GEFRAN

GFX4-GFXtermo4 PROFINET

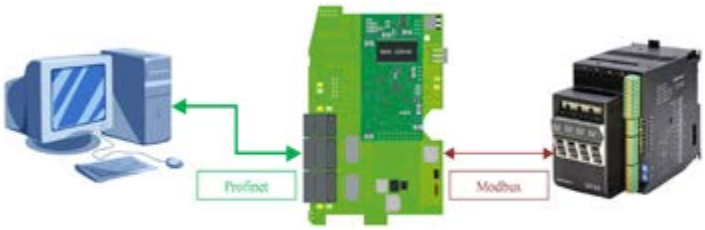
USER MANUAL

codice: **80419D - 01-2021 - ENGLISH**

INDEX

INTRODUCTION

The RTE (Real Time Ethernet) card is a device that connects slaves for data transmission and reception with the Profinet protocol. The connection diagram is shown below.

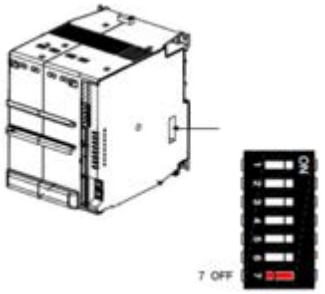


We have:

- A Profinet-controller master connected to a Profinet-IO device (Gefran RTE Profinet Bridge) via the Profinet protocol (green)
- A Modbus RTU master running on the RTE card (Gefran Profinet Bridge) connected via serial line to a Modbus slave RTU

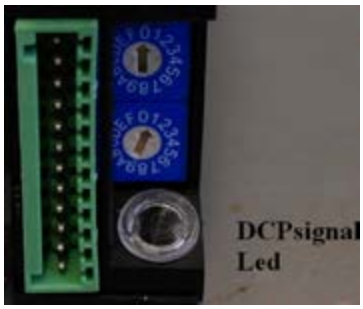
MAIN CHARACTERISTICS

- Profinet-IO module ↔ Modbus RTU
- Two Ethernet RJ45 ports: Eth 0 and Eth 1
- Internal switch
- Baud rate 100Mbits
- Auto_Negotiation, Auto_Polarity, Auto_Crossover
- Internal installation
- Data transport layer Ethernet II , IEEE 802.3
- RTC – Real time Cyclic Protocol- Class 1 & Class 2 (unsynchronised)
- RTA – Real time Acyclic Protocol
- Device address via DCP– Discovery and Configuration Protocol (No DHCP)
- CL-RPC – Connectionless Remote Procedure Call
- LLDP – Link Layer Discovery Protocol
- No fast star-tup
- 32 input words (16 bits per word) for each GFX4-GFXtermo4
- 32 output words (16 bits per word) for each GFX4-GFXtermo4
- Minimum device interval for Profinet cyclic data: 8ms
- Supports GFX4 standard address mode (dip-switch 7 off)



dip switch per configurazione software

- Minimum cycle time on serial: 50ms for 16 contiguous words using GFX4-GFXtermo4 custom map function
- DCP signal LED on front panel



Serial communication time constraints in Modbus RTU

The following time constraints must be complied with in order to allow correct serial data exchange with the device:

Reading Word/Register parameters: Reading N consecutive parameters, with N from 1 to 16, requires a time of almost 50 ms. In this case the following read and write Modbus command, to the same node, must be sent after this interval time.

Writing Word/Register parameters: Writing N consecutive parameters, with N ranging from 1 to 16, if all values (maximum 16) on the device are updated, will take a time of:50ms + N x 80ms(*) with N from 1 to 16.

The times reported refer to the case in which the Baudrate of the serial line (parameter bAu Modbus address 45) is 19200.

(*) If STATUS_W parameters (Modbus address 305) are included in the write request and their value is different from the one currently present in the slave, the time required to write each one will be 240ms (instead of 80ms).

CONNECTING HOST DEVICES

Data is exchanged in the GFX4-GFXtermo4 device by encapsulating Modbus data in Profinet packets.
The serial port must be configured as follows:

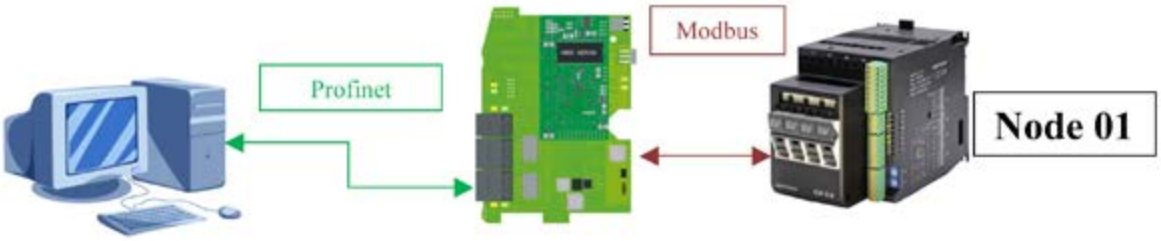
- Serial link speed: 19200 baud
- No parity
- Data 8 bits
- Modbus node addresses MUST BE between 1 and 4 in sequence
- The GFX4-GFXtermo4 with Profinet card MUST have address 1

POSSIBLE CONNECTIONS

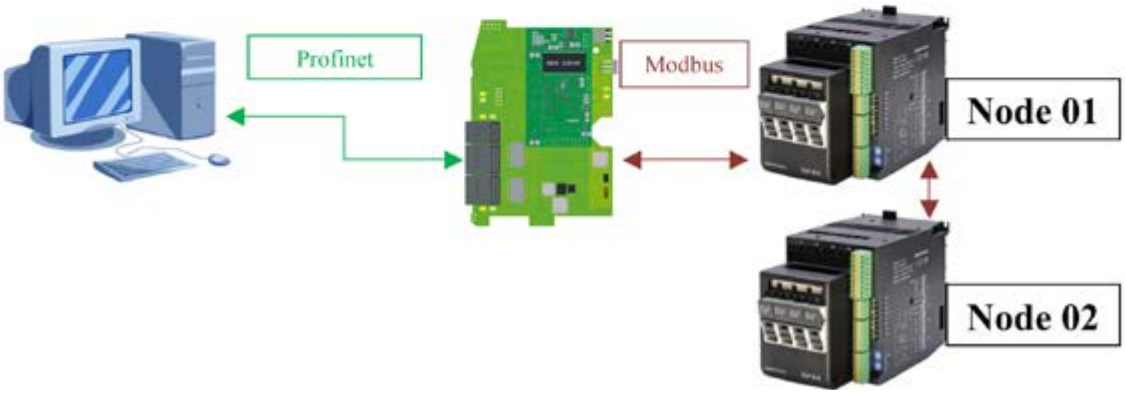
The following pages show possible combinations for connection and address of GFX4-GFXtermo4 modules.

Connection combinations other than those shown below WILL NOT allow Profinet communication with a Controller!

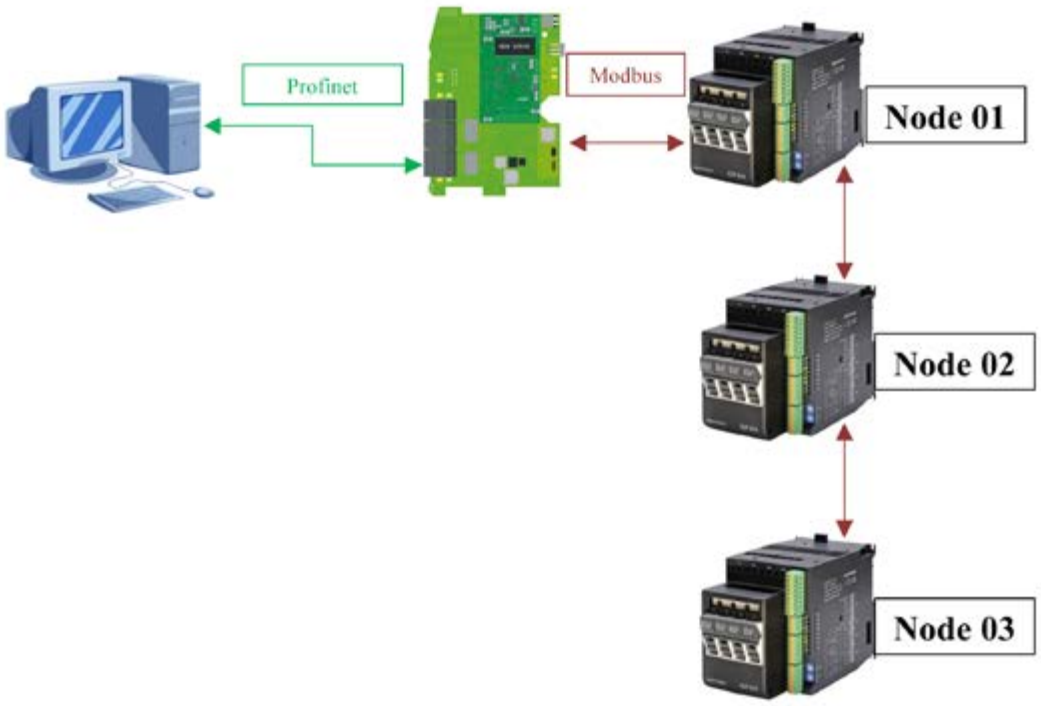
Connection diagram 1 (4 zones) :
1 GFX4 (or GFXtermo4) with Modbus node address = 1 and dip switch 7 Off. .



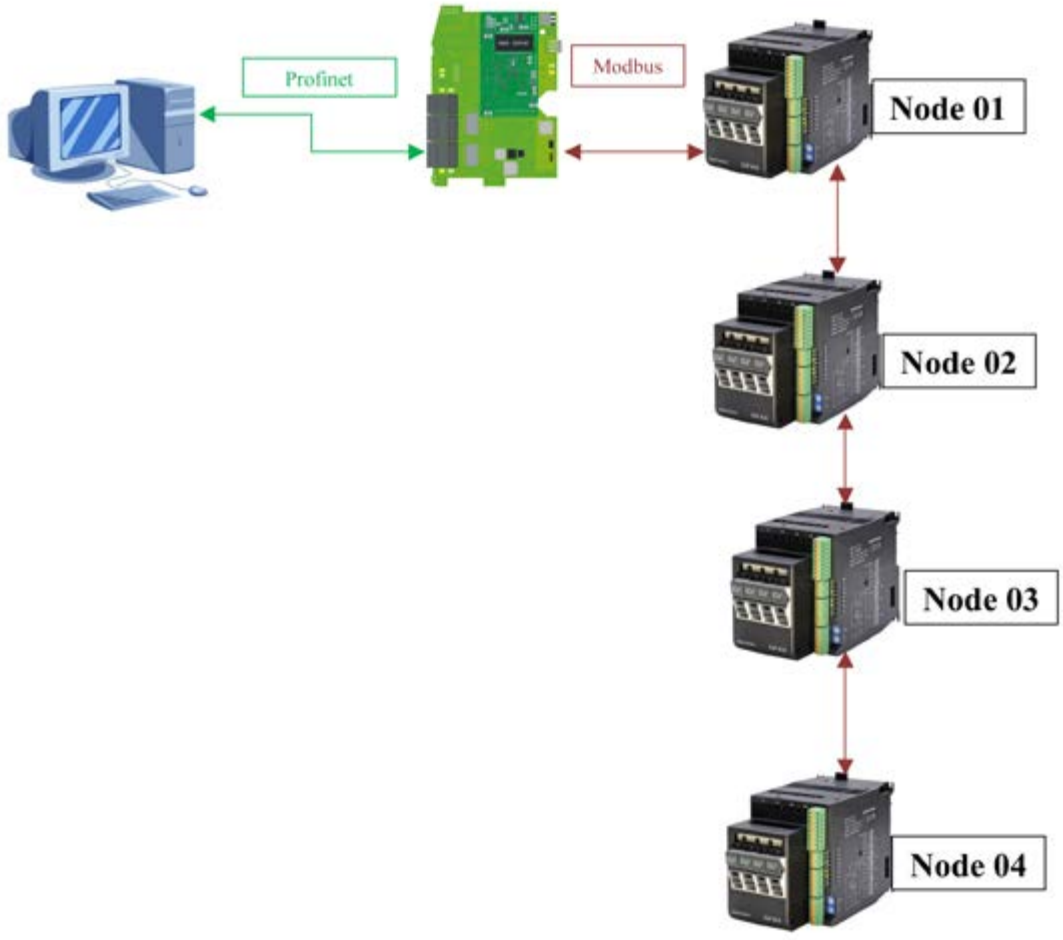
Connection diagram 2 (8 zones):
2 GFX4 (or GFXtermo4) with Modbus node addresses = 1 and 2 and dip switch 7 Off.



Connection diagram 3 (12 zones) :
3 GFX4 (or GFXtermo4) with Modbus node addresses = 1 2 and 3 and dip switch 7 Off.



Connection diagram 4 (16 zones) :
4 GFX4 (or GFXtermo4) with Modbus node addresses = 1,2,3 and 4 dip switch 7 Off.



DESCRIPTION OF DATA EXCHANGE

The Profinet-IO module on the GFX4-GFXtermo4 device supports the following data types

- Parameter data
- Cyclic data
- Acyclic data

This data is characterised by device description file GSDML .

Data flows must be interpreted by the application that produces/consumes the data transmitted/received by the device.

The Gefran Profinet-IO card acts like a bridge between Modbus serial and Profinet Ethernet.

Data flows as follows:

- from Profinet-controller master to Profinet-IO slave and vice versa via acyclic mailboxes (acyclic and parameter data)
- or via cyclic data for fast IO data.

Use a configuration tool to define which slave data are exchanged via fast cyclic data.

USANDO STEP 7

FROM GSDML DESCRIPTION FILE TO DATA EXCHANGE

To activate data exchange, download the GSDML product description file (GSDML-V2.3-GEFRAN-GFX4-GFXTERMO4-20121119.xml) from www.gefran.com and install it in the programming environment.

After this, you can see the Controllers → Geflex folders with the GFX4-GFXtermo4 Standard Mode module (Fig.1)

Figure 1

You can now connect to the network (2) by dragging the device (1) as shown in figure 2

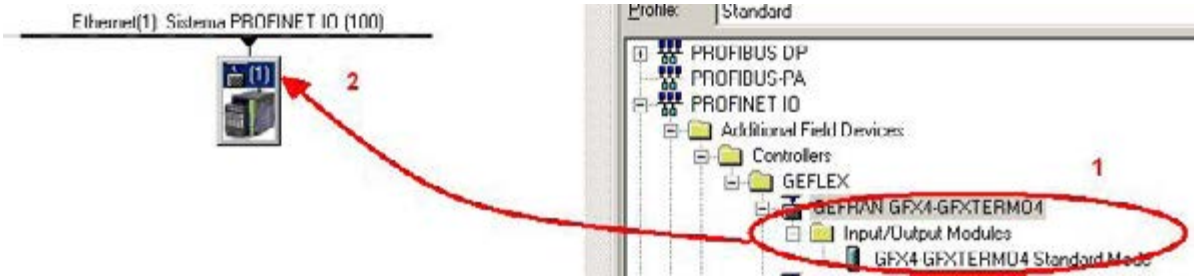


Figure 2

If you need to set a device name/ip address, do it with the System Manager tool using the PLC → Ethernet → Edit Ethernet Node menus (Fig.3)

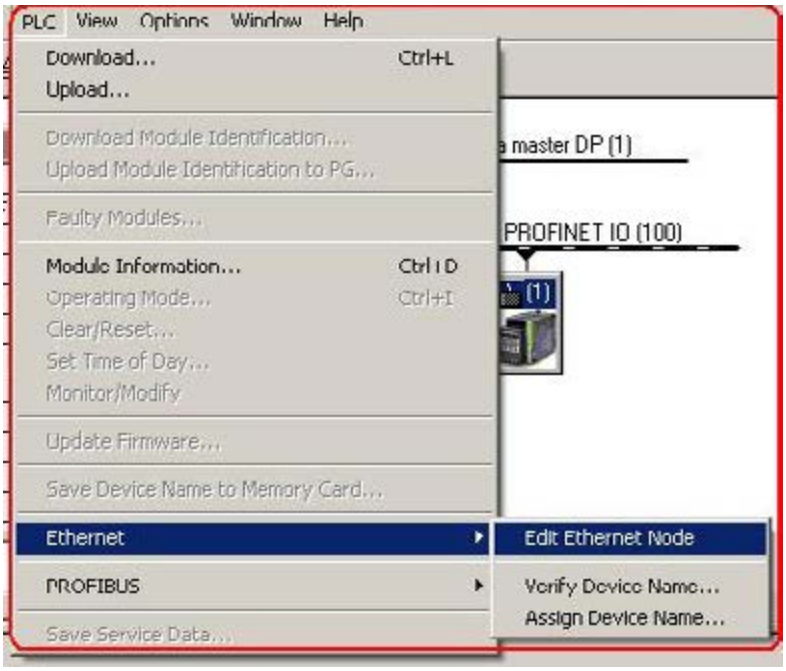


Figure 3

In the Edit Ethernet Node window, click the Browse button (Fig. 4) to search for nodes accessible online.

This will take a few seconds.

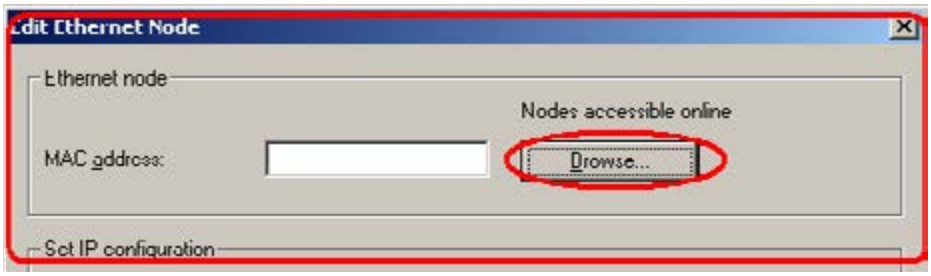


Figure 4

After a few seconds, the Browse Network window appears, summarising the current settings of the nodes connected to the network.

