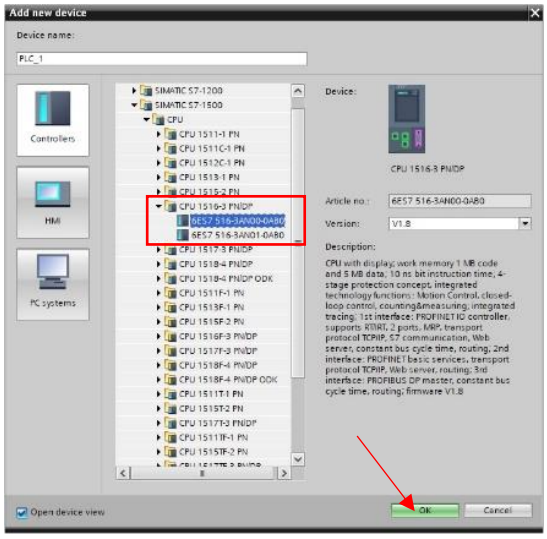


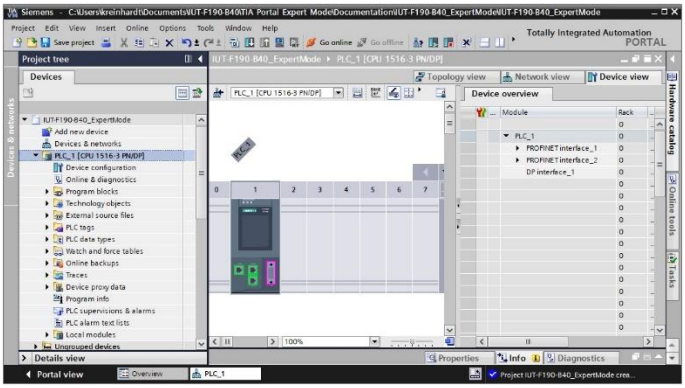
After creating the empty control project, switch to the project view. A selection window is called up by "Add new device" in the project navigation on the left.



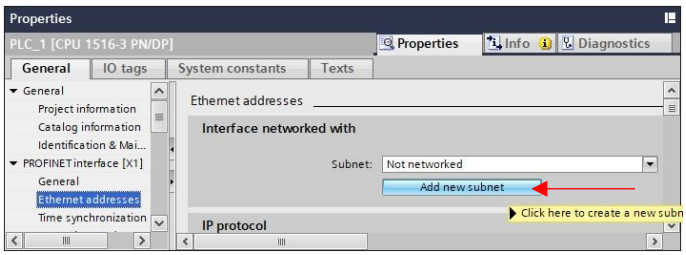


In this selection window, the appropriate controller must be selected.

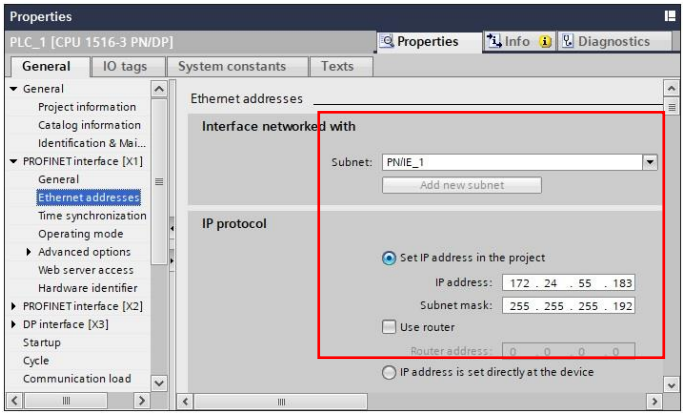




After assigning the CPU, the project view switches to the setting of the control parameters.

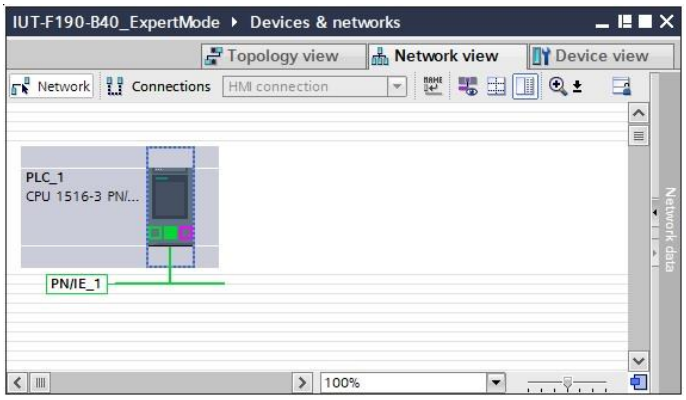


For the Profinet interface X1, a Profinet subnet must be added under the selection "Ethernet addresses" via the selection "Add new subnet". A subnet with the designation "PN/IE_1" is created.

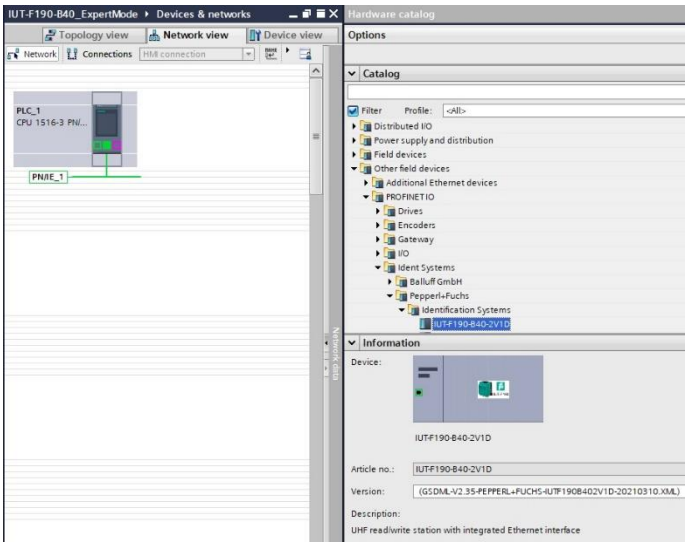


Then set the network parameters (IP address, subnet mask) of the controller.

IP-Address: 172.24.55.183
Subnet mask: 255.255.255.192



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



On the right-hand side, call up the hardware catalog and select the GSDML file of the IUT-F190-B40:
"Other field devices" → "Profinet IO" → "Ident Systems" → "Pepperl+Fuchs" → "Identification Systems" → "IUT-F190-B40-2V1D".

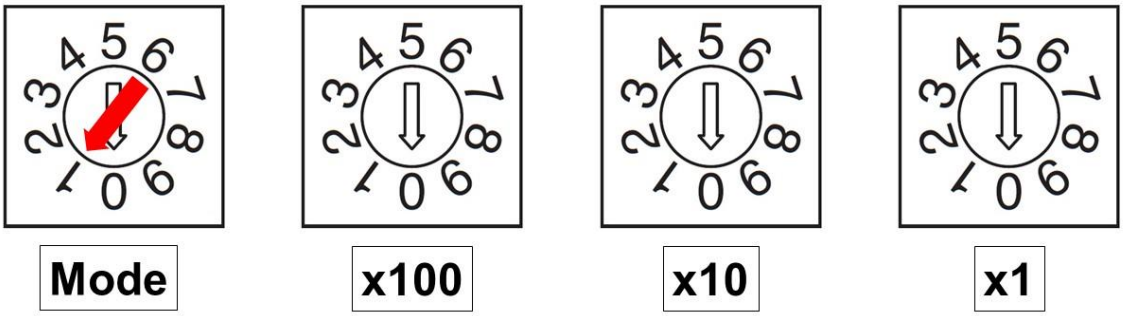
If the GSDML file is not in the catalog, it must be imported beforehand.

2. Setting rotary switch on the rear of the device

On the back of the RFID station there are rotary switches for setting the communication protocol ("Mode" switch) and for presetting an IP address ("x100", "x10", "x1" switches).

In the delivery state, all switches are in position 0.

Before initial commissioning via the Profinet protocol, the "Mode" rotary switch must be set to position 1. After a reset of the supply voltage, communication via Profinet is possible.

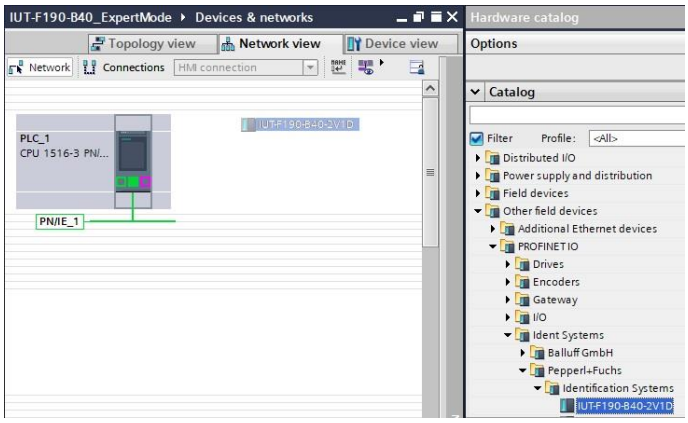


The following table contains an overview of the device setting depending on the rotary switch positions.

Mode	X100	X10	X1	Meaning
0	0	0	0	Ethernet/IP Static IP-Address: IP-Address: 192.168.1.250 Subnet mask: 255.255.255.0
0	0	0	1	Ethernet/IP BOOTP
0	0	0	2	Ethernet/IP DHCP
0	0…2	0…5	0…9	Ethernet/IP Default settings IP-Address: 192.168.1.xxx XXX = Rotary switch position x100, x10, x1 Value range: 003…254 Subnet mask: 255.255.255.0
1	-	-	-	Profinet DCP
9	9	9	9	Reset to factory setting

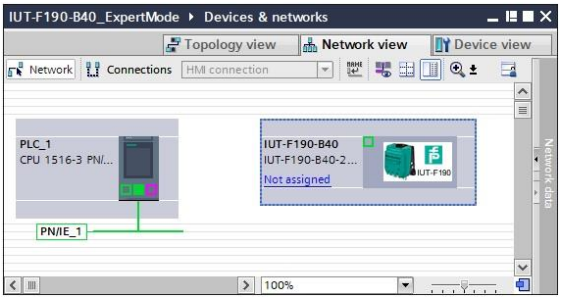
The device can be reset to the factory setting via the rotary switches. For this purpose, all switches must be set to position 9 and a reset of the supply voltage must be performed.

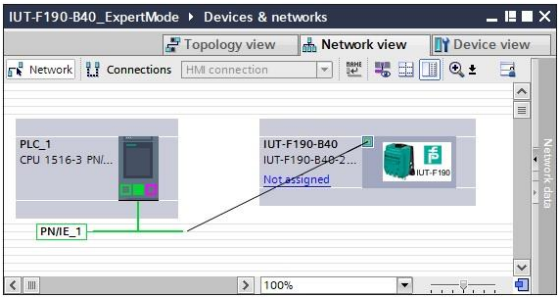
3. Hardware configuration IUT-F190-B40-2V1D

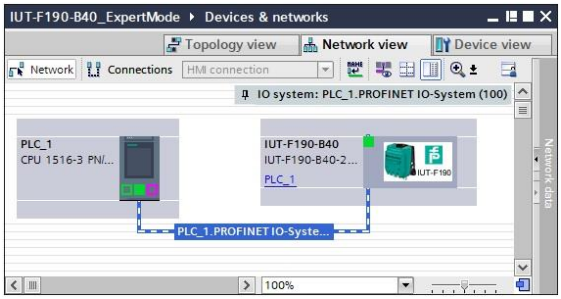


The GSDML for the RFID station IUT-F190-B40 is to be dragged over from the hardware catalog into the center window of the device view.

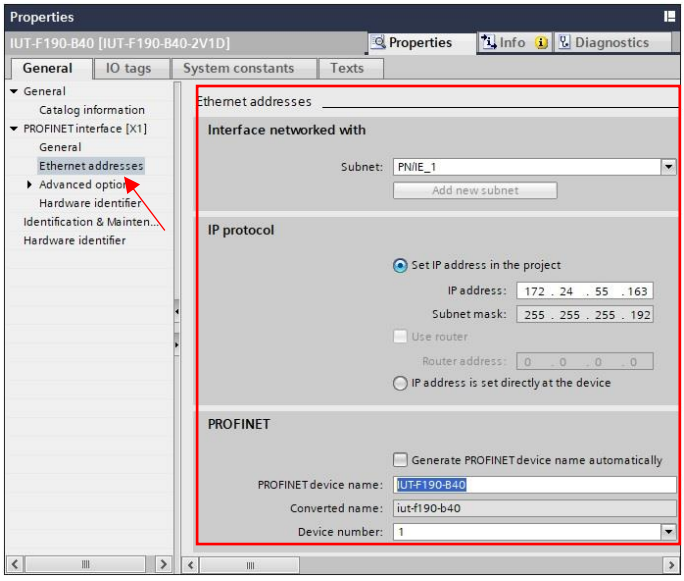
Other field devices → Profinet IO → Ident Systems → Pepperl+Fuchs → Identification Systems → IUT-F190-B40-2V1D





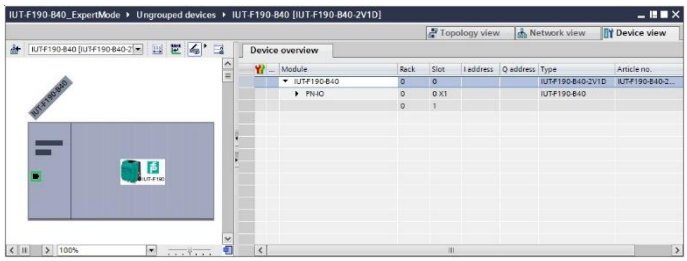


Connection of the RFID station to the Profinet network PN/IE_1
The Profinet connection between IUT-F190-B40 and controller is connected manually in the network view via the mouse indicator. The RFID station is thus connected to the "PN/IE_1" subnet. The correct Profinet connection is displayed in green. The assignment to the CPU is visible at the IUT-F190-B40 (PLC_1).



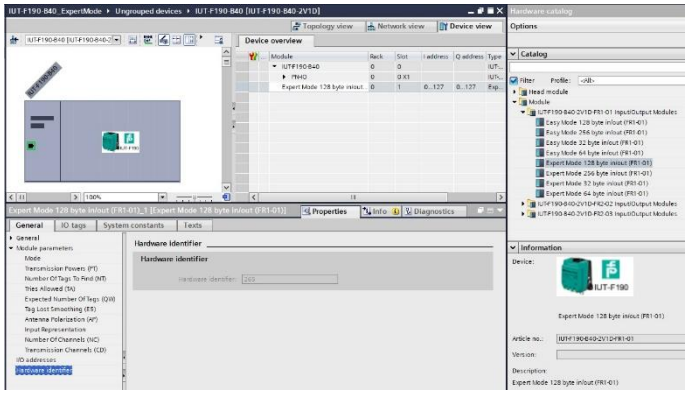
Then set the network parameters (IP address, subnet mask) and the Profinet name of the IUT-F190-B40.

IP-Address:	172.24.55.163
Subnet mask:	255.255.255.192
Profinet Name:	IUT-F190-B40



Double-click on the IUT-F190-B40 icon to open the device view. The communication modules used for the read/write station are shown here in the delivery state.

No module is preset at the factory.



Selection of communication module "Expert Mode":
Select the desired communication module from the hardware catalog on the right side and drag it to slot 1. In this example the module "Expert Mode 128 Byte in/out (FR1-01) was selected. 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. "Expert Mode 128 Byte in/out (FR1-01)" = 265

The communication modules from the hardware catalog are divided according to the country specific devices. The following assignment applies:

IUT-F190-B40-2V1D-FR1-01 Input/Output Modules
→ IUT-F190-B40-2V1D-FR1-01 → Europe

IUT-F190-B40-2V1D-FR2-02 Input/Output Modules
→ IUT-F190-B40-2V1D-FR2-02 → USA

IUT-F190-B40-2V1D-FR2-03 Input/Output Modules
→ IUT-F190-B40-2V1D-FR2-03 → China

The selected communication module must match the existing country-specific device. Otherwise, commissioning of the station is not possible.

The following communication modules are available for the use of the Expert Mode:

- Expert Mode 32 Byte in/out
- Expert Mode 64 Byte in/out
- Expert Mode 128 Byte in/out
- Expert Mode 256 Byte in/out

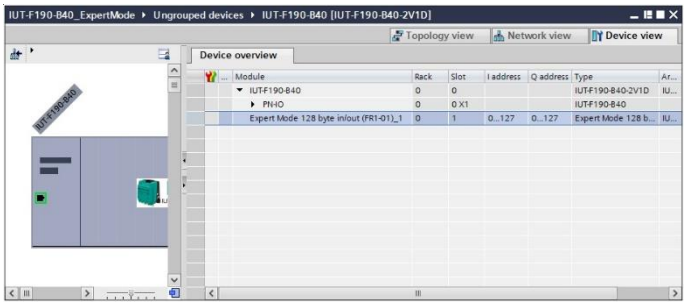
The Easy Mode is activated in the RFID station by configuring the "Easy Mode" modules. This mode is not supported by the function block described below.

4. Setting parameter IUT-F190-B40-2V1D

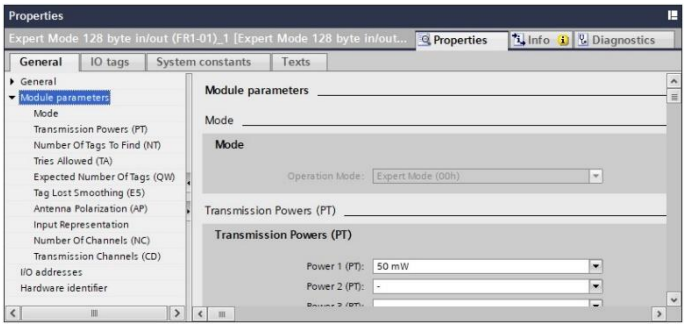
The RFID station IUT-F190-B40-2V1D has different module parameters when using the Expert mode. All parameters are stored in the GSDML file and are set within the hardware configuration in the PLC.

The parameters can also be read or changed by the function block via the "SpecialCommand" function. A change made by the function block is temporarily valid. After a device restart, the parameters stored in the PLC by the GSDML file are transferred to the device. This overwrites the parameter values previously changed by the function block.
In order to read or change a parameter with the "SpecialCommand" function, the command telegram must first be configured within the "SpecialCommand" data field. Thereby the control byte (element [0] of the output data) is not set. The command telegram within the "SpecialCommand" data field thus starts with element [1] of the output data.
The "I_b_SpecialCommand" input must then be set. The function block transfers the command telegram to the output data field and adds the control byte. I.e. the required handshake sequence for the command is completely realized by the function block. The command telegram is transmitted to the RFID station. The response to the command is located within the "ReadData" data field.
The command telegrams for reading and changing the parameters are listed below. The length specification for the command fragment (frame length) to be set in the command telegrams refers to a length including the control byte.

It is also possible to change the parameters via the integrated web server of the RFID station. Here, too, the changes are only temporary until the parameters are overwritten by the parameter values stored in the PLC after a device restart.

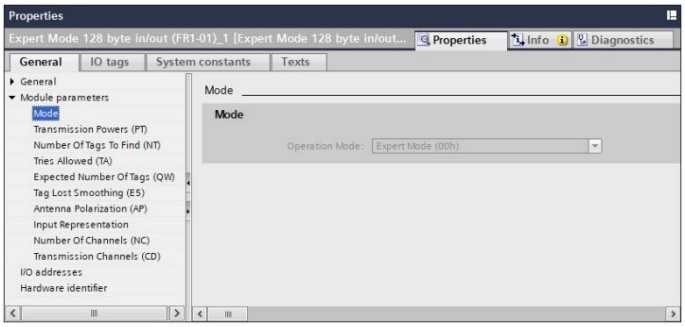


The module parameters are called up by clicking on the "Expert Mode 128 Byte in/out" module.



Mode
Transmission Power (PT)
Number of Tags to find (NT)
Tries Allowed (TA)
Expected Number of Tags (QW)
Tag Lost Smoothing (E5)
Antenna Polarization (AP)
Input Representation
Number of Channels (NC)
Transmission Channels (CD)

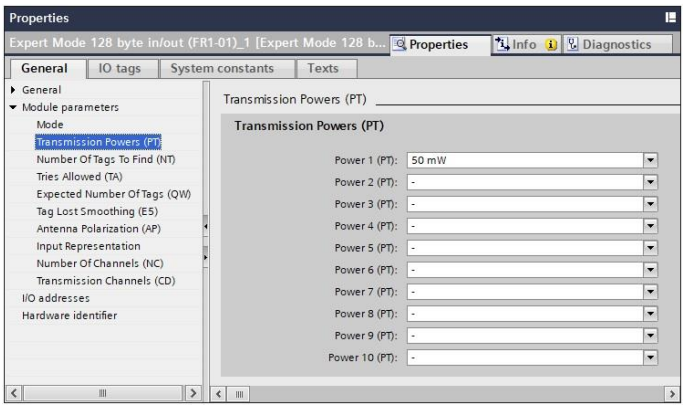
4.1 Parameter „Mode“



The "Mode" parameter has no relevance for the IUT-F190-B40 RFID station. Therefore, it is not possible to change the parameter value.

4.2 Parameter “Transmission Powers - PT“

The "Transmission Powers - PT" parameter can be used to set one or more transmission power levels for the IUT-F190-B40 RFID station.



Default setting parameter “Transmission Powers - PT“:

Power level 1 (PT):	50mW	PT1
Power level 2 (PT):	-	PT2
Power level 3 (PT):	-	PT3
…		
Power level 10 (PT):	-	PT10

Several predefined values of output power are available for the parameterization of a transmit power stage. This can be set via a drop-down menu for each transmit power level.

Value range “transmission powers” (FR1-01):
3mW; 4mW; 5mW; 6mW; 8mW; 10mW; 13mW; 15mW; 20mW; 25mW; 30mW; 40mW; 50mW; 60mW; 80mW; 100mW; 125mW; 150mW; 200mW; 250mW, 300mW; 400mW; 500mW; 600mW; 800mW; 1000mW

Default setting: 50mW (FR1-01)

The transmission power required for an access to the data carrier depends on whether a read access or a write access is to take place. Writing data to a data carrier requires greater power. Thus, the transmission power required to write data is greater compared to read access to the same data carrier at an identical distance.
As a result, the range of the IUT-F190-B40 RFID station is smaller for a write command with the same transmission power compared to the range when executing a read command. This must be taken into account when setting the transmission power, as this applies to both the read command and the write command.

