GEFRAN

GFX4/GFXTERMO4/GFX4-IR ETHERNET-IP

INSTALLATION AND USE MANUAL

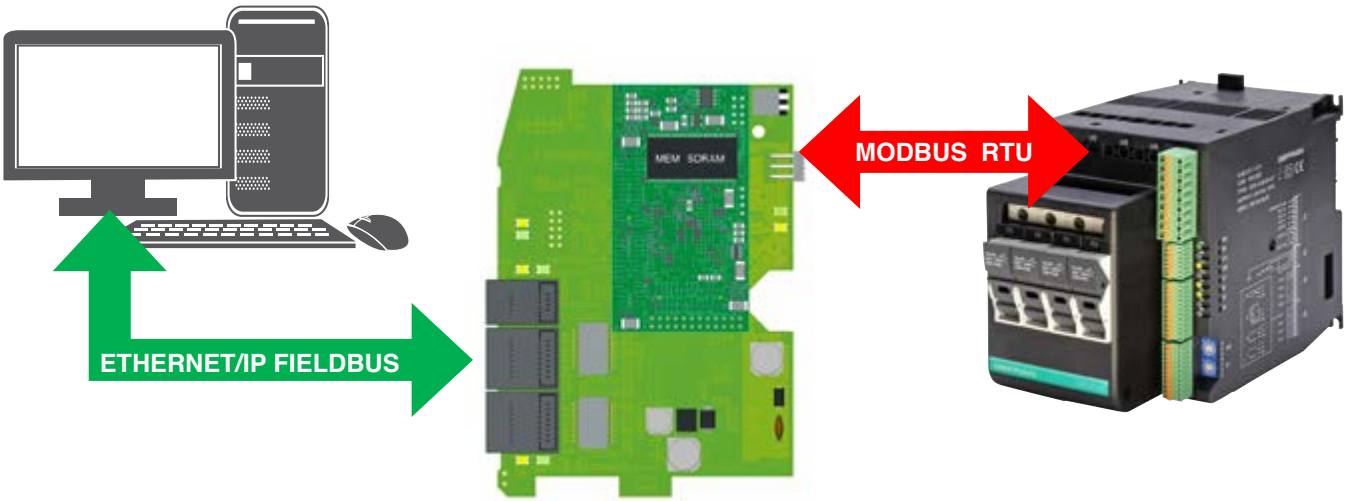
Code: **81076A - 01/-2021 - EN**

CONTENTS

1 • INTRODUCTION

The RTE (Real Time Ethernet) board is a device permitting connection of slaves for transmitting and receiving data with the Ethernet/Ip protocol.

The connection diagram appears below

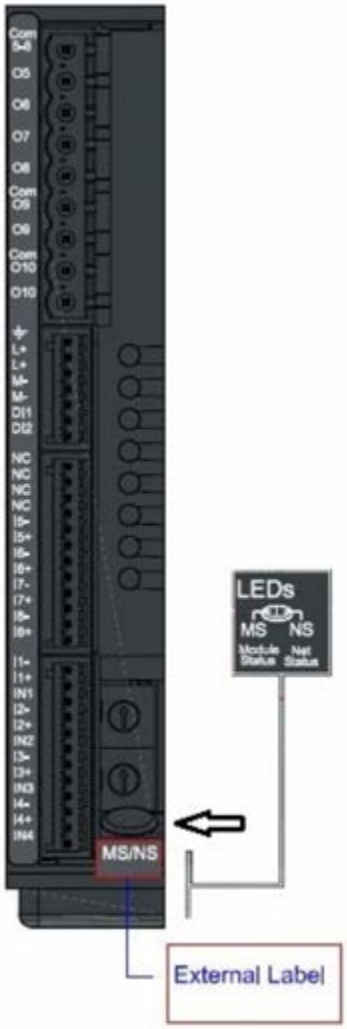


we have:

- An Ethernet/IP scanner connected to an Ethernet/IP adapter (the Bridge Gefran RTE Ethernet/IP board), connected via Ethernet/IP protocol.
- A Master Modbus RTU operating on RTE (the Gefran RTE Ethernet/IP Bridge), connected via serial line with a Modbus RTU slave (GFX4-IRHeat-Controller).