The example shows a network consisting of two nodes:

- a controller
- a GFX4 or GFXtermo4 device

To change the settings (Fig. 5) of the GFX4 or GFXtermo4, select the line with Device type = GEFLEX (1) and confirm with OK (2)

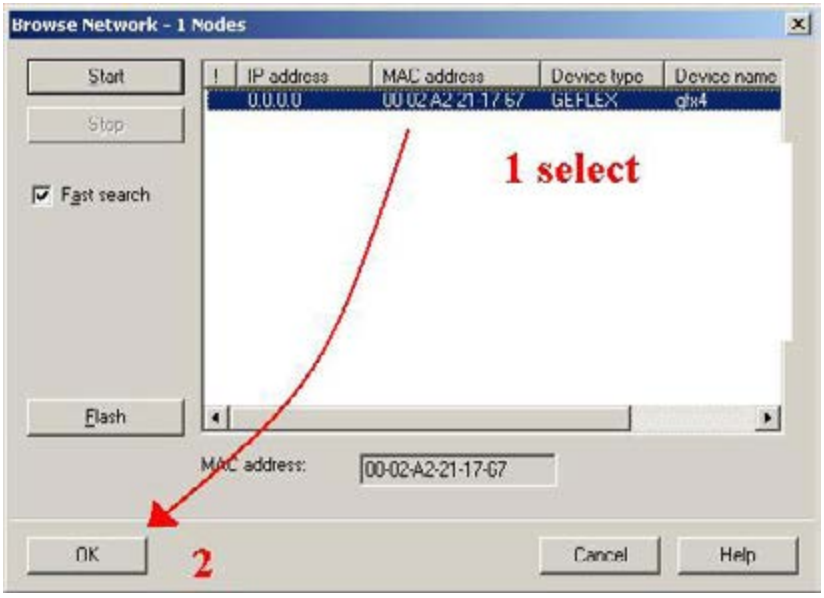


Figure 5

The next window opens (Fig. 6) for setting the Device name / ip address. DHCP protocol is not supported.

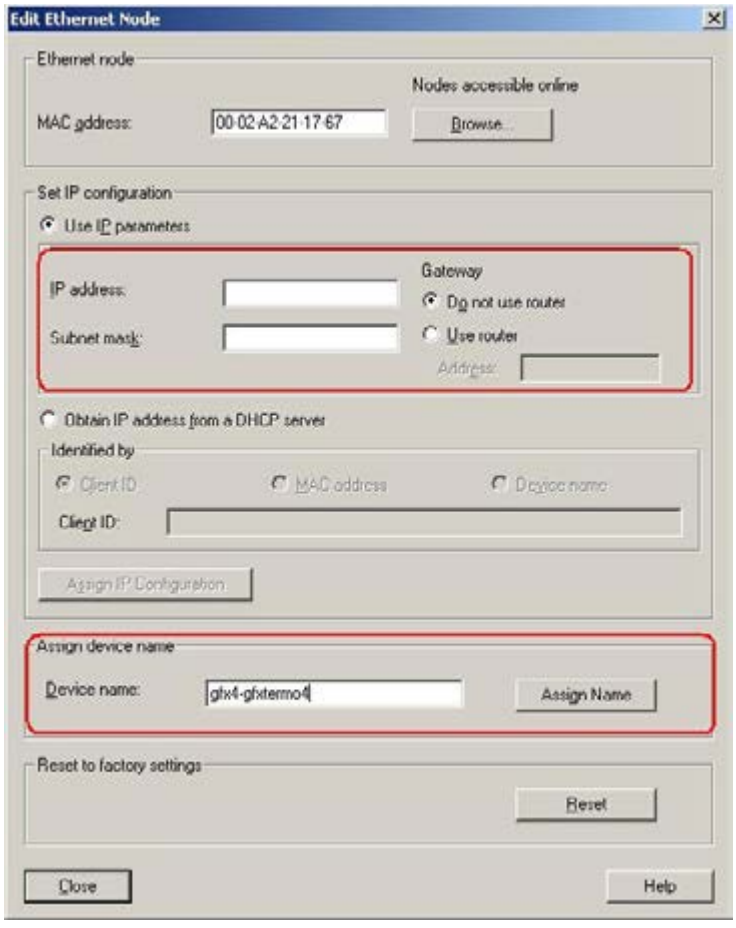


Figure 6

Let's see how to insert a device in the configuration tool (HW-config window).

Configuration for Connection 1 (4 zone) :

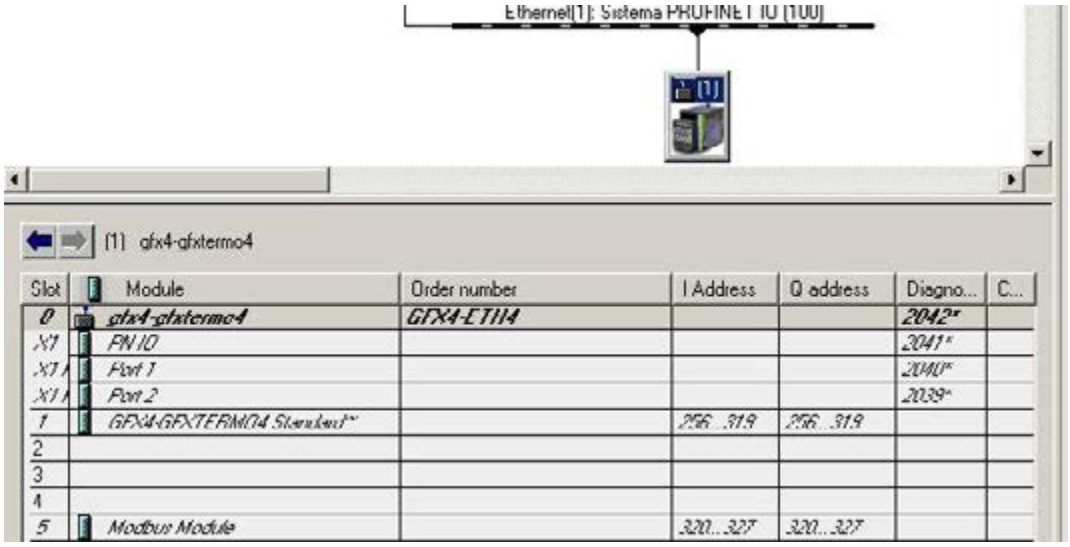


Figure 7

Figure 7 shows the GFX4-GFXtermo4 device in slot 1, controlling 4 zones.
There is also a generic Modbus channel in slot 5 (see description of Modbus channel).
If you click the module, slot 1 is as shown in figure 8:

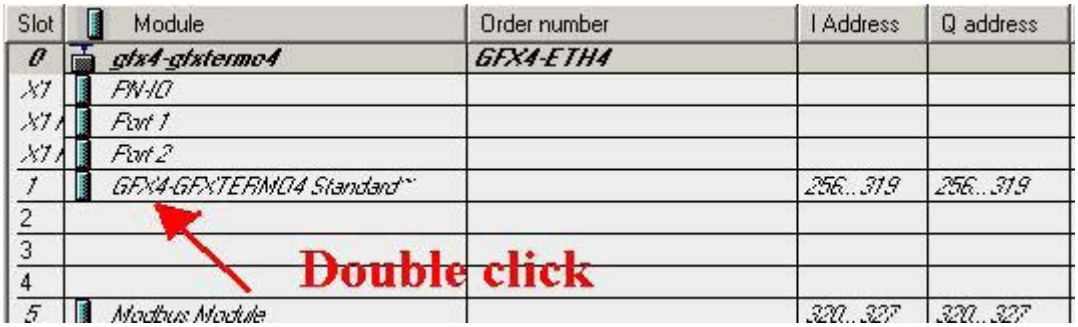


Figure 8

You can check/change the parameters of the process I/O variables (Fig. 9)

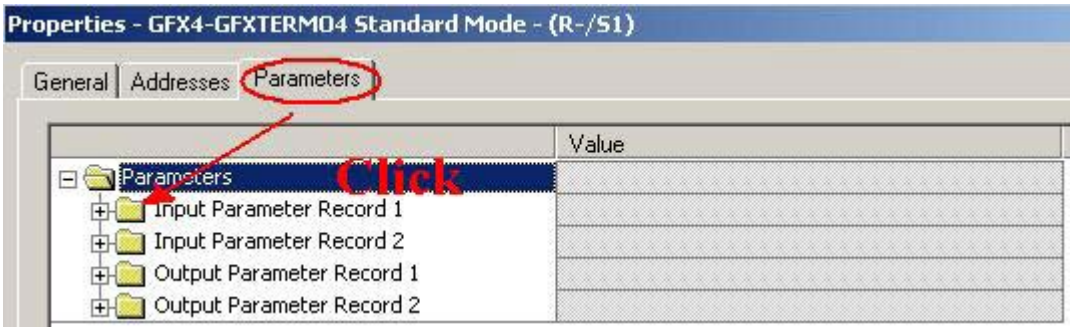


Figura 9

There are 32 input variables in two blocks

- Input Parameter Record 1 (16 words)
- Input Parameter Record 2 (16 words)

In the Value column, you can change the parameter value if necessary (Fig. 10)

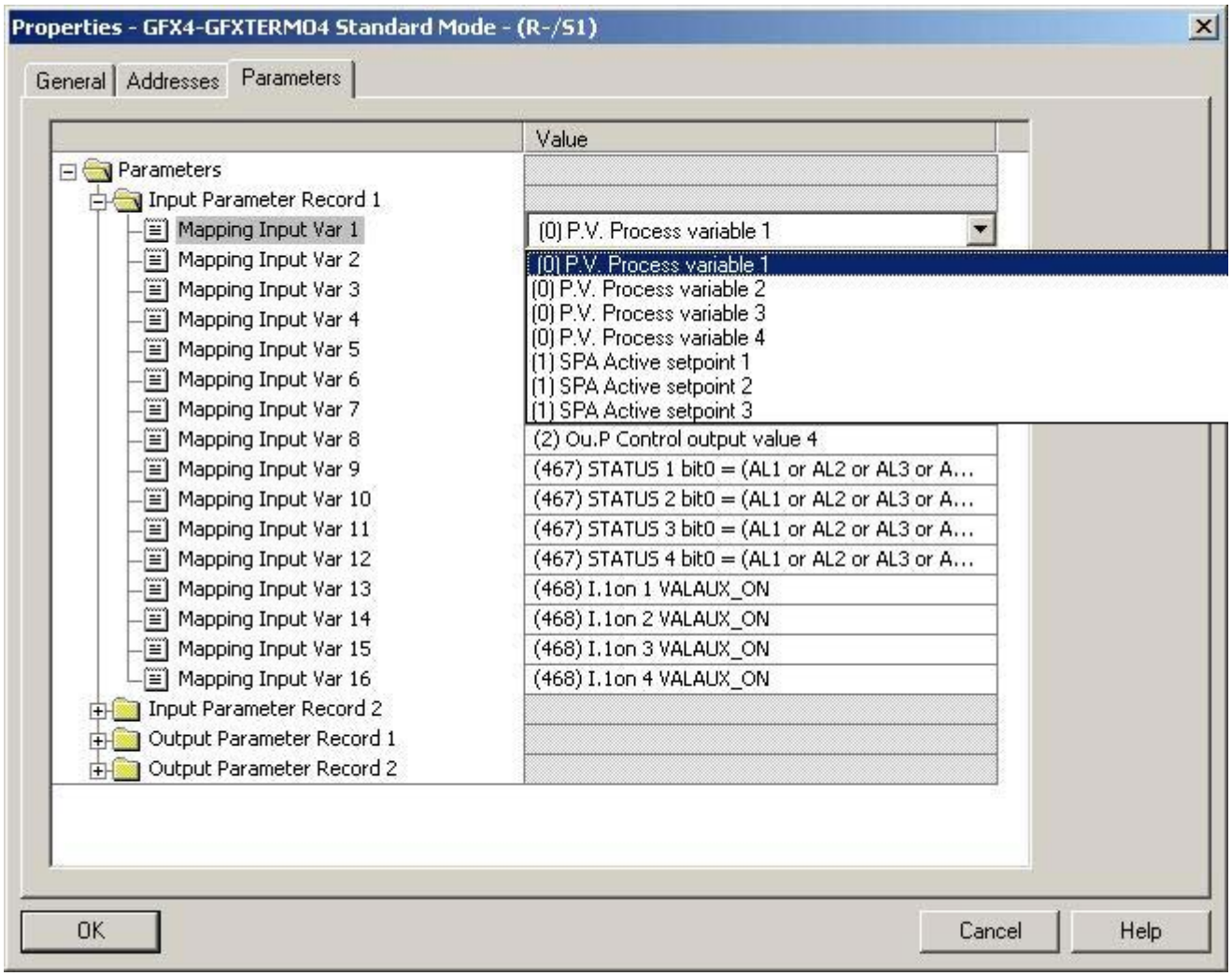


Figure 10

There are 32 output variables in two blocks :

- Output Parameter Record 1
- Output Parameter Record 2

In the Value column, you can change the output variables if necessary (Fig.11)

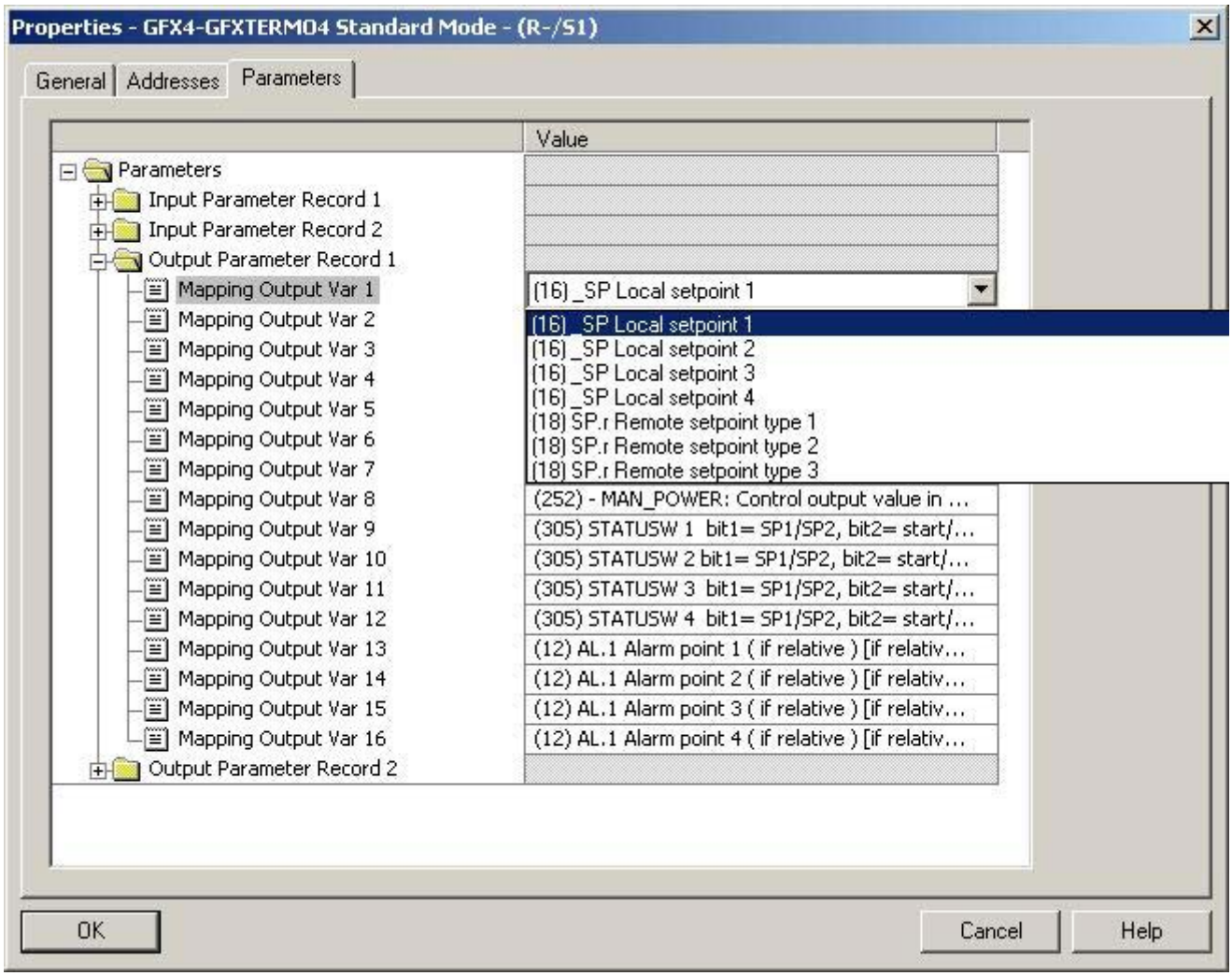


Figure 11

Configuration for Connection 2 (8 zones) :

Select the GFX4-GFXtermo4 Standard Mode module with the configuration tool and drag it to slot 2.
The Modbus module is in slot 5 (Fig.12).

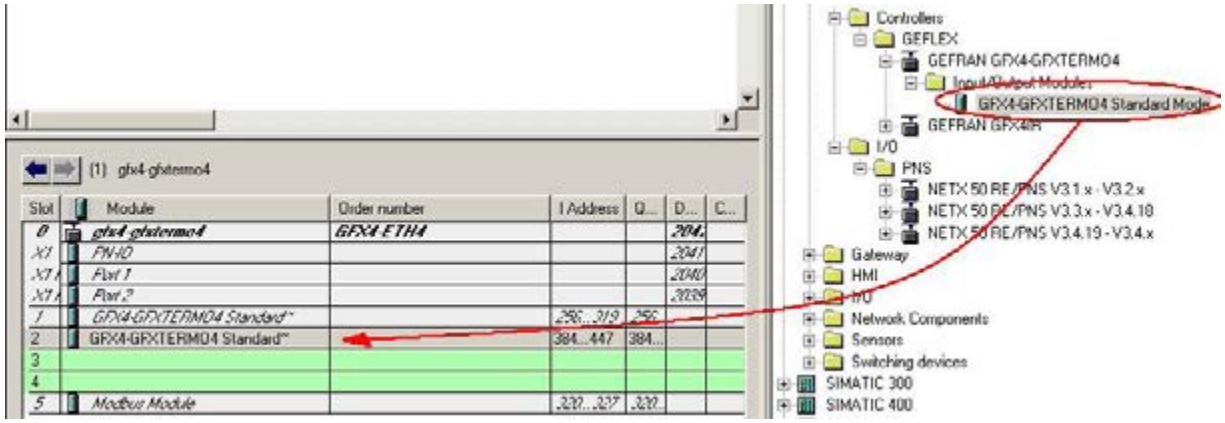


Figure 12

As described above, you can parameterise input and output data in the parameters window of each module.

Configuration for Connection 3 (12 zones) :

Select the GFX4-GFXtermo4 Standard Mode module with the configuration tool, drag it to slot 2 and then to slot 3. The Modbus module is in slot 5 (Fig.13).