Read out parameter “Transmission Powers – PT“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'P'	'P'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#50
SpecialCommand[7]	Byte	16#0	16#54
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Transmission Powers – PT“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „PT“	16#5054 „PT“
SpecialCommand [8]…[9]	Length Parameter	16#0000

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor...
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#32
ReadData[2]	Byte	16#0	16#00

Read-out value of the “Transmission Powers – PT“ parameter
ReadData [0]…[1] power level PT1 16#0032 (50mW)

Change parameter “Transmission Powers – PT“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0D	16#0D
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'P'	'P'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#02	16#02
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#64	16#64
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[12]		Hex	16#00	16#00

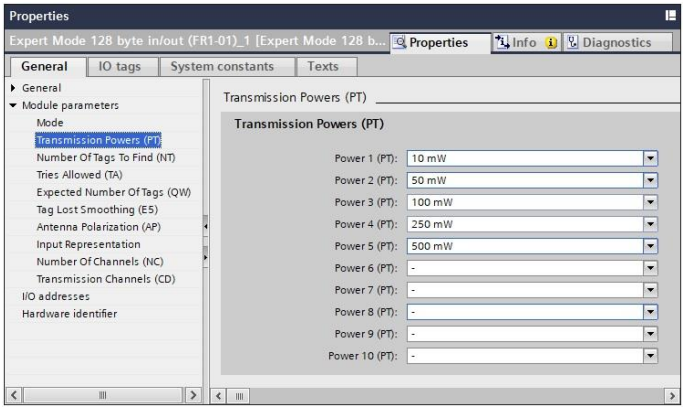
SpecialCommand	Array...		
SpecialCommand[0]	Byte	16#0	16#0D
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#0A
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#50
SpecialCommand[7]	Byte	16#0	16#54
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#02
SpecialCommand[10]	Byte	16#0	16#00
SpecialCommand[11]	Byte	16#0	16#64
SpecialCommand[12]	Byte	16#0	16#00

Command write parameter “Transmission Powers – PT“

SpecialCommand [0]	Frame Length	16#0D
SpecialCommand [1]	Fragmentation Counter	16#00
SpecialCommand [2]…[3]	Telegram Length	16#000A
SpecialCommand [4]	Command	16#BF
SpecialCommand [5]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „PT“	16#5054 „PT“
SpecialCommand [8]…[9]	Length Parameter	16#0002
SpecialCommand [10]…[11]	Transmission Power PT1	16#0064 (100mW)

4.2.1 Parametrization of a ramp function for the transmit power:

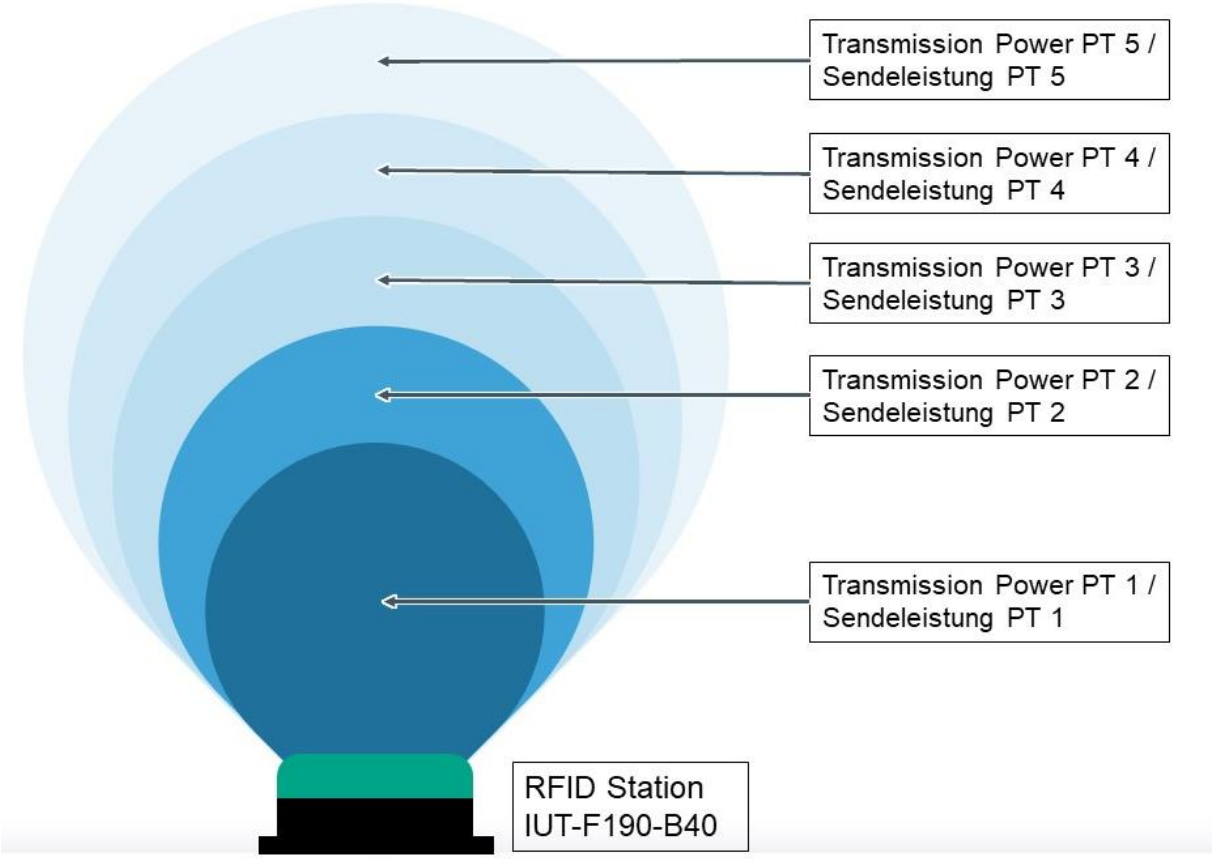
The RFID station IUT-F190-B40 offers the possibility to set several transmit power levels (transmit power 1, transmit power 2 etc.). These power levels are run through one after the other when a write or read command is executed. Thus it is possible to parameterize a ramp with a continuously increasing transmit power.



Parameterization of a ramp with 5 levels for the transmitting power

Power level 1 (PT1):	10mW
Power level 2 (PT2):	50mW
Power level 3 (PT3):	100mW
Power level 4 (PT4):	250mW
Power level 5 (PT5):	500mW
Power level 6 (PT6):	-
…	
Power level 10 (PT10):	-

After the start of the read/write command, transmit power 1 (PT1) is used first. After completion of all scan processes (inventory rounds) on this power level, the next power level (PT 2) is set. This process is repeated until all scan processes have been executed 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 passed through.



Set the "Transmission Powers - PT" parameter to 5 power levels via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#15	16#15
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#12	16#12
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'P'	'P'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[12]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[13]		Hex	16#32	16#32
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[14]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[15]		Hex	16#64	16#64
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[16]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[17]		Hex	16#FA	16#FA
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[18]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[19]		Hex	16#F4	16#F4
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[20]		Hex	16#00	16#00

SpecialCommand	Array...		
SpecialCommand[0]	Byte	16#0	16#15
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#12
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#50
SpecialCommand[7]	Byte	16#0	16#54
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#0A
SpecialCommand[10]	Byte	16#0	16#00
SpecialCommand[11]	Byte	16#0	16#0A
SpecialCommand[12]	Byte	16#0	16#00
SpecialCommand[13]	Byte	16#0	16#32
SpecialCommand[14]	Byte	16#0	16#00
SpecialCommand[15]	Byte	16#0	16#64
SpecialCommand[16]	Byte	16#0	16#00
SpecialCommand[17]	Byte	16#0	16#FA
SpecialCommand[18]	Byte	16#0	16#01
SpecialCommand[19]	Byte	16#0	16#F4
SpecialCommand[20]	Byte	16#0	16#00

Command Write Parameter “Transmission Powers – PT“ (5 power levels)

SpecialCommand [0]	Frame Length	16#15
SpecialCommand [1]	Fragmentation Counter	16#00
SpecialCommand [2]…[3]	Telegram Length	16#0012
SpecialCommand [4]	Command	16#BF
SpecialCommand [5]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „PT“	16#5054 „PT“
SpecialCommand [8]…[9]	Length Parameter	16#000A
SpecialCommand [10]…[11]	Power Level PT1	16#000A (10mW)
SpecialCommand [12]…[13]	Power Level PT2	16#0032 (50mW)
SpecialCommand [14]…[15]	Power Level PT3	16#0064 (100mW)
SpecialCommand [16]…[17]	Power Level PT4	16#00FA (250mW)
SpecialCommand [18]…[19]	Power Level PT5	16#01F4 (500mW)

Read out parameter “Transmission Powers – PT“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'P'	'P'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#50
SpecialCommand[7]	Byte	16#0	16#54
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Transmission Powers – PT“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „PT“	16#5054 „PT“
SpecialCommand [8]…[9]	Length Parameter	16#0000

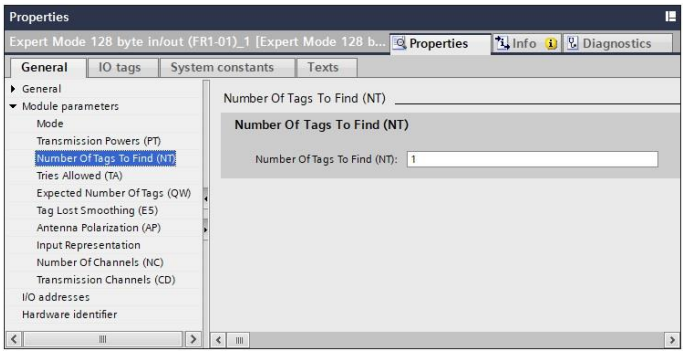
IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor...
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0A
ReadData[2]	Byte	16#0	16#00
ReadData[3]	Byte	16#0	16#32
ReadData[4]	Byte	16#0	16#00
ReadData[5]	Byte	16#0	16#64
ReadData[6]	Byte	16#0	16#00
ReadData[7]	Byte	16#0	16#FA
ReadData[8]	Byte	16#0	16#01
ReadData[9]	Byte	16#0	16#F4
ReadData[10]	Byte	16#0	16#00

Read-out values of “Transmission Powers – PT“ parameter:

ReadData[0]…[1]	Power level PT1	16#000A (10mW)
ReadData[2]…[3]	Power level PT2	16#0032 (50mW)
ReadData[4]…[5]	Power level PT3	16#0064 (100mW)
ReadData[6]…[7]	Power level PT4	16#00FA (250mW)
ReadData[8]…[9]	Power level PT5	16#01F4 (500mW)

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



Parameterization "Number of Tags to Find" termination criterion

Number of Tags to Find (NT): 1

The Single command or the execution of the ramp is aborted as soon as at least one volume has been identified during the Inventory round.

A test in the application is required to find suitable power levels. For this purpose, the target data carrier (i.e. the data carrier that is to be identified) is positioned at the location it has during the execution of the read/write command. The transmission power required to reliably identify this data carrier in the position is then determined (PT min; e.g. 100mW).
The target data carrier is then removed and the neighboring data carriers are placed at the positions they had during the identification of the target data carrier. The transmitting power is then increased until one of the neighboring tags is identified (PT max; e.g. 800mW). These data carriers must not be detected by the RFID station under any circumstances later in the application.
How many power levels are used for parameterizing the ramp depends on the application. The more power stages are used, the smaller the change in the jumps of the transmit power can be. However, the longer the number of power stages, the longer the ramp cycle time. A number of 5 power stages should be sufficient for initial commissioning.

Data carriers are subject to variations in range. I.e. identical data carriers can be identified at identical positions with different transmission power levels. It is therefore recommended to start the ramp with a lower power level than PT min (PT 1 < PT min).
The last power level of the ramp (e.g. PT 5) must have a lower power value than the transmit power with which a neighboring data carrier is unintentionally identified (PT 5 < PT max).

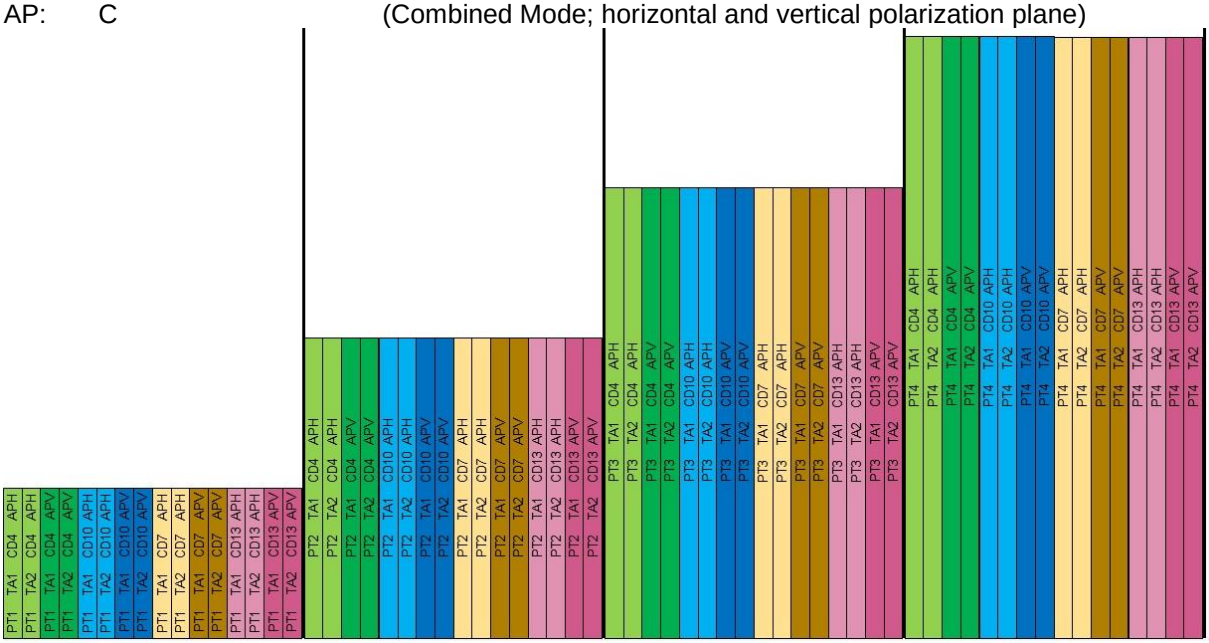
In the preceding example, the PT 1 and PT 2 stages were parameterized with a power value below the output power required for reliable identification of the data carrier (PT 1 < PT 2 < PT min). Stage PT 3 corresponds exactly to the required transmit power (PT 3 = PT min). The power values of PT 4 and PT 5 are above the required transmit power, but below the power at which neighboring tags are unintentionally identified (PT max > PT 5 > PT 4 > PT min).

The number of scan operations (inventory rounds) for each power level can be influenced by the "Tries allowed" (TA), "Antenna Polarization" (AP) and "Transmit Channels" (CD) or "Number of Channels" (NC) parameters. If the value of the "Tries allowed" (TA) parameter is increased, more scans are performed per power level. This means that the detection range is scanned longer at this level. If the value of the "Tries allowed" parameter (TA) is reduced and the "Transmit channels" (CD) or "Number

of channels" (NC) is also reduced, fewer scans are performed per power level. An additional reduction in the number of scans is also achieved by setting the "Antenna Polarization" (AP) parameter to horizontal or vertical polarization plane. This causes the transmit power ramp to be run through more quickly.

In the factory setting of the parameters, 2 read attempts (TA = 2) are first performed with horizontal polarization on transmit channel 4 for one power level (PT 1). After this, the polarization switches to the vertical polarization plane and 2 read attempts are carried out again on transmit channel 4. Then 2 read attempts are made on transmit channel 10 with horizontal polarization, followed by 2 read attempts on the same transmit channel with vertical polarization. This sequence is then repeated for transmitting channels 7 and 13. 16 read attempts are thus performed per power

Example 1: Scanning with factory settings and 4 power levels
PT: PT1, PT2, PT3, PT4 (4 power levels)
TA: 2 (2 trials per transmission channel)
CD: 4, 10, 7, 13 (4 transmission channels)
AP: C (Combined Mode; horizontal and vertical polarization plane)

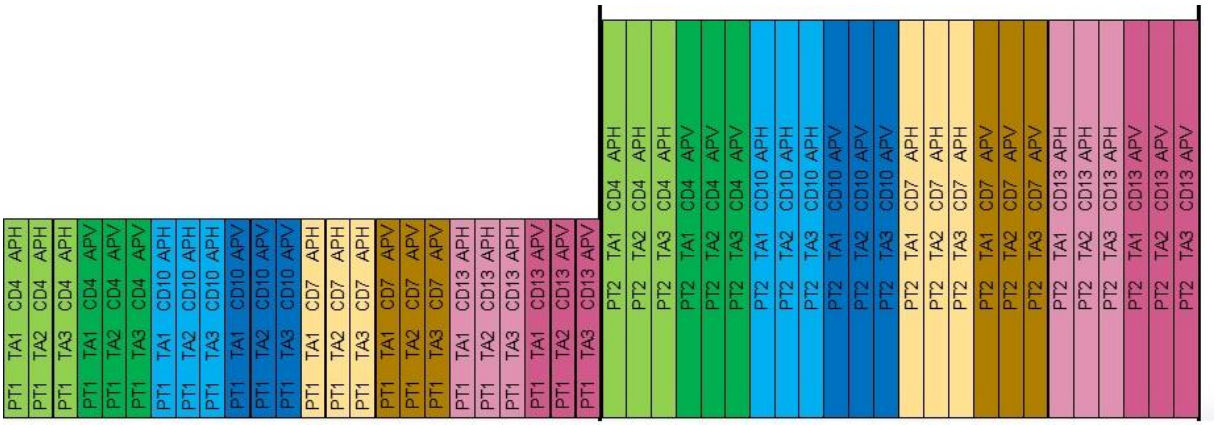


For this configuration, 16 scans are performed per power level. The number of scans can be calculated as follows:
Number of scans
= (Number of polarization planes) * (Number transmission channels) * (Number trials)
= 2 * 4 * 2
= 16
Taking into account 4 power levels, this results in 64 scans.

If a Single command is executed, the command execution is terminated by the RFID station after all scanning processes have passed through at the last power level. If, on the other hand, an enhanced command is executed, the transmit power is reduced again to the value of level 1 (PT 1) after all scans have been performed at the last power level and the ramp starts again. This process is repeated until the write or read command is aborted by the function block.

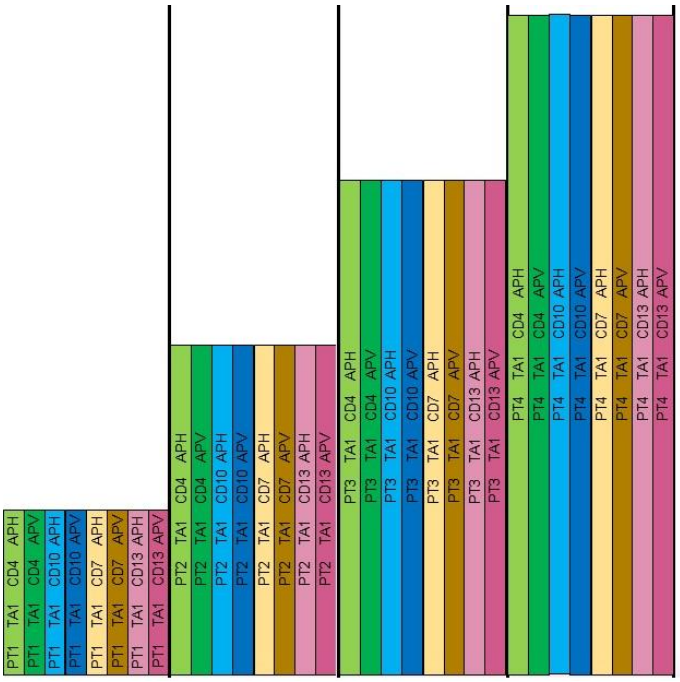
Example 2: Scanning operations with a number of tries (TA) = 3 and 2 power levels

PT:	PT1, PT2	(2 power levels)
TA:	3	(3 trials per transmission channel)
CD:	4, 10, 7, 13	(4 transmission channels)
AP:	C	(Combined Mode; horizontal and vertical polarization plane)



The value of the "Tries allowed" (TA) parameter has been increased to 3. This increases the number of scan attempts to 24 for each power level. The detection zone is scanned longer for each power level. The increase of the ramp or the transmit power is slower.

Example 3: Scanning operations with a number of tries (TA) = 1 and 4 power levels



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

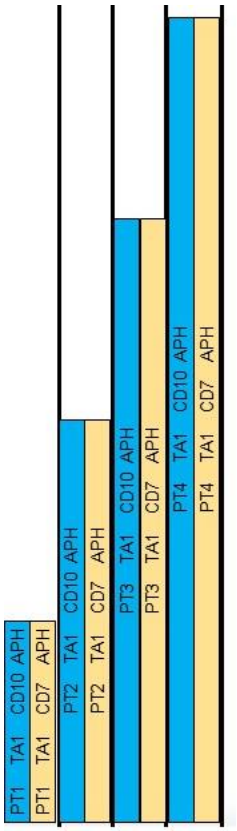
TA: 1 (1 trial per transmission channel)

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

AP: C (Combined Mode; horizontal and vertical polarization plane)

The value of the "Tries allowed" (TA) parameter has been reduced to 1. This reduces the number of scan attempts to 8 for each power level. The time with which the detection zone is scanned with a power level is reduced. The power levels of the ramp are scanned faster.

Example 4: Scan trials with horizontal polarization (AP), 2 transmit channels (CD), 1 trial (TA) and 4 power levels

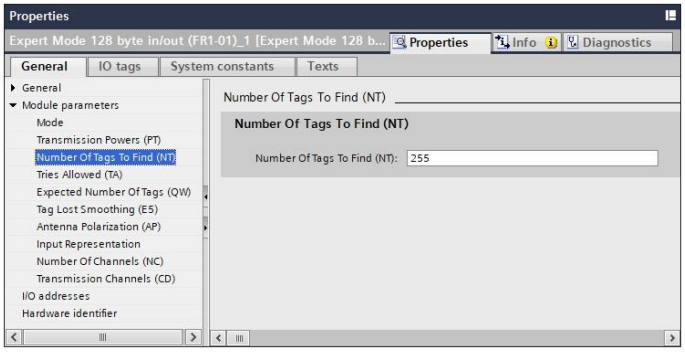


PT: PT1, PT2, PT3, PT4 (4 power levels)
TA: 1 (1 trial per transmission channel)
CD: 10, 13 (2 transmission channels)
AP: H (horizontal polarization plane)

The value of the "Tries allowed" (TA) parameter has been reduced to 1. In addition, only 2 transmit channels (10 and 7) are used. The scan attempts are only performed in the horizontal polarization. This reduces the number of scan attempts to 2 for each power level. The time with which the detection zone is scanned with one power level is reduced. The power levels of the ramp are scanned more quickly.

4.3 Parameter “Number of Tags to Find - NT“

The parameter "Number of Tags to Find - NT" (abort criterion) can be used to terminate the execution of a Single command when a certain number of tags are identified during the command execution.



Default setting parameter “Number of Tags to Find“

Number of Tags to Find (NT): 255

With a setting of 255 there is no abort of the running Single command. All scan processes are executed.

Value range “Number of Tags to Find“: 1…255
Default setting: 255

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.

Read out parameter “Number of Tags to Find – NT“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'N'	'N'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#4E
SpecialCommand[7]	Byte	16#0	16#54
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Number of Tags to Find – NT“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „NT“	16#4E54 „NT“
SpecialCommand [8]…[9]	Length Parameter	16#0000

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor...
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#FF
ReadData[1]	Byte	16#0	16#00

Read-out value “Number of Tags to Find – NT“ parameter
ReadData [0] Number of Tags 16#FF (255; no termination)

Change parameter “Number of Tags to Find – NT“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'N'	'N'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#00	16#00

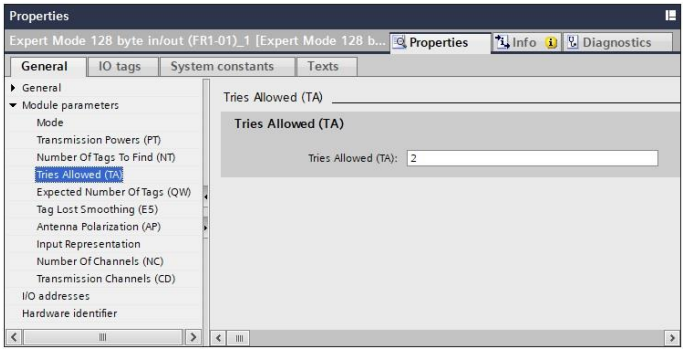
SpecialCommand	Array...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#4E
SpecialCommand[7]	Byte	16#0	16#54
SpecialCommand[8]	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

Command write parameter “Number of Tags to Find – NT“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „NT“	16#4E54 „NT“
SpecialCommand [8]…[9]	Length Parameter	16#0001
SpecialCommand [10]	Number of Tags to find NT	16#01 (1; Abort after 1 data carrier)

4.4 Parameter “Tries Allowed - TA“

The "Tries Allowed - TA" parameter allows you to set the number of scan attempts (inventory rounds) that are performed for each transmit channel (parameter CD or NC) per power level (parameter PT).