2 • LED INDICATORS ON THE FIELDBUS BOARD

There are two two-tone LED lights on the front panel of the instrument (NS = Network State and MS = Module State).
Legend:
Network Status indicator = NS (Red/Green), Module Status indicator = MS (Red/Green)



Behaviour of LEDs on the RTE board when turned on				
Time after boot	**Green MS LED**	**Red MS LED**	**Green NS LED**	**Red NS LED**
t=0 ms	Off	Off	Off	Off
t = 250 ms	On	Off	Off	Off
t = 500 ms	Off	On	Off	Off
t = 750 ms	Off	Off	On	Off
t = 1000 ms	Off	Off	Off	On
t = 1250 ms	Off	Off	Off	Off

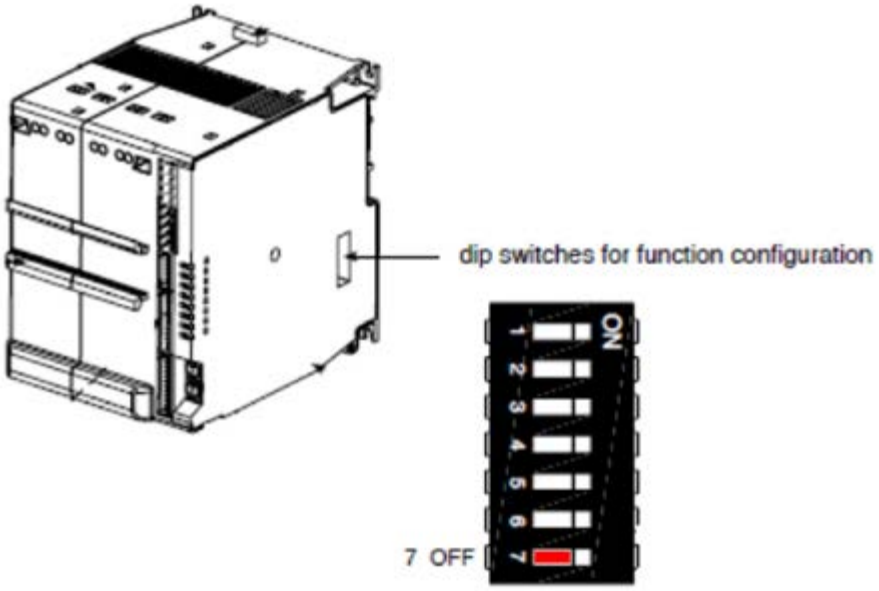
MS LED behaviour during operation			
State	**Green MS LED**	**Red MS LED**	**NB:**
No-power	Off	Off	
Device on standby	On/Off	Off	Flashing Green MS LED (500msec on, 500 msec off)
Device Operational	On	Off	Green MS on
Minor Fault	Off	On/Off	Flashing Red MS LED (500msec on, 500 msec off)
Major Fault	Off	On	
Duplicate ip	Off	On/Off	Flashing Red MS LED (500msec on, 500 msec off) IP address

NS LED behaviour during operation			
State	**Green NS LED**	**Red NS LED**	**NB:**
No-power / No-IP address	Off	Off	
No connection	On/Off	Off	Flashing Green NS LED (500msec on, 500 msec off)
Connected	On	Off	NS green steady on
Connection timeout	Off	On/Off	Flashing Red NS LED (500msec on, 500 msec off)
Duplicate Ip	Off	On	NS Red steady on: device has detected a duplicate IP address in the network

3 • CONFIGURATIONS REQUIRED FOR CORRECT OPERATION

The GFX4/GFXTERMO4/GFX4-IR device in which the board is assembled must have:

- Dip switch S7 in the off position



- Rotary switch equal to 1

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.