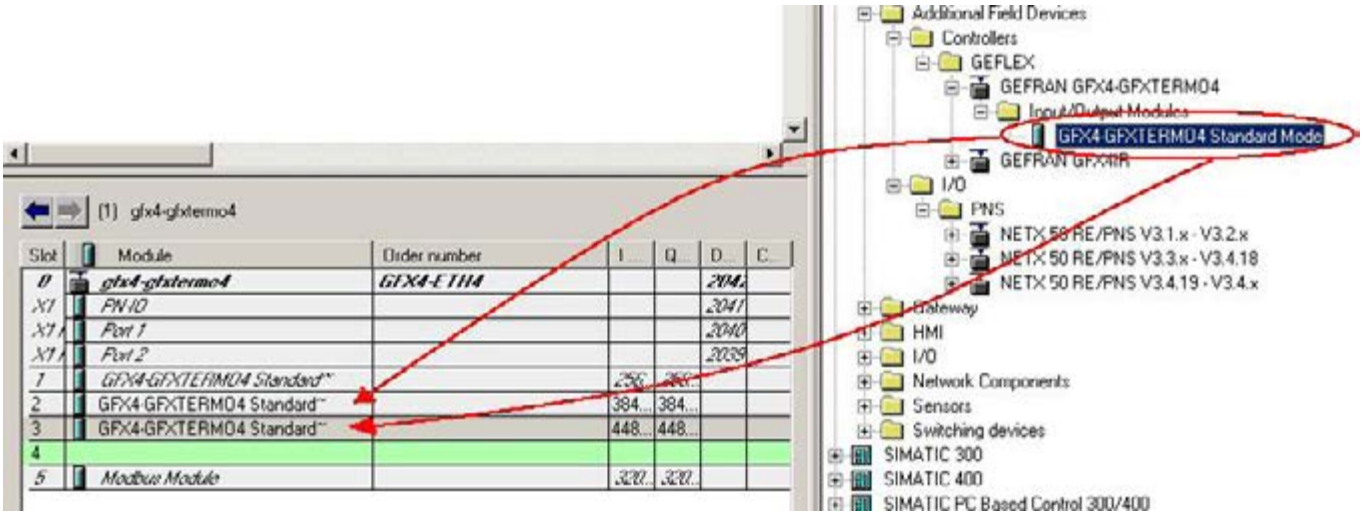


Figure 13

As described above, you can parameterise input and output data in the parameters window of each module.

Configuration for Connection 4 (16 zones) :

Select the GFX4-GFXtermo4 Standard Mode module with the configuration tool, drag it to slot 2 , 3 and then to slot 4. The Modbus module is in slot 5 (Fig.14).

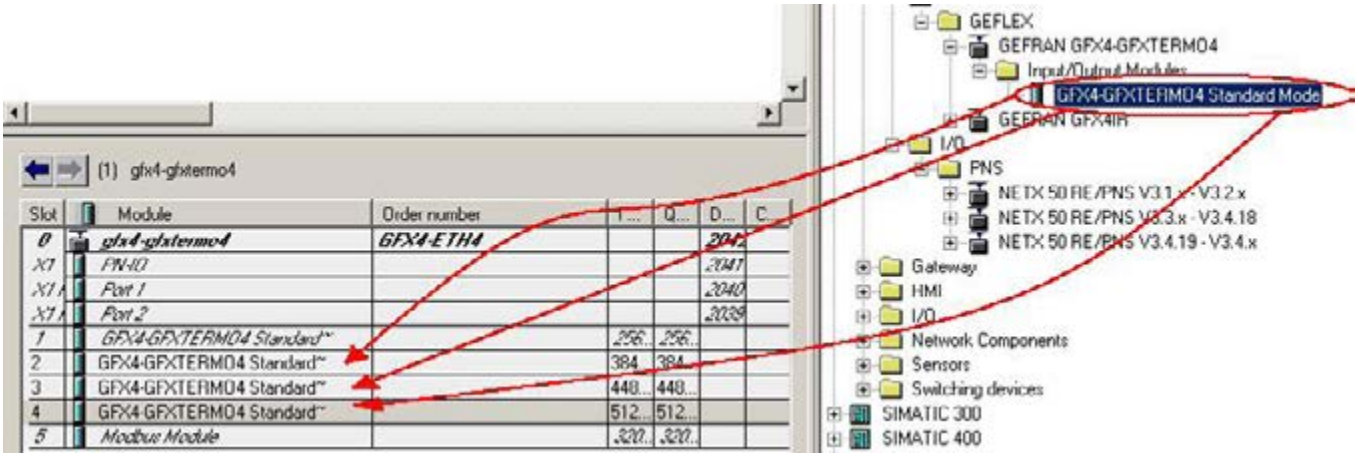


Figure 14

As described above, you can parameterise input and output data in the parameters window of each module.

Modbus virtual slot 5

Slot 5 (Fig. 15) is a virtual device that encapsulates a Modbus control in cyclic Profinet data.

Figure 15

You can configure a few communication aspects in the module parameters.

- Fault Mode (Fig.16) : if Profinet communication fails, you may set the modules as follows

√ Take no action
√ Device to Software Off mode
√ Device to manual mode
√ Set SP2 as Setpoint

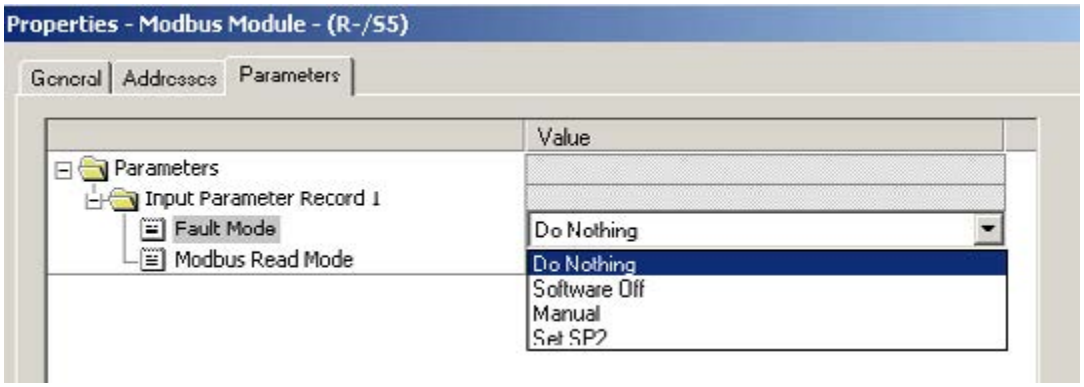


Figure 16

Modbus Read Mode (Fig.17) :

√ Normal Modbus read: all 32 input words are updated in read (Input parameter record 1 and Input parameter record 2)
√ Half Modbus read: if the read variables needed by the application are equal to a maximum of 16 words, only the parameter record 1 inputs are updated

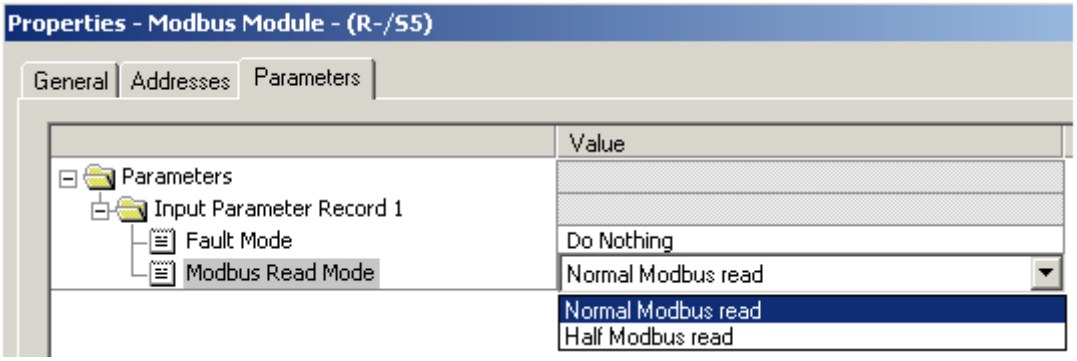


Figure 17

Modbus slot 5 has a dimension of 8 bytes in write and 8 bytes in read. With this channel you can read or write any variable on the Modbus map of the GFX4-GFXtermo4 modules connected to the network.

Canale modbus , slot 5 output , size 8bytes

MODBUS OUTPUT CHANNEL						
BYTE1 BYTE2	**BYTE 3**	**BYTE 4**	**BYTE 5**	**BYTE 6**	**BYTE 7**	**BYTE 8**
REQUEST TRIGGER WORD	INDIRIZZO MODBUS	FUNCTION CODE	DATA 1	DATA 2	DATA 3	DATA 4

Canale modbus , slot 5 input , size 8bytes

MODBUS INPUT CHANNEL						
BYTE1 BYTE2	**BYTE 3**	**BYTE 4**	**BYTE 5**	**BYTE 6**	**BYTE 7**	**BYTE 8**
REQUEST TRIGGER WORD	MODBUS ADDRESS	FUNCTION CODE	DATA 1	DATA 2	DATA 3	DATA 4

DESCRIPTION		
BYTE OFFSET	**PARAMETER**	**DESCRIZIONE**
0	REQUEST/RESPONSE TRIGGER WORD	TRIGGER WORD REQUEST: MUST BE INCREASED BY 1 FOR EACH NEW REQUEST.THE ANSWER IS VALID WHEN THE TRIGGER WORD RESPONSE IS EQUAL TO THE TRIGGER WORD REQUEST
2	SLAVE ADDRESS	MODBUS ADDRESS OF GFX4-GFXTERMO4
3	FUNCTION CODE	FUNCTION CODE BIT/WORD READ/WRITE
4	DATA 1	DEPENDS ON FUNCTION CODE
5	DATA 2	DEPENDS ON FUNCTION CODE
6	DATA 3	DEPENDS ON FUNCTION CODE
7	DATA 4	DEPENDS ON FUNCTION CODE

Reading a bit (1,2)

REQUEST						
TRG	**SLAVE ADDRESS**	**FUNCTION CODE**	**ADDRESS BIT BYTE + MEANING**	**ADDRESS BIT BYTE - MEANING**	**NUMBER BIT BYTE + MEANING**	**NUMBER BIT BYTE - MEANING**
REQUEST TRIGGER WORD	SLAVE ADDRESS	1 or 2	ADDRESS OF BIT TO READ	ADDRESS OF BIT TO READ	NUMBER OF BITS TO READ. (MUST BE 0)	NUMBER OF BITS TO READ

RESPONSE						
TRG	**SLAVE ADDRESS**	**FUNCTION CODE**	**BYTES COUNT**	**BIT**	**BIT**	**#**
RESPONSE TRIGGER WORD	SLAVE ADDRESS	CONFIRM CODE	NUMBER OF BYTE (1 OR 2)	VALUE OF BITS (1÷8)	VALUE OF BITS (9÷16)	DUMMY

Reading a word (3,4)

REQUEST						
TRG	**ADD SLAVE**	**FUNCTION CODE**	**ADDRESS WORD + MEANING**	**ADDRESS WORD - MEANING**	**NUMBER WORD + MEANING**	**NUMBER WORD - MEANING**
REQUEST TRIGGER WORD	SLAVE ADDRESS	3 or 4	ADDRESS OF WORD TO READ	ADDRESS OF WORD TO READ	0	1

RESPONSE						
TRG	**ADD SLAVE**	**FUNCTION CODE**	**BYTES COUNT**	**DATA WORD + MEANING**	**DATA WORD - MEANING**	**#**
RESPONSE TRIGGER WORD	SLAVE ADDRESS	FUNCTION CODE	NUMBER OF BYTES READ	VALUE	VALUE	DUMMY

Writing a bit (5)

REQUEST						
TRG	**ADD SLAVE**	**FUNCTION CODE**	**ADDRESS + MEANING**	**ADDRESS - MEANING**	**BIT**	**#**
REQUEST TRIGGER WORD	SLAVE ADDRESS	5	ADDRESS OF BIT TO WRITE	ADDRESS OF BIT TO WRITE	VALUE OF BIT 00 = OFF o FFHEX = ON)	0

RESPONSE						
TRG	**ADD SLAVE**	**FUNCTION CODE**	**ADDRESS + MEANING**	**ADDRESS - MEANING**	**BIT**	**00**
RESPONSE TRIGGER WORD	SLAVE ADDRESS	CONFIRM CODE	ADDRESS OF BIT WRITTEN	ADDRESS OF BIT WRITTEN	VALUE OF BIT 00 = OFF o FFHEX = ON)	0

Writing a word (6)

REQUEST						
TRG	**SLAVE ADDRESS**	**FUNCTION CODE**	**ADDRESS + MEANING**	**ADDRESS - MEANING**	**DATA + MEANING**	**DATA - MEANING**
REQUEST TRIGGER WORD	SLAVE ADDRESS	6	ADDRESS OF WORD TO WRITE	ADDRESS OF WORD TO WRITE	VALUE OF WORD TO WRITE	VALUE OF WORD TO WRITE

RESPONSE						
TRG	**SLAVE ADDRESS**	**FUNCTION CODE**	**ADDRESS + MEANING**	**ADDRESS - MEANING**	**DATA + MEANING**	**DATA - MEANING**
RESPONSE TRIGGER WORD	SLAVE ADDRESS	CONFIRM CODE	ADDRESS OF WORD WRITTEN	ADDRESS OF WORD WRITTEN	VALUE OF WORD WRITTEN	VALUE OF WORD WRITTEN

In case of error, 80 hex plus the value of the request function code is returned in the response function code

RESPONSE						
TRG	**SLAVE ADDRESS**	**FUNCTION CODE**	**ERROR CODE**	**#**	**#**	**#**
RESPONSE TRIGGER WORD	CONFIRM SLAVE ADDRESS	REQUEST FUNCTION CODE + 80HEX	ERROR CODE	DUMMY	DUMMY	DUMMY

Error Code

1	2	3	9	10
ILLEGAL FC	ILLEGAL DATA ADDRESS	ILLEGAL DATA	ILLEGAL NUMBER OF DATA	DATA IS READ ONLY

FROM DESCRIPTIVE GSDML FILE TO DATA EXCHANGE

In order to activate the data exchange, you must obtain the GSDML file describing the product (GSDML-V2.3-GEFRAN-GFX4-GFXTERMO4-20121119.xml), downloadable from ww.gefran.com, and install it in the programming environment.

To install the device, select *“Options/Manage general station description files (GSD)”* (Figure 18).

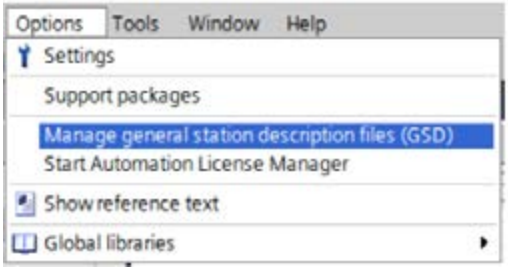


Figure 18

Select the desired item in the dialogue box that appears and click on *"Install"* (Figure 19).

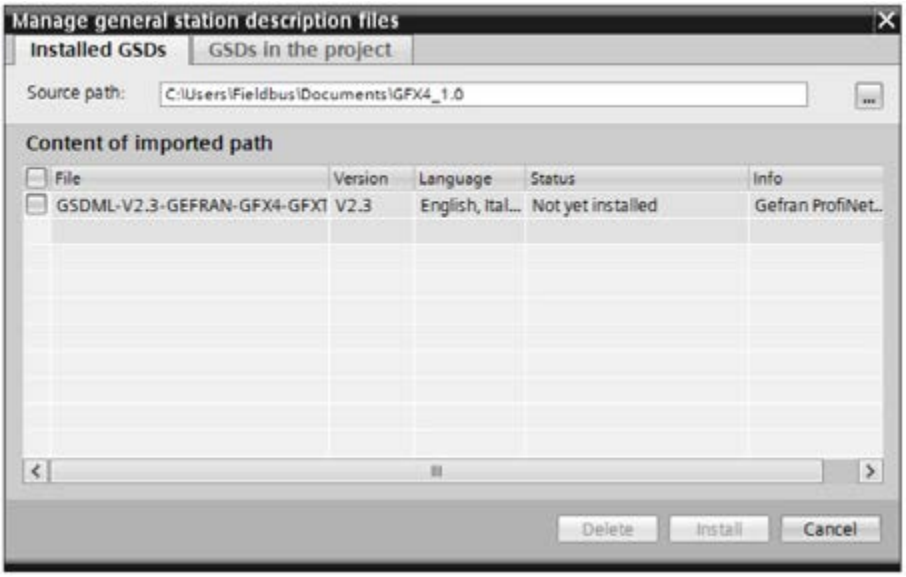


Figure 19

After doing this you will see the selected device in the catalogue *"Other field devices/Controllers/Gefran Spa/GEFLEX/ GEFRAN GFX4-GFXTERMO4"* (Figure 20):

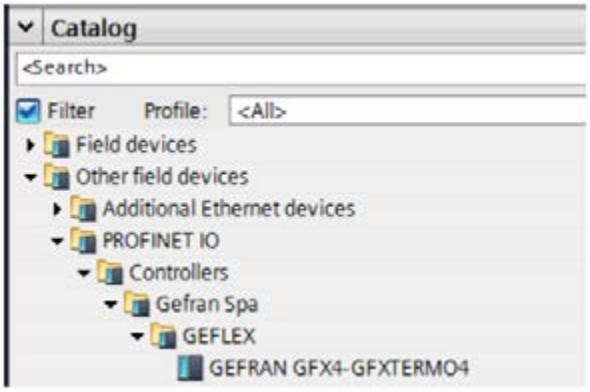


Figure 20

Once you have added and configured your master plc, you may insert your slave device, dragging it as shown in figure 21

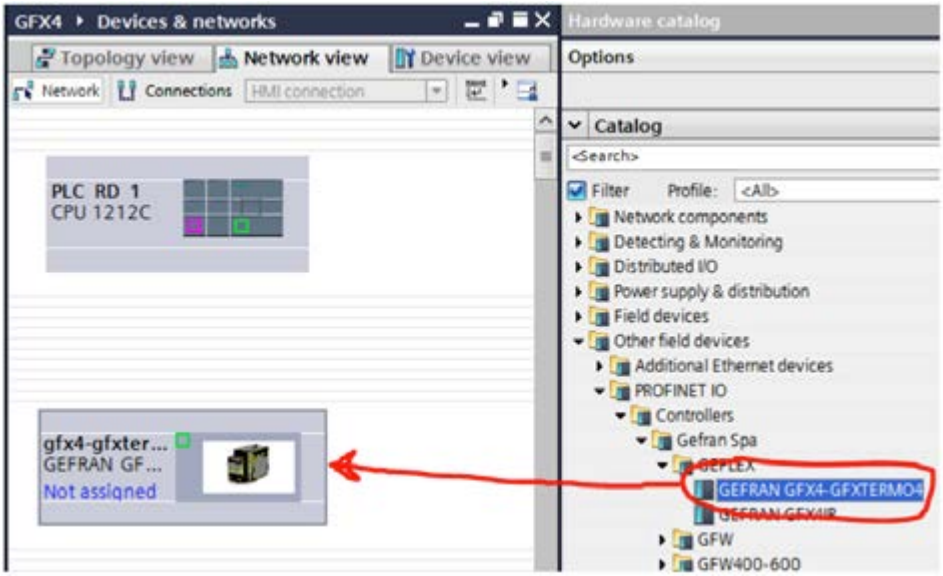


Figure 21

You must now connect the slave (GFX4/GFXTERMO4) to the Master's ProfiNET network, joining the two squares with the mouse as shown in figure 22.