Default setting parameter “Tries Allowed“

Tries allowed (TA): 2

This results in 2 scan attempts per polarization plane and power level per transmit channel.

Value range “Tries allowed”: 1…255
Default setting: 2

The setting of the "Tries Allowed" parameter has a direct influence on how many scan 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 transmit 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. More detailed information about this can be found in the section "Parameterization of a ramp function for the transmit power" in the previous chapter.

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

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

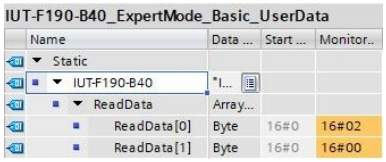
Read out parameter “Tries Allowed – TA“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'A'	'A'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#54
SpecialCommand[7]	Byte	16#0	16#41
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Tries Allowed – TA“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „TA“	16#5441 „TA“
SpecialCommand [8]…[9]	Length Parameter	16#0000



IUT-F190-B40_ExpertMode_Basic_UserData			
Name	Data ...	Start ...	Monitor..
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#02
ReadData[1]	Byte	16#0	16#00

Read-out value “Tries Allowed – TA” parameter

ReadData [0]	Number of trials	16#02 (2 trials)

Change parameter “Tries Allowed – TA“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'T'	'T'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'A'	'A'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#00	16#00

SpecialCommand	Array...		
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#54
SpecialCommand[7]	Byte	16#0	16#41
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#0A
SpecialCommand[11]	Byte	16#0	16#00

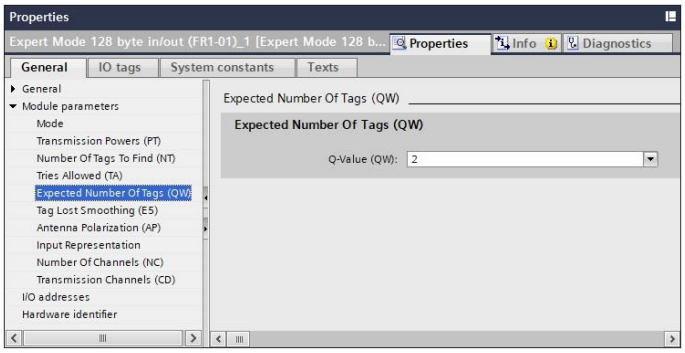
Command write parameter “Tries Allowed – TA“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „TA“	16#5441 „TA“
SpecialCommand [8]…[9]	Length Parameter	16#0001
SpecialCommand [10]	Number of trials TA	16#0A (10 trials)

4.5 Parameter “Expected Number of Tags - QW“

When identifying one or more data carriers via the air interface, each data carrier is assigned a defined time slot for data transmission by the IUT-F190-B40 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" the number of time slots is determined by 2^QW.



Default setting parameter „Expected Number of Tags“

Expected number of tags (QW): 2

This uses $2^2 = 4$ time slots on the air interface.

Value range “Expected Number of Tags“: 0…7

0 → 1 time slot resp. 1 data carrier
1 → 2 time slots resp. 2 data carriers
2 → 4 time slots resp. 4 data carriers
3 → 8 time slots resp. 8 data carriers
….
7 → 128 time slots resp. 128 data carriers

Default setting: 2

In the case of an intended identification of only one data carrier, the "Expected Number of Tags" (QW) parameter 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 result in collisions of the responses from the data carriers on the air interface because they respond in the same time slot. Therefore, as the number of data carriers increases, the value of the parameter QW or the time slots should be adjusted accordingly. An increase in the number of time slots leads to slower identification of the data carriers.

Read out parameter “Expected Number of Tags – QW“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'Q'	'Q'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'W'	'W'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#51
SpecialCommand[7]	Byte	16#0	16#57
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Expected Number of Tags – QW“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „QW“	16#5157 „QW“
SpecialCommand [8]…[9]	Length Parameter	16#0000

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor...
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#02
ReadData[1]	Byte	16#0	16#00

Read-out value “Expected Number of Tags – QW” parameter

ReadData [0]	Number 2^QW	16#02	(4 Tags)

Change parameter “Expected Number of Tags – QW“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'Q'	'Q'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'W'	'W'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#00	16#00

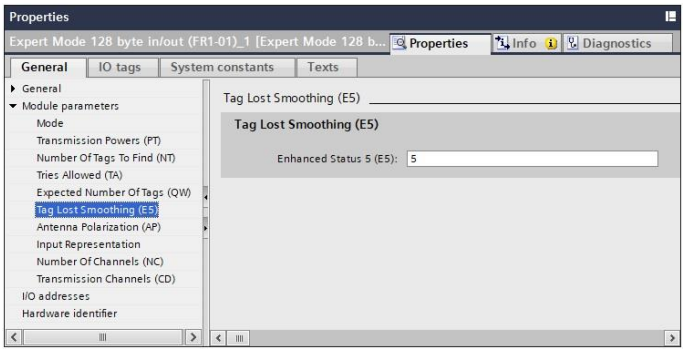
SpecialCommand	Array...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#51
SpecialCommand[7]	Byte	16#0	16#57
SpecialCommand[8]	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

Command write parameter “Expected Number of Tags – QW“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „QW“	16#5157 „QW“
SpecialCommand [8]…[9]	Length Parameter	16#0001
SpecialCommand [10]	Number 2^QW	16#00 (2^0 = 1 data carrier)

4.5 Parameter “Tag Lost Smoothing – E5“

If a tag leaves the detection zone, the IUT-F190-B40 RFID station continues to make access attempts to this tag. The "Tag Lost Smoothing" parameter can be used to set how many unsuccessful access attempts should be made before the exit of the tag from the detection zone is reported to the controller.



Default setting parameter “Tag Lost Smoothing“:

Tag Lost Smoothing (E5): 5

5 unsuccessful read accesses to a data carrier must be executed before a corresponding message is sent to the PLC.

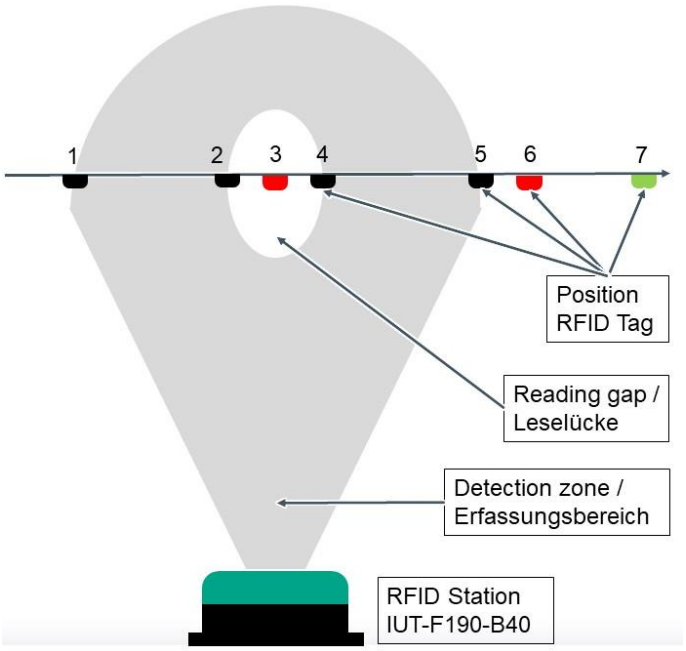
Value range “Tag Lost Smoothing“: 0…252
Default setting: 5

The "Tag Lost Smoothing" parameter (E5) influences how quickly the loss of a data carrier is reported to the PLC. The IUT-F190-B40 RFID station uses electromagnetic waves to identify data carriers. Electromagnetic waves cause reflections on metal surfaces. This can create areas in the detection zone where no stable communication with the data carrier is possible (read gap). If a tag enters such an area, a message is sent to the controller that the tag can no longer be read. The "Tag Lost Smoothing" parameter can be used to delay this message until the tag leaves this area again and enters an area in which it can be stably recognized again.

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

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

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



1: Data carrier enters the detection zone; successful read access is immediately reported to the PLC
2: Data carrier leaves detection zone and reaches the area of a read gap; no message to the PLC
3: small value of the "Tag lost Smoothing" → Exit of the data carrier from the detection zone is reported to the PLC
4: Data carrier re-enters the detection range from the read gap; successful read access is reported to the PLC
5: Data carrier leaves detection zone permanently; no message to the PLC
6: small value of the "Tag lost Smoothing" → Exit of the data carrier from the acquisition zone is reported to the PLC
7: large value of "Tag lost smoothing" → Exit of the tag from the acquisition zone is reported to the PLC

Read out parameter “Tag Lost Smoothing – E5“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'E'	'E'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'5'	'5'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#45
SpecialCommand[7]	Byte	16#0	16#35
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Tag Lost Smoothing – E5“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „E5“	16#4535 „E5“
SpecialCommand [8]…[9]	Length Parameter	16#0000

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor...
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#05
ReadData[1]	Byte	16#0	16#00

Read-out value “Tag Lost Smoothing – E5” parameter
ReadData [0] Number of trials 16#05 (5 trials)

Change parameter “Tag Lost Smoothing – E5“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'E'	'E'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'5'	'5'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#64	16#64
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#00	16#00

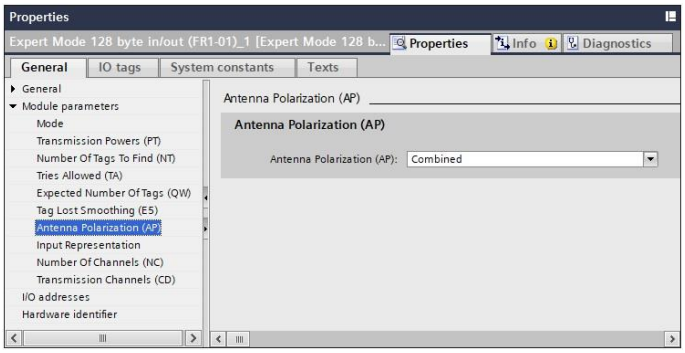
SpecialCommand	Array...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#45
SpecialCommand[7]	Byte	16#0	16#35
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#64
SpecialCommand[11]	Byte	16#0	16#00

Command write parameter “Tag Lost Smoothing – E5“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „E5“	16#4535 „E5“
SpecialCommand [8]…[9]	Length Parameter	16#0001
SpecialCommand [10]	Number of access trials	16#64 (100 access trials)

4.6 Parameter “Antenna Polarization – AP“

The identification of data carriers by the RFID station IUT-F190-B40 takes place via an electromagnetic field. The waves emitted for this purpose are polarized. The "Antenna Polarization" (AP) parameter is used to set the polarization type of the electromagnetic waves.



Default setting parameter “Antenna Polarization“:

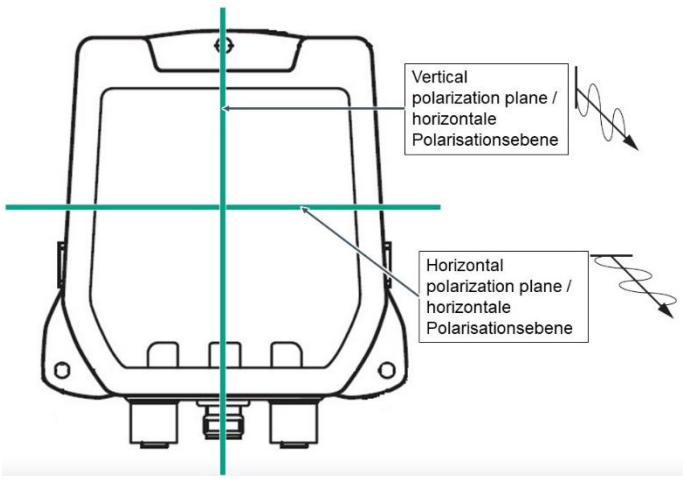
Antenna Polarization (AP):Combined

With the "Combined" setting, a scan with horizontal polarization is performed first. This is followed by a scan with vertical polarization.

Value range “Antenna Polarization“: Combined (horizontal + vertical polarization)
Horizontal (horizontal polarization only)
Vertical (Vertical polarization only)

Default setting: Combined

The antenna of the IUT-F190-B40 RFID station and the antenna inside a data carrier have a polarization orientation. The orientation of the data carrier must be selected so that the polarization is identical to the set polarization type of the RFID station.



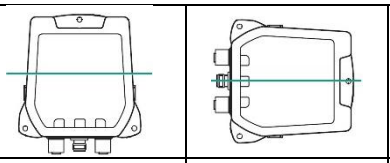
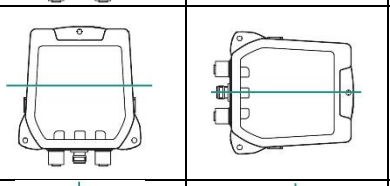
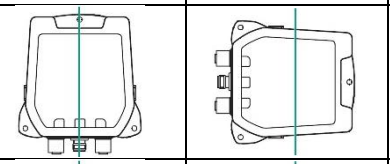
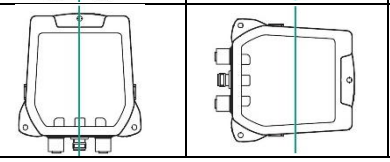
Polarization planes RFID Station IUT-F190-B40:

Horizontal polarization: plane from left to right ground connection

Vertical polarization: plane from connection supply voltage to mounting hole

In the factory setting, the "Combined" mode is activated. Under this setting, first a scan with horizontal polarization and then another scan with vertical polarization is performed. This mode has the advantage that the orientation of the data carrier does not have to be taken into account. However, the scan attempt cycle time is extended for each power level, since a scan attempt is performed alternately with both polarization levels.

If the orientation of the data carrier is known and remains unchanged, it is recommended to change the polarization to the setting "horizontal" or "vertical" according to the orientation of the data carrier. In this way, only scan attempts in the polarization type that matches the orientation of the data carrier are executed. The number of scan attempts per power level is thus reduced by half and the throughput time is shortened accordingly.

	Alignment of the polarization plane IUT-F190-B40 identical to the alignment of the polarization plane of the data carrier → correct alignment → Data carrier can be identified
	Alignment of the polarization plane IUT-F190-B40 rotated by 90° to the alignment of the polarization plane of the data carrier → incorrect alignment → Data carrier cannot be identified
	Alignment of the polarization plane IUT-F190-B40 identical to the alignment of the polarization plane of the data carrier → correct alignment → Data carrier can be identified
	Alignment of the polarization plane IUT-F190-B40 rotated by 90° to the alignment of the polarization plane of the data carrier → incorrect alignment → Data carrier cannot be identified

If the RFID station unintentionally identifies neighboring tags, this behavior can be reduced by reducing the transmitting power (parameter PT) and switching to only one polarization plane. Instead of the combined mode (factory setting), horizontal or vertical polarization is then used. However, the orientation of the data carrier must be constant and known.

The energy transmitted to a data carrier depends on the alignment of the data carrier to the RFID station. If the polarization planes of the data carrier and RFID station are the same, the transmitted energy is at a maximum and the greatest possible range is achieved. If the polarization planes are rotated relative to each other, less energy is transmitted to the data carrier. This reduces the range for detecting the data carrier. When using only one polarization plane (horizontal or vertical), the transmitted energy is minimal if the angle between the polarization plane of the RFID station and the data carrier is 90°.

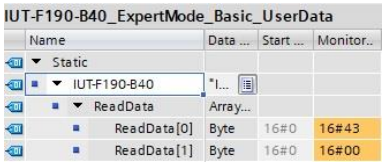
Read out parameter “Antenna Polarization – AP“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'A'	'A'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'P'	'P'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#41
SpecialCommand[7]	Byte	16#0	16#50
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Antenna Polarization – AP“

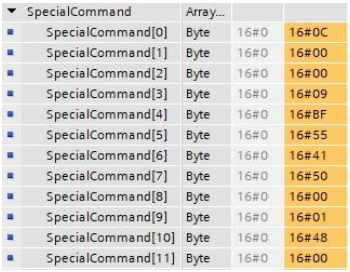
SpecialCommand [0]	Frame Length	16#0B
SpecialCommand [1]	Fragmentation Counter	16#00
SpecialCommand [2]…[3]	Telegram Length	16#0008
SpecialCommand [4]	Command	16#BE
SpecialCommand [5]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „AP“	16#4150 „AP“
SpecialCommand [8]…[9]	Length Parameter	16#0000



Read-out value “Antenna Polarization – AP” parameter
ReadData [0] Polarization 16#43 (Combined Mode)

Change parameter “Antenna Polarization – AP“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'A'	'A'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'P'	'P'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#48	16#48
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#00	16#00



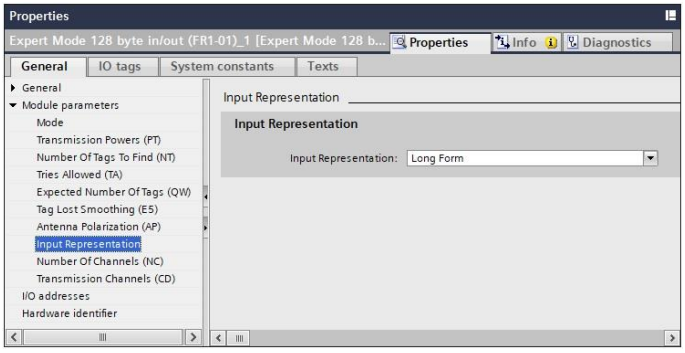
SpecialCommand	Array...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#41
SpecialCommand[7]	Byte	16#0	16#50
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#48
SpecialCommand[11]	Byte	16#0	16#00

Command write parameter “Antenna Polarization – AP“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „AP“	16#4150 „AP“
SpecialCommand [8]…[9]	Length Parameter	16#0001
SpecialCommand [10]	Polarization	16#48 („H“ = horizontal)

4.7 Parameter “Input Representation“

The IUT-F190-B40 RFID station supports two data formats for transmission via the process interface. The "Input Representation" parameter can be used to switch between the two formats.



Default setting parameter “Input Representation“:

Input Representation: Long Form

This setting allows multiple data carriers to be identified simultaneously within the detection zone.

Value range “Input Representation“: Long Form
Short Form
Default setting: Long Form

When using the "Long Form" data format, one or more data carriers can be identified that are simultaneously located in the detection zone of the RFID station. For an assignment of the data sent back from the RFID station to the PLC to the associated data carrier, the UII/EPC information is always prefixed in the returned data when using the "Long Form" data format. The UII/EPC code (memory bank 01) is a unique identifier for the data carrier. There must not be more than one data carrier with the same UII/EPC code within the acquisition zone.

Telegram structure returned data "Long Form":

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
…	…
255	16#00

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

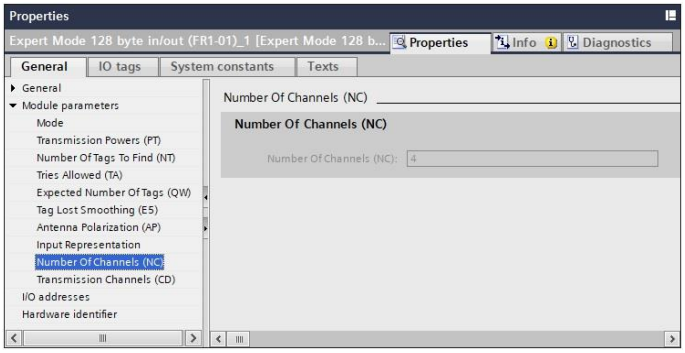
Telegram structure returned data "Short Form":

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				
…	…				
255	16#00				

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

4.8 Parameter “Number of Channels - NC“

This parameter cannot be set for all device variants of the IUT-F190-B40 RFID station. The parameter is only supported by the variants IUT-F190-B40-FR2-02 (USA) and IUT-F190-B40-FR2-03 (China). These devices use the frequency hopping method (FHSS) for data transmission. The "Number of Channels" (NC) parameter can be used to set the number of transmit channels on the air interface that are used within a scan cycle.



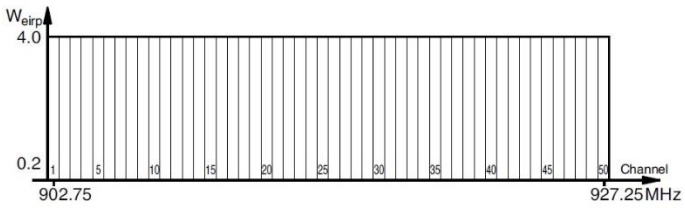
Default setting parameter “Number of Channels“:

Number of channels (NC): 4

Under this setting, 4 transmit channels are used during the execution of a scan cycle. The preset value depends on the device variant.

IUT-F190-B40-FR1-01 (Europe):
The "Number of Channels" (NC) parameter is not valid for this device variant. This device uses the Dense Reader Mode (DRM) for data transmission. The transmit channels used can be parameterized by the "Transmit Channels" (CD) parameter.

IUT-F190-B40-FR2-02 (USA):
The device version for use in the USA uses 50 transmit channels on the air interface. All 50 channels are always used one after the other.



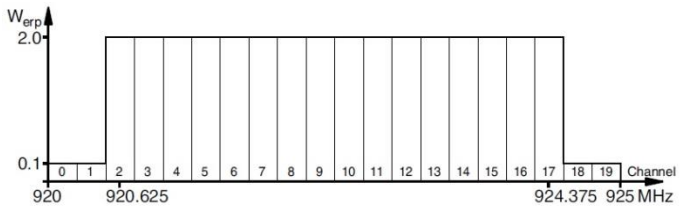
Channel layout IUT-F190-B40-FR2-02:

Use of channels 1 to 50 for data transmission

Value range “Number of Channels“ (FR2-02): 1…50
Default setting (FR2-02): 50

If the value of the "Number of Channels" (NC) parameter is set to the value 10, channels 1 to 10 are used within the first scan cycle. The next scan cycle then uses channels 11 to 20. After channel 50 is used, channel 1 and subsequent channels on the air interface are used again.

IUT-F190-B40-FR2-03 (China):
The device version for use in China has 20 transmission channels available. However, the device only uses channels 2 to 17. All of these 16 channels are always used one after the other.



Channel layout IUT-F190-B40-FR2-03:

Use of channels 2 to 17 for data transmission

Value range “Number of Channels“ (FR2-03): 1…16
Default setting (FR2-03): 16

If the value of the "Number of Channels" (NC) parameter is set to 4, channels 2 to 5 are used within the first scan cycle. The next scan cycle then uses channels 6 to 9. After channel 17 is used, channel 2 and subsequent channels on the air interface are used again.