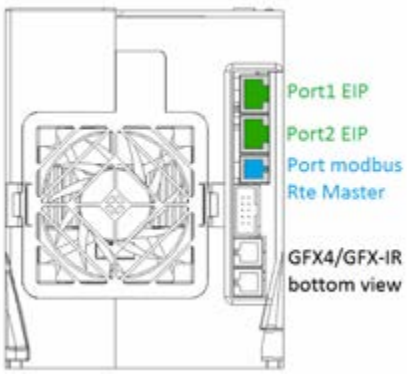
(*) If STATUS_W parameters (Modbus address 305) are included in the write request and their value is different from the one currently present in the slave, the time required to write each one will be 240ms (instead of 80ms).

4 • PRINCIPAL CONNECTIONS FOR DIGITAL COMMUNICATION

The device has digital communication interfaces permitting communication of Ethernet packets and RTU Modbus messages.

In the figure we can see:

- Port1 Eip, port 1 on the Ethernet/Ip protocol communication switch
- Port2 Eip, port 2 on the Ethernet/Ip protocol communication switch
- Port modbus, Modbus/Rtu Master port



5 • MAIN FEATURES

- Specific Gefran Modbus class (Ethernet/IP adapter for Modbus Master RTU)
- Integrated internal switch
- Device Level Ring Support
- Address Conflict Detection V2 Support (Ring Topology)
- An I/O Exclusive Owner connection, default RPI 2 msec
- Configuration assembly
- Output: 16 or 24 words (16 bits) for each module GFX4/GFXTERMO4/GFX4-IR selectable by Gf_eXpress (F.SIZE)
- Input: 16 or 24 words (16 bits) for each module GFX4/GFXTERMO4/GFX4-IR (the number of words in input must be the same as the number in output) selectable by Gf_eXpress (F.SIZE)
- Up to 4 GFX4/GFXTERMO4/GFX4-IR connected with a 19200 baud serial port with the Modbus RTU protocol
- Minimum reading time 50mec for 16 registers
- Maximum writing time for 16 registers if all values have changed 2 seconds
- DHCP/Bootp protocol support
- ACD Address support Conflict Detection supported
- Reset service support
- Default/Reset Ip address 192.168.1.100
- Default/Reset NetMask 255.255.255.0
- Default/Reset Gateway Ip address 192.168.1.1
- Utility SetIp RTE tool for network parameter configuration

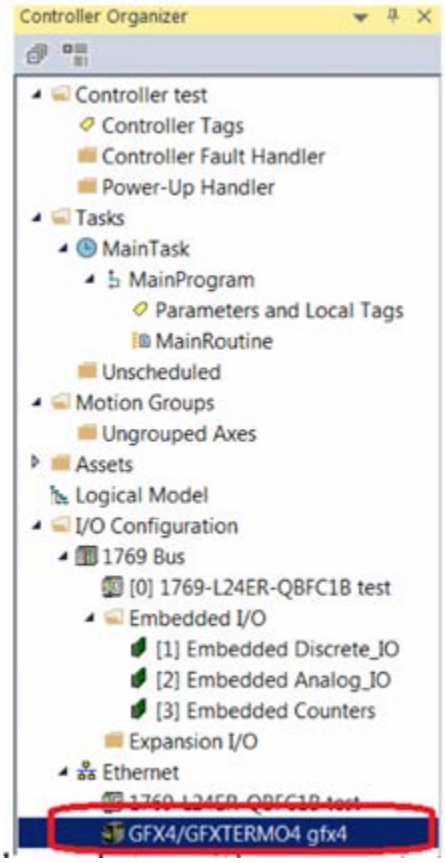
6 • ADMISSIBLE CONFIGURATIONS

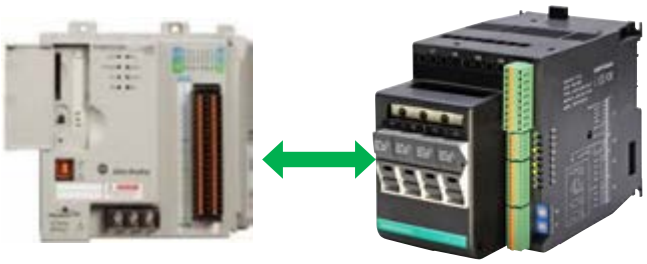
(e.g. with Studio 5000 Logix Designer and PLC CompactLogix environment; for other environments/plcs, consult the corresponding documents)