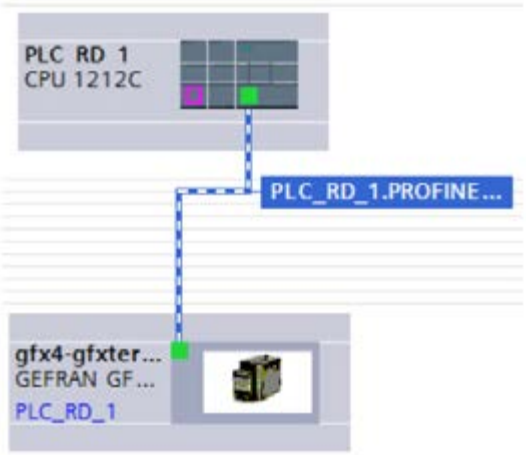


Figure 22

Follow this procedure if it is necessary to set a different device name or IP address.

Connect with the desired device point to point, for example, first with the master plc and then with the slave GFX4/GFXTERMO4.

Double click on the project tree, at the item "*Update accessible devices*" (Figures 23 e 24)

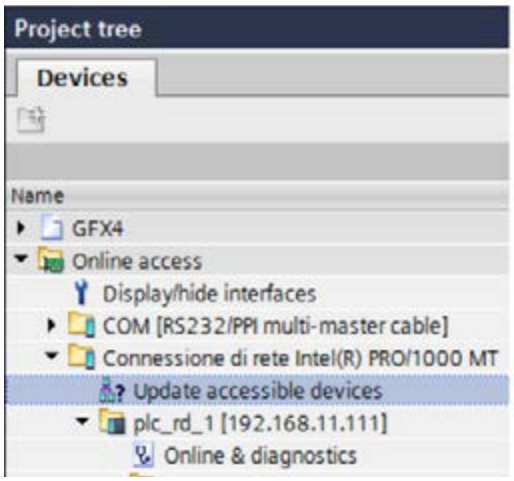


Figure 23

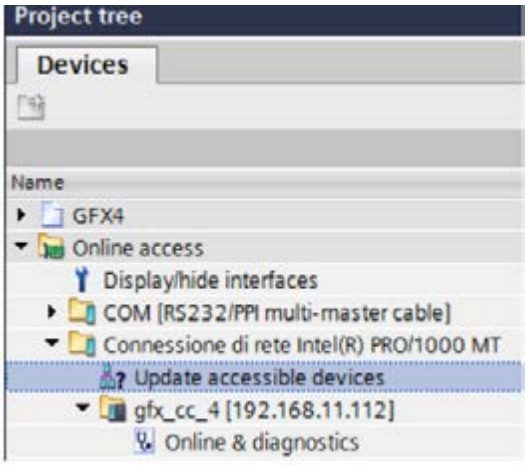


Figure 24

Once we have identified the device, double click on *"Online & diagnostics"* to access the necessary commands in the corresponding *"Functions"* menus (Figures 25 e 26).

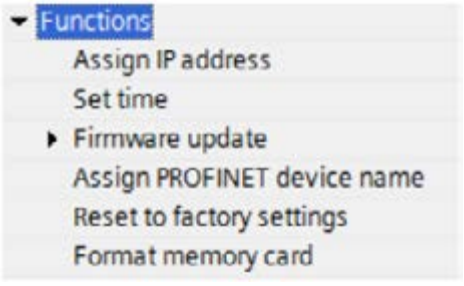


Figure 25

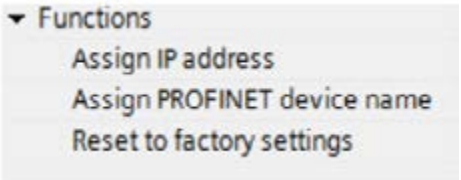


Figure 26

You may change the IP address under the item *"Functions/Assign IP address"* (Figure 27).

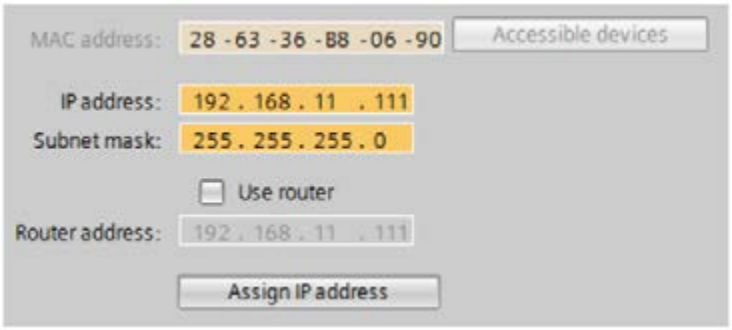


Figure 27

You may change the name under the item *"Functions/Assign PROFINET device name"* (Figure 28).

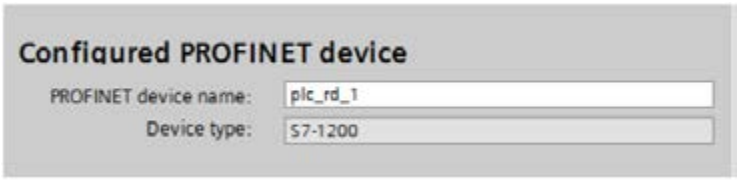


Figure 28

Figure 29 shows the GFX4-GFXTERMO4 device in slot 1 controlling 4 zones.
There is also a generic modbus channel in slot 5 (refer to the description of the modbus channel).

Figure 29

The same information may be accessed via a similar representation (not showing empty slots) in the project tree on the left (Figure 30).

Figure 30

Double click on "*GFX4-GFXTERMO4 Standard Mode_1*" in the "*Device overview*" in Figure 29 to go to the "*Properties*" window, where the item *"Module parameters"* show a map of the device's memory (Figure 31).

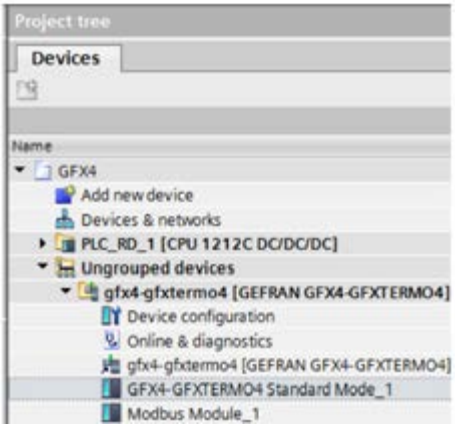


Figure 31

The same information may be accessed in a dialogue box, using the project tree shown in Figure 30.

Select *"GFX4-GFXTERMO4 Standard Mode_1"*, click with the right mouse button and select the item "*Properties*" in the context-specific menu that appears.

The following default variables are available:

- 32 input variables in two blocks
  - Input Parameter Record 1 (16 words)
  - Input Parameter Record 2 (16 words)
- 32 output variables in two blocks
  - Output Parameter Record 1 (16 words)
  - Output Parameter Record 2 (16 words)

To modify them, simply click on the item in question and select the desired variable from among those proposed.

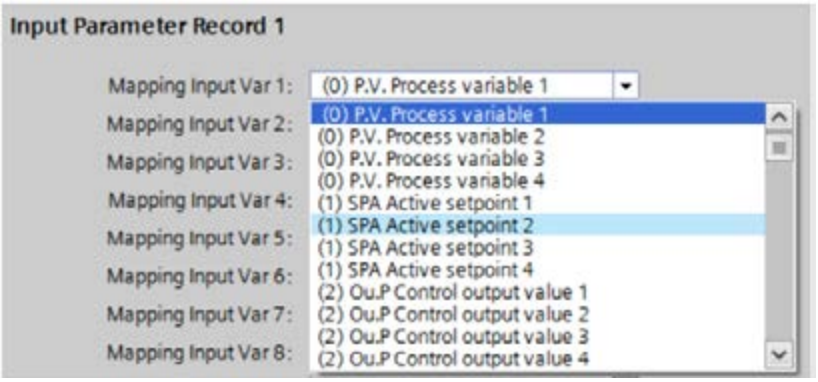


Figure 32

The table below shows the default map:

	INPUT PARAMETER RECORD 1
1	(0) P.V. Process Variable 1
2	(0) P.V. Process variable 2
3	(0) P.V. Process variable 3
4	(0) P.V. Process variable 4
5	(2) Ou.P. Control output value 1
6	(2) Ou.P. Control output value 2
7	(2) Ou.P. Control output value 3
8	(2) Ou.P. Control output value 4
9	(467) STATUS 1 bit0 = (AL1 or AL2 or AL3 or AL4 or ALHB.TA1 or ALHB.TA2 or ALHB.TA3 or POWER_FAULT), bit1 = input Lo, bit2 = input Hi, bit3 = input Err, bit4 = input Sbr, bit5 = heat, bit6 = cool, bit7 = LBA, bit8 = AL1, bit9 = AL2, bit10 = AL3, bit11 = AL4, bit12 = ALHB or POWER_FAULT, bit13 = ON/OFF, bit14 = AUTO/MAN, bit15 = LOC/REM 1
10	(467) STATUS 2 bit0 = (AL1 or AL2 or AL3 or AL4 or ALHB.TA1 or ALHB.TA2 or ALHB.TA3 or POWER_FAULT), bit1 = input Lo, bit2 = input Hi, bit3 = input Err, bit4 = input Sbr, bit5 = heat, bit6 = cool, bit7 = LBA, bit8 = AL1, bit9 = AL2, bit10 = AL3, bit11 = AL4, bit12 = ALHB or POWER_FAULT, bit13 = ON/OFF, bit14 = AUTO/MAN, bit15 = LOC/REM 1
11	(467) STATUS 3 bit0 = (AL1 or AL2 or AL3 or AL4 or ALHB.TA1 or ALHB.TA2 or ALHB.TA3 or POWER_FAULT), bit1 = input Lo, bit2 = input Hi, bit3 = input Err, bit4 = input Sbr, bit5 = heat, bit6 = cool, bit7 = LBA, bit8 = AL1, bit9 = AL2, bit10 = AL3, bit11 = AL4, bit12 = ALHB or POWER_FAULT, bit13 = ON/OFF, bit14 = AUTO/MAN, bit15 = LOC/REM 1
12	(467) STATUS 4 bit0 = (AL1 or AL2 or AL3 or AL4 or ALHB.TA1 or ALHB.TA2 or ALHB.TA3 or POWER_FAULT), bit1 = input Lo, bit2 = input Hi, bit3 = input Err, bit4 = input Sbr, bit5 = heat, bit6 = cool, bit7 = LBA, bit8 = AL1, bit9 = AL2, bit10 = AL3, bit11 = AL4, bit12 = ALHB or POWER_FAULT, bit13 = ON/OFF, bit14 = AUTO/MAN, bit15 = LOC/REM 1
13	(468) I.1on 1 VALAUX_ON
14	(468) I.1on 2 VALAUX_ON
15	(468) I.1on 3 VALAUX_ON
16	(468) I.1on 4 VALAUX_ON
	Input Parameter Record 2
17	(498) I.2on VAL_TA2_ON
18	(499) I.3ON VAL_TA2_ON
19	(1) SPA Active setpoint 1
20	(1) SPA Active setpoint 2
21	(1) SPA Active setpoint 3
22	(1) SPA Active setpoint 4
23	(232) I.tV1 TV 1 input value 1
24	(232) I.tV1 TV 1 input value 2
25	(232) I.tV1 TV 1 input value 3
26	(232) I.tV1 TV 1 input value 4
27	(322) I.VF1 VALAUXTV_F 1
28	(322) I.VF1 VALAUXTV_F 2
29	(322) I.VF1 VALAUXTV_F 3
30	(322) I.VF1 VALAUXTV_F 4
31	(317) - Digital input status INPUT_DIG

32	(140) diG. Digital input function
	Output Parameter Record 1
1	(16) _SP Set point locale 1
2	(16) _SP Set point locale 2
3	(16) _SP Set point locale 3
4	(16) _SP Set point locale 4
5	(252) - MAN_POWER: Control output value in manual mode 1
6	(252) - MAN_POWER: Control output value in manual mode 2
7	(252) - MAN_POWER: Control output value in manual mode 3
8	(252) - MAN_POWER: Control output value in manual mode 4
9	(305) STATUSW 1 bit1= SP1/SP2, bit2= start/stop selftuning,bit3 = ON/OFF, bit4 = AUTO/MAN, bit5= start/stop autotuning, bit6 = LOC/REM
10	(305) STATUSW 2 bit1= SP1/SP2, bit2= start/stop selftuning,bit3 = ON/OFF, bit4 = AUTO/MAN, bit5= start/stop autotuning, bit6 = LOC/REM
11	(305) STATUSW 3 bit1= SP1/SP2, bit2= start/stop selftuning,bit3 = ON/OFF, bit4 = AUTO/MAN, bit5= start/stop autotuning, bit6 = LOC/REM
12	(305) STATUSW 4 bit1= SP1/SP2, bit2= start/stop selftuning,bit3 = ON/OFF, bit4 = AUTO/MAN, bit5= start/stop autotuning, bit6 = LOC/REM
13	(12) AL.1 Alarm point 1 (if relative) [if relative and symmetrical]
14	(12) AL.1 Alarm point 2 (if relative) [if relative and symmetrical]
15	(12) AL.1 Alarm point 3 (if relative) [if relative and symmetrical]
16	(12) AL.1 Alarm point 4 (if relative) [if relative and symmetrical]
	Output Parameter Record 2
17	(13) AL.2 Alarm point 1 (if relative) [if relative and symmetrical]
18	(13) AL.2 Alarm point 2 (if relative) [if relative and symmetrical]
19	(13) AL.2 Alarm point 3 (if relative) [if relative and symmetrical]
20	(13) AL.2 Alarm point 4 (if relative) [if relative and symmetrical]
21	(14) AL.3 Alarm point 1 (if relative) [if relative and symmetrical]
22	(14) AL.3 Alarm point 2 (if relative) [if relative and symmetrical]
23	(14) AL.3 Alarm point 3 (if relative) [if relative and symmetrical]
24	(14) AL.3 Alarm point 4 (if relative) [if relative and symmetrical]
25	(230) SP.1 Setpoint1 1
26	(230) SP.1 Setpoint1 2
27	(230) SP.1 Setpoint1 3
28	(230) SP.1 Setpoint1 4
29	(231) SP.2 Setpoint2 1
30	(231) SP.2 Setpoint2 2
31	(231) SP.2 Setpoint2 3
32	(231) SP.2 Setpoint2 4

In the project tree, click on “gfx4-gfxtermo4” to go to the *“Device overview”*.

In the catalogue, select the item *“Module/Input Output Modules/GEFRAN GFX4-GFXTERMO4”* and drag it into the first free slot (slot 2).

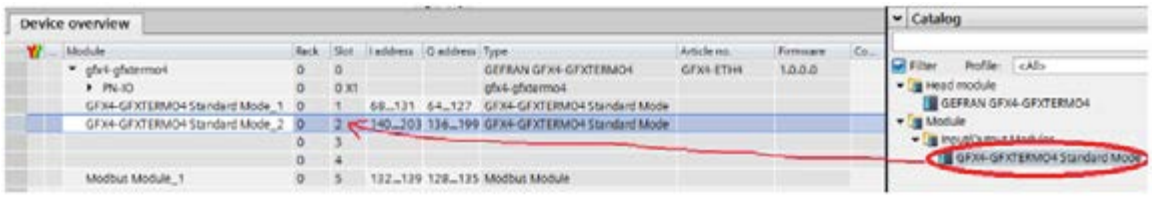


Figure 33

In the properties window in each module (accessible by clicking on the new item entered), you may set the parameters for input and output data as seen above.

In the project tree, click on “gfx4-gfxtermo4” to go to the *“Device overview”*.

In the catalogue, select the item *“Module/Input Output Modules/GEFRAN GFX4-GFXTERMO4”* and drag it into the first free slot (slot 3).

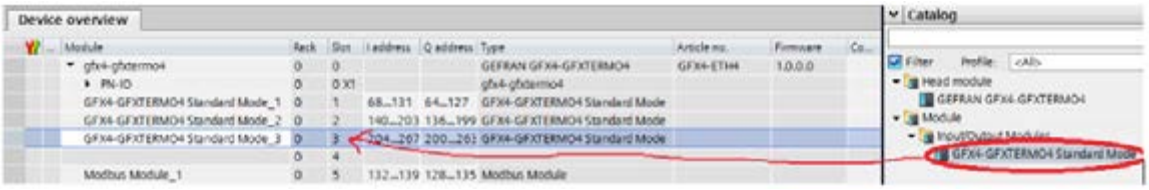


Figure 34

In the properties window in each module (accessible by clicking on the new item entered), you may set the parameters for input and output data as seen above.

In the project tree, click on “gfx4-gfxtermo4” to go to the *“Device overview”*.

In the catalogue, select the item *“Module/Input Output Modules/GEFRAN GFX4-GFXTERMO4”* and drag it into the first free slot (slot 4).

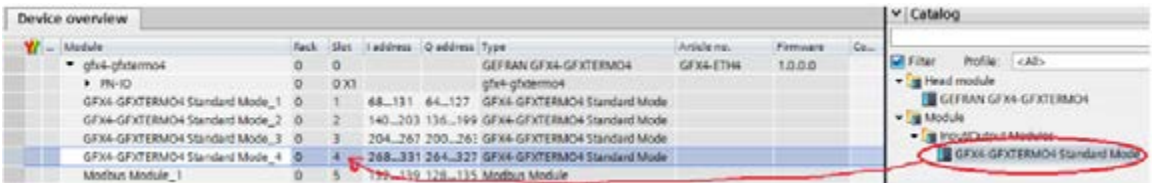


Figure 35

In the properties window in each module (accessible by clicking on the new item entered), you may set the parameters for input and output data as seen above.

Slot 5 (Figure 36) is a virtual device encapsulating a modbus control in cyclic ProfiNET data.

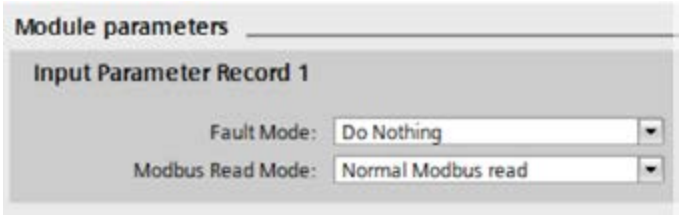


Figure 36

A number of communications-related aspects may be configured in the module parameters.