Read out parameter “Number of Channels – NC“ via SpecialCommand:

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'N'	'N'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'C'	'C'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Array...		
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#4E
SpecialCommand[7]	Byte	16#0	16#43
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter “Number of Channels – NC“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „NC“	16#4E43 „NC“
SpecialCommand [8]…[9]	Length Parameter	16#0000

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data ...	Start ...	Monitor...
Static			
IUT-F190-B40	"I...		
ReadData	Array...		
ReadData[0]	Byte	16#0	16#04
ReadData[1]	Byte	16#0	16#00

Read-out value “Number of Channels – NC” parameter

ReadData [0]…[1]	Number of channels (4 channels; FR1-01)	16#04

Change parameter “Number of Channels – NC“ via SpecialCommand (FR2-02 und FR2-03):

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'N'	'N'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'C'	'C'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#00	16#00

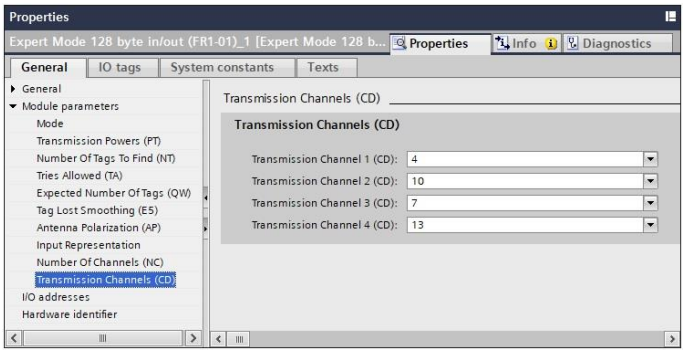
SpecialCommand	Arr...		
SpecialCommand[0]	Byte	16#0	16#0C
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#09
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#4E
SpecialCommand[7]	Byte	16#0	16#43
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#01
SpecialCommand[10]	Byte	16#0	16#0A
SpecialCommand[11]	Byte	16#0	16#00

Command write parameter “Number of Channels – NC“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „NC“	16#4E43 „NC
SpecialCommand [8]…[9]	Length Parameter	16#0001
SpecialCommand [10]	Number of Channels	16#0A (10 channels)

4.9 Parameter “Transmission Channels - CD“

By means of the parameter "Transmission Channels" (CD) the transmission channels to be used for the device version IUT-F190-B40-FR1-01 (Europe) can be parameterized. This device uses the Dense Reader Mode (DRM) where only channels 4, 7, 10 and 13 of the channel spectrum can be used. It is possible to change the number and the order of the channels by this parameter.



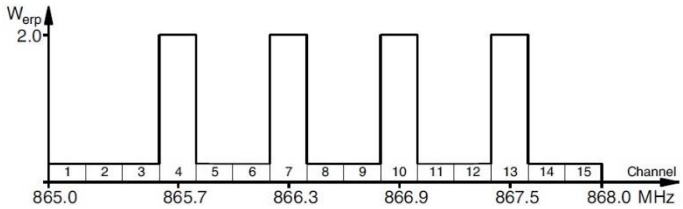
Default setting parameter “Transmission Channels“:

Transmission Channels (CD):

1/4	Channel 4
2/4	Channel 10
3/4	Channel 7
4/4	Channel 13

4 channels are used in the order 4, 10, 7 and 13.

IUT-F190-B40-FR1-01 (Europe):
Channels 4, 7, 10 and 13 of the channel spectrum can be used for this device version. The number of channels can be between 1 (minimum) and 4 (maximum). The order of the channels is adjustable.



Channel layout IUT-F190-B40-FR1-01:

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

The number of transmission channels used can be reduced by the "Transmission Channels" (CD) parameter. If fewer transmission channels are used, the execution time for a scan cycle on a power level is reduced. Fewer scans are executed per power level 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.

Read out parameter „Transmission Channels – CD“ via SpecialCommand (FR1-01):

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BE	16#BE
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'C'	'C'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'D'	'D'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#00	16#00

SpecialCommand	Arr...		
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#43
SpecialCommand[7]	Byte	16#0	16#44
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#00
SpecialCommand[10]	Byte	16#0	16#00

Command read parameter „Transmission Channels – CD“

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]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „CD“	16#4344 „CD“
SpecialCommand [8]…[9]	Length Parameter	16#0000

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Da...	Start ...	Monitor...
Static			
IUT-F190-B40	"IU...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#04
ReadData[1]	Byte	16#0	16#0A
ReadData[2]	Byte	16#0	16#07
ReadData[3]	Byte	16#0	16#0D
ReadData[4]	Byte	16#0	16#00

Read-out value “Transmission Channels – CD” parameter

ReadData [0]	Channel 1	16#04 (transmit channel 4)
ReadData [1]	Channel 2	16#0A (transmit channel 10)
ReadData [2]	Channel 3	16#07 (transmit channel 7)
ReadData [3]	Channel 4	16#0D (transmit channel 13)

Change parameter “Transmission Channels – CD“ via SpecialCommand (FR1-01):

Name	A...	Dis...	Monit...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[0]		Hex	16#0D	16#0D
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[2]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[3]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[4]		Hex	16#BF	16#BF
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[5]		Cha...	'U'	'U'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[6]		Cha...	'C'	'C'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[7]		Cha...	'D'	'D'
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[8]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[9]		Hex	16#02	16#02
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[10]		Hex	16#07	16#07
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[11]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".SpecialCommand[12]		Hex	16#00	16#00

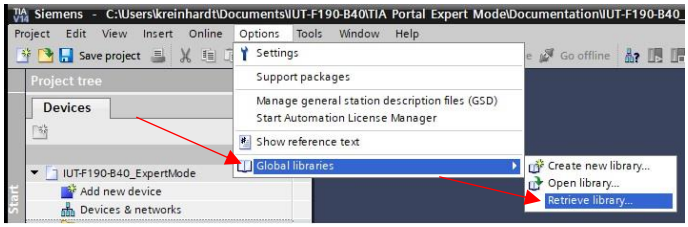
SpecialCommand	Arr...		
SpecialCommand[0]	Byte	16#0	16#0D
SpecialCommand[1]	Byte	16#0	16#00
SpecialCommand[2]	Byte	16#0	16#00
SpecialCommand[3]	Byte	16#0	16#0A
SpecialCommand[4]	Byte	16#0	16#BF
SpecialCommand[5]	Byte	16#0	16#55
SpecialCommand[6]	Byte	16#0	16#43
SpecialCommand[7]	Byte	16#0	16#44
SpecialCommand[8]	Byte	16#0	16#00
SpecialCommand[9]	Byte	16#0	16#02
SpecialCommand[10]	Byte	16#0	16#07
SpecialCommand[11]	Byte	16#0	16#0A
SpecialCommand[12]	Byte	16#0	16#00

Command write parameter “Transmission Channels – CD“

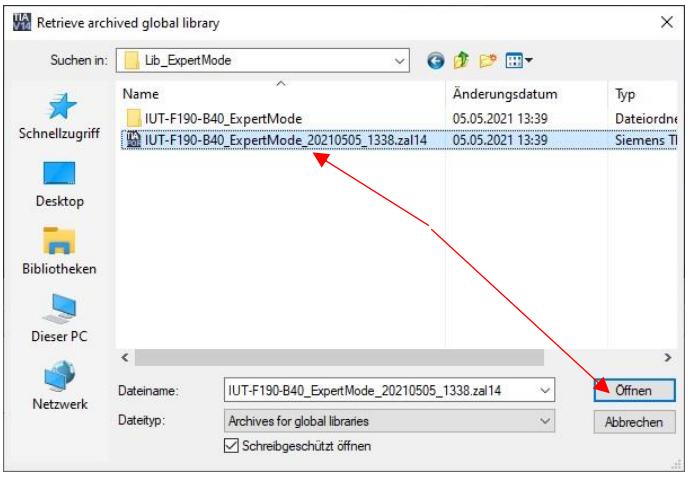
SpecialCommand [0]	Frame Length	16#0D
SpecialCommand [1]	Fragmentation Counter	16#00
SpecialCommand [2]…[3]	Telegram Length	16#000A
SpecialCommand [4]	Command	16#BF
SpecialCommand [5]	System Code „U“	16#55 „U“
SpecialCommand [6]…[7]	Parameter Code „CD“	16#4344 „CD“
SpecialCommand [8]…[9]	Length Parameter	16#0002
SpecialCommand [10]	Channel 1	16#07 transmit channel 7)
SpecialCommand [11]	Channel 2	16#0A (transmit channel 10)

5. Import library “IUT-F190-B40_ExpertMode“

The "IUT-F190-B40_ExpertMode" library contains a function block for using the Expert Mode. This library must first be unpacked.

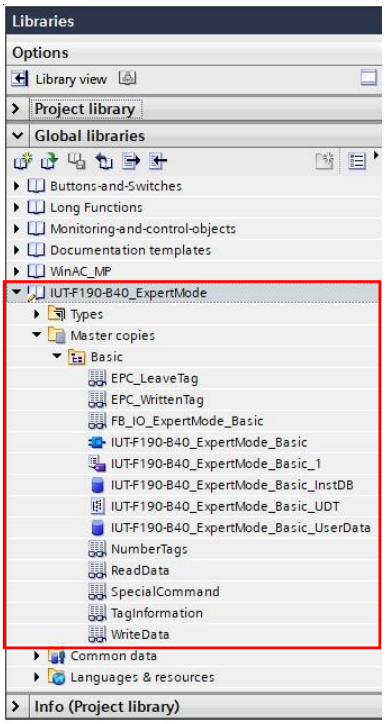


Retrieve library:
Options → Global libraries → Retrieve library



Select library:

Here: IUT-F190-B40_ExpertMode…..zal14



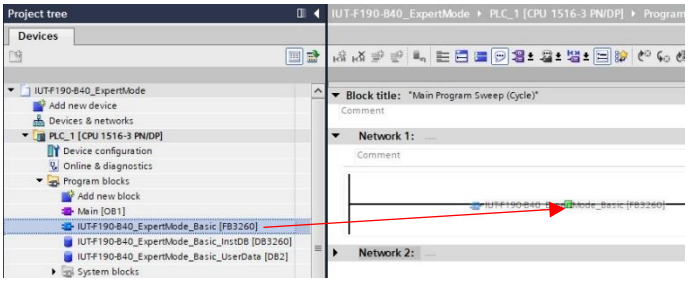
The function block is located inside the "Master copies" folder. In addition, the associated data blocks and a UDT are contained there.

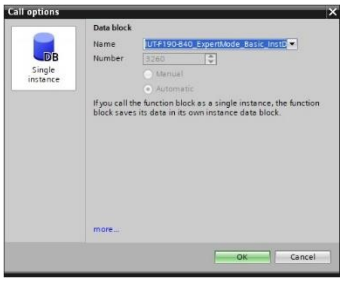
For a test of the control there are also variable tables and a symbol table in the folder.

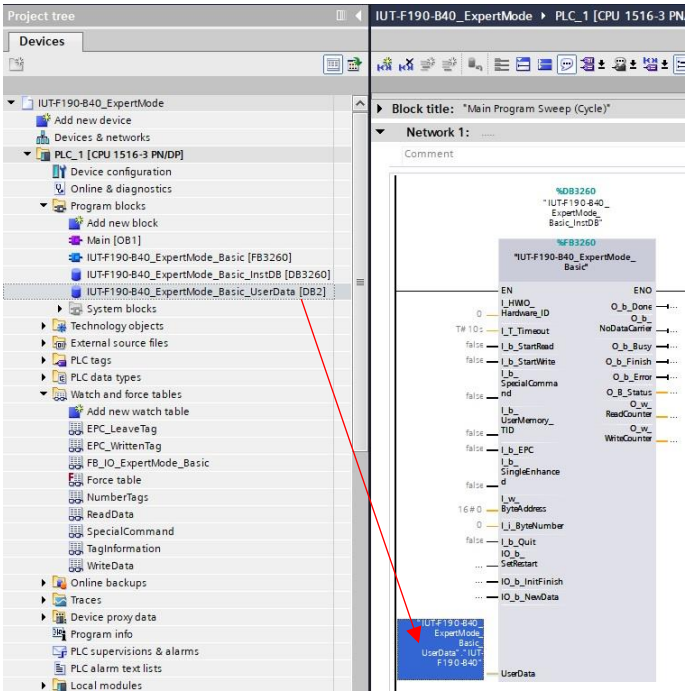
6. Function block “IUT-F190-B40_ExpertMode_Basic“

Functional description "IUT-F190-B40_ExpertMode_Basic:
Basic version of a function block for using the Expert Mode. Write and read commands can be executed. The number of successful read or write accesses is output. In addition, the time of access to the data carrier is saved. When a new read or write command is started, all internal data and the outputs are reset. The read and write data as well as the access times are located within the data block "IUT-F190-B40_ExpertMode_Basic_UserData".

Implementation of function block "IUT-F190-B40_ExpertMode_Basic":
Drag function block "IUT-F190-B40_ExpertMode_Basic" (FB3260) from the project tree into OB1. Then select the corresponding instance data block. The library contains the data block "IUT-F190-B40_ExpertMode_Basic_InstDB" (DB3260) which can be used as instance data block. The instance data block can also be regenerated.

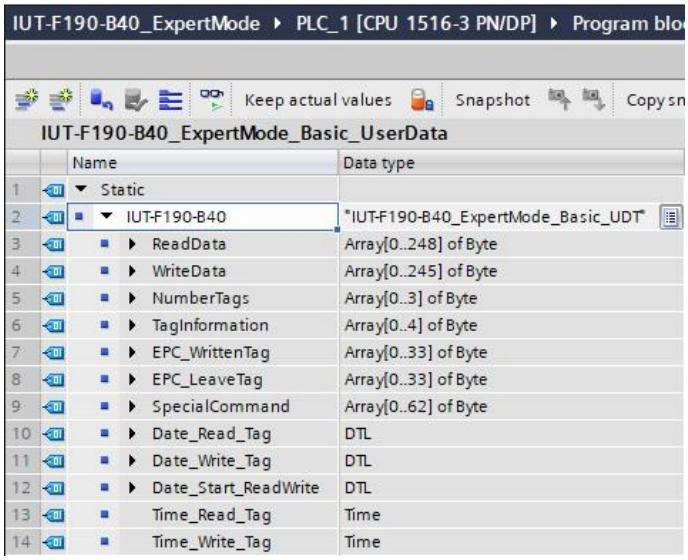






The read/write data and the access times of the function block are located in a separate data block. This is parameterized at the "UserData" input. The library contains the data block "IUT-F190-B40_ExpertMode_Basic_UserData" which can be used for this purpose.

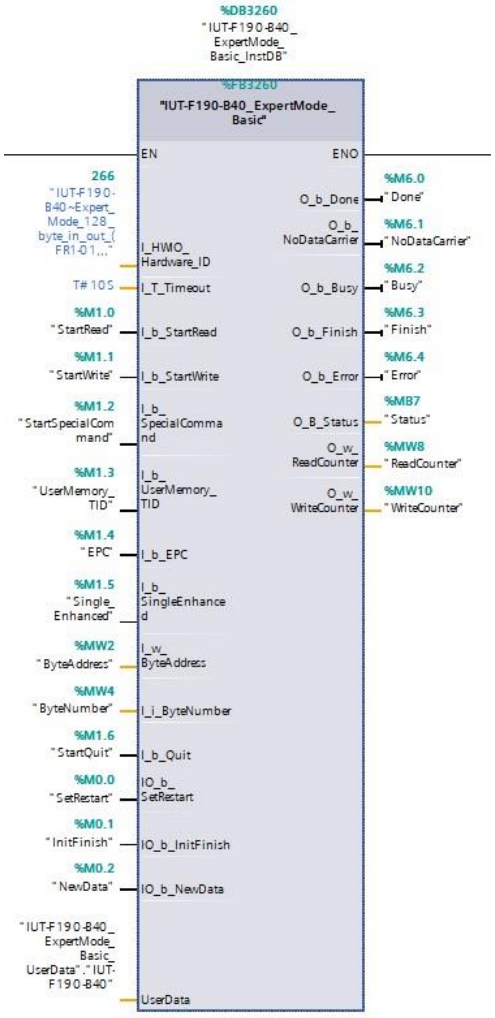
The data block can be generated by the user. The internal data structure is generated from the library via the "IUT-F190-B40_ExpertMode_Basic_UDT" data type.



The data block "IUT-F190-B40_ExpertMode_Basic_UserData" consists of the structure "IUT-F190-B40". This is divided into the following fields:

ReadData → Read data from data carrier
WriteData → Write data for data carrier
NumberTags → Number of detected data carrier 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 that has stepped out of the detection zone during the execution of an Enhanced command.
SpecialCommand → Data field for parameterization of a "SpecialCommand" (e.g. change of transmit power)

Date_Read_Tag → Date and time of successful read access to a data carrier
Date_Write_Tag → Date and time of successful write access to a data carrier
Date_Start_ReadWrite → Date and time Start of a write or read command
Time_Read_Tag → Time duration between start read command and successful read access to a data carrier
Time_Write_Tag → Time duration between start write command and successful write access to a data carrier



Complete wiring of the "IUT-F190-B40_ExpertMode_Basic" function block:

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

All modules or telegram lengths of the Expert Mode are supported.

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

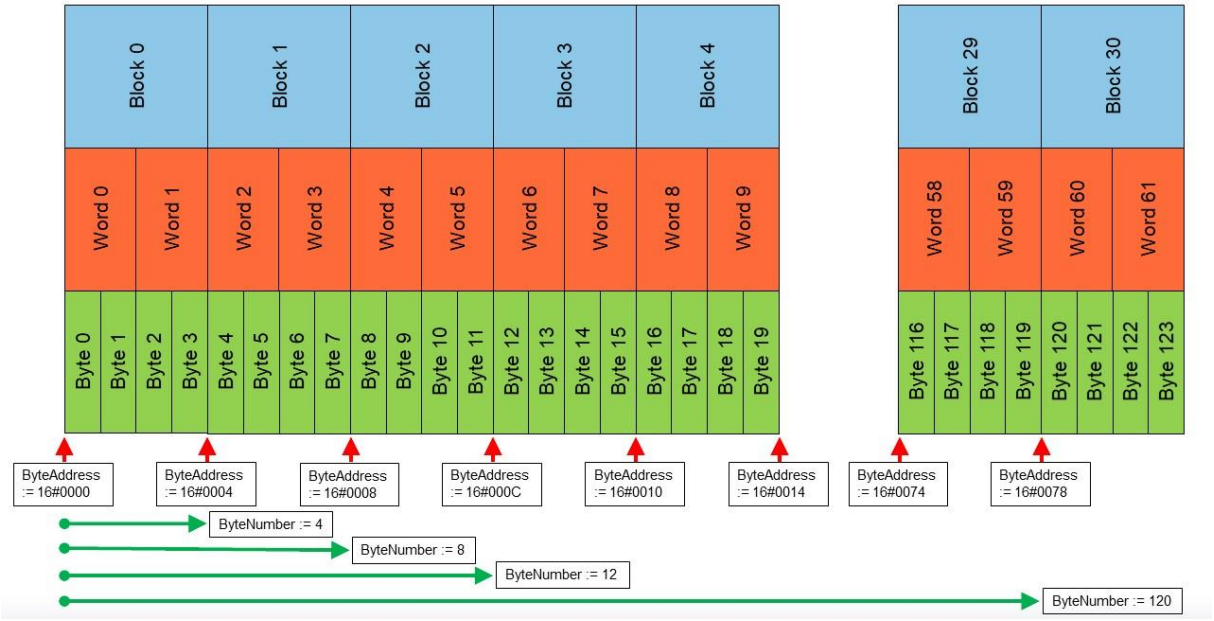
Name	Input / Output	Data type	Meaning
I_HWIO_Hardware_ID	Input	HW_IO	Hardware identifier of the communication module from the hardware configuration
I_T_Timeout	Input	Time	Timer for monitoring the communication; default 10 s (T#10s)
I_b_StartRead	Input	Bool	Start read command; With edge change from 0 → 1; starts execution of 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 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-F190-B40_ExpertMode_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 Rrite
I_b_SingleEnhanced	Input	Bool	Definition of execution type Read and Write 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 4; 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 4; the smallest amount of data is 4 bytes ("4"); a maximum of 120 bytes can be read or written per command
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 execution of commands.
IO_b_NewData	InOut	Bool	New response data of the RFID station available With edge change from 0 → 1 the reception of new response data of the RFID station is indicated; reset of IO_b_NewData by the user directly after the reception of the data.
UserData	InOut	DB	Data block "UserData → IUT-F190-B40_ExpertMode_Basic.IUT-F190-B40
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 job activated
O_b_Error	Output	Bool	Error condition 1 → An error has occurred during the execution of a read/write 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_ReadCounter	Output	Word	Number of successful read accesses Counter for the number of successful read accesses within one command execution.
O_w_WriteCounter	Output	Word	Number of successful write accesses Counter for the number of successful write accesses within one command execution

6.1 SR - Single Read 4-Byte Blocks (Bank 11; User Memory)

The "Single Read 4-Byte Blocks" 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 4-Byte Blocks” command reads memory blocks with a size of 4 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 4.