Example with 1 GFX4/GFXTERMO4/GFX4-IR:

set slave rotaries to value 01 and dip switch S7 in the off position. Record eds files (N.B: EDS files in version 1.xx and version 2.xx cannot coexist on the GFX4\GFXTERMO4 device) of the GFX4/GFXTERMO4/GFX4-IR device, and add the desired slave in the project tree under the ethernet sheet as shown in the figure:

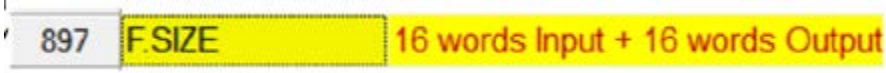
Open the Module properties window in the General submenu; define the name field (e.g. gfx4), assign the desired

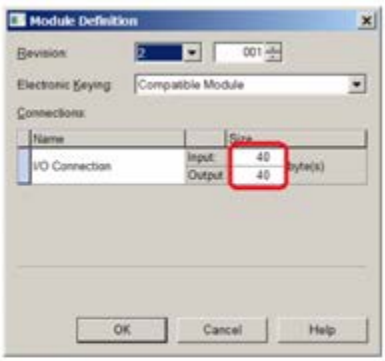


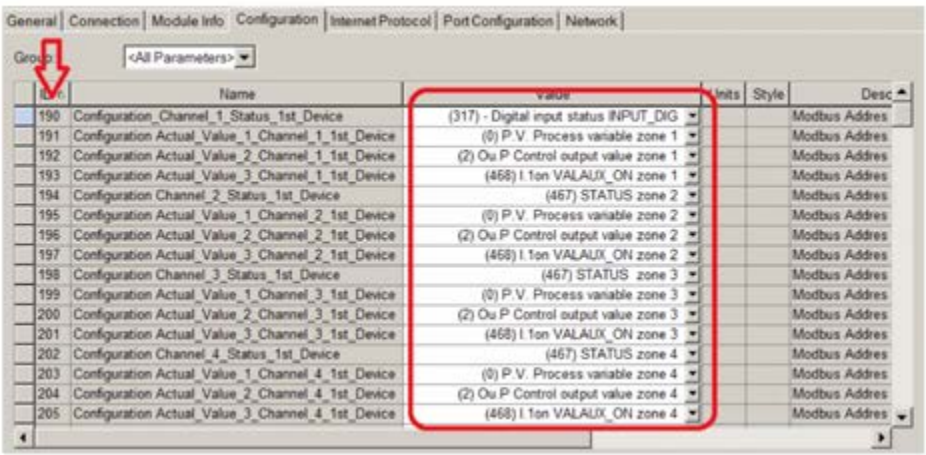


Ip address (e.g. 192.168.105.249) and click on the Change … button to define the size of input / output data. There are two possible cases:

1. Size 16 words 16 bits input and 16 words 16 bits output. Set name = I/O Connection and size equal to 40 bytes. In this case you may select mapping data by accessing the Configuration submenu. Significant mapping data includes param with ID 190 ÷ 205 for input values and ID 216 ÷ 231 for output values. Use the Gf_eXpress configuration tool to set the parameter F.SIZE