Fault Mode

If Profinet communication fails, you may set the modules as follows (Figure 37)

- Take no action
- Control the device in Software Off mode
- Control the device in manual mode
- Set SP2 as Setpoint

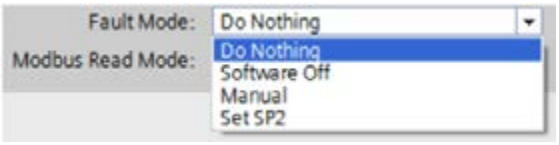


Figure 37

Modbus Read Mode

Indicates the read mode for Modbus parameters (Figure 38)

- Normal read mode; all 32 input words are updated in read (Input parameter record 1 and Input parameter record 2)
- Half read mode; if the read variables needed by the application are equal to a maximum of 16 words, only the parameter record 1 inputs are updated

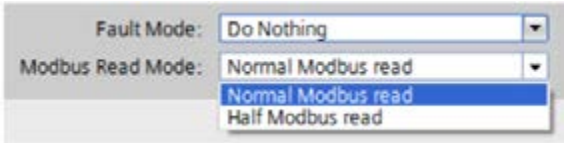


Figure 38

Modbus slot 5 has a size of 8 bytes in write mode and 8 bytes in read mode. This channel may be used to read or write any of the variables published in the modbus map of GFX4-GFXTERMO4 modules connected to the network.

To see the composition of the bytes in the message, refer to the corresponding section (virtual modbus slot 5) in the paragraph on STEP 7.

Incorrect setting of dip-switch 7

As mentioned above, the GFX4-GFXtermo4 MUST work in Geflex standard mode, with dip-switch 7 OFF at power-up. Communication is impossible if the device is launched with dip-switch 7 ON. An error message (Fig. 39) is sent to the Profinet-Controller station

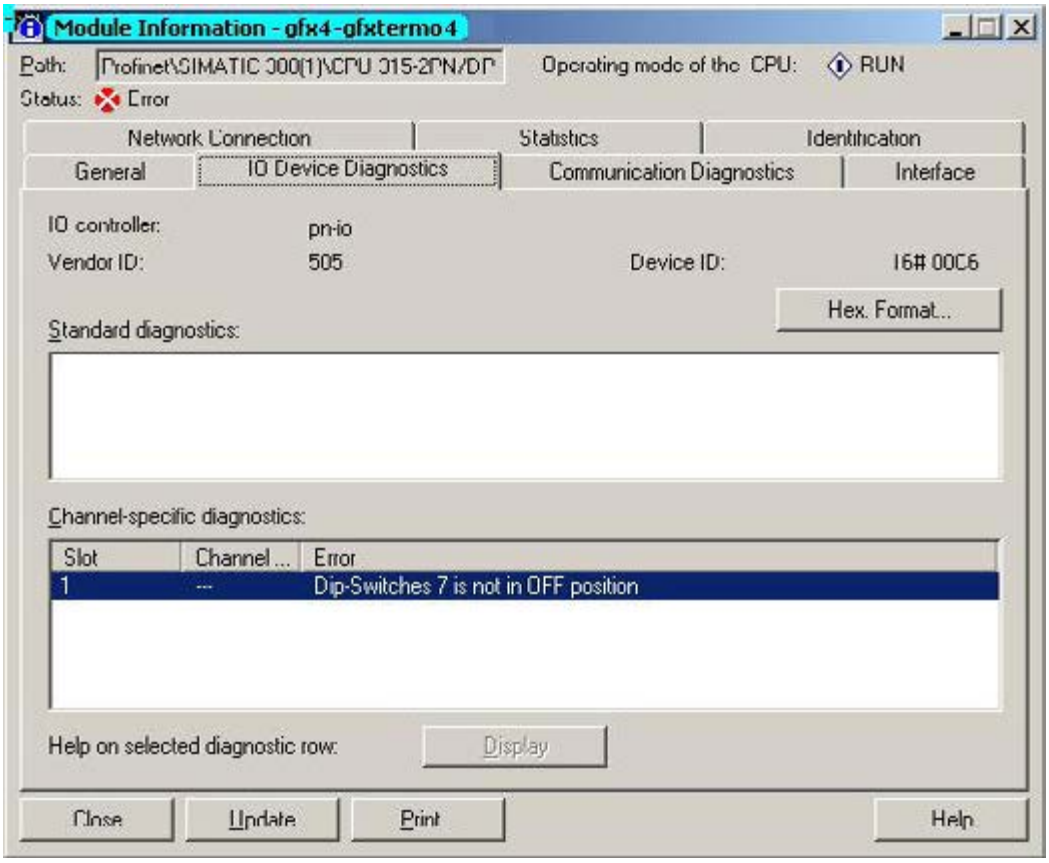


Figure 39

The slot specified in the diagnostics message corresponds to the node of the device with dip switch 7 incorrectly set.

Communication fault on Modbus serial

This occurs when communication fails between the Modbus master of the Profinet-IO card and the Modbus slave running in GFX4-GFXtermo4, as shown in Figure 40

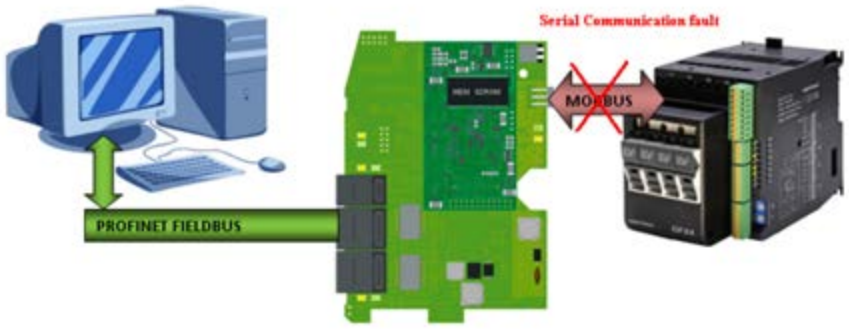


Figure 40

When this occurs, the Profinet-IO device sends the Profinet-Controller the Communication error message Fig.41

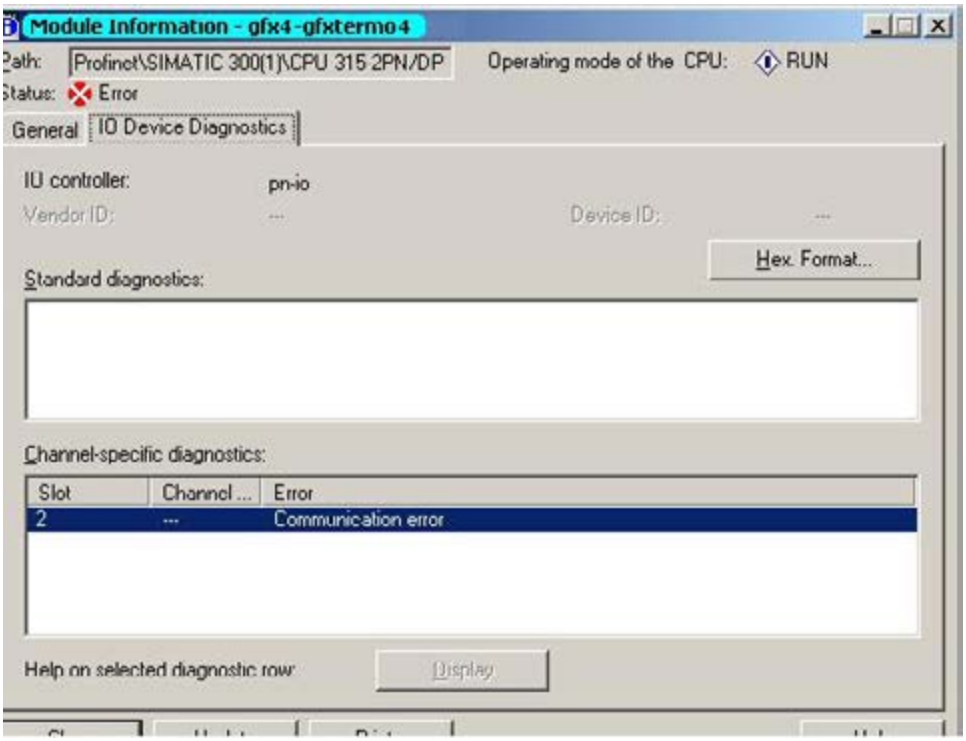


Figure 41

The slot specified in the error message corresponds to the node of the device in which the error occurred.

DIAGNOSTICS

Communication fault on modbus serial

his condition applies when communication between the master modbus on the Profinet-io card and the slave modbus in execution in gfx 4-GFXtermo4 is no longer active.

The error may be simulated by disconnecting the rj10 connection between the devices.

For example, by disconnecting the cable connecting GFX4 number 2 with GFX4 number 3. Error signals will appear in the project tree for the plc and the modules with which communication has been lost (in the case at hand, modules 3 and 4) (Figures 42 e 43).

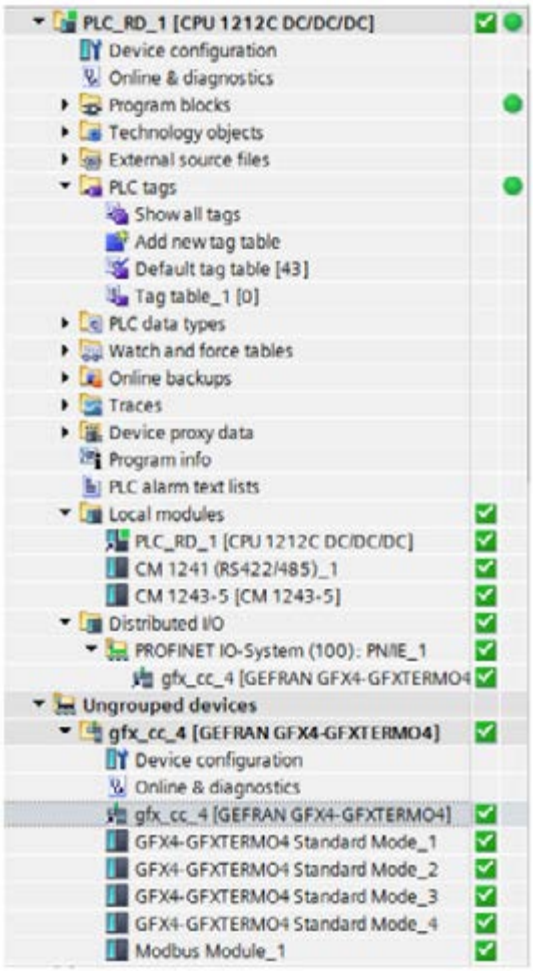


Figure 42

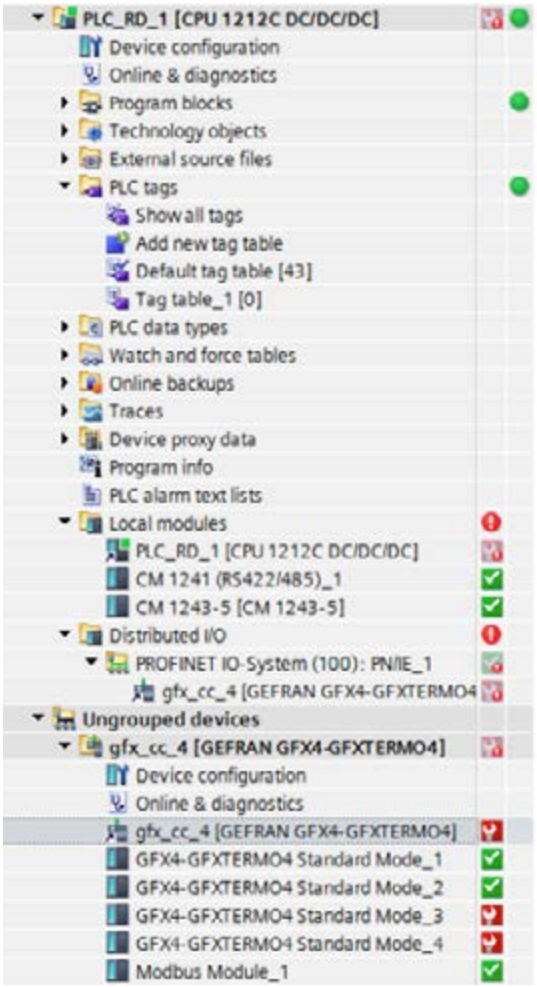


Figure 43

At the same time, the errors detected will be shown in the *"Device Information"* window (Figure 44).

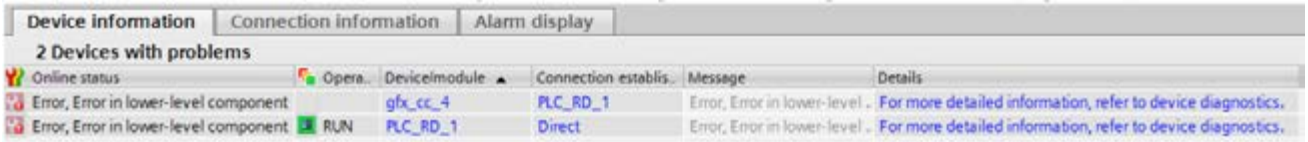


Figure 44

To access a possible detailed description of the error, select the item *"Online & diagnostics"* on the context-specific menu for the module for which the error is shown in the project tree (Figure 43, item GFX4-GFXTERMO4 Standard Mode_3). Select the *"Diagnostic status*" item in which the description of the error appears.

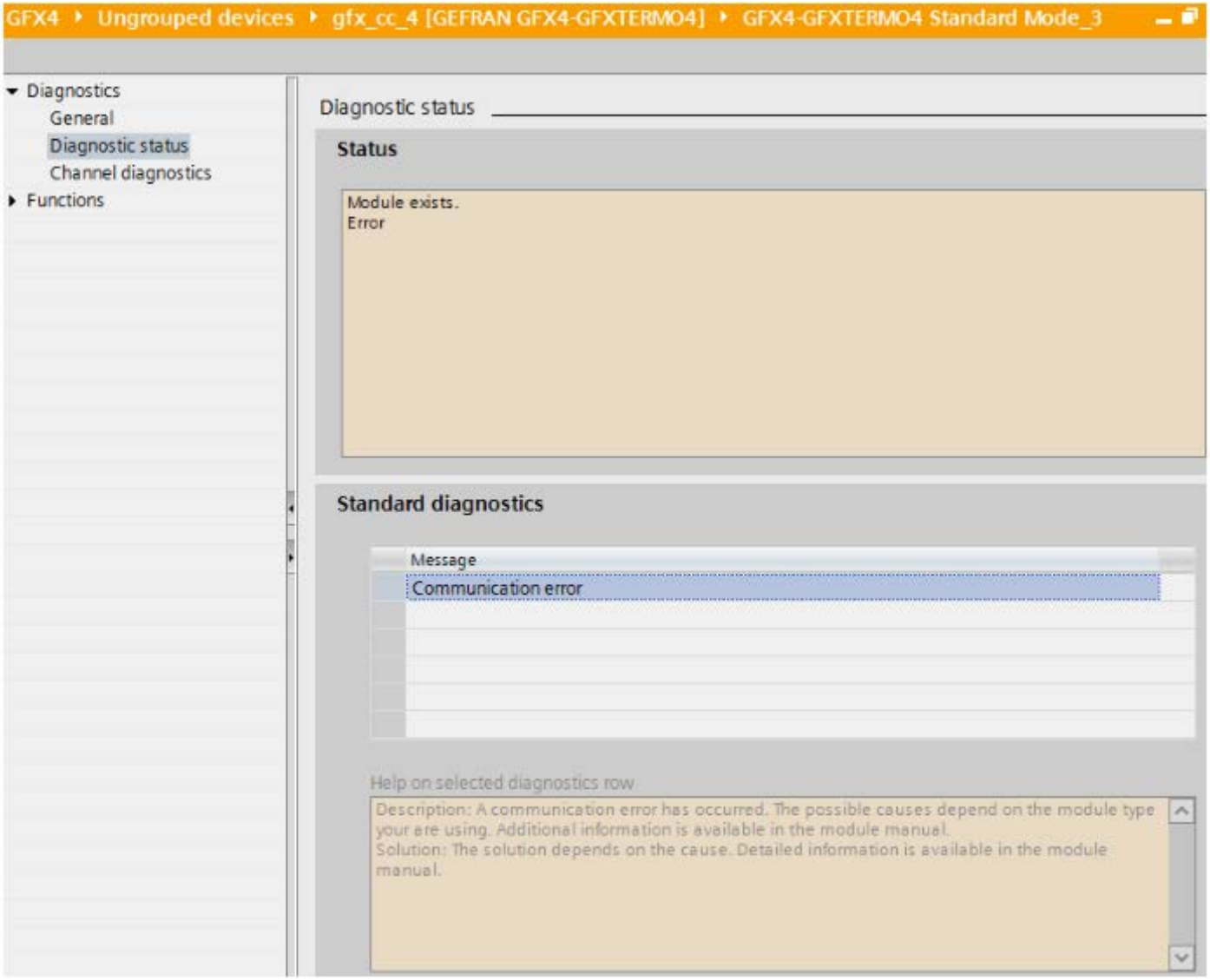


Figure 45

Ethernet/Profinet connectors are shown in green; serial connectors in blue.