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_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 in from the data carrier during execution of the command are stored within the "IUT-F190-B40_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. If the transfer of additional information (parameter IF) has been activated, this is located in the "TagInformation" data structure. At the end of the command execution, the number of data carriers identified during the command is transferred. This information is located in the "NumberTags" data structure.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the "IO_b_NewData" variable directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers simultaneously in the detection zone, since the transferred information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

Single Read 4-Byte Blocks with one data carrier inside the detection zone:

Name	Address	Displ...	Monitor ..	Modify ...
"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	B...	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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 are 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 ..	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	1	
"WriteCounter"	%MW10	DEC+/-	0	

After the end of the command execution; a data carrier is read in.
IO_b_NewData = TRUE (is to be set after signal change from 0 → 1 directly back to 0)
O_b_Done = TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier = FALSE (is set 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_i_ReadCounter = 1 (number of data carriers read during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data t...	Start ..	Monitor..
Static			
IUT-F190-B40	"IU...		
ReadData	Array[...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#08
ReadData[18]	Byte	16#0	16#01
ReadData[19]	Byte	16#0	16#02
ReadData[20]	Byte	16#0	16#03
ReadData[21]	Byte	16#0	16#04
ReadData[22]	Byte	16#0	16#05
ReadData[23]	Byte	16#0	16#06
ReadData[24]	Byte	16#0	16#07
ReadData[25]	Byte	16#0	16#08
ReadData[26]	Byte	16#0	16#00

Read data within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "ReadData

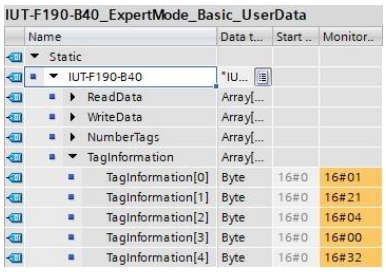
ReadData [0...1]: Length UII/EPC Information
Length 2 Byte; UII/EPC-Information = PC-Word + UII/EPC-Code; 16#000E = 14 Byte; 2 Byte PC-Word + 12 Byte UII/EPC-Code

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

ReadData [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

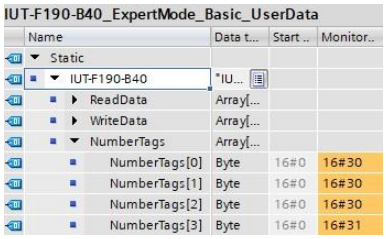
ReadData [16…17]: Length of read user memory data
Length 2 Byte; corresponds to input parameter "I_b_ByteNumber"; 16#0008 = 8 bytes

ReadData [18…25]: read User Memory data
Length depending on the setting "I_b_ByteNumber"; read out partial area of the user memory



IUT-F190-B40_ExpertMode_Basic_UserData				
Name	Data t...	Start ...	Monitor...	
Static				
IUT-F190-B40	"IU...			
ReadData	Array[...			
WriteData	Array[...			
NumberTags	Array[...			
TagInformation	Array[...			
TagInformation[0]	Byte	16#0	16#01	
TagInformation[1]	Byte	16#0	16#21	
TagInformation[2]	Byte	16#0	16#04	
TagInformation[3]	Byte	16#0	16#00	
TagInformation[4]	Byte	16#0	16#32	

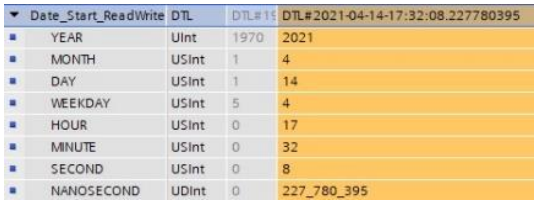
Additional information within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "TagInformation
TagInformation [0]: Information type
Length 1 Byte; always16#01
TagInformation [1]: RSSI value
Length 1 Byte; value range between 16#00 and 16#64
TagInformation [2]: Transmit channel
Length 1 Byte; Transmission channel on which the data carrier access was made; value range: 16#04, 16#07, 16#0A and 16#0D
TagInformation [3…4]: Transmission power
Length 2 Byte; Level of the transmission power on which the data carrier access was made



IUT-F190-B40_ExpertMode_Basic_UserData				
Name	Data t...	Start ...	Monitor...	
Static				
IUT-F190-B40	"IU...			
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	

Number of identified data carriers within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "NumberTags

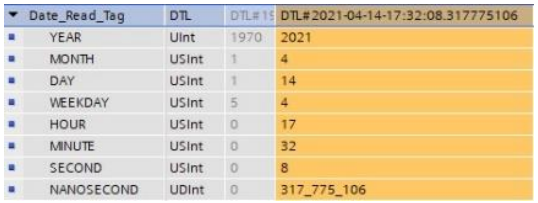
NumberTags [0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier



Date_Start_ReadWrite	DTL	DTL#19	DTL#2021-04-14-17:32:08.227780395
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	14
WEEKDAY	USInt	5	4
HOUR	USInt	0	17
MINUTE	USInt	0	32
SECOND	USInt	0	8
NANOSECOND	UDInt	0	227_780_395

Time start read operation:

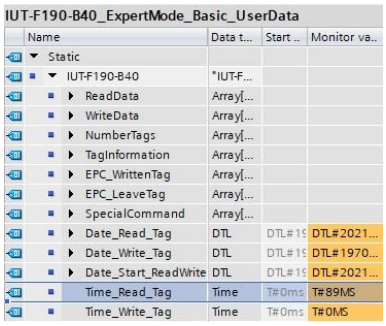
Data structure Date_Start_ReadWrite



Date_Read_Tag	DTL	DTL#19	DTL#2021-04-14-17:32:08.317775106
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	14
WEEKDAY	USInt	5	4
HOUR	USInt	0	17
MINUTE	USInt	0	32
SECOND	USInt	0	8
NANOSECOND	UDInt	0	317_775_106

Time of successful read access to a data carrier:

Data structure Date_Read_Tag

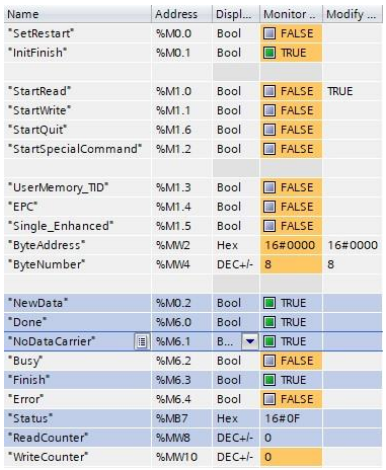


IUT-F190-B40_ExpertMode_Basic_UserData			
Name	Data t...	Start ...	Monitor va...
Static			
IUT-F190-B40	"IUT-F...		
ReadData	Array[...		
WriteData	Array[...		
NumberTags	Array[...		
TagInformation	Array[...		
EPC_WrittenTag	Array[...		
EPC_LeaveTag	Array[...		
SpecialCommand	Array[...		
Date_Read_Tag	DTL	DTL#19	DTL#2021...
Date_Write_Tag	DTL	DTL#19	DTL#1970...
Date_Start_ReadWrite	DTL	DTL#19	DTL#2021...
Time_Read_Tag	Time	T#0ms	T#89MS
Time_Write_Tag	Time	T#0ms	T#0MS

Execution time of the command until successful read access to the data carrier.

Time_Read_Tag data structure

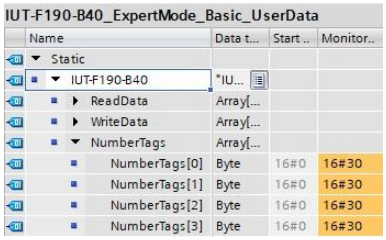
Single Read 4-Byte Blocks without data carrier in the detection zone or no data carrier detected:



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= TRUE (is set 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_i_ReadCounter	= 0 (no data carrier read)



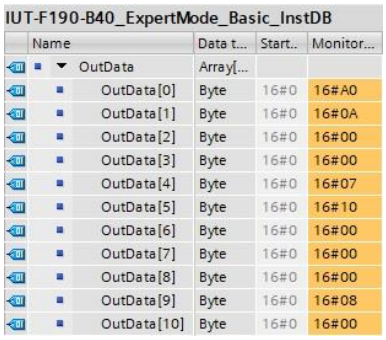
IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data t...	Start ..	Monitor..
Static			
IUT-F190-B40	"IU...		
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

Number of identified data carriers within data block "IUT-F190-B40_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 4-Byte Blocks:



IUT-F190-B40_ExpertMode_Basic_InstDB

Name	Data t...	Start..	Monitor...
OutData	Array[...		
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#10
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#00

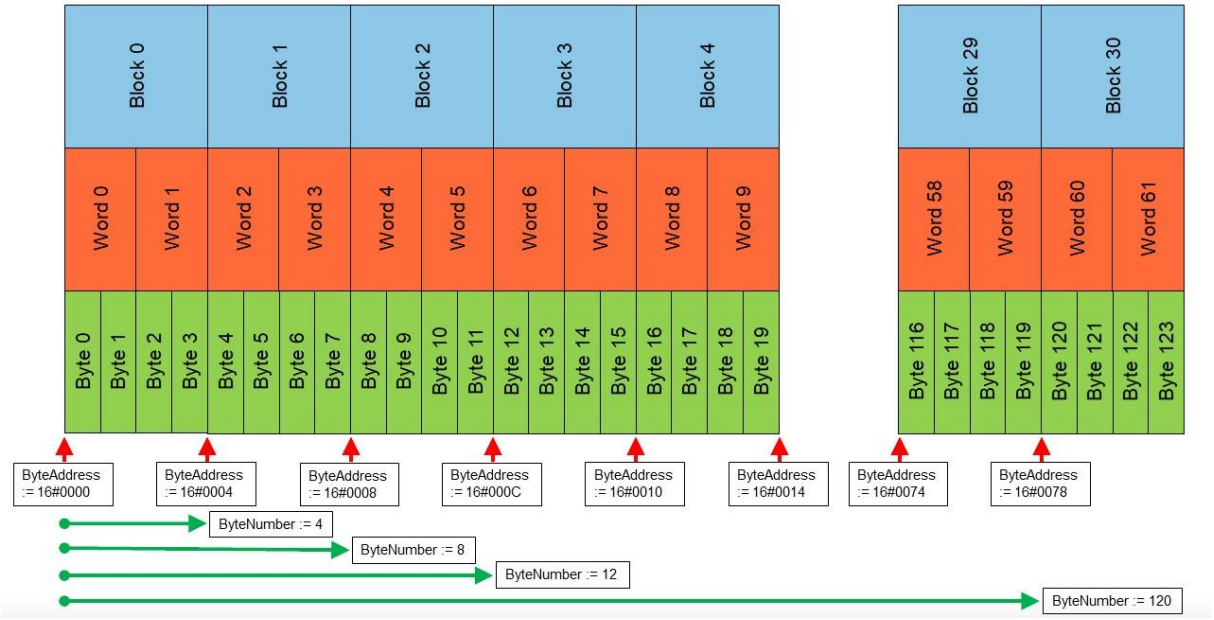
Command telegram within instance data block "IUT-F190-B40_ExpertMode_Basic_InstDB".

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#10
OutData [6…7]:	Byte Address	16#0000
OutData [8…9]:	Byte Number	16#0008

6.2 ER - Enhanced Read 4-Byte Blocks (Bank 11; User Memory)

The "Enhanced Read 4-Byte Blocks" 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 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 “Enhanced Read 4-Byte Blocks” command reads memory blocks with a size of 4 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 4.

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

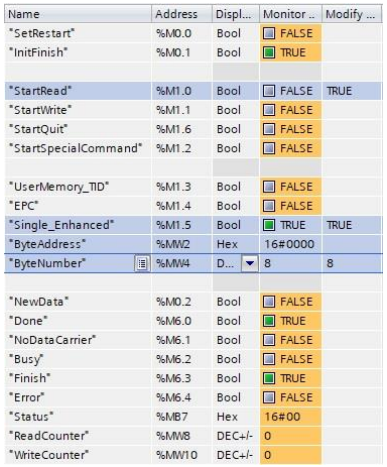


The command execution is started by a positive edge at the "I_b_StartRead" input. Within the function block, the signal change from FALSE to TRUE is evaluated. The input can either be set to FALSE again in the next PLC cycle or remain TRUE. The command execution is triggered exactly once by the one-time 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 in from the data carrier during execution of the command are stored within the "IUT-F190-B40_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. If the transfer of additional information (parameter IF) has been activated, this is located 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.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the "IO_b_NewData" variable directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers simultaneously in the detection zone, since the transferred information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

Enhanced Read 4-Byte Blocks:

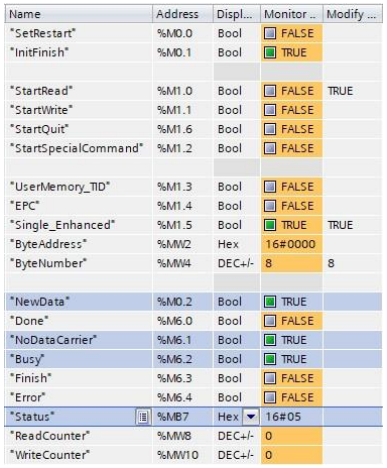


Name	Address	Displ...	Monitor ..	Modify ...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	TRUE
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	FALSE	
"Single_Enhanced"	%M1.5	Bool	TRUE	TRUE
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	D...	8	8
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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 are read)

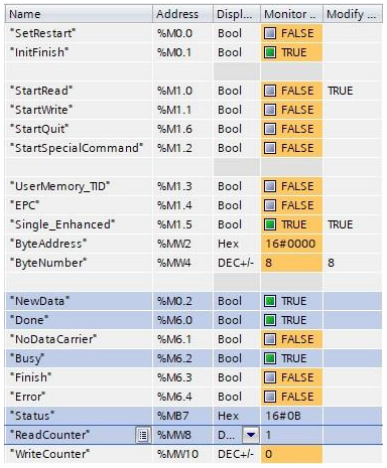
The command is started as soon as the input "I_b_StartRead" is set to TRUE.

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 ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; no data carrier.
IO_b_NewData = TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done = FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier = TRUE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter = 0 (number of data carriers read during command execution)



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	1	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; 1 data carrier read.
IO_b_NewData = TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done = TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier = FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter = 1 (number of data carriers read during Command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monito...
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#08
ReadData[18]	Byte	16#0	16#01
ReadData[19]	Byte	16#0	16#02
ReadData[20]	Byte	16#0	16#03
ReadData[21]	Byte	16#0	16#04
ReadData[22]	Byte	16#0	16#05
ReadData[23]	Byte	16#0	16#06
ReadData[24]	Byte	16#0	16#07
ReadData[25]	Byte	16#0	16#08
ReadData[26]	Byte	16#0	16#00

Read data within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "ReadData

ReadData [0...1]: Length UII/EPC Information
Length 2 Byte; UII/EPC-Information = PC-Word + UII/EPC-Code; 16#000E = 14 Byte; 2 Byte PC-Word + 12 Byte UII/EPC-Code

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

ReadData [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 user memory data
Length 2 Byte; corresponds to input parameter "I_b_ByteNumber"; 16#0008 = 8 bytes

ReadData [18…25]: read User Memory data
Length depending on the setting "I_b_ByteNumber"; read out partial area of the user memory

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monito...
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#14
TagInformation[2]	Byte	16#0	16#07
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#32

Additional information 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
Length 2 byte; transmit power on which the data carrier access took place.

Date_Start_ReadWrite	DTL	DTL#19	DTL#2021-04-15-13:07:07.199675546
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	15
WEEKDAY	USInt	5	5
HOUR	USInt	0	13
MINUTE	USInt	0	7
SECOND	USInt	0	7
NANOSECOND	UDInt	0	199_675_546

Time start read operation:

Data structure Date_Start_ReadWrite

Date_Read_Tag	DTL	DTL#19	DTL#2021-04-15-13:08:22.711263964
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	15
WEEKDAY	USInt	5	5
HOUR	USInt	0	13
MINUTE	USInt	0	8
SECOND	USInt	0	22
NANOSECOND	UDInt	0	711_263_964

Time of successful read access to a data carrier:

Data structure Date_Read_Tag

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monitor value
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	Arra...		
SpecialCommand	Arra...		
Date_Read_Tag	DTL	DTL#19	DTL#2021-04-15-...
Date_Write_Tag	DTL	DTL#19	DTL#1970-01-01-...
Date_Start_ReadWrite	DTL	DTL#19	DTL#2021-04-15-...
Time_Read_Tag	Time	T#0ms	T#1M_15S_511MS
Time_Write_Tag	Time	T#0ms	T#0MS

Execution time of the command until successful read access to the data carrier.

Time_Read_Tag data structure

Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	FALSE	
"NoDataCarrier"	%M6.1	B...	TRUE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#05	
"ReadCounter"	%MW8	DEC+/-	1	
"WriteCounter"	%MW10	DEC+/-	0	

Command active; data carrier has left detection zone

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 1 (number of data carriers read during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monit..
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#34
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#30
EPC_LeaveTag[5]	Byte	16#0	16#14
EPC_LeaveTag[6]	Byte	16#0	16#F7
EPC_LeaveTag[7]	Byte	16#0	16#33
EPC_LeaveTag[8]	Byte	16#0	16#7C
EPC_LeaveTag[9]	Byte	16#0	16#00
EPC_LeaveTag[10]	Byte	16#0	16#1F
EPC_LeaveTag[11]	Byte	16#0	16#00
EPC_LeaveTag[12]	Byte	16#0	16#00
EPC_LeaveTag[13]	Byte	16#0	16#00
EPC_LeaveTag[14]	Byte	16#0	16#74
EPC_LeaveTag[15]	Byte	16#0	16#83
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 ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"ReadCounter"	%MW8	DEC+/-	2	
"WriteCounter"	%MW10	DEC+/-	0	

Command execution active; second data carrier read in

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 2 (number of data carriers read during command execution)

Name	Address	Displ...	Monitor ..	Modify ...
"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	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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	2	
"WriteCounter"	%MW10	DEC+/-	0	

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.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception 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_i_ReadCounter	= 2 (number of data carriers read during command execution)

Command Enhanced Read 4-Byte Blocks:

IUT-F190-B40_ExpertMode_Basic_InstDB

Name	Data...	Start v..	Monito...
OutData	Arra...		
OutData[0]	Byte	16#0	16#80
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#19
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#00

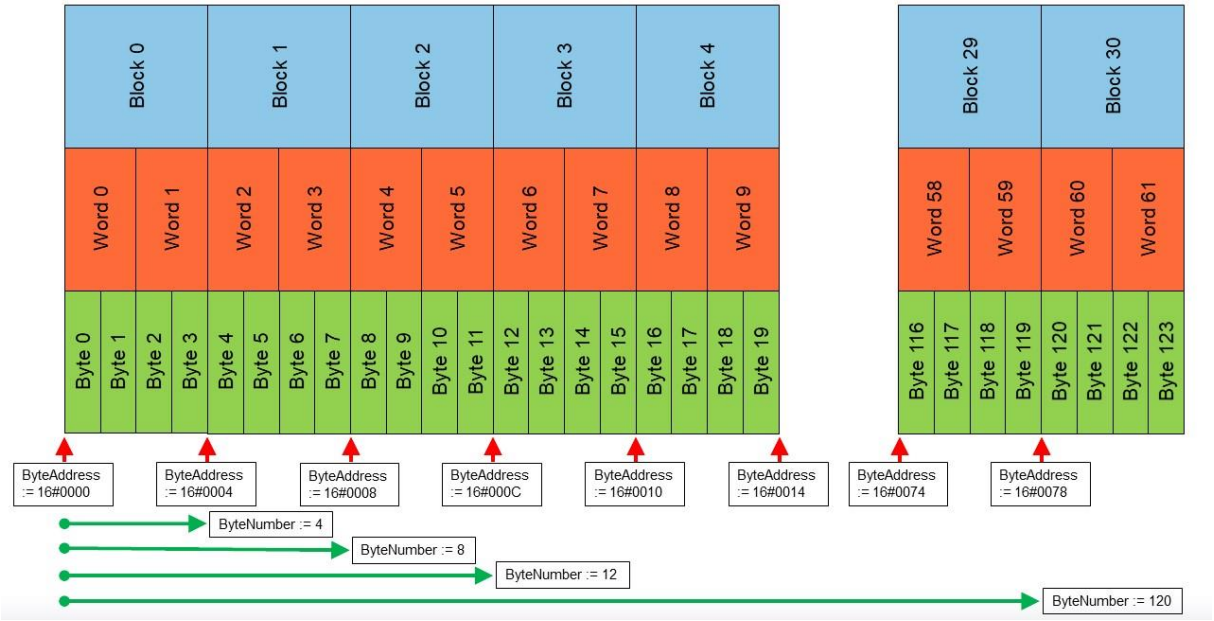
Command telegram within instance data block "IUT-F190-B40_ExpertMode_Basic_InstDB".

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#19
OutData [6…7]:	Byte Address	16#0000
OutData [8…9]:	Byte Number	16#0008

6.3 SW - Single Write 4-Byte Blocks (Bank 11; User Memory)

The "Single Write 4-Byte Blocks" command performs a single write access to the user memory (memory bank 11). The inputs "I_b_UserMemory_TID", "I_b_EPC" as well as "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.
By the command Single Write 4-Byte Blocks memory blocks with a size of 4 bytes each are programmed 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 4.

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 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_StartWrite" input must be set to 0 again for at least one cycle. Before other commands (Read; Quit) can be started, 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 data block "IUT-F190-B40_ExpertMode_Basic_UserData" in the data structure "EPC_WrittenTag". If the transfer of additional information (parameter IF) has been activated, this is located in the "TagInformation" data structure. At the end of the command execution, the number of tags successfully written during the command execution is transferred. This information is located in the "NumberTags" data structure.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the variable "IO_b_NewData" directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers at the same time in the detection zone, because the transmitted information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

Single Write 4-Byte Blocks with one data carrier inside the detection zone:

Assignment of write data in the "WriteData" data structure

Name	A...	Dis...	Monitor...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[0]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[1]		Hex	16#02	16#02
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[2]		Hex	16#03	16#03
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[3]		Hex	16#04	16#04
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[4]		Hex	16#05	16#05
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[5]		Hex	16#06	16#06
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[6]		Hex	16#07	16#07
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[7]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[8]		Hex	16#00	

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monit...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
WriteData[0]	Byte	16#0	16#01
WriteData[1]	Byte	16#0	16#02
WriteData[2]	Byte	16#0	16#03
WriteData[3]	Byte	16#0	16#04
WriteData[4]	Byte	16#0	16#05
WriteData[5]	Byte	16#0	16#06
WriteData[6]	Byte	16#0	16#07
WriteData[7]	Byte	16#0	16#08
WriteData[8]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	D...	8	8
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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 are read)

The command is started as soon as the 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 ..	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	D...	1	

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

IO_b_NewData	= TRUE (is to be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the UII/EPC information)
O_b_NoDataCarrier	= FALSE (is set 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_i_WriteCounter	= 1 (number of data carriers programmed during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monit...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
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#34
EPC_WrittenTag[3]	Byte	16#0	16#00
EPC_WrittenTag[4]	Byte	16#0	16#30
EPC_WrittenTag[5]	Byte	16#0	16#14
EPC_WrittenTag[6]	Byte	16#0	16#F7
EPC_WrittenTag[7]	Byte	16#0	16#33
EPC_WrittenTag[8]	Byte	16#0	16#7C
EPC_WrittenTag[9]	Byte	16#0	16#00
EPC_WrittenTag[10]	Byte	16#0	16#1F
EPC_WrittenTag[11]	Byte	16#0	16#00
EPC_WrittenTag[12]	Byte	16#0	16#00
EPC_WrittenTag[13]	Byte	16#0	16#00
EPC_WrittenTag[14]	Byte	16#0	16#74
EPC_WrittenTag[15]	Byte	16#0	16#83
EPC_WrittenTag[16]	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in the "EPC_WrittenTag" data structure

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-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monit...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#50
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#32

Additional information within data block "IUT-F190-B40_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 was done

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monit...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
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

Number of identified data carriers within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "NumberTags

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

Date_Start_ReadWrite	DTL	DTL#1	DTL#2021-04-23-14:51:02.429065591
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	23
WEEKDAY	USInt	5	6
HOUR	USInt	0	14
MINUTE	USInt	0	51
SECOND	USInt	0	2
NANOSECOND	UDInt	0	429_065_591

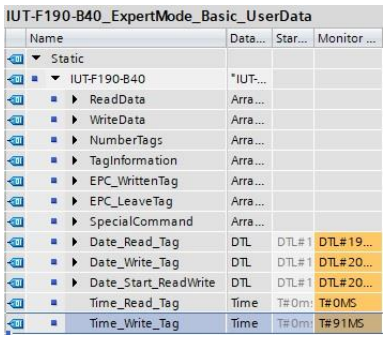
Time start write operation:

Data structure Date_Start_ReadWrite

Date_Write_Tag	DTL	DTL#1	DTL#2021-04-23-14:51:02.520919146
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	23
WEEKDAY	USInt	5	6
HOUR	USInt	0	14
MINUTE	USInt	0	51
SECOND	USInt	0	2
NANOSECOND	UDInt	0	520_919_146

Time of successful write access to a data carrier:

Data structure Date_Write_Tag



IUT-F190-B40_ExpertMode_Basic_UserData				
	Name	Data...	Star...	Monitor ...
	Static			
	IUT-F190-B40	"IUT-...		
	ReadData	Arra...		
	WriteData	Arra...		
	NumberTags	Arra...		
	TagInformation	Arra...		
	EPC_WrittenTag	Arra...		
	EPC_LeaveTag	Arra...		
	SpecialCommand	Arra...		
	Date_Read_Tag	DTL	DTL#1	DTL#19...
	Date_Write_Tag	DTL	DTL#1	DTL#20...
	Date_Start_ReadWrite	DTL	DTL#1	DTL#20...
	Time_Read_Tag	Time	T#0m:	T#0MS
	Time_Write_Tag	Time	T#0m:	T#91MS

Execution time of the command until successful write access to the data carrier.