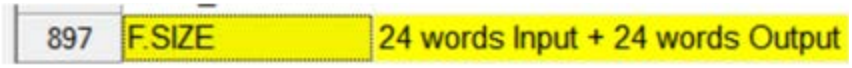


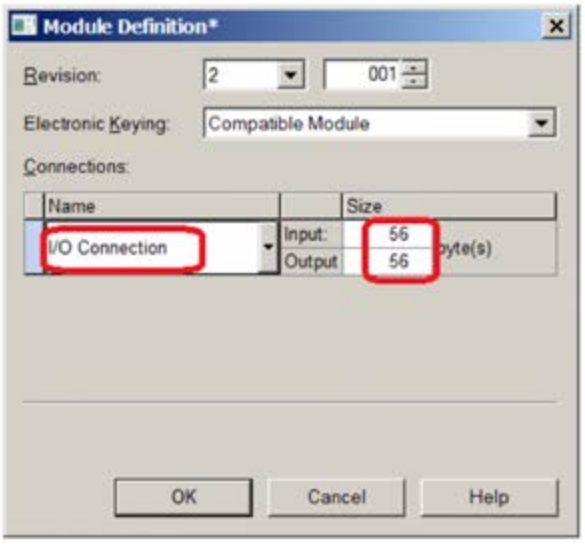


Available input variables (unless specified, variable size is 16 bits)		
Name Tag	**NB:**	**Default Modbus address**
gfx4:I.Adapter_Status (DINT 32bits) bit # 0 Base_Unit_ok bit # 1 Expansion_1_Unit_ok bit # 2 Expansion_2_Unit_ok bit # 3 Expansion_3_Unit_ok bit # 4 Base_Unit_write_error_word_1_16 bit # 5 Expansion_1_write_error_word_1_16 bit # 6 Expansion_2_write_error_word_1_16 bit # 7 Expansion_3_write_error_word_1_16 bit # 8 Base_Unit_write_error_word_17_24 bit # 9 Expansion_1_write_error_word_17_2 bit #10 Expansion_2_write_error_word_17_2 bit #11 Expansion_3_write_error_word_17_2	0=ok, 1 = error	
gfx4:I.Device_1_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_1st_Device	mappable	(468)
gfx4:I.Channel_2_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_1st_Device	mappable	(468)
gfx4:I.Channel_3_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_1st_Device	mappable	(468)
gfx4:I.Channel_4_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_1st_Device	mappable	(468)

Available output variables (unless specified, variable size is 16 bits)		
Tag	**NB:**	**Default Modbus address**
gfx4:O.Adapter_Command DINT 32bit	dummy	
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_1st_Device	mappable	(12) AL.1

2. Size 24 words 16 bits input and 24 words 16 bits output . Set name = I/O Connection and size equal to 40 bytes. In this case you may select mapping data by accessing the Configuration submenu. Significant mapping data includes param with ID 190 ÷ 213 for input values and ID 216 ÷ 239 for output values. Use the Gf_eXpress configuration tool to set the parameter F.SIZE