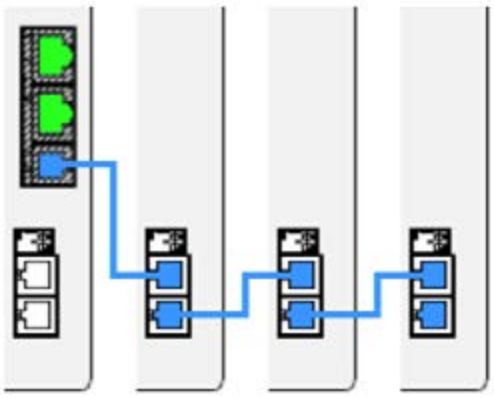
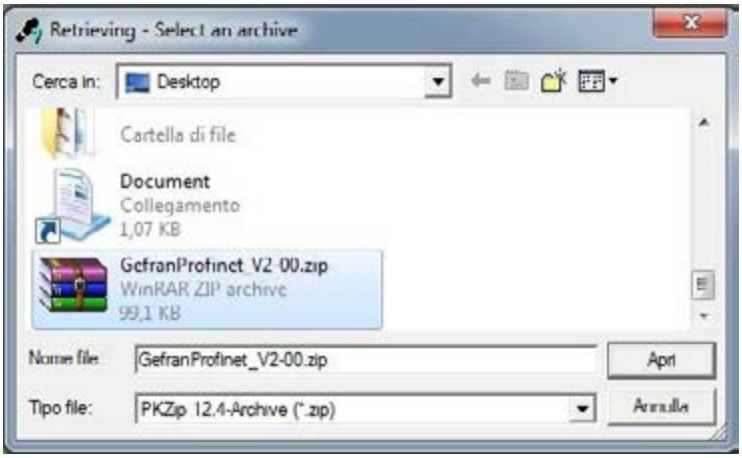


Figure 46

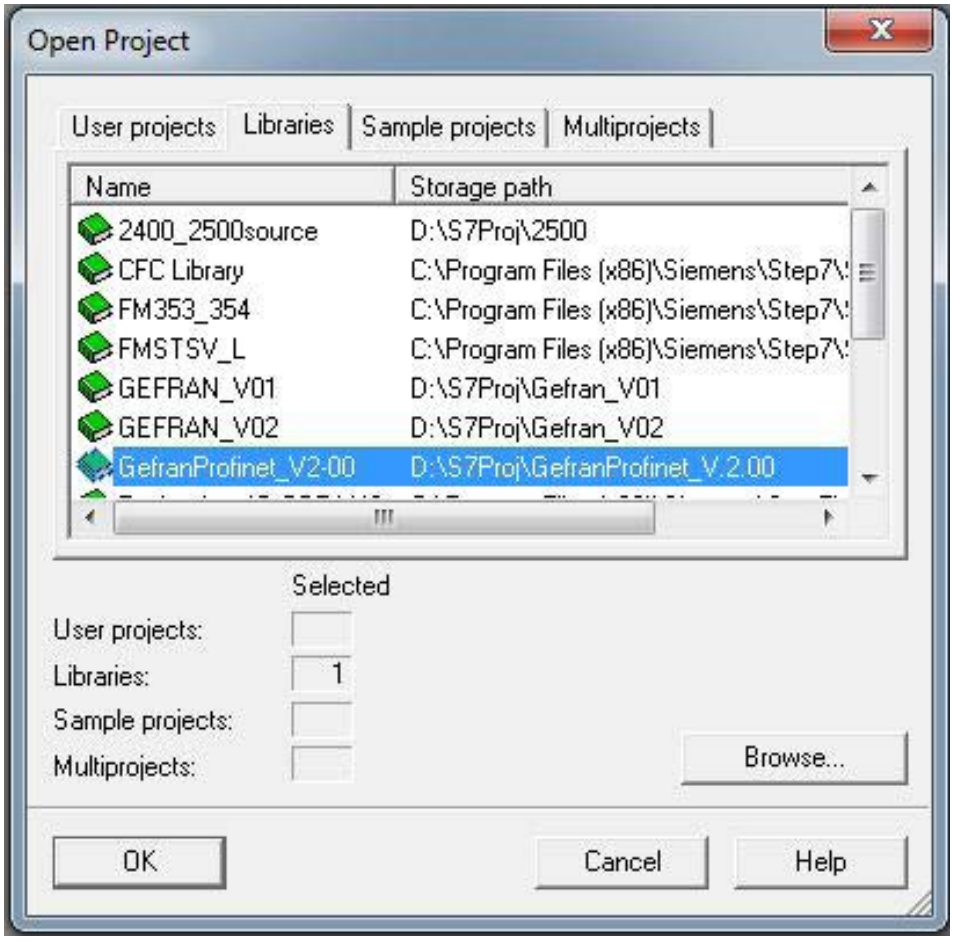
GEFRAN SW “GEFRAN S7” for GFX4-GFXtermo4

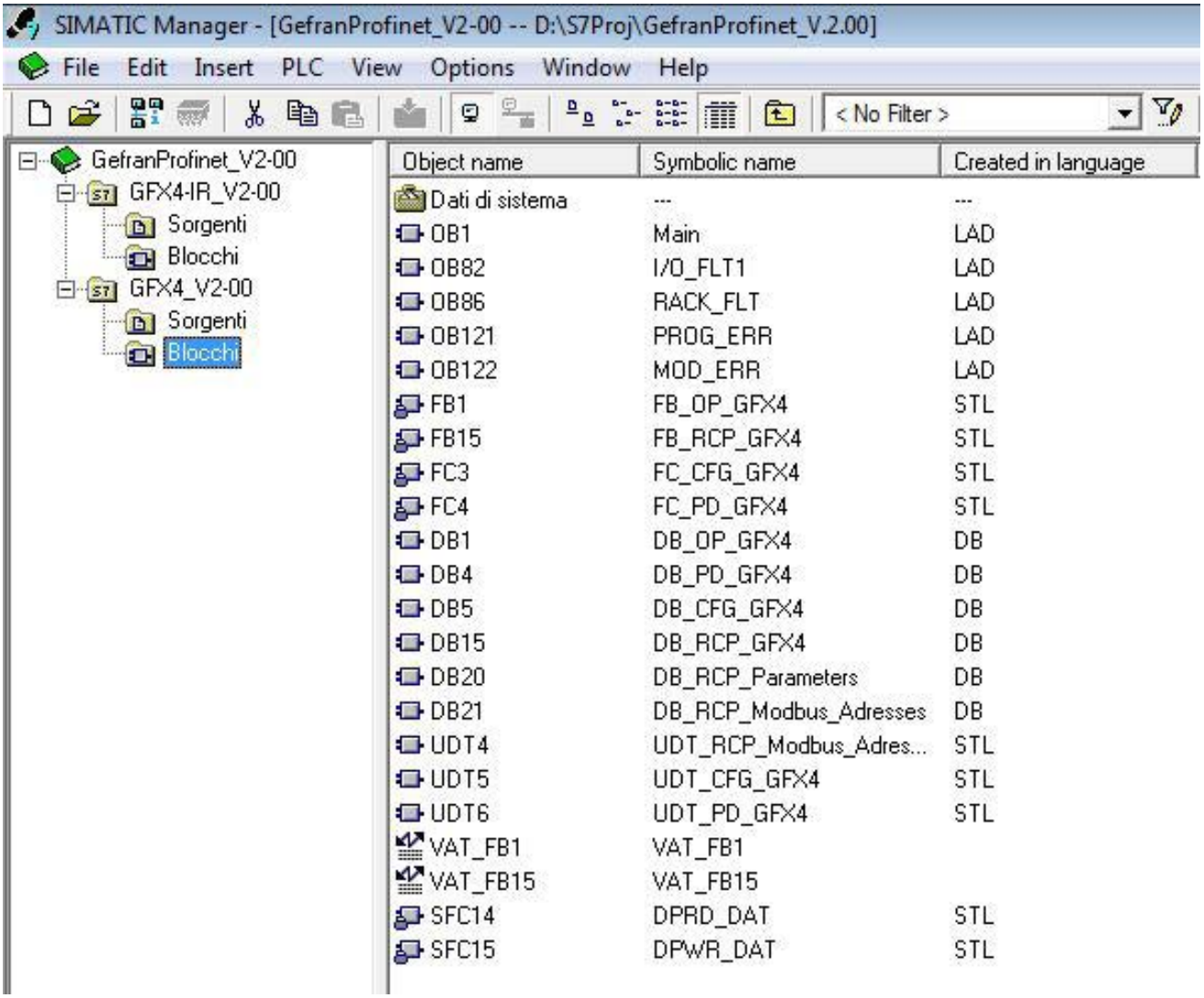
INSTALLATION

GEFRAN S.p.A. supplies a series of library files to facilitate installation of the GFX4 or GFXTERMO4 and management of process data in SIEMENS STEP7 environment.
These libraries are contained in a compressed file “GefranProfinet_V2-00.zip” on the CD enclosed with the product or downloadable from www.gefran.com.
After launching SIMATIC Manager, select the Unarchive command on the File drop-down menu and open the “GefranProfinet_V2-00.zip” file from the folder in which it was copied.



Then select the destination folder in ..STEP7/S7Proj.
When extraction is complete, select the Open Project command on the File drop-down menu and open the Libraries folder to display the ““GefranProfinet_V2-00” for the GFX4 e GFXtermo4.





It contains Function Blocks, Data Blocks, and Functions:
GFX4 in HIGH PERFORMANCE modality

OBJECT	DESCRIPTION
UDT6	DATA TYPE FOR MANAGING PROCESS DATA
FC4	MANAGEMENT OF PROCESS DATA AREA
UDT5	BLOCK ACYCLIC DATA EXCHANGE
FC3	MANAGEMENT FUNCTION DATA PARAMETRIC
FB1	FUNCTION BLOCK TO MANAGE PARAMETERS
FB15	FUNCTION BLOCK TO MANAGE PARAMETER RECIPES

FUNCTIONS

UDT6

Data type for GFX4 process data management

Data block in read from word 0 address to word 62 address

Data block in write from word 64 address to word 126 address

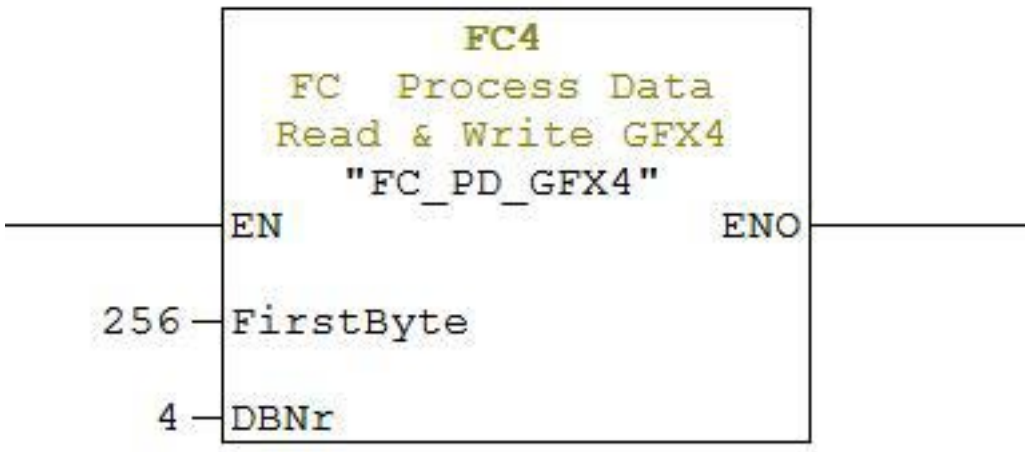
Address	Name	Type	Initial value	Comment
0.0		**STRUCT**		
+ 0.0	GFX4_Read_W01	INT	0	GFX4 Read Process Word 01
+ 2.0	GFX4_Read_W02	INT	0	GFX4 Read Process Word 02
+ 4.0	GFX4_Read_W03	INT	0	GFX4 Read Process Word 03
+ 6.0	GFX4_Read_W04	INT	0	GFX4 Read Process Word 04
+ 8.0	GFX4_Read_W05	INT	0	GFX4 Read Process Word 05
+ 10.0	GFX4_Read_W06	INT	0	GFX4 Read Process Word 06
+ 12.0	GFX4_Read_W07	INT	0	GFX4 Read Process Word 07
+ 14.0	GFX4_Read_W08	INT	0	GFX4 Read Process Word 08
+ 16.0	GFX4_Read_W09	INT	0	GFX4 Read Process Word 09
+ 18.0	GFX4_Read_W10	INT	0	GFX4 Read Process Word 10
+ 20.0	GFX4_Read_W11	INT	0	GFX4 Read Process Word 11
+ 22.0	GFX4_Read_W12	INT	0	GFX4 Read Process Word 12
+ 24.0	GFX4_Read_W13	INT	0	GFX4 Read Process Word 13
+ 26.0	GFX4_Read_W14	INT	0	GFX4 Read Process Word 14
+ 28.0	GFX4_Read_W15	INT	0	GFX4 Read Process Word 15
+ 30.0	GFX4_Read_W16	INT	0	GFX4 Read Process Word 16
+ 32.0	GFX4_Read_W17	INT	0	GFX4 Read Process Word 17
+ 34.0	GFX4_Read_W18	INT	0	GFX4 Read Process Word 18
+ 36.0	GFX4_Read_W19	INT	0	GFX4 Read Process Word 19
+ 38.0	GFX4_Read_W20	INT	0	GFX4 Read Process Word 20
+ 40.0	GFX4_Read_W21	INT	0	GFX4 Read Process Word 21
+ 42.0	GFX4_Read_W22	INT	0	GFX4 Read Process Word 22
+ 44.0	GFX4_Read_W23	INT	0	GFX4 Read Process Word 23
+ 46.0	GFX4_Read_W24	INT	0	GFX4 Read Process Word 24
+ 48.0	GFX4_Read_W25	INT	0	GFX4 Read Process Word 25
+ 50.0	GFX4_Read_W26	INT	0	GFX4 Read Process Word 26
+ 52.0	GFX4_Read_W27	INT	0	GFX4 Read Process Word 27
+ 54.0	GFX4_Read_W28	INT	0	GFX4 Read Process Word 28
+ 56.0	GFX4_Read_W29	INT	0	GFX4 Read Process Word 29
+ 58.0	GFX4_Read_W30	INT	0	GFX4 Read Process Word 30
+ 60.0	GFX4_Read_W31	INT	0	GFX4 Read Process Word 31
+ 62.0	GFX4_Read_W32	INT	0	GFX4 Read Process Word 32
+ 64.0	GFX4_Write_W01	INT	0	GFX4 Write Process Word 01
+ 66.0	GFX4_Write_W02	INT	0	GFX4 Write Process Word 02
+ 68.0	GFX4_Write_W03	INT	0	GFX4 Write Process Word 03
+ 70.0	GFX4_Write_W04	INT	0	GFX4 Write Process Word 04
+ 72.0	GFX4_Write_W05	INT	0	GFX4 Write Process Word 05
+ 74.0	GFX4_Write_W06	INT	0	GFX4 Write Process Word 06
+ 76.0	GFX4_Write_W07	INT	0	GFX4 Write Process Word 07
+ 78.0	GFX4_Write_W08	INT	0	GFX4 Write Process Word 08
+ 80.0	GFX4_Write_W09	INT	0	GFX4 Write Process Word 09
+ 82.0	GFX4_Write_W10	INT	0	GFX4 Write Process Word 10

+ 84.0	GFX4_Read_W11	INT	0	GFX4 Write Process Word 11
+ 86.0	GFX4_Read_W12	INT	0	GFX4 Write Process Word 12
+ 88.0	GFX4_Read_W13	INT	0	GFX4 Write Process Word 13
+ 90.0	GFX4_Read_W14	INT	0	GFX4 Write Process Word 14
+ 92.0	GFX4_Read_W15	INT	0	GFX4 Write Process Word 15
+ 94.0	GFX4_Write_W16	INT	0	GFX4 Write Process Word 16
+ 96.0	GFX4_Write_W17	INT	0	GFX4 Write Process Word 17
+ 98.0	GFX4_Write_W18	INT	0	GFX4 Write Process Word 18
+ 100.0	GFX4_Write_W19	INT	0	GFX4 Write Process Word 19
+ 102.0	GFX4_Write_W20	INT	0	GFX4 Write Process Word 20
+ 104.0	GFX4_Write_W21	INT	0	GFX4 Write Process Word 21
+ 106.0	GFX4_Write_W22	INT	0	GFX4 Write Process Word 22
+ 108.0	GFX4_Write_W23	INT	0	GFX4 Write Process Word 23
+ 110.0	GFX4_Write_W24	INT	0	GFX4 Write Process Word 24
+ 112.0	GFX4_Write_W25	INT	0	GFX4 Write Process Word 25
+ 114.0	GFX4_Write_W26	INT	0	GFX4 Write Process Word 26
+ 116.0	GFX4_Write_W27	INT	0	GFX4 Write Process Word 27
+ 118.0	GFX4_Write_W28	INT	0	GFX4 Write Process Word 28
+ 120.0	GFX4_Write_W29	INT	0	GFX4 Write Process Word 29
+ 122.0	GFX4_Write_W30	INT	0	GFX4 Write Process Word 30
+ 124.0	GFX4_Write_W31	INT	0	GFX4 Write Process Word 31
+ 126.0	GFX4_Write_W32	INT	0	GFX4 Write Process Word 32
= 128.0		**END_STRUCT**		

FUNCTIONS

FC4 “FC_PD_GFX4” (FUNCTION CALL) ”

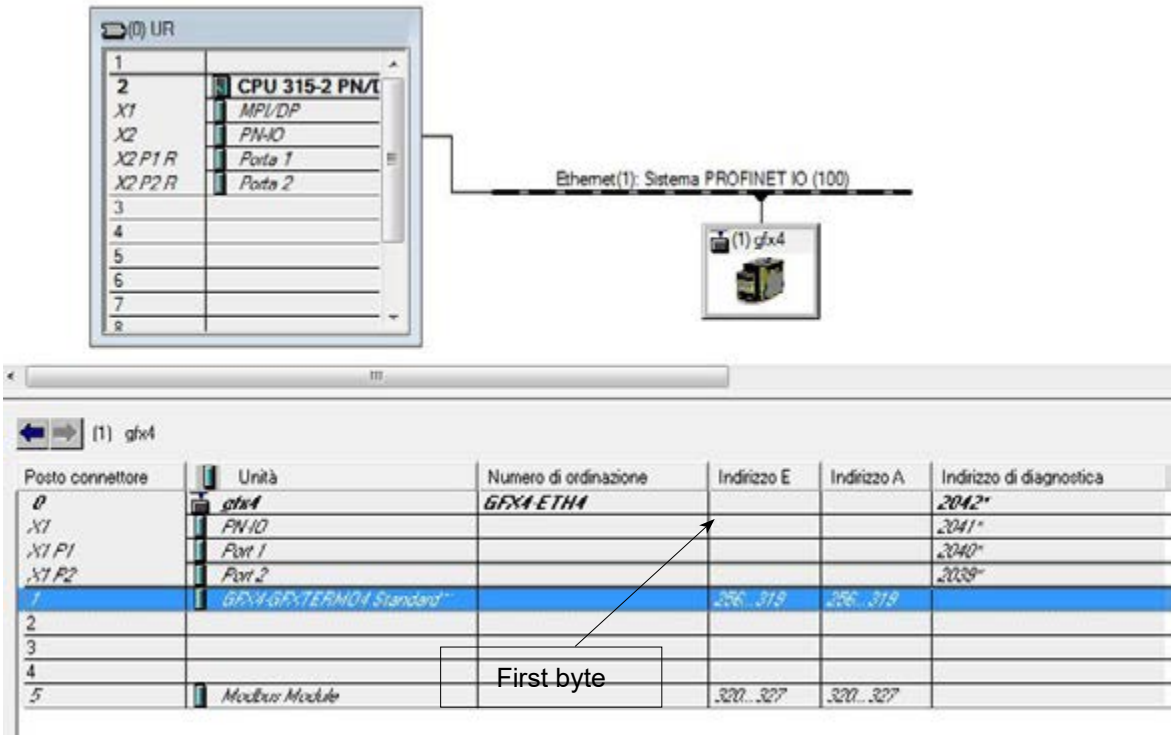
Management function processes the data area GFX4 . This function provides the area for exchange of process data between PLC and GFX4 (or GFXtermo4) in the data block created with the UDT6 described above.