Data structure Time_Write_Tag

Single Write 4-Byte Blocks without data carrier in the detection zone or no data carrier detected:

Name	Address	Displ...	Monitor ...	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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

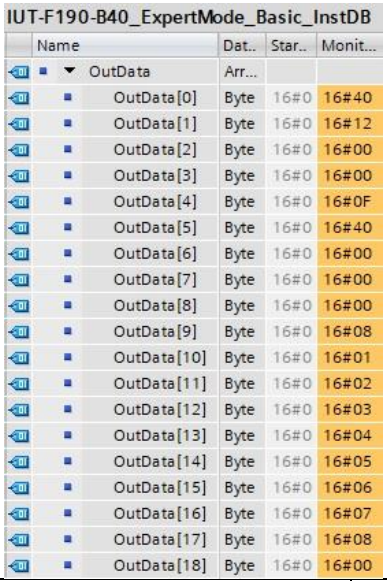
IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the UII/EPC information)
O_b_NoDataCarrier	= TRUE (is set to TRUE if no data carrier could be identified)
O_b_Busy	= FALSE (changes to FALSE with the end of the command 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_i_WriteCounter	= 0 (no data carrier detected)

IUT-F190-B40_ExpertMode_Basic_UserData				
	Name	Data...	Star...	Monitor ...
	Static			
	IUT-F190-B40	"IUT-...		
	ReadData	Arra...		
	WriteData	Arra...		
	NumberTags	Arra...		
	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

Number of identified data carriers within data block "IUT-F190-B40_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 4-Byte Blocks:



IUT-F190-B40_ExpertMode_Basic_InstDB				
	Name	Dat..	Star..	Monit...
	OutData	Arr...		
	OutData[0]	Byte	16#0	16#40
	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#40
	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

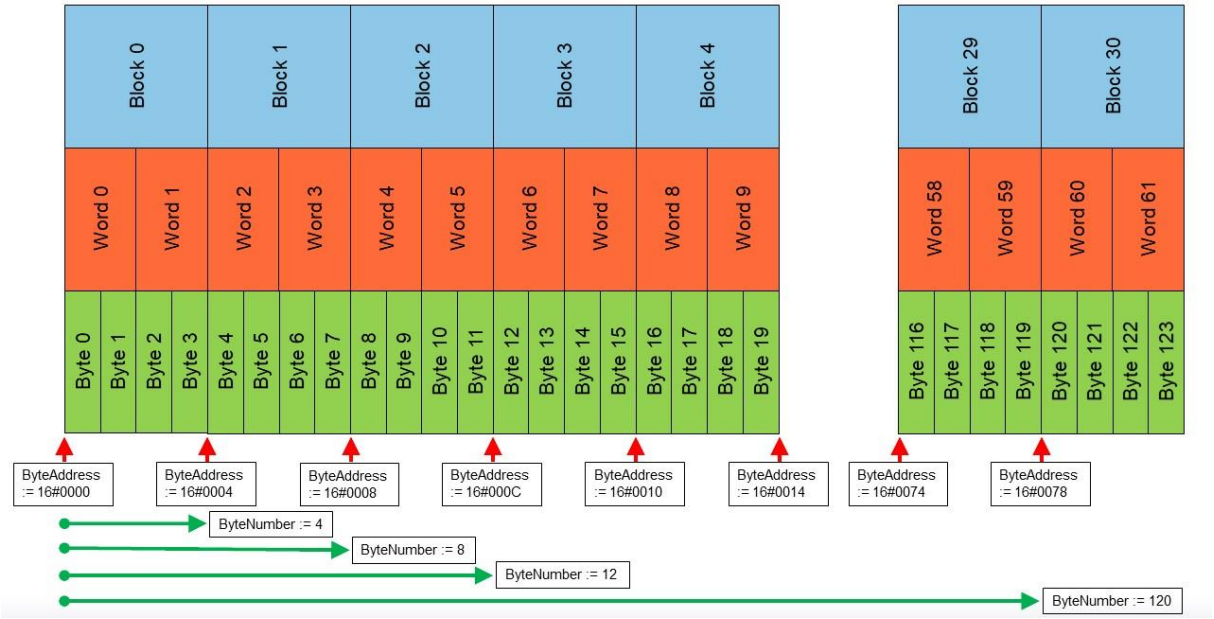
Command telegram within instance data block "IUT-F190-B40_ExpertMode_Basic_InstDB".

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#40
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

6.4 EW - Enhanced Write 4-Byte Blocks (Bank 11; User Memory)

The "Enhanced Write 4-Byte Blocks" 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 is to be specified to the data structure "WriteData" before the command execution. The “Enhanced Write 4-Byte Blocks” command programs memory blocks with a size of 4 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 4.

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 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_StartWrite" input must be set to 0 again for at least one cycle. Before other commands (Read; Quit) can be controlled, the "I_b_StartWrite" input must be set to FALSE.

Within the data block "IUT-F190-B40_ExpertMode_Basic_UserData" in the data structure "EPC_WrittenTag" the UII/EPC information of the tags successfully programmed during the command execution is stored. If the transmission of additional information (parameter IF) has been activated, these are located 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.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the variable "IO_b_NewData" directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers at the same time in the detection zone, because the transmitted information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

Enhanced Write 4-Byte Blocks:

Assignment of write data in the "WriteData" data structure

Name	A...	Dis...	Monitor...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[0]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[1]		Hex	16#02	16#02
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[2]		Hex	16#03	16#03
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[3]		Hex	16#04	16#04
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[4]		Hex	16#05	16#05
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[5]		Hex	16#06	16#06
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[6]		Hex	16#07	16#07
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[7]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[8]		Hex	16#00	

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monit...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
WriteData[0]	Byte	16#0	16#01
WriteData[1]	Byte	16#0	16#02
WriteData[2]	Byte	16#0	16#03
WriteData[3]	Byte	16#0	16#04
WriteData[4]	Byte	16#0	16#05
WriteData[5]	Byte	16#0	16#06
WriteData[6]	Byte	16#0	16#07
WriteData[7]	Byte	16#0	16#08
WriteData[8]	Byte	16#0	16#00

Name	Address	Displ...	Monitor ...	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	D...	8	8
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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 are read)

The command is started as soon as the 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 ...	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; no data carrier.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (is set 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 to TRUE at the end of command execution)
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_i_WriteCounter	= 0 (number of data carriers programmed during command execution)

Name	Address	Displ...	Monitor ...	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	D...	1	

After start of command execution; 1 data carrier programmed.

IO_b_NewData	= TRUE (is to be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_WriteCounter	= 1 (number of data carriers programmed during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monitor ...
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
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#34
EPC_WrittenTag[3]	Byte	16#0	16#00
EPC_WrittenTag[4]	Byte	16#0	16#30
EPC_WrittenTag[5]	Byte	16#0	16#14
EPC_WrittenTag[6]	Byte	16#0	16#F7
EPC_WrittenTag[7]	Byte	16#0	16#33
EPC_WrittenTag[8]	Byte	16#0	16#7C
EPC_WrittenTag[9]	Byte	16#0	16#00
EPC_WrittenTag[...	Byte	16#0	16#1F
EPC_WrittenTag[...	Byte	16#0	16#00
EPC_WrittenTag[...	Byte	16#0	16#00
EPC_WrittenTag[...	Byte	16#0	16#00
EPC_WrittenTag[...	Byte	16#0	16#74
EPC_WrittenTag[...	Byte	16#0	16#83
EPC_WrittenTag[...	Byte	16#0	16#00

UII/EPC information of the successfully programmed data carrier within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in the "EPC_WrittenTag" data structure

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-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monitor ...
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
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#32

Additional information within data block "IUT-F190-B40_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 was done

Date_Start_ReadWrite	DTL	DTL#1	DTL#2021-04-23-17:07:17.087124791
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	23
WEEKDAY	USInt	5	6
HOUR	USInt	0	17
MINUTE	USInt	0	7
SECOND	USInt	0	17
NANOSECOND	UDInt	0	87124791

Time start write operation:

Data structure Date_Start_ReadWrite

Date_Write_Tag	DTL	DTL#1	DTL#2021-04-23-17:08:43.140572119
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	23
WEEKDAY	USInt	5	6
HOUR	USInt	0	17
MINUTE	USInt	0	8
SECOND	USInt	0	43
NANOSECOND	UDInt	0	140_572_119

Time of successful write access to a data carrier:

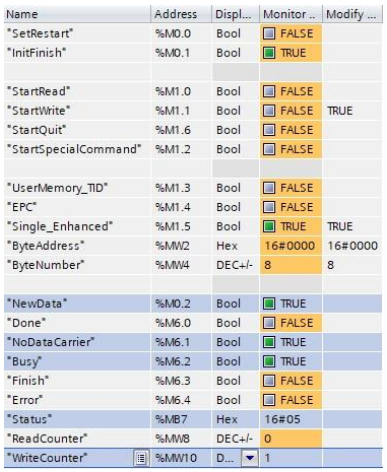
Data structure Date_Write_Tag

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monitor value
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	Arra...		
SpecialCommand	Arra...		
Date_Read_Tag	DTL	DTL#1	DTL#1970-01-01...
Date_Write_Tag	DTL	DTL#1	DTL#2021-04-23...
Date_Start_ReadWrite	DTL	DTL#1	DTL#2021-04-23...
Time_Read_Tag	Time	T#0ms	T#0MS
Time_Write_Tag	Time	T#0ms	T#1M_26S_53MS

Execution time of the command until successful write access to the data carrier.

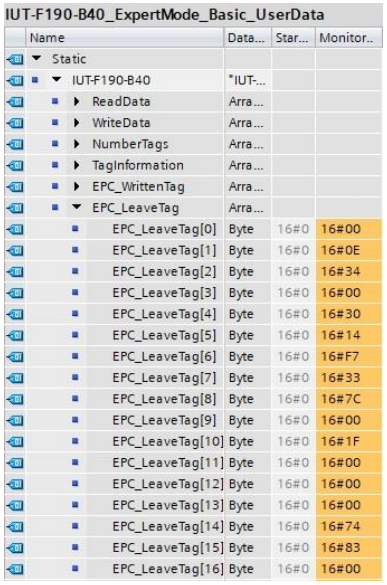
Data structure Time_Write_Tag



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	D...	1	

Command active; data carrier has left detection zone

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (is set 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 to TRUE at the end of command execution)
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_i_WriteCounter	= 1 (number of data carriers programmed during command execution)



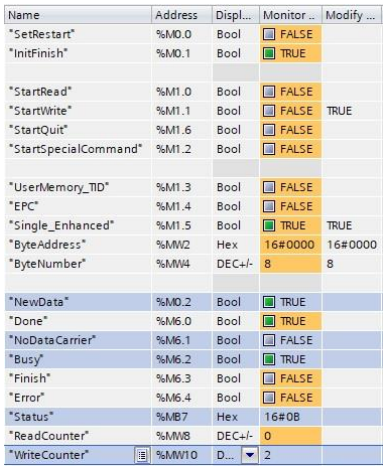
IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Star...	Monitor..
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	Arra...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#34
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#30
EPC_LeaveTag[5]	Byte	16#0	16#14
EPC_LeaveTag[6]	Byte	16#0	16#F7
EPC_LeaveTag[7]	Byte	16#0	16#33
EPC_LeaveTag[8]	Byte	16#0	16#7C
EPC_LeaveTag[9]	Byte	16#0	16#00
EPC_LeaveTag[10]	Byte	16#0	16#1F
EPC_LeaveTag[11]	Byte	16#0	16#00
EPC_LeaveTag[12]	Byte	16#0	16#00
EPC_LeaveTag[13]	Byte	16#0	16#00
EPC_LeaveTag[14]	Byte	16#0	16#74
EPC_LeaveTag[15]	Byte	16#0	16#83
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 ..	Modify ...
"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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	D...	2	

Command execution active; second data carrier programmed

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 2 (number of data carriers read during command execution)

Name	Address	Displ...	Monitor ...	Modify ...
"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	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	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	8	8
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	2	

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.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception 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_i_WriteCounter	= 2 (number of data carriers programmed during command execution)

Command Enhanced Write 4-Byte Blocks:

IUT-F190-B40_ExpertMode_Basic_InstDB

Name	Dat..	Star..	Monit...
OutData	Arr...		
OutData[0]	Byte	16#0	16#A0
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#1A
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-F190-B40_ExpertMode_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#1A
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

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

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

The 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 in from the data carrier during execution of the command are stored within the "IUT-F190-B40_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. If the transfer of additional information (parameter IF) has been activated, this is located in the "TagInformation" data structure. At the end of the command execution, the number of data carriers identified during the command is transferred. This information is located in the "NumberTags" data structure.

The above information is transmitted from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the variable "IO_b_NewData" directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers at the same time in the detection zone, because the transmitted information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

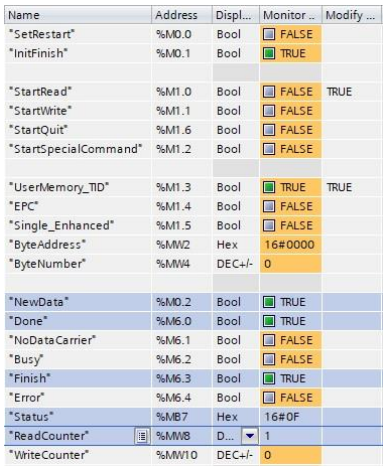
Single Read Fixcode with one data carrier inside the detection zone:

Name	Address	Displ...	Monitor ..	Modify ...
"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	B...	FALSE	
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.



Name	Address	Displ...	Monitor ..	Modify ...
"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	FALSE	
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	1	
"WriteCounter"	%MW10	DEC+/-	0	

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

IO_b_NewData = TRUE (changes directly back to 0 after signal change from 0 → 1)

O_b_Done = TRUE (changes to TRUE with the reception of the read data)

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

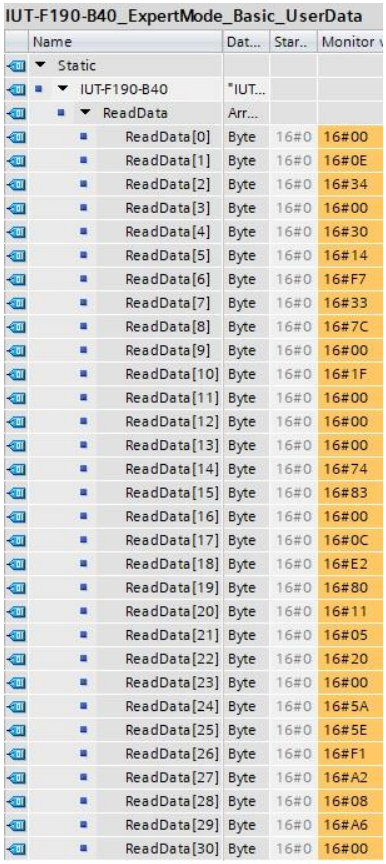
O_b_Busy = FALSE (changes to FALSE with the end of the command execution)

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_i_ReadCounter = 1 (number of data carriers read during command execution)



IUT-F190-B40_ExpertMode_Basic_UserData

Name	Dat...	Star..	Monitor v
Static			
IUT-F190-B40	"IUT...		
ReadData	Arr...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#0C
ReadData[18]	Byte	16#0	16#E2
ReadData[19]	Byte	16#0	16#80
ReadData[20]	Byte	16#0	16#11
ReadData[21]	Byte	16#0	16#05
ReadData[22]	Byte	16#0	16#20
ReadData[23]	Byte	16#0	16#00
ReadData[24]	Byte	16#0	16#5A
ReadData[25]	Byte	16#0	16#5E
ReadData[26]	Byte	16#0	16#F1
ReadData[27]	Byte	16#0	16#A2
ReadData[28]	Byte	16#0	16#08
ReadData[29]	Byte	16#0	16#A6
ReadData[30]	Byte	16#0	16#00

Read data within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "ReadData"

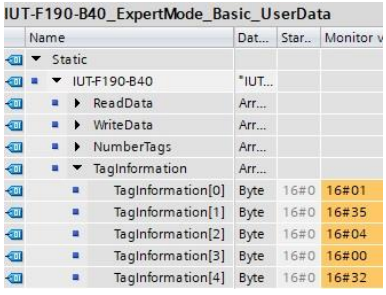
ReadData [0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code; 16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

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

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

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

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



IUT-F190-B40_ExpertMode_Basic_UserData

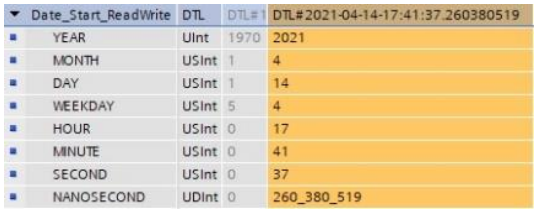
Name	Dat...	Star..	Monitor v
Static			
IUT-F190-B40	"IUT...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
TagInformation	Arr...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#35
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#32

Additional information within data block "IUT-F190-B40_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 was done

IUT-F190-B40_ExpertMode_Basic_UserData			
Name	Dat...	Star..	Monitor v
Static			
IUT-F190-B40	"IUT...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
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

Number of identified data carriers within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "NumberTags"

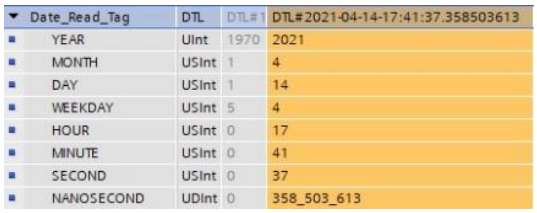
NumberTags [0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier



Date_Start_ReadWrite	DTL	DTL#1	DTL#2021-04-14-17:41:37.260380519
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	14
WEEKDAY	USInt	5	4
HOUR	USInt	0	17
MINUTE	USInt	0	41
SECOND	USInt	0	37
NANOSECOND	UDInt	0	260_380_519

Time start read operation:

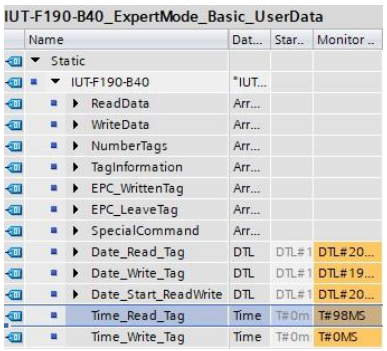
Data structure Date_Start_ReadWrite



Date_Read_Tag	DTL	DTL#1	DTL#2021-04-14-17:41:37.358503613
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	14
WEEKDAY	USInt	5	4
HOUR	USInt	0	17
MINUTE	USInt	0	41
SECOND	USInt	0	37
NANOSECOND	UDInt	0	358_503_613

Time of successful read access to a data carrier:

Data structure Date_Read_Tag

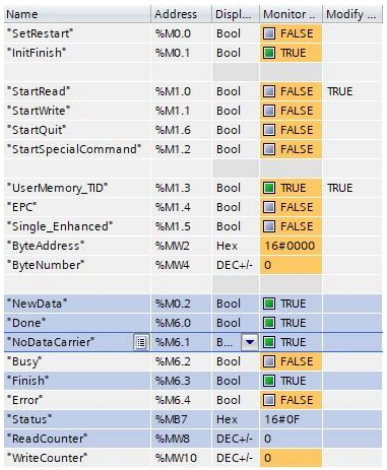


IUT-F190-B40_ExpertMode_Basic_UserData			
Name	Dat...	Star..	Monitor ..
Static			
IUT-F190-B40	"IUT...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
TagInformation	Arr...		
EPC_WrittenTag	Arr...		
EPC_LeaveTag	Arr...		
SpecialCommand	Arr...		
Date_Read_Tag	DTL	DTL#1	DTL#20...
Date_Write_Tag	DTL	DTL#1	DTL#19...
Date_Start_ReadWrite	DTL	DTL#1	DTL#20...
Time_Read_Tag	Time	T#0m	T#98MS
Time_Write_Tag	Time	T#0m	T#0MS

Execution time of the command until successful read access to the data carrier.

Time_Read_Tag data structure

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



Name	Address	Displ...	Monitor ..	Modify ...
"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	FALSE	
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= TRUE (is set 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_i_ReadCounter	= 0 (no data carrier read)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Dat...	Star..	Monitor ..
Static			
IUT-F190-B40	"IUT...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
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

Number of identified data carriers within data block "IUT-F190-B40_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-F190-B40_ExpertMode_Basic_InstDB

Name	Data t...	Start..	Monitor...
OutData	Array[...		
OutData[0]	Byte	16#0	16#C0
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-F190-B40_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

6.6 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.

The 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 in from the data carrier during execution of the command are stored within the "IUT-F190-B40_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. If the transfer of additional information (parameter IF) has been activated, this is located 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.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the variable "IO_b_NewData" directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers at the same time in the detection zone, because the transmitted information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

Enhanced Read Fixcode:

Name	Address	Displ...	Monitor ..	Modify ...
"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	B...	TRUE	TRUE
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; no data carrier;

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 1)
O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 0 (number of data carriers read during command execution)

Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	1	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; 1 data carrier read.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 1 (number of data carriers read during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monit..
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00
ReadData[17]	Byte	16#0	16#0C
ReadData[18]	Byte	16#0	16#E2
ReadData[19]	Byte	16#0	16#80
ReadData[20]	Byte	16#0	16#11
ReadData[21]	Byte	16#0	16#05
ReadData[22]	Byte	16#0	16#20
ReadData[23]	Byte	16#0	16#00
ReadData[24]	Byte	16#0	16#5A
ReadData[25]	Byte	16#0	16#5E
ReadData[26]	Byte	16#0	16#F1
ReadData[27]	Byte	16#0	16#A2
ReadData[28]	Byte	16#0	16#08
ReadData[29]	Byte	16#0	16#A6
ReadData[30]	Byte	16#0	16#00

Read data within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "ReadData"

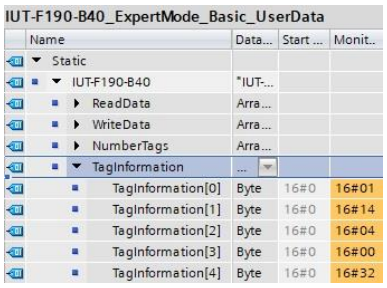
ReadData [0...1]: Length UII/EPC information
Length 2 bytes; UII/EPC information = PC word + UII/EPC code; 16#000E = 14 bytes; 2 bytes PC word + 12 bytes UII/EPC code

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

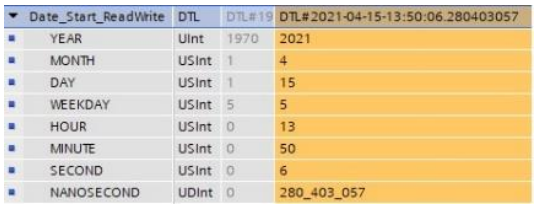
ReadData [4...15]: UII/EPC code
Length depends on the programming of the data carrier; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all data carriers in the detection zone must be unique

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

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

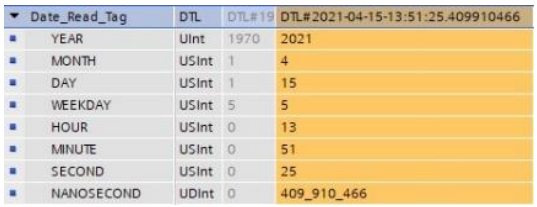


Additional information in the "TagInformation" data structure
TagInformation [0]: Information type
Length 1 byte; always 16#01
TagInformation [1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation [2]: Send channel
Length 1 byte; send channel on which the data carrier access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



Time start read operation:

Data structure Date_Start_ReadWrite

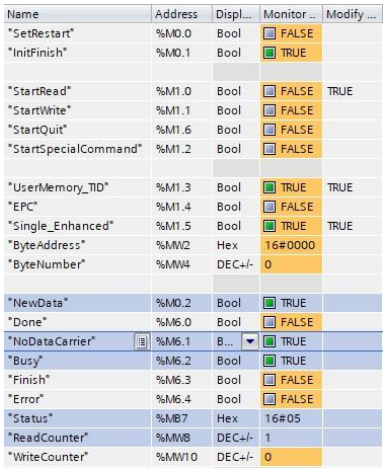


Time of successful read access to a data carrier:

Data structure Date_Read_Tag

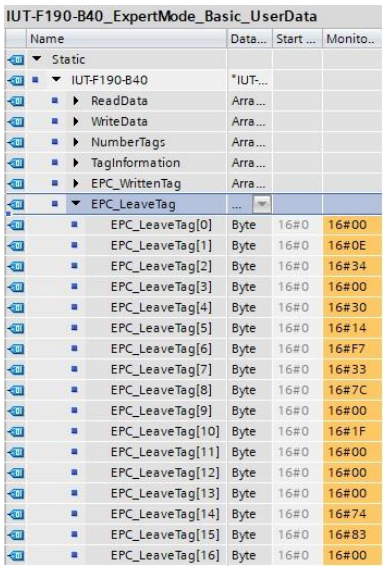
Execution time of the command until successful read access to the data carrier.