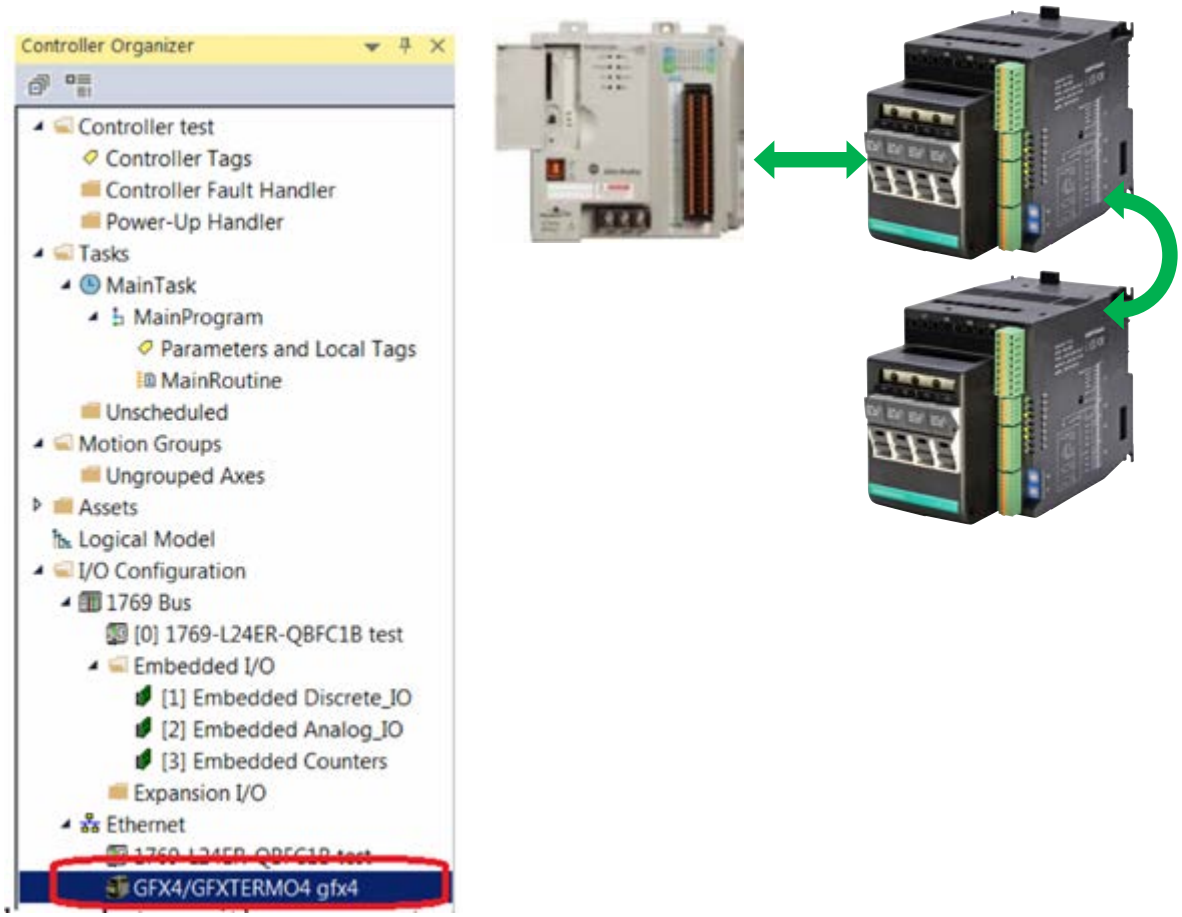
Available input variables (unless specified, variable size is 16 bits)		
Name Tag	**NB:**	**Default Modbus address**
gfx4:I.Adapter_Status (DINT 32bits) bit # 0 Base_Unit_ok bit # 1 Expansion_1_Unit_ok bit # 2 Expansion_2_Unit_ok bit # 3 Expansion_3_Unit_ok bit # 4 Base_Unit_write_error_word_1_16 bit # 5 Expansion_1_write_error_word_1_16 bit # 6 Expansion_2_write_error_word_1_16 bit # 7 Expansion_3_write_error_word_1_16 bit # 8 Base_Unit_write_error_word_17_24 bit # 9 Expansion_1_write_error_word_17_2 bit #10 Expansion_2_write_error_word_17_2 bit #11 Expansion_3_write_error_word_17_2	0=ok, 1 = error	
gfx4:I.Device_1_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_1st_Device	mappable	(468)
gfx4:I.Channel_2_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_1st_Device	mappable	(468)
gfx4:I.Channel_3_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_1st_Device	mappable	(468)
gfx4:I.Channel_4_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_1st_Device	mappable	(468)
gfx4:I.Actual_Value_17_1st_Device	mappable	(1)SPA

gfx4:I.Actual_Value_18_1st_Device	mappable	(12) AL.1
gfx4:I.Actual_Value_19_1st_Device	mappable	(1)SPA
gfx4:I.Actual_Value_20_1st_Device	mappable	(12) AL.1
gfx4:I.Actual_Value_21_1st_Device	mappable	(1)SPA
gfx4:I.Actual_Value_22_1st_Device	mappable	(12) AL.1
gfx4:I.Actual_Value_23_1st_Device	mappable	(1)SPA
gfx4:I.Actual_Value_24_1st_Device	mappable	(12) AL.1