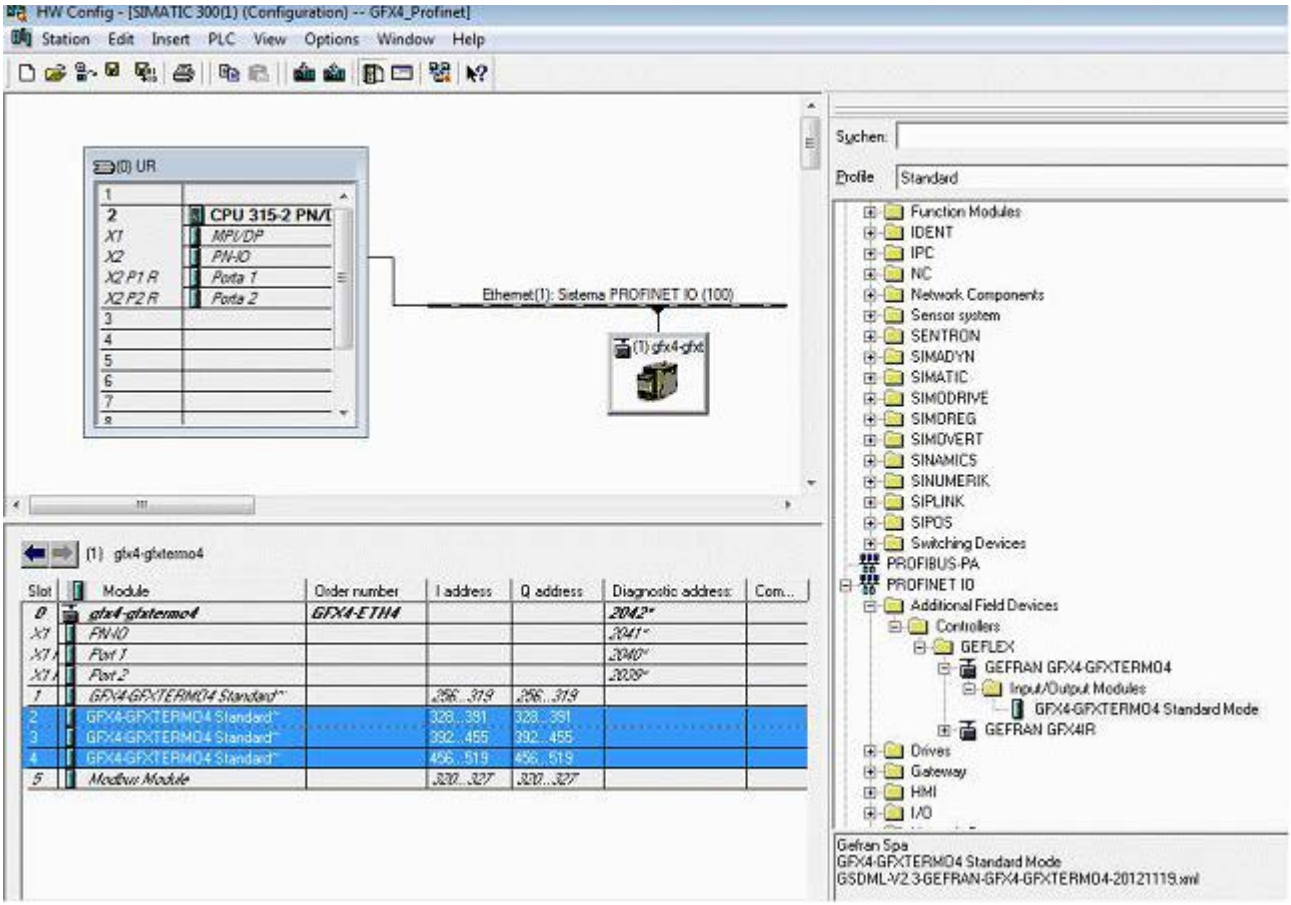
FC4 is called so that each scan updates the data.

Two input parameters are required:

1. FirstByte : (INT) the first memory address assigned to the GFX4 (or GFXtermo4) rack in the Hardware configuration.
2. DBNr : (INT) the number of the data block created with UDT6 for data exchange between GFX4 (or GFXtermo4) and PLC



The figure below shows a connection with 4 slaves



UDT5

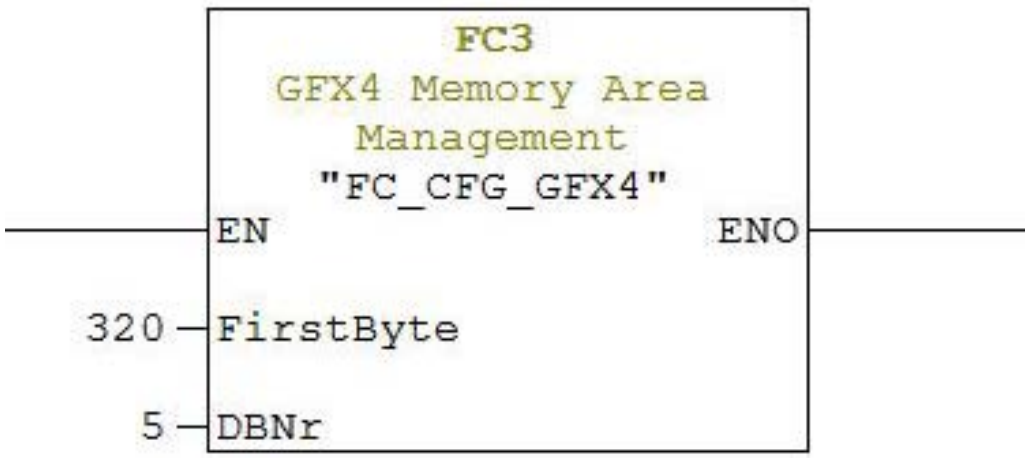
Acyclic data exchange block

Address	Name	Type	Initial value	Comment
0.0		**STRUCT**		
+ 0.0	Trigger	BYTE	B#16#0	Reserved
+ 1.0	Cont	BYTE	B#16#0	Reserved
+ 2.0	ParamWord1	WORD	W#16#0	Request Byte 1 e 2
+ 4.0	ParamByte3	BYTE	B#16#0	Request Byte 3
+ 5.0	ParamByte4	BYTE	B#16#0	Request Byte 4
+ 6.0	ParamByte5	BYTE	B#16#0	Request Byte 5
+ 7.0	ParamByte6	BYTE	B#16#0	Request Byte 6
+ 8.0	ParamByte7	BYTE	B#16#0	Request Byte 7
+ 9.0	ParamByte8	BYTE	B#16#0	Request Byte 8
+ 10.0	StatusWord1	WORD	W#16#0	Answer Byte 1 e 2
+ 12.0	StatusByte3	BYTE	B#16#0	Answer Byte 3
+ 13.0	StatusByte4	BYTE	B#16#0	Answer Byte 4
+ 14.0	StatusByte5	BYTE	B#16#0	Answer Byte 5
+ 15.0	StatusByte6	BYTE	B#16#0	Answer Byte 6
+ 16.0	StatusByte7	BYTE	B#16#0	Answer Byte 7
+ 17.0	StatusByte8	BYTE	B#16#0	Answer Byte 8
+ 18.0	ParamWriteDiag	INT	0	Status Word write param operation
+ 20.0	StatusReadDiag	INT	0	Status Word read param operation
= 22.0		**END_STRUCT**		

FC3 “FC_CFG_GFX4” (FUNCTION CALL)

Function for management of of the parametric data GFX4

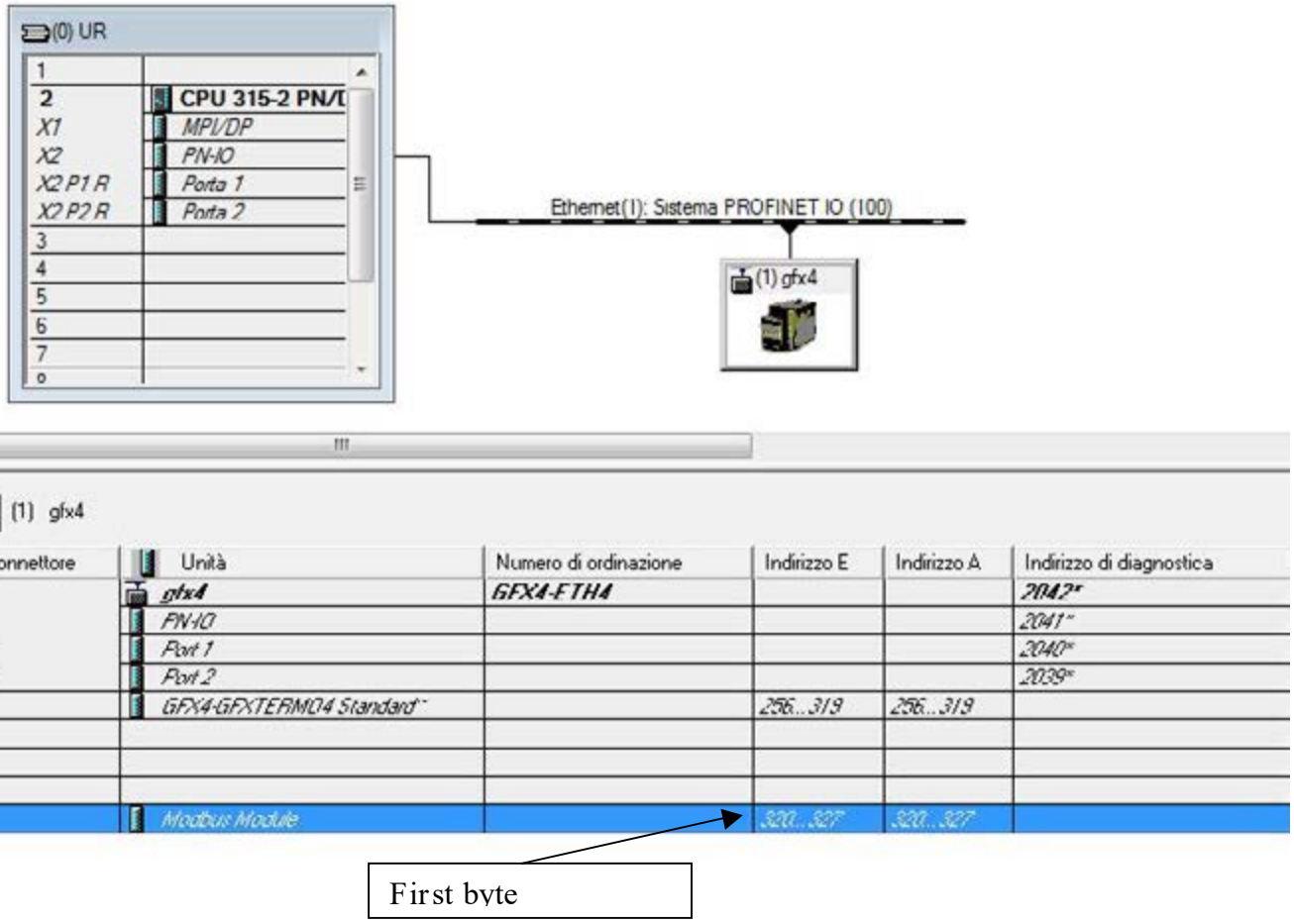
This Function provides the Parametric Data of the instrument needed for functioning of FB1 in the data block created with the UDT5s described in the previous paragraph.



The FC is called in OB1, without conditions, so that each scan updates the data.

Two input parameters are required:

1. FirstByte : (INT) the first memory address assigned to the GFX4 (or GFXtermo4) rack in Hardware configuration.
2. DBNr : (INT) the number of the data block created with UDT5 for date exchange between GFX4 (or GFXtermo4) and PLC.



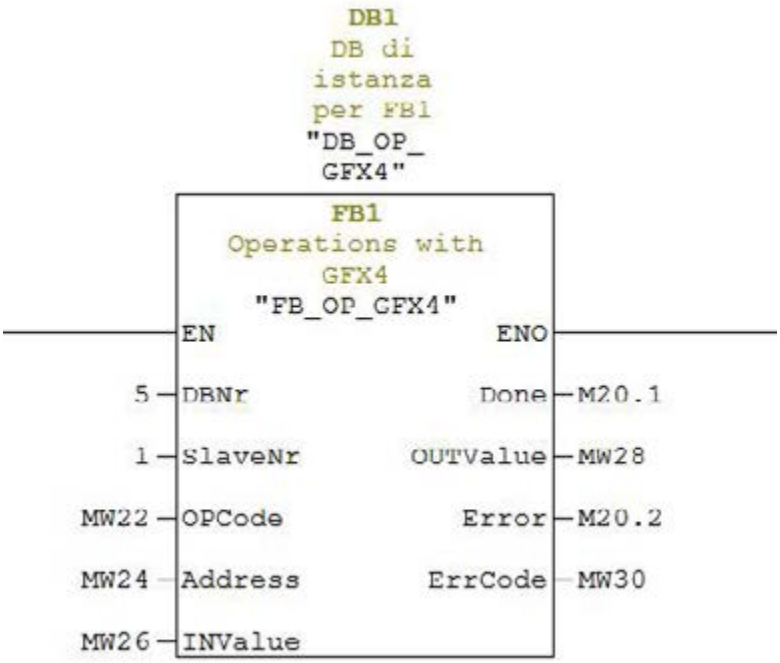
FUNCTIONAL BLOCKS

All Function Blocks require a freely assignable instance DB. They must be called only on request and kept active until completion of the operation.
Typically, you set a Bit that enables the branch (EN) and is reset with the rising edge of the Done bit.

FB1 “FB_OP_GFX4” (FUNCTION BLOCK)

Manages basic Parametric Data operations for the GFX4 configuration.
There are 4 operations:

1. Read bit (op. code 1)
2. Read word (op. code 3)
3. Write bit (op. code 5)
4. Write word (op. code 6)



The block requires 5 input parameters and responds with 4 output parameters.

Input parameters:

1. DBNr (INT): the data block number assigned to the GFX4 to be interrogated or controlled.
2. SlaveNr (INT): the MODBUS address of the slave to be worked with.
3. OPCode (INT): the operation code that tells the function whether you want to read or write a word or a bit.
   The operation codes are:
   - Read bit Operation Code: 1
   - Read word Operation Code: 3
   - Write bit Operation Code: 5
   - Write word Operation Code: 6
4. Address (INT): the address of the word or bit to be read or written.
   (Refer to the GFX4 manual for the MODBUS addresses of words and bits.)
5. INValue (INT): the value to be written in the selected word or bit.
   Of course, only values 1 and 0 are allowed when writing a bit.
   This parameter is ignored in read operations.

Output parameters:

- Done (BOOL): value is 1 when reading is done.
- OUTValue (INT): value read in the specified word or bit.

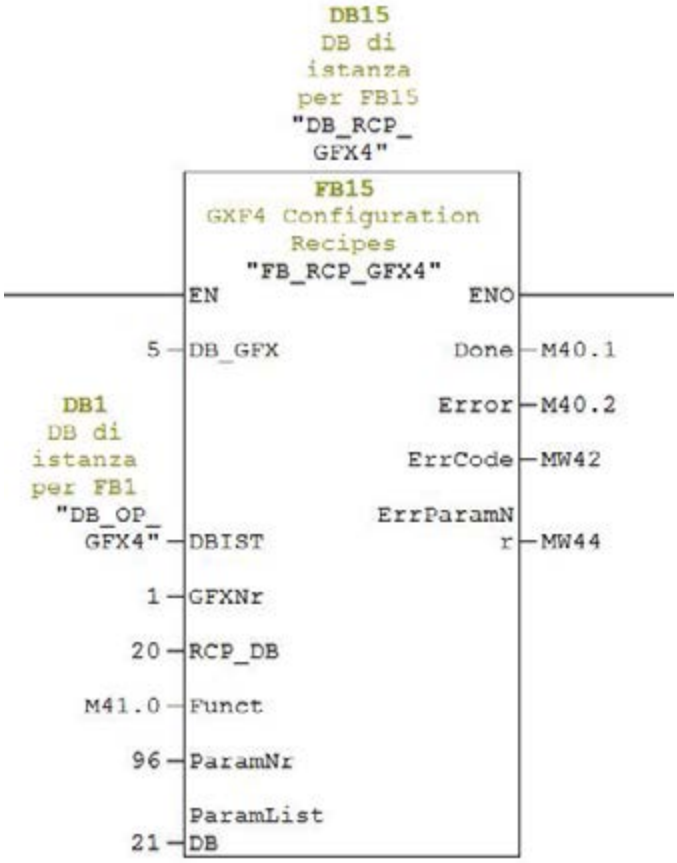
In write operations, 1 is written if the action ended correctly or 0 if it ended with an error.

- Error (BOOL): value is 1 when operation ended with an error.
- ErrCode (INT): error code displayed:

1 Illegal function
2 Illegal data address
3 Illegal data value
6 Slave device busy
9 Illegal number data
10 Read only data
20 Timeout Communication
21 Input value error

FB15 “FB_RCP_GFX4” (FUNCTION BLOCK)

Archives a set of parameters from a GFX4 in a DB or sends a set of parameters contained in a DB to a GFX4.



Input parameters:

- DB_GFX (INT): indicates the number (only the number in digits or an INT variable that contains its value) of the DB assigned to the GFX4 to be worked on.
- DBIST (BLOCK_DB): indicates the name (use the symbolic name of the DB or the indication “DBxx” in full) of the instance DB of FB1 “OP_GFX4” assigned to the GFX4.
- GFXNr (INT):the address of the GFX4 to be worked with.
- RCP_DB (INT): the number of the DB in which to write or from which to read the data set.
- Funct (BOOL): specifies the type of operation to be done:

  False = Store (save GFX4 parameters in DB)

  True = Load (load parameters saved in DB in the GFX4)
- ParamNr (INT): the number of parameters to be saved/read.
- ParamListDB (INT): the number of the DB in which each line specifies the modbus address of the parameters to be read/written.

Output parameters:

- Done (BOOL): value is 1 when the operation is done.
- Error (BOOL): value is 1 when there was an error during write.
- ErrorCode (INT): the error code is displayed in case of error:

  1 Illegal function

  2 Illegal data address

  3 Illegal data value

  6 Slave device busy

  9 Illegal number data

  10 Read only data

  20 Timeout Communication

  21 Input value error

- ErrorParamNr (INT): in case of error, you see the ordinal number in the DB with a list of the addresses of the parameter that caused the error.