Time_Read_Tag data structure



Command active; data carrier has left detection zone

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 1 (number of data carriers read during command execution)

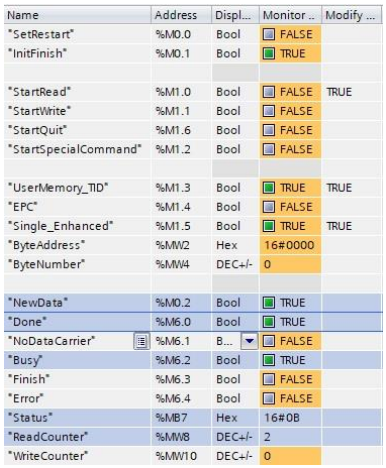


IUT-F190-B40_ExpertMode_Basic_UserData				
Name		Data...	Start ...	Monito..
Static				
IUT-F190-B40		"IUT-...		
ReadData		Arra...		
WriteData		Arra...		
NumberTags		Arra...		
TagInformation		Arra...		
EPC_WrittenTag		Arra...		
EPC_LeaveTag		...		
EPC_LeaveTag[0]		Byte	16#0	16#00
EPC_LeaveTag[1]		Byte	16#0	16#0E
EPC_LeaveTag[2]		Byte	16#0	16#34
EPC_LeaveTag[3]		Byte	16#0	16#00
EPC_LeaveTag[4]		Byte	16#0	16#30
EPC_LeaveTag[5]		Byte	16#0	16#14
EPC_LeaveTag[6]		Byte	16#0	16#F7
EPC_LeaveTag[7]		Byte	16#0	16#33
EPC_LeaveTag[8]		Byte	16#0	16#7C
EPC_LeaveTag[9]		Byte	16#0	16#00
EPC_LeaveTag[10]		Byte	16#0	16#1F
EPC_LeaveTag[11]		Byte	16#0	16#00
EPC_LeaveTag[12]		Byte	16#0	16#00
EPC_LeaveTag[13]		Byte	16#0	16#00
EPC_LeaveTag[14]		Byte	16#0	16#74
EPC_LeaveTag[15]		Byte	16#0	16#83
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

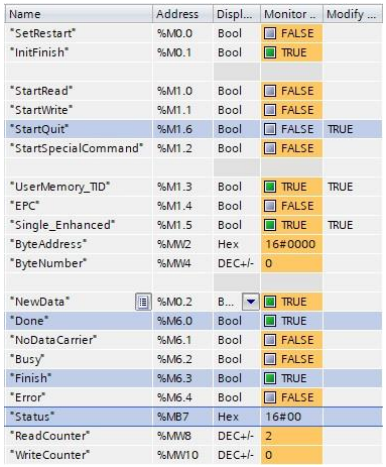
EPC_LeaveTag [4...15]: UII/EPC code
Length depends on the programming of the tag; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"ReadCounter"	%MW8	DEC+/-	2	
"WriteCounter"	%MW10	DEC+/-	0	

Command execution active; second data carrier read in

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 2 (number of data carriers read during command execution)



Name	Address	Displ...	Monitor ..	Modify ...
"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	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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	B...	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	2	
"WriteCounter"	%MW10	DEC+/-	0	

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.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception 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_i_ReadCounter	= 2 (number of data carriers read during command execution)

Command Enhanced Read Fixcode:

IUT-F190-B40_ExpertMode_Basic_InstDB

	Name	Data...	Start v...	Monito...
	OutData	Arra...		
	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#1D
	OutData[6]	Byte	16#0	16#00

Command message frame within instance data block "IUT-F190-B40_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#1D

6.7 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.

The 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 in from the data carrier during execution of the command are stored within the "IUT-F190-B40_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. If the transfer of additional information (parameter IF) has been activated, this is located in the "TagInformation" data structure. At the end of the command execution, the number of volumes identified during the command is transferred. This information is located in the "NumberTags" data structure.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the "IO_b_NewData" variable directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers at the same time in the detection zone, because the transmitted information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

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

Name	Address	Displ...	Monitor ..	Modify ...
"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	B...	TRUE	TRUE
"Single_Enhanced"	%M1.5	Bool	FALSE	
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.

Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	1	
"WriteCounter"	%MW10	DEC+/-	0	

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

IO_b_NewData	= TRUE (changes directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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_i_ReadCounter	= 1 (number of data carriers read during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monito...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00

Read data within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "ReadData"

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-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monito...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#3C
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#32

Additional information within data block "IUT-F190-B40_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 took place.

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monito...
Static			
IUT-F190-B40	"I...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
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

Number of identified data carriers within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "NumberTags"

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

Date_Start_ReadWrite	DTL	DTL#19	DTL#2021-04-15-09:15:09.914383484
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	15
WEEKDAY	USInt	5	5
HOUR	USInt	0	9
MINUTE	USInt	0	15
SECOND	USInt	0	9
NANOSECOND	UDInt	0	914_383_484

Time start read operation:

Data structure Date_Start_ReadWrite

Date_Read_Tag	DTL	DTL#19	DTL#2021-04-15-09:15:10.029909977
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	15
WEEKDAY	USInt	5	5
HOUR	USInt	0	9
MINUTE	USInt	0	15
SECOND	USInt	0	10
NANOSECOND	UDInt	0	29909977

Time of successful read access to a data carrier:

Data structure Date_Read_Tag

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monitor ...
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	Arra...		
SpecialCommand	Arra...		
Date_Read_Tag	DTL	DTL#19	DTL#20...
Date_Write_Tag	DTL	DTL#19	DTL#19...
Date_Start_ReadWrite	DTL	DTL#19	DTL#20...
Time_Read_Tag	Time	T#0ms	T#115MS
Time_Write_Tag	Time	T#0ms	T#0MS

Execution time of the command until successful read access to the data carrier.

Time_Read_Tag data structure

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

Name	Address	Displ...	Monitor ...	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the receipt of the read data)
O_b_NoDataCarrier	= TRUE (is set 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_i_ReadCounter	= 0 (no data carrier read)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monitor ...
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
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

Number of identified data carriers within data block "IUT-F190-B40_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-F190-B40_ExpertMode_Basic_InstDB

Name	Data...	Start v...	Monito...
OutData	Arra...		
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-F190-B40_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#D2

6.8 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.

The 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 in from the data carrier during execution of the command are stored within the "IUT-F190-B40_ExpertMode_Basic_UserData" data block in the "ReadData" data structure. If the transfer of additional information (parameter IF) has been activated, this is located 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.

The above information is transferred from the RFID station to the PLC via several telegrams. The "IO_b_NewData" IO variable is used by the function block to signal the receipt of new telegrams in the PLC. The function block sets the "IO_b_NewData" variable to TRUE if a new telegram is present. The user must then set the "IO_b_NewData" variable directly back to FALSE in order to be able to evaluate a positive edge change for the reception of the subsequent telegram.
The use of the IO variable "IO_b_NewData" is mandatory for the identification of several data carriers at the same time in the detection zone, because the transmitted information from the data carriers is copied into the same data structures. I.e. a new information of a data carrier overwrites thereby the information of the data carrier read in before. By the variable "IO_b_NewData" the read in data can be copied into separate data areas.

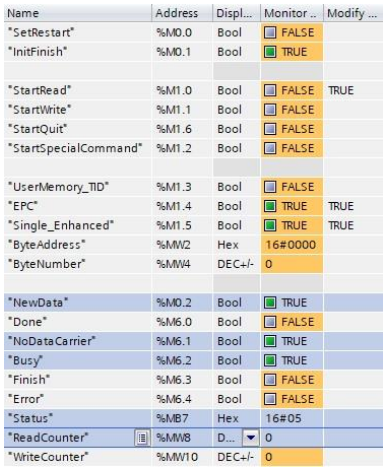
Enhanced Read UII/EPC:

Name	Address	Displ...	Monitor ..	Modify ...
"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	B...	TRUE	TRUE
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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.

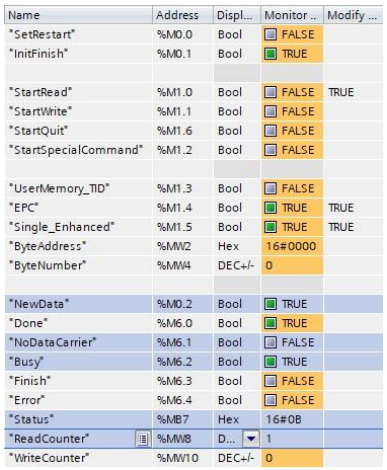
All outputs are initially reset to FALSE. The active execution of the command is signaled by TRUE at the "O_b_Busy" output.



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	0	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; no data carrier;

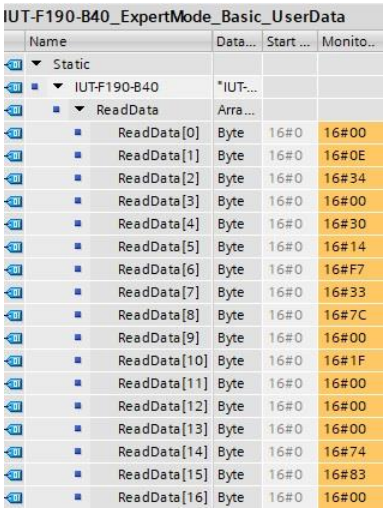
IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= FALSE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= TRUE (is set to TRUE if no data carrier could be identified)
O_b_Busy	= TRUE (changes to FALSE with the end of the command execution)
O_b_Finish	= FALSE (changes to TRUE at the end of command execution)
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_i_ReadCounter	= 0 (number of data carriers read during command execution)



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	1	
"WriteCounter"	%MW10	DEC+/-	0	

After start of command execution; 1 data carrier read.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 1 (number of data carriers read during command execution)



IUT-F190-B40_ExpertMode_Basic_UserData

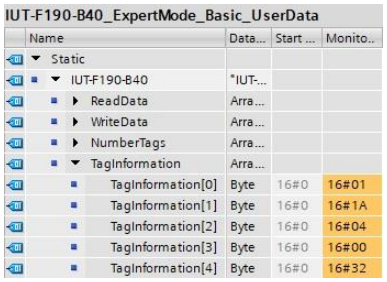
Name	Data...	Start ...	Monito..
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
ReadData[0]	Byte	16#0	16#00
ReadData[1]	Byte	16#0	16#0E
ReadData[2]	Byte	16#0	16#34
ReadData[3]	Byte	16#0	16#00
ReadData[4]	Byte	16#0	16#30
ReadData[5]	Byte	16#0	16#14
ReadData[6]	Byte	16#0	16#F7
ReadData[7]	Byte	16#0	16#33
ReadData[8]	Byte	16#0	16#7C
ReadData[9]	Byte	16#0	16#00
ReadData[10]	Byte	16#0	16#1F
ReadData[11]	Byte	16#0	16#00
ReadData[12]	Byte	16#0	16#00
ReadData[13]	Byte	16#0	16#00
ReadData[14]	Byte	16#0	16#74
ReadData[15]	Byte	16#0	16#83
ReadData[16]	Byte	16#0	16#00

Read data within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "ReadData"

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-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monito..
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
TagInformation[0]	Byte	16#0	16#01
TagInformation[1]	Byte	16#0	16#1A
TagInformation[2]	Byte	16#0	16#04
TagInformation[3]	Byte	16#0	16#00
TagInformation[4]	Byte	16#0	16#32

Additional information 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
Length 2 byte; transmit power on which the data carrier access took place.

Date_Start_ReadWrite	DTL	DTL#19	DTL#2021-04-15-14:23:44.493436186
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	15
WEEKDAY	USInt	5	5
HOUR	USInt	0	14
MINUTE	USInt	0	23
SECOND	USInt	0	44
NANOSECOND	UDInt	0	493_436_186

Time start read operation:

Data structure Date_Start_ReadWrite

Date_Read_Tag	DTL	DTL#19	DTL#2021-04-15-14:25:07.236708711
YEAR	UInt	1970	2021
MONTH	USInt	1	4
DAY	USInt	1	15
WEEKDAY	USInt	5	5
HOUR	USInt	0	14
MINUTE	USInt	0	25
SECOND	USInt	0	7
NANOSECOND	UDInt	0	236_708_711

Time of successful read access to a data carrier:

Data structure Date_Read_Tag

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monitor value
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	Arra...		
SpecialCommand	Arra...		
Date_Read_Tag	DTL	DTL#19	DTL#2021-04-15-...
Date_Write_Tag	DTL	DTL#19	DTL#1970-01-01-...
Date_Start_ReadWrite	DTL	DTL#19	DTL#2021-04-15-...
Time_Read_Tag	Time	T#0ms	T#1M_22S_743MS
Time_Write_Tag	Time	T#0ms	T#0MS

Execution time of the command until successful read access to the data carrier.

Time_Read_Tag data structure

Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	D...	1	
"WriteCounter"	%MW10	DEC+/-	0	

Command active; data carrier has left detection zone

IO_b_NewData = TRUE (must be set directly back to 0 after signal change from 0 → 1)

O_b_Done = FALSE (changes to TRUE with the reception of the read data)

O_b_NoDataCarrier = TRUE (is set 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 to TRUE at the end of command execution)

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_i_ReadCounter = 1 (number of data carriers read during command execution)

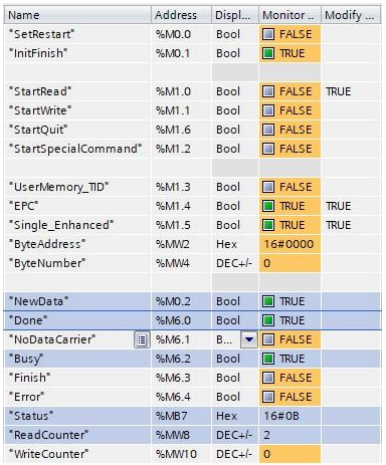
IUT-F190-B40_ExpertMode_Basic_UserData

Name	Data...	Start ...	Monitor v
Static			
IUT-F190-B40	"IUT-...		
ReadData	Arra...		
WriteData	Arra...		
NumberTags	Arra...		
TagInformation	Arra...		
EPC_WrittenTag	Arra...		
EPC_LeaveTag	...		
EPC_LeaveTag[0]	Byte	16#0	16#00
EPC_LeaveTag[1]	Byte	16#0	16#0E
EPC_LeaveTag[2]	Byte	16#0	16#34
EPC_LeaveTag[3]	Byte	16#0	16#00
EPC_LeaveTag[4]	Byte	16#0	16#30
EPC_LeaveTag[5]	Byte	16#0	16#14
EPC_LeaveTag[6]	Byte	16#0	16#F7
EPC_LeaveTag[7]	Byte	16#0	16#33
EPC_LeaveTag[8]	Byte	16#0	16#7C
EPC_LeaveTag[9]	Byte	16#0	16#00
EPC_LeaveTag[10]	Byte	16#0	16#1F
EPC_LeaveTag[11]	Byte	16#0	16#00
EPC_LeaveTag[12]	Byte	16#0	16#00
EPC_LeaveTag[13]	Byte	16#0	16#00
EPC_LeaveTag[14]	Byte	16#0	16#74
EPC_LeaveTag[15]	Byte	16#0	16#83
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

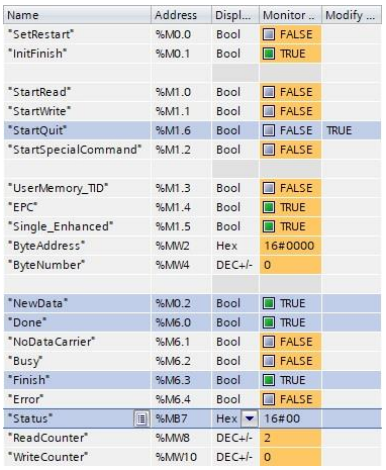
EPC_LeaveTag [4...15]: UII/EPC code
Length depends on the programming of the tag; length can be changed by reprogramming; length always multiple of 2 bytes; the UII/EPC code of all tags in the detection zone must be unique



Name	Address	Displ...	Monitor ..	Modify ...
"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	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	FALSE	
"Busy"	%M6.2	Bool	TRUE	
"Finish"	%M6.3	Bool	FALSE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0B	
"ReadCounter"	%MW8	DEC+/-	2	
"WriteCounter"	%MW10	DEC+/-	0	

Command execution active; second data carrier read in

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the read data)
O_b_NoDataCarrier	= FALSE (is set 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 to TRUE at the end of command execution)
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_i_ReadCounter	= 2 (number of data carriers read during command execution)

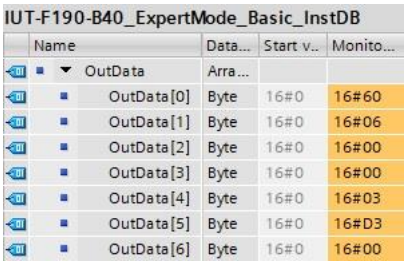


Name	Address	Displ...	Monitor ..	Modify ...
"SetRestart"	%M0.0	Bool	FALSE	
"InitFinish"	%M0.1	Bool	TRUE	
"StartRead"	%M1.0	Bool	FALSE	
"StartWrite"	%M1.1	Bool	FALSE	
"StartQuit"	%M1.6	Bool	FALSE	TRUE
"StartSpecialCommand"	%M1.2	Bool	FALSE	
"UserMemory_TID"	%M1.3	Bool	FALSE	
"EPC"	%M1.4	Bool	TRUE	
"Single_Enhanced"	%M1.5	Bool	TRUE	
"ByteAddress"	%MW2	Hex	16#0000	
"ByteNumber"	%MW4	DEC+/-	0	
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	2	
"WriteCounter"	%MW10	DEC+/-	0	

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.

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception 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_i_ReadCounter	= 2 (number of data carriers read during command execution)

Command Enhanced Read UII/EPC:



IUT-F190-B40_ExpertMode_Basic_InstDB

Name	Data...	Start v...	Monito...
OutData	Arra...		
OutData[0]	Byte	16#0	16#60
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 inside instance data block "IUT-F190-B40_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#D3

6.9 #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 onto 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 or 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#3000_0102_0304_0506_0708_090A_0B0C_0D0E
16	16#4000	16#4100	18	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00
18	16#4800	16#4900	20	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102
20	16#5000	16#5100	22	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304
22	16#5800	16#5900	24	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506
24	16#6000	16#6100	26	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708
26	16#6800	16#6900	28	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708_090A
28	16#7000	16#7100	30	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708_090A_0B0C
30	16#7800	16#7900	32	16#3000_0102_0304_0506_0708_090A_0B0C_0D0E_0F00_0102_0304_0506_0708_090A_0B0C_0D0E

Single Write UII/EPC with a data carrier in the detection zone: Write EPC code with a length of 12 bytes

Assignment of write data in the "WriteData" data structure

Name	A...	Dis...	Monitor...	Modify ...
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[0]		Hex	16#30	16#30
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[1]		Hex	16#00	16#00
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[2]		Hex	16#01	16#01
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[3]		Hex	16#02	16#02
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[4]		Hex	16#03	16#03
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[5]		Hex	16#04	16#04
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[6]		Hex	16#05	16#05
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[7]		Hex	16#06	16#06
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[8]		Hex	16#07	16#07
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[9]		Hex	16#08	16#08
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[10]		Hex	16#09	16#09
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[11]		Hex	16#0A	16#0A
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[12]		Hex	16#0B	16#0B
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[13]		Hex	16#0C	16#0C
"IUT-F190-B40_ExpertMode_Basic_UserData"."IUT-F190-B40".WriteData[14]		Hex	16#00	

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Da...	Start...	Monit...
Static			
IUT-F190-B40	...		
ReadData	Arr...		
WriteData	Arr...		
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 ..	Modify ...
"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	FALSE
"ByteAddress"	%MW2	Hex	16#0000	16#0000
"ByteNumber"	%MW4	D...	14	14
"NewData"	%M0.2	Bool	FALSE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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 the 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 output "O_b_Busy".