UDT4

List of Modbus addresses of the parameters used in FB15

Address	Name	Type	Initial value	Comment
+ 36.0	CIT_ZONE_1	INT	1100	COOLING INTEGRAL TIME (1100) ZONE 1
+ 38.0	HDT_ZONE_1	INT	1032	HEATING DERIVATIVE TIME (1032) ZONE 1
+ 40.0	CDT_ZONE_1	INT	1101	COOLING DERIVATIVE TIME (1101) ZONE 1
+ 42.0	AL1_ZONE_1	INT	1036	ALARM 1 MIN TEMP (1036) ZONE 1
+ 44.0	AL2_ZONE_1	INT	1037	ALARM 2 MAX TEMP (1037) ZONE 1
+ 46.0	ALHB_ZONE_1	INT	1079	ALARM HB AMPER (1079) ZONE 1
+ 48.0	TYP_ZONE_2	INT	2448	PROBE/INPUT TYPE (2448) ZONE 2
+ 50.0	HIS_ZONE_2	INT	2450	MAX INPUT (2450) ZONE 2
+ 52.0	HSTA_ZONE_2	INT	2453	MAX LIMIT TA (2453) ZONE 2
+ 54.0	CTR_ZONE_2	INT	2228	CONTROL TYPE (2228) ZONE 2
+ 56.0	HPH_ZONE_2	INT	2090	MAX POWER HEATING % (2090) ZONE 2
+ 58.0	HPL_ZONE_2	INT	2302	MIN POWER HEATING % (2302) ZONE 2
+ 60.0	HIL_ZONE_2	INT	2074	MAX SETPOINT (2074) ZONE 2
+ 62.0	ALN_ZONE_2	INT	2243	ALARMS ENABLING (2243) ZONE 2
+ 64.0	A1R_ZONE_2	INT	2263	ALARM 1 REFERENCE (2263) ZONE 2
+ 66.0	A2R_ZONE_2	INT	2264	ALARM 2 REFERENCE (2264) ZONE 2
+ 68.0	A1T_ZONE_2	INT	2454	ALARM 1 TYPE (2454) ZONE 2
+ 70.0	A2T_ZONE_2	INT	2455	ALARM 2 TYPE (2455) ZONE 2
+ 72.0	HBF_ZONE_2	INT	2105	ALARM HB TYPE (2105) ZONE 2
+ 74.0	HBT_ZONE_2	INT	2104	DELAY TIME FOR ALARM HB (2104) ZONE 2
+ 76.0	LBT_ZONE_2	INT	2092	DELAY TIME FOR ALARM LBA (2092) ZONE 2
+ 78.0	HPB_ZONE_2	INT	2053	HEATING PROPORTIONAL BANDE (2053) ZONE 2
+ 80.0	CPB_ZONE_2	INT	2054	COOLING PROPORTIONAL BANDE (2054) ZONE 2
+ 82.0	HIT_ZONE_2	INT	2055	HEATING INTEGRAL TIME (2055) ZONE 2
+ 84.0	CIT_ZONE_2	INT	2124	COOLING INTEGRAL TIME (2124) ZONE 2
+ 86.0	HDT_ZONE_2	INT	2056	HEATING DERIVATIVE TIME (2056) ZONE 2
+ 88.0	CDT_ZONE_2	INT	2125	COOLING DERIVATIVE TIME (2125) ZONE 2
+ 90.0	AL1_ZONE_2	INT	2060	ALARM 1 MIN TEMP (2060) ZONE 2
+ 92.0	AL2_ZONE_2	INT	2061	ALARM 2 MAX TEMP (2061) ZONE 2
+ 94.0	ALHB_ZONE_2	INT	2103	ALARM HB AMPER (2103) ZONE 2
+ 96.0	TYP_ZONE_3	INT	4496	PROBE/INPUT TYPE (4496) ZONE 3
+ 98.0	HIS_ZONE_3	INT	4498	MAX INPUT (4498) ZONE 3
+ 100.0	HSTA_ZONE_3	INT	4501	MAX LIMIT TA (4501) ZONE 3
+ 102.0	CTR_ZONE_3	INT	4276	CONTROL TYPE (4276) ZONE 3
+ 104.0	HPH_ZONE_3	INT	4138	MAX POWER HEATING % (4138) ZONE 3
+ 106.0	HPL_ZONE_3	INT	4350	MIN POWER HEATING % (4350) ZONE 3
+ 108.0	HIL_ZONE_3	INT	4122	MAX SETPOINT (4122) ZONE 3
+ 110.0	ALN_ZONE_3	INT	4291	ALARMS ENABLING (4291) ZONE 3
+ 112.0	A1R_ZONE_3	INT	4311	ALARM 1 REFERENCE (4311) ZONE 3
+ 114.0	A2R_ZONE_3	INT	4312	ALARM 2 REFERENCE (4312) ZONE 3
+ 116.0	A1T_ZONE_3	INT	4502	ALARM 1 TYPE (4502) ZONE 3
+ 118.0	A2T_ZONE_3	INT	4503	ALARM 2 TYPE (4503) ZONE 3
+ 120.0	HBF_ZONE_3	INT	4153	ALARM HB TYPE (4153) ZONE 3

+ 122.0	HBT_ZONE_3	INT	4152	DELAY TIME FOR ALARM HB (4152) ZONE 3
+ 124.0	LBT_ZONE_3	INT	4140	DELAY TIME FOR ALARM LBA (4140) ZONE 3
+ 126.0	HPB_ZONE_3	INT	4101	HEATING PROPORTIONAL BANDE (4101) ZONE 3
Address	**Name**	**Type**	**Initial value**	**Comment**
+ 128.0	CPB_ZONE_3	INT	4102	COOLING PROPORTIONAL BANDE (4102) ZONE 3
+ 130.0	HIT_ZONE_3	INT	4103	HEATING INTEGRAL TIME (4103) ZONE 3
+ 132.0	CIT_ZONE_3	INT	4172	COOLING INTEGRAL TIME (4172) ZONE 3
+ 134.0	HDT_ZONE_3	INT	4104	HEATING DERIVATIVE TIME (4104) ZONE 3
+ 136.0	CDT_ZONE_3	INT	4173	COOLING DERIVATIVE TIME (4173) ZONE 3
+ 138.0	AL1_ZONE_3	INT	4108	ALARM 1 MIN TEMP (4108) ZONE 3
+ 140.0	AL2_ZONE_3	INT	4109	ALARM 2 MAX TEMP (4109) ZONE 3
+ 142.0	ALHB_ZONE_3	INT	4151	ALARM HB AMPER (4151) ZONE 3
+ 144.0	TYP_ZONE_4	INT	8592	PROBE/INPUT TYPE (8592) ZONE 4
+ 146.0	HIS_ZONE_4	INT	8594	MAX INPUT (8594) ZONE 4
+ 148.0	HSTA_ZONE_4	INT	8597	MAX LIMIT TA (8597) ZONE 4
+ 150.0	CTR_ZONE_4	INT	8372	CONTROL TYPE (8372) ZONE 4
+ 152.0	HPH_ZONE_4	INT	8234	MAX POWER HEATING % (8234) ZONE 4
+ 154.0	HPL_ZONE_4	INT	8446	MIN POWER HEATING % (8446) ZONE 4
+ 156.0	HIL_ZONE_4	INT	8218	MAX SETPOINT (8218) ZONE 4
+ 158.0	ALN_ZONE_4	INT	8387	ALARMS ENABLING (8387) ZONE 4
+ 160.0	A1R_ZONE_4	INT	8407	ALARM 1 REFERENCE (8407) ZONE 4
+ 162.0	A2R_ZONE_4	INT	8408	ALARM 2 REFERENCE (8408) ZONE 4
+ 164.0	A1T_ZONE_4	INT	8598	ALARM 1 TYPE (8598) ZONE 4
+ 166.0	A2T_ZONE_4	INT	8599	ALARM 2 TYPE (8599) ZONE 4
+ 168.0	HBF_ZONE_4	INT	8249	ALARM HB TYPE (8249) ZONE 4
+ 170.0	HBT_ZONE_4	INT	8248	DELAY TIME FOR ALARM HB (8248) ZONE 4
+ 172.0	LBT_ZONE_4	INT	8236	DELAY TIME FOR ALARM LBA (8236) ZONE 4
+ 174.0	HPB_ZONE_4	INT	8197	HEATING PROPORTIONAL BANDE (8197) ZONE 4
+ 176.0	CPB_ZONE_4	INT	8198	COOLING PROPORTIONAL BANDE (8198) ZONE 4
+ 178.0	HIT_ZONE_4	INT	8199	HEATING INTEGRAL TIME (8199) ZONE 4
+ 180.0	CIT_ZONE_4	INT	8268	COOLING INTEGRAL TIME (8268) ZONE 4
+ 182.0	HDT_ZONE_4	INT	8200	HEATING DERIVATIVE TIME (8200) ZONE 4
+ 184.0	CDT_ZONE_4	INT	8269	COOLING DERIVATIVE TIME (8269) ZONE 4
+ 186.0	AL1_ZONE_4	INT	8204	ALARM 1 MIN TEMP (8204) ZONE 4
+ 188.0	AL2_ZONE_4	INT	8205	ALARM 2 MAX TEMP (8205) ZONE 4
+ 190.0	ALHB_ZONE_4	INT	8247	ALARM HB AMPER (8247) ZONE 4
= 192.0		**END_ STRUCT**		

DB20

Lista parametri utilizzata nella FB15

Address	Name	Type	Initial value	Comment
0.0		**STRUCT**		
+ 0.0	TYP_ZONE_1	INT	2	PROBE/INPUT TYPE ZONE 1
+ 2.0	HIS_ZONE_1	INT	1000	MAX INPUT ZONE 1
+ 4.0	HSTA_ZONE_1	INT	1400	MAX LIMIT TA ZONE 1
+ 6.0	CTR_ZONE_1	INT	14	CONTROL TYPE ZONE 1
+ 8.0	HPH_ZONE_1	INT	1000	MAX POWER HEATING % ZONE 1
+ 10.0	HPL_ZONE_1	INT	0	MIN POWER HEATING % ZONE 1
+ 12.0	HIL_ZONE_1	INT	300	MAX SETPOINT ZONE 1
+ 14.0	ALN_ZONE_1	INT	19	ALARMS ENABLING ZONE 1
+ 16.0	A1R_ZONE_1	INT	0	ALARM 1 REFERENCE ZONE 1
+ 18.0	A2R_ZONE_1	INT	0	ALARM 2 REFERENCE ZONE 1
+ 20.0	A1T_ZONE_1	INT	3	ALARM 1 TYPE ZONE 1
+ 22.0	A2T_ZONE_1	INT	2	ALARM 2 TYPE ZONE 1
+ 24.0	HBF_ZONE_1	INT	0	ALARM HB TYPE ZONE 1
+ 26.0	HBT_ZONE_1	INT	30	DELAY TIME FOR ALARM HB ZONE 1
+ 28.0	LBT_ZONE_1	INT	300	DELAY TIME FOR ALARM LBA ZONE 1
+ 30.0	HPB_ZONE_1	INT	12	HEATING PROPORTIONAL BANDE ZONE 1
+ 32.0	CPB_ZONE_1	INT	10	COOLING PROPORTIONAL BANDE ZONE 1
+ 34.0	HIT_ZONE_1	INT	527	HEATING INTEGRAL TIME ZONE 1
+ 36.0	CIT_ZONE_1	INT	100	COOLING INTEGRAL TIME ZONE 1
+ 38.0	HDT_ZONE_1	INT	131	HEATING DERIVATIVE TIME ZONE 1
+ 40.0	CDT_ZONE_1	INT	100	COOLING DERIVATIVE TIME ZONE 1
+ 42.0	AL1_ZONE_1	INT	-10	ALARM 1 MIN TEMP ZONE 1
+ 44.0	AL2_ZONE_1	INT	20	ALARM 2 MAX TEMP ZONE 1
+ 46.0	ALHB_ZONE_1	INT	360	ALARM HB AMPER ZONE 1
+ 48.0	TYP_ZONE_2	INT	2	PROBE/INPUT TYPE ZONE 2
+ 50.0	HIS_ZONE_2	INT	1000	MAX INPUT ZONE 2
+ 52.0	HSTA_ZONE_2	INT	1400	MAX LIMIT TA ZONE 2
+ 54.0	CTR_ZONE_2	INT	14	CONTROL TYPE ZONE 2
+ 56.0	HPH_ZONE_2	INT	1000	MAX POWER HEATING % ZONE 2
+ 58.0	HPL_ZONE_2	INT	0	MIN POWER HEATING % ZONE 2
+ 60.0	HIL_ZONE_2	INT	300	MAX SETPOINT ZONE 2
+ 62.0	ALN_ZONE_2	INT	19	ALARMS ENABLING ZONE 2
+ 64.0	A1R_ZONE_2	INT	0	ALARM 1 REFERENCE ZONE 2
+ 66.0	A2R_ZONE_2	INT	0	ALARM 2 REFERENCE ZONE 2
+ 68.0	A1T_ZONE_2	INT	3	ALARM 1 TYPE ZONE 2
+ 70.0	A2T_ZONE_2	INT	2	ALARM 2 TYPE ZONE 2
+ 72.0	HBF_ZONE_2	INT	0	ALARM HB TYPE ZONE 2
+ 74.0	HBT_ZONE_2	INT	30	DELAY TIME FOR ALARM HB ZONE 2
+ 76.0	LBT_ZONE_2	INT	300	DELAY TIME FOR ALARM LBA ZONE 2
+ 78.0	HPB_ZONE_2	INT	12	HEATING PROPORTIONAL BANDE ZONE 2
+ 80.0	CPB_ZONE_2	INT	10	COOLING PROPORTIONAL BANDE ZONE 2
+ 82.0	HIT_ZONE_2	INT	527	HEATING INTEGRAL TIME ZONE 2
+ 84.0	CIT_ZONE_2	INT	100	COOLING INTEGRAL TIME ZONE 2
+ 86.0	HDT_ZONE_2	INT	131	HEATING DERIVATIVE TIME ZONE 2
+ 88.0	CDT_ZONE_2	INT	100	COOLING DERIVATIVE TIME ZONE 2
+ 90.0	AL1_ZONE_2	INT	-10	ALARM 1 MIN TEMP ZONE 2
+ 92.0	AL2_ZONE_2	INT	20	ALARM 2 MAX TEMP ZONE 2

Address	Name	Type	Initial value	Comment
+ 94.0	ALHB_ZONE_2	INT	360	ALARM HB AMPER ZONE 2
+ 96.0	TYP_ZONE_3	INT	2	PROBE/INPUT TYPE ZONE 3
+ 98.0	HIS_ZONE_3	INT	1000	MAX INPUT ZONE 3
+ 100.0	HSTA_ZONE_3	INT	1400	MAX LIMIT TA ZONE 3
+ 102.0	CTR_ZONE_3	INT	14	CONTROL TYPE ZONE 3
+ 104.0	HPH_ZONE_3	INT	1000	MAX POWER HEATING % ZONE 3
+ 106.0	HPL_ZONE_3	INT	0	MIN POWER HEATING % ZONE 3
+ 108.0	HIL_ZONE_3	INT	300	MAX SETPOINT ZONE 3
+ 110.0	ALN_ZONE_3	INT	19	ALARMS ENABLING ZONE 3
+ 112.0	A1R_ZONE_3	INT	0	ALARM 1 REFERENCE ZONE 3
+ 114.0	A2R_ZONE_3	INT	0	ALARM 2 REFERENCE ZONE 3
+ 116.0	A1T_ZONE_3	INT	3	ALARM 1 TYPE ZONE 3
+ 118.0	A2T_ZONE_3	INT	2	ALARM 2 TYPE ZONE 3
+ 120.0	HBF_ZONE_3	INT	0	ALARM HB TYPE ZONE 3
+ 122.0	HBT_ZONE_3	INT	30	DELAY TIME FOR ALARM HB ZONE 3
+ 124.0	LBT_ZONE_3	INT	300	DELAY TIME FOR ALARM LBA ZONE 3
+ 126.0	HPB_ZONE_3	INT	12	HEATING PROPORTIONAL BANDE ZONE 3
+ 128.0	CPB_ZONE_3	INT	10	COOLING PROPORTIONAL BANDE ZONE 3
+ 130.0	HIT_ZONE_3	INT	527	HEATING INTEGRAL TIME ZONE 3
+ 132.0	CIT_ZONE_3	INT	100	COOLING INTEGRAL TIME ZONE 3
+ 134.0	HDT_ZONE_3	INT	131	HEATING DERIVATIVE TIME ZONE 3
+ 136.0	CDT_ZONE_3	INT	100	COOLING DERIVATIVE TIME ZONE 3
+ 138.0	AL1_ZONE_3	INT	-10	ALARM 1 MIN TEMP ZONE 3
+ 140.0	AL2_ZONE_3	INT	20	ALARM 2 MAX TEMP ZONE 3
+ 142.0	ALHB_ZONE_3	INT	360	ALARM HB AMPER ZONE 3
+ 144.0	TYP_ZONE_4	INT	2	PROBE/INPUT TYPE ZONE 4
+ 146.0	HIS_ZONE_4	INT	1000	MAX INPUT ZONE 4
+ 148.0	HSTA_ZONE_4	INT	1400	MAX LIMIT TA ZONE 4
+ 150.0	CTR_ZONE_4	INT	14	CONTROL TYPE ZONE 4
+ 152.0	HPH_ZONE_4	INT	1000	MAX POWER HEATING % ZONE 4
+ 154.0	HPL_ZONE_4	INT	0	MIN POWER HEATING % ZONE 4
+ 156.0	HIL_ZONE_4	INT	300	MAX SETPOINT ZONE 4
+ 158.0	ALN_ZONE_4	INT	19	ALARMS ENABLING ZONE 4
+ 160.0	A1R_ZONE_4	INT	0	ALARM 1 REFERENCE ZONE 4
+ 162.0	A2R_ZONE_4	INT	0	ALARM 2 REFERENCE ZONE 4
+ 164.0	A1T_ZONE_4	INT	3	ALARM 1 TYPE ZONE 4
+ 166.0	A2T_ZONE_4	INT	2	ALARM 2 TYPE ZONE 4
+ 168.0	HBF_ZONE_4	INT	0	ALARM HB TYPE ZONE 4
+ 170.0	HBT_ZONE_4	INT	30	DELAY TIME FOR ALARM HB ZONE 4
+ 172.0	LBT_ZONE_4	INT	300	DELAY TIME FOR ALARM LBA ZONE 4
+ 174.0	HPB_ZONE_4	INT	12	HEATING PROPORTIONAL BANDE ZONE 4
+ 176.0	CPB_ZONE_4	INT	10	COOLING PROPORTIONAL BANDE ZONE 4
+ 178.0	HIT_ZONE_4	INT	527	HEATING INTEGRAL TIME ZONE 4
+ 180.0	CIT_ZONE_4	INT	100	COOLING INTEGRAL TIME ZONE 4
+ 182.0	HDT_ZONE_4	INT	131	HEATING DERIVATIVE TIME ZONE 4
+ 184.0	CDT_ZONE_4	INT	100	COOLING DERIVATIVE TIME ZONE 4
+ 186.0	AL1_ZONE_4	INT	-10	ALARM 1 MIN TEMP ZONE 4
+ 188.0	AL2_ZONE_4	INT	20	ALARM 2 MAX TEMP ZONE 4
+ 190.0	ALHB_ZONE_4	INT	360	ALARM HB AMPER ZONE 4
= 192.0		**END_STRUCT**		

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