Name	Address	Displ...	Monitor ..	Modify ...
"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	FALSE
"ByteAddress"	%MW2	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	14	14
"NewData"	%M0.2	Bool	TRUE	
"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	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	D...	1	

After the end of the command execution; a data carrier is programmed.
IO_b_NewData = TRUE (is to be set directly back to 0 after signal change from 0 1)

O_b_Done	= TRUE (changes to TRUE with the reception of the UII/EPC information)
O_b_NoDataCarrier	= FALSE (is set 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_i_WriteCounter	= 1 (number of data carriers programmed during command execution)

IUT-F190-B40_ExpertMode_Basic_UserData

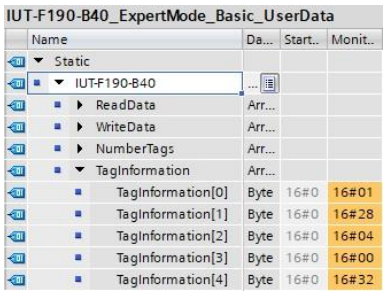
Name	Da...	Start..	Monit..
Static			
IUT-F190-B40	...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
TagInformation	Arr...		
EPC_WrittenTag	Arr...		
EPC_WrittenTag[0]	Byte	16#0	16#00
EPC_WrittenTag[1]	Byte	16#0	16#0E
EPC_WrittenTag[2]	Byte	16#0	16#30
EPC_WrittenTag[3]	Byte	16#0	16#00
EPC_WrittenTag[4]	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-F190-B40_ExpertMode_Basic_UserData" in the "EPC_WrittenTag" data structure

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

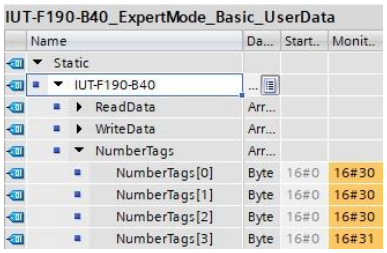
EPC_WrittenTag [2...3]: PC-Word
Length 2 bytes; PC-Word contains additional information (e.g. length) about the UII/EPC code; does not belong to the actual UII/EPC code; 16#3400 or 16#3000 is the PC-Word for a 12-byte UII/EPC code

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-F190-B40_ExpertMode_Basic_UserData				
Name	Da...	Start..	Monit..	
Static				
IUT-F190-B40	...			
ReadData	Arr...			
WriteData	Arr...			
NumberTags	Arr...			
TagInformation	Arr...			
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#32	

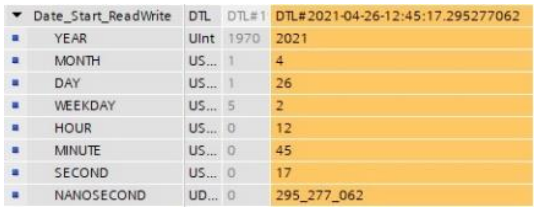
Additional information within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "TagInformation
TagInformation [0]: Information type
Length 1 byte; always 16#01
TagInformation [1]: RSSI value
Length 1 byte; value range between 16#00 and 16#64
TagInformation [2]: Send channel
Length 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; transmission power on which the data carrier took place



IUT-F190-B40_ExpertMode_Basic_UserData				
Name	Da...	Start..	Monit..	
Static				
IUT-F190-B40	...			
ReadData	Arr...			
WriteData	Arr...			
NumberTags	Arr...			
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	

Number of identified data carriers within data block "IUT-F190-B40_ExpertMode_Basic_UserData" in data structure "NumberTags

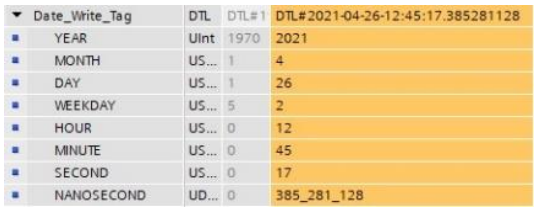
NumberTags[0...3]: Number of identified data carriers
Length 4 bytes; 16#303031 = "0001" = 1 data carrier



Date_Start_ReadWrite	DTL	DTL#1	DTL#2021-04-26-12:45:17.295277062
YEAR	UInt	1970	2021
MONTH	US...	1	4
DAY	US...	1	26
WEEKDAY	US...	5	2
HOUR	US...	0	12
MINUTE	US...	0	45
SECOND	US...	0	17
NANOSECOND	UD...	0	295_277_062

Time start write operation:

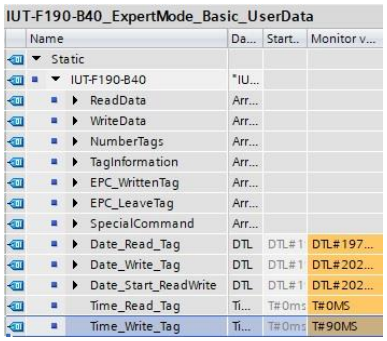
Data structure Date_Start_ReadWrite



Date_Write_Tag	DTL	DTL#1	DTL#2021-04-26-12:45:17.385281128
YEAR	UInt	1970	2021
MONTH	US...	1	4
DAY	US...	1	26
WEEKDAY	US...	5	2
HOUR	US...	0	12
MINUTE	US...	0	45
SECOND	US...	0	17
NANOSECOND	UD...	0	385_281_128

Time of successful write access to a data carrier:

Data structure Date_Write_Tag



IUT-F190-B40_ExpertMode_Basic_UserData			
Name	Da...	Start..	Monitor v...
Static			
IUT-F190-B40	"IU...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
TagInformation	Arr...		
EPC_WrittenTag	Arr...		
EPC_LeaveTag	Arr...		
SpecialCommand	Arr...		
Date_Read_Tag	DTL	DTL#1	DTL#197...
Date_Write_Tag	DTL	DTL#1	DTL#202...
Date_Start_ReadWrite	DTL	DTL#1	DTL#202...
Time_Read_Tag	Ti...	T#0ms	T#0MS
Time_Write_Tag	Ti...	T#0ms	T#90MS

Execution time of the command until successful write access to the data carrier

Data structure Time_Write_Tag

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

Name	Address	Displ...	Monitor ..	Modify ...
"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	FALSE
"ByteAddress"	%MW2	Hex	16#0000	16#0000
"ByteNumber"	%MW4	DEC+/-	14	14
"NewData"	%M0.2	Bool	TRUE	
"Done"	%M6.0	Bool	TRUE	
"NoDataCarrier"	%M6.1	B...	TRUE	
"Busy"	%M6.2	Bool	FALSE	
"Finish"	%M6.3	Bool	TRUE	
"Error"	%M6.4	Bool	FALSE	
"Status"	%MB7	Hex	16#0F	
"ReadCounter"	%MW8	DEC+/-	0	
"WriteCounter"	%MW10	DEC+/-	0	

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

IO_b_NewData	= TRUE (must be set directly back to 0 after signal change from 0 → 1)
O_b_Done	= TRUE (changes to TRUE with the reception of the UII/EPC information)
O_b_NoDataCarrier	= TRUE (is set 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_i_WriteCounter	= 0 (no data carrier detected)

IUT-F190-B40_ExpertMode_Basic_UserData

Name	Da...	Start..	Monitor v...
Static			
IUT-F190-B40	"IU...		
ReadData	Arr...		
WriteData	Arr...		
NumberTags	Arr...		
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

Number of identified data carriers within data block "IUT-F190-B40_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 UII/EPC:

IUT-F190-B40_ExpertMode_Basic_InstDB

Name	Dat...	Start...	Monito..
OutData	Arr...		
OutData[0]	Byte	16#0	16#E0
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 inside instance data block "IUT-F190-B40_ExpertMode_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 Informt.	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

7. Expert-Mode – Structure process data

The process data fields are used to transfer the process data between the IUT-F190-B40-2V1D 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 max. 256 bytes. This length is constant and is permanently set in the hardware configuration of the control.

The following telegram lengths are available for the integration of the Expert Mode:

Expert Mode 32 byte in/out
Expert Mode 64 byte in/out
Expert Mode 128 bytes in/out
Expert Mode 256 byte in/out

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				
255	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				
255	Data / Parameter				

<Delete_Slave>: 1 Bit
Inverting the bit deletes all data present in the FIFO memory of the IUT-F190-B40.

<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 "Telegram Length" is 3 less than the value of "Frame Length".

<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.

7.1 Example 1: Single Read 4-Byte Blocks

This command executes a single read attempt on the user memory (bank 11) of a data carrier. As additional parameters the command contains a start address on the user memory (ByteAddress) as well as a number of bytes which are to be read (Number of Bytes). 4 bytes are read starting from address 0.

Output data field with command:

Byte	Content					Single Read 4-Byte Blocks	
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#10	
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#04	
10	Not relevant					16#00	
…	Not relevant					16#00	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#0A (10). The length of the fragment extends from byte 0 (control byte) up to and including byte 9 (number of bytes low byte). The <Fragmentation Counter> has the value 16#00, because the command telegram can be transmitted within one fragment. The <Telegram Length> has the value 16#0007 and extends starting from byte 3 (Telegram Length High Byte) to byte 9 (Number of Bytes Low Byte). The <Command> command code for the Single Read 4-Byte Blocks command has a value of 16#10. The value of the <ByteAddress> parameter is 16#0000. As a result, read access to the data carrier occurs at the beginning of the user memory. The parameter <Number of Bytes) has the value 16#0004. Thus exactly 4 bytes are read from the user memory.

The RFID station responds to this command with one or more replies. The number of responses depends on the number of tags identified during the command execution.

If no data carrier could be identified within the command execution, the RFID station sends exactly one response. This response has the status value 16#0F and contains the number of identified tags as information. In this case this is the value 16#303030 which is "0000" in ASCII representation.

If exactly one tag was identified during the command execution, the RFID station sends two responses. The first response has the status value 16#00 and contains the information read from the tag. This is followed by the second and last response with the status value 16#0F. The information transmitted in it is the number of identified data carriers. If one volume is identified, the value 16#303031 or "0001" is transmitted.
If several data carriers are identified at the same time during command execution, the number of status 16#00 responses increases according to the number of data carriers. The final response always has the status value 16#0F and contains the number of identified data carriers in ASCII coding.

Input data field with status 16#00 Response → Data read

Byte	Content					Single Read 4-Byte Blocks	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#1D	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#1A	
5	Command					16#10	
6	Status					16#00	
7	Length UII/EPC Information (High Byte)					16#00	
8	Length UII/EPC Information (Low Byte)					16#0E	
9	PC-Word (High Byte)					16#34	
10	PC-Word (Low Byte)					16#00	
11	UII/EPC Byte 1					16#30	
12	UII/EPC Byte 2					16#14	
13	UII/EPC Byte 3					16#F7	
14	UII/EPC Byte 4					16#33	
15	UII/EPC Byte 5					16#7C	
16	UII/EPC Byte 6					16#00	
17	UII/EPC Byte 7					16#1F	
18	UII/EPC Byte 8					16#00	
19	UII/EPC Byte 9					16#00	
20	UII/EPC Byte 10					16#00	
21	UII/EPC Byte 11					16#74	
22	UII/EPC Byte 12					16#83	
23	Length Data (High Byte)					16#00	
24	Length Data (Low Byte)					16#04	
25	Data Byte 1					16#01	
26	Data Byte 2					16#02	
27	Data Byte 3					16#03	
28	Data Byte 4					16#04	
29	Not relevant					16#00	
…	Not relevant					16#00	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#1D (29). The length of the fragment extends from byte 0 (control byte) up to and including byte 28 (data byte 4). The <Fragmentation Counter> has the value 16#00, because the response telegram can be transmitted within one fragment. The <Telegram Length> has the value 16#001A (26) and extends starting from byte 3 (Telegram Length High Byte) up to and including byte 28 (Data Byte 4). The <Command> command code is identical to the command telegram and has the value 16#10. The value of <Status> is 16#00 and it is thus signaled that this telegram contains the data read in from the data carriers.
The parameter <Length UII/EPC Information> specifies the length of the UII/EPC information. The UII/EPC information consists of the PC word with a length of 2 bytes and the UII or EPC code. In this

example the EPC code has a length of 12 bytes. Thus the parameter <Length UII/EPC Information> has the value 16#000E.
The <PC-Word> has a fixed length of 2 bytes and contains additional information about the UII or EPC code. This information is e.g. length and the type of the code. Here in the example the PC-Word has the value 16#3400. This indicates that the code is an EPC with the length of 12 bytes. Furthermore, there are data within the first memory block of the user memory.
Starting from byte 11 up to and including byte 22, the EPC code of the identified data carrier is located. The length of the code in this example is 12 bytes. This is the most common length of the EPC. However, the length of the EPC can be different from 12 bytes. The EPC is used to uniquely assign the data read from the tags to a tag. The RFID station is designed to identify several tags simultaneously in the detection zone. The EPC code of the tags within the detection zone must be different.
The <Length Data> parameter specifies the length of the bytes read from the user memory transferred in this telegram. In this example, 4 bytes of user memory were read out and transferred.
The <Data Byte> contains the information read from the user memory of the data carrier.

Input data field with status 16#0F response → Command finished

Byte	Content					Single Read 4-Byte Blocks	
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#10	
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	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#0B (11). The length of the fragment extends from byte 0 (control byte) up to and including byte 10 (number of tags byte 4). The <Fragmentation Counter> has the value 16#00, because the response telegram can be transmitted within one fragment.
The <Telegram Length> has the value 16#0008 (8) and extends starting from byte 3 (Telegram Length High Byte) up to and including byte 28 (Number of Tags Byte 4). The <Command> command code is identical to the command telegram and has the value 16#10. The value of <Status> is 16#0F and it signals the end of the command execution. The number of tags identified during the command execution is coded within the <Number of Tags> parameter. The number is specified in ASCII data format.

7.2 Example 2: Enhanced Read Fixcode

This command performs a permanent read operation on the TID (bank 10) of a data carrier. The command does not require any further command parameters.

Output data field with command:

Byte	Content					Enhanced Read Fixcode (TID)	
0	D	UM	US	0	Frame Length	D,UM,US	0
1	Frame Length					0x06	
2	Fragmentation Counter					0x00	
3	Telegram Length (High Byte)					0x00	
4	Telegram Length (Low Byte)					0x03	
5	Command					0x1D	
6	not relevant					0x00	
…	not relevant					0x00	
255	not relevant					0x00	

The <Frame Length> parameter has the value 16#06 (16). The length of the fragment extends from byte 0 (control byte) up to and including byte 5 (command). The <Fragmentation Counter> has the value 16#00, since the command telegram can be transmitted within a fragment. The <Telegram Length> has the value 16#0003 and extends starting from byte 3 (Telegram Length High Byte) to byte 5 (Command). The <Command> command code for the Enhanced Read Fixcode command has the value 16#1D.

If a tag was successfully read during the command execution, the RFID station sends a response telegram with the status value 16#00. In addition to the UII/EPC information, this telegram also contains the TID of the tag. If a tag leaves the detection zone, the RFID station sends a response telegram with the status value 16#05. This telegram only contains the UII/EPC information of the tag that has left the detection zone.

Input data field with status 16#00 response → Data read

Byte	Content					Enhanced Read Fixcode (TID)	
0	D	UM	US	0	Frame Length	D,UM,US	16#0
1	Frame Length					16#25	
2	Fragmentation Counter					16#00	
3	Telegram Length (High Byte)					16#00	
4	Telegram Length (Low Byte)					16#22	
5	Command					16#1D	
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	UII/EPC Byte 1					16#30	
12	UII/EPC Byte 2					16#14	
13	UII/EPC Byte 3					16#F7	
14	UII/EPC Byte 4					16#33	
15	UII/EPC Byte 5					16#7C	
16	UII/EPC Byte 6					16#00	
17	UII/EPC Byte 7					16#1F	
18	UII/EPC Byte 8					16#00	
19	UII/EPC Byte 9					16#00	
20	UII/EPC Byte 10					16#00	
21	UII/EPC Byte 11					16#74	
22	UII/EPC Byte 12					16#83	
23	Length Data (High Byte)					16#00	
24	Length Data (Low Byte)					16#0C	
25	TID Byte 1					16#E2	
26	TID Byte 2					16#80	

27	TID Byte 3	16#11
28	TID Byte 4	16#05
29	TID Byte 5	16#20
30	TID Byte 6	16#00
31	TID Byte 7	16#5A
32	TID Byte 8	16#5E
33	TID Byte 9	16#F1
34	TID Byte 10	16#A2
35	TID Byte 11	16#08
36	TID Byte 12	16#A6
37	Not relevant	16#00
…	Not relevant	16#00
255	Not relevant	16#00

The <Frame Length> parameter has the value 16#25 (37). The length of the fragment extends from byte 0 (control byte) up to and including byte 36 (TID byte 12). The <Fragmentation Counter> has the value 16#00, since the response telegram can be transmitted within a fragment. The <Telegram Length> has the value 16#0022 (34) and extends starting from byte 3 (Telegram Length High Byte) up to and including byte 36 (TID Byte 12). The <Command> command code is identical to the command telegram and has the value 16#1D. The value of <Status> is 16#00 and it is thus signaled that this telegram contains the TID read from the data carriers.
The parameter <Length UII/EPC Information> specifies the length of the UII/EPC information. The UII/EPC information consists of the PC word with a length of 2 bytes and the UII or EPC code. In this example the EPC code has a length of 12 bytes. Thus the parameter <Length UII/EPC Information> has the value 16#000E.
The <PC-Word> has a fixed length of 2 bytes and contains additional information about the UII or EPC code. This information is e.g. length and the type of the code. Here in the example the PC-Word has the value 16#3400. This indicates that the code is an EPC with the length of 12 bytes. Furthermore, there are data within the first memory block of the user memory.
Starting from byte 11 up to and including byte 22, the EPC code of the identified data carrier is located. The length of the code in this example is 12 bytes. This is the most common length of the EPC. However, the length of the EPC can be different from 12 bytes. The EPC is used to uniquely assign the data read from the tags to a tag. The RFID station is designed to identify several tags simultaneously in the detection zone. The EPC code of the tags within the detection zone must be different.
The <Length Data> parameter specifies the length of the bytes read from the user memory transferred in this telegram. In this example, a TID with a length of 12 bytes was read out.
The <TID byte> contains the TID of the identified data carrier. The length of the TID can vary depending on the RFID chip used.

Input data field with status 16#05 response → Data carrier has left detection zone

Byte	Content					Enhanced Read Fixcode (TID)	
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#1D	
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	UII/EPC Byte 1					16#30	
12	UII/EPC Byte 2					16#14	
13	UII/EPC Byte 3					16#F7	
14	UII/EPC Byte 4					16#33	
15	UII/EPC Byte 5					16#7C	
16	UII/EPC Byte 6					16#00	

17	UII/EPC Byte 7	16#1F
18	UII/EPC Byte 8	16#00
19	UII/EPC Byte 9	16#00
20	UII/EPC Byte 10	16#00
21	UII/EPC Byte 11	16#74
22	UII/EPC Byte 12	16#83
23	Not relevant	16#00
…	Not relevant	16#00
255	Not relevant	16#00

The <Frame Length> parameter has the value 16#17 (23). The length of the fragment extends from byte 0 (control byte) up to and including byte 22 (UII/EPC byte 12). The <Fragmentation Counter> has the value 16#00, because the response telegram can be transmitted within one fragment. The <Telegram Length> has the value 16#0014 (20) and extends starting from byte 3 (Telegram Length High byte) up to and including byte 36 (UII/EPC byte 12). The <Command> command code is identical to the command telegram and has the value 16#1D. The value of <Status> is 16#05 and it is thereby signaled that the transponder has left the detection zone with this UII/EPC information.
The parameter <Length UII/EPC Information> specifies the length of the UII/EPC information. The UII/EPC information consists of the PC word with a length of 2 bytes and the UII or EPC code. In this example the EPC code has a length of 12 bytes. Thus the parameter <Length UII/EPC Information> has the value 16#000E.
The <PC Word> has a fixed length of 2 bytes and contains additional information about the UII or EPC code.
Starting from byte 11 up to and including byte 22, it contains the EPC code of the data carrier that has left the detection zone.

7.3 Example 3: 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	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#0B (11). The length of the fragment extends from byte 0 (control byte) up to and including byte 10 (length parameter low byte). The <Fragmentation Counter> has the value 16#00, because the command telegram can be transmitted within one fragment. The <Telegram Length> has the value 16#0008 and extends starting from byte 3 (Telegram Length High Byte) to byte 9 (Length Parameter Low Byte). The <Command> command code for the Read Parameter command has the value 16#BE. For the <SystemCode> the value "U" (16#55) must be set.

The identification of the antenna parameter to be read out is defined by <UHF parameter>. Via <Length Parameter>, length information of subsequent data is transmitted if necessary. The length information is 16#0000 for most Read Parameter commands.

Input data field with status 16#00 Response → Antenna parameter 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	Parameter Byte 11 → PT6 High Byte (optional)					16#00	
18	Parameter Byte 12 → PT6 Low Byte (optional)					16#00	
19	Parameter Byte 13 → PT7 High Byte (optional)					16#00	
20	Parameter Byte 14 → PT7 Low Byte (optional)					16#00	
21	Parameter Byte 15 → PT8 High Byte (optional)					16#00	
22	Parameter Byte 16 → PT8 Low Byte (optional)					16#00	
23	Parameter Byte 17 → PT9 High Byte (optional)					16#00	
24	Parameter Byte 18 → PT9 Low Byte (optional)					16#00	
25	Parameter Byte 19 → PT10 High Byte (optional)					16#00	
26	Parameter Byte 20 → PT10 Low Byte (optional)					16#00	
27	Not relevant					16#00	
…	Not relevant					16#00	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#09 (9). The length of the fragment extends from byte 0 (control byte) up to and including byte 8 (parameter byte 2). The <Fragmentation Counter> has the value 16#00, since the response telegram can be transmitted within a fragment. The <Telegram Length> has the value 16#0006 (6) and extends starting from byte 3 (Telegram Length High Byte) up to and including byte 8 (parameter byte 2). The command code <Command> is identical to the command telegram and has the value 16#BE. The value of <Status> is 16#00 and it signals that the antenna parameter has been read successfully. This telegram contains the transmit power currently set in the RFID station. The <parameter byte> contains the PT transmit power that was read in. The transmit power has a length of 2 bytes. Up to 10 power levels PT1, PT2, ... PT10 can be set. Depending on the number of power levels set, the values for <Frame Length> and <Telegram Length> may differ from the example above.

7.4 Example 4: 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	Parameter Byte 11 → PT6 High Byte (optional)					16#00	
22	Parameter Byte 12 → PT6 Low Byte (optional)					16#00	
23	Parameter Byte 13 → PT7 High Byte (optional)					16#00	
24	Parameter Byte 14 → PT7 Low Byte (optional)					16#00	
25	Parameter Byte 15 → PT8 High Byte (optional)					16#00	
26	Parameter Byte 16 → PT8 Low Byte (optional)					16#00	
27	Parameter Byte 17 → PT9 High Byte (optional)					16#00	
28	Parameter Byte 18 → PT9 Low Byte (optional)					16#00	
29	Parameter Byte 19 → PT10 High Byte (optional)					16#00	
30	Parameter Byte 20 → PT10 Low Byte (optional)					16#00	
31	Not relevant					16#00	
…	Not relevant					16#00	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#0D (13). The length of the fragment extends from byte 0 (control byte) up to and including byte 12 (parameter byte 2). The <Fragmentation Counter> has the value 16#00, because the command telegram can be transmitted within one fragment. The <Telegram Length> has the value 16#000A and extends starting from byte 3 (Telegram Length High Byte) to byte 12 (parameter byte 2). The <Command> command code for the Write Parameter command has the value 16#BF. For the <SystemCode> the value "U" (16#55) is to be set.
By <UHF Parameter> the identifier of the antenna parameter is defined, which is to be changed. Via <Length Parameter> a length information of the following parameter data is transferred. The <Parameter Byte> contains the new parameter values. The number of <Parameter Byte> depends on the parameter which is to be changed. Up to 10 power levels can be set for the PT transmit power. Each power level has a length of 2 bytes.

Input data field with status 16#00 response → Antenna parameter 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	
255	Not relevant					16#00	

The <Frame Length> parameter has the value 16#07 (7). The length of the fragment extends from byte 0 (control byte) up to and including byte 6 (status). The <Fragmentation Counter> has the value 16#00, since the response telegram can be transmitted within a fragment. The <Telegram Length> has the value 16#0004 (4) and extends starting from byte 3 (Telegram Length High Byte) up to and including byte 6 (Status). The <Command> command code is identical to the command telegram and has the value 16#BF. The value of <Status> is 16#00 and it signals that the antenna parameter has been successfully changed.

8. Troubleshooting

Index	Description	Correction
1	Profinet communication does not work	1. Check whether the setting of the Profinet name in the device and in the controller are identical 2. check if the rotary switch "Mode" on the back of the device is in position "1
2	All data within the DBs for Expert Mode are 16#00	1. Control of the initialization by "IO_b_SetRestart" check whether input data show a change. 2. Check if the input parameter "I_HWIO_Hardware_ID" is parameterized with the same submodule from the 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	ReadCounter or WriteCounter are constantly increased if a data carrier is still present (standstill).	1. counters for successful reading or writing are incremented for each access to a data carrier 2. data carrier is constantly re-read → unstable communication between RFID station and data carrier 3. Increase of parameter E5 (tag loss smoothing). As a result, the logoff of the tag 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 GSDML). 2. Long form: at least 2 data carriers with the same UII/EPC information are not permitted in the detection zone; only data carriers with different UII/EPC information are permitted 3. Short form: at least 2 data carriers are not allowed in the detection zone; 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 substrate 4. Increase of the transmitting power by the parameter PT in the GSDML 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. When a read command is executed, the orange LED lights up for as long as a data carrier remains in the detection zone and can be read.
9	Temporary change UHF parameters	1. The device parameters for setting the UHF antenna are carried out by parameterizing the GSDML in the PLC. After device start-up or voltage reset, the parameters are transferred from the PLC to the device and updated if necessary. 2. 2. Temporary change of the UHF parameters is possible via the integrated web server. These settings are then active until the next power reset. 3. 3. Thus, for example, the transmitting power can be changed during initial commissioning without having to reload the change in the hardware configuration into the PLC. If the suitable setting is found, this value is then set in the GSDML and the hardware configuration is updated.
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).