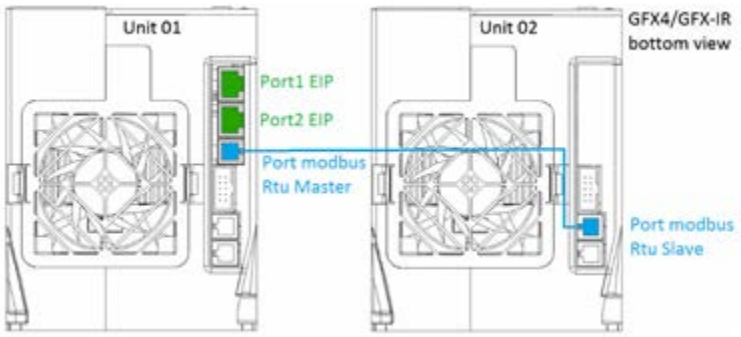
Available output variables (unless specified, variable size is 16 bits)		
Tag	**NB:**	**Default Modbus address**
gfx4:O.Adapter_Command DINT 32bit	dummy	
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_1st_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_1st_Device	mappable	(13)AL.3
gfx4:O.Set_Value_18_1st_Device	mappable	(14) AL.4
gfx4:O.Set_Value_19_1st_Device	mappable	(13)AL.3
gfx4:O.Set_Value_20_1st_Device	mappable	(14) AL.4
gfx4:O.Set_Value_21_1st_Device	mappable	(13)AL.3
gfx4:O.Set_Value_22_1st_Device	mappable	(14) AL.4
gfx4:O.Set_Value_23_1st_Device	mappable	(13)AL.3
gfx4:O.Set_Value_24_1st_Device	mappable	(14) AL.4

Example with 2 GFX4/GFXTERMO4/GFX4-IR:

set slave rotaries to value 01 and 02 and dip switch S7 in the off position for both slave units. Record the eds file on the GFX4/GFXTERMO4/GFX4-IR device, add the desired slave to the project tree under the ethernet sheet as shown in the figure:

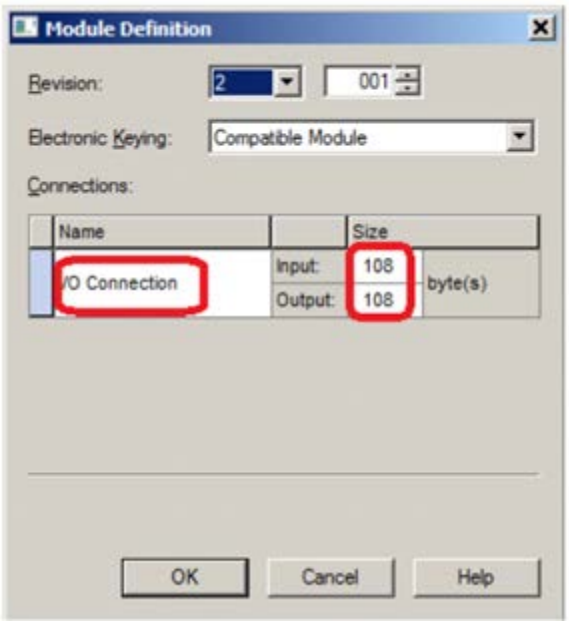


Connect the two units as shown in the figure



Open the Module properties window in the General submenu; define the name field (e.g. gfx4), assign the desired Ip address (e.g. 192.168.105.249) and click on the Change … button to define the size of input / output data. In this case, the usable word size is 48 words 16 bits input and 48 words 16 bits output

Set name = I/O Connection and size equal to 108 bytes.



In this case you may select mapping data by accessing the Configuration submenu.

The data of significance for mapping is:

- **If F.SIZE of Gf_eXpress = 16 words:** param with ID 190 ÷ 205 and 333 ÷ 348 for input values and ID 216 ÷ 231 and 357 ÷ 372 for output.
- **If F.SIZE of Gf_eXpress = 24 words:** param with ID 190 ÷ 213 and 333 ÷ 356 for input values and ID 216 ÷ 239 and 357 ÷ 330 for output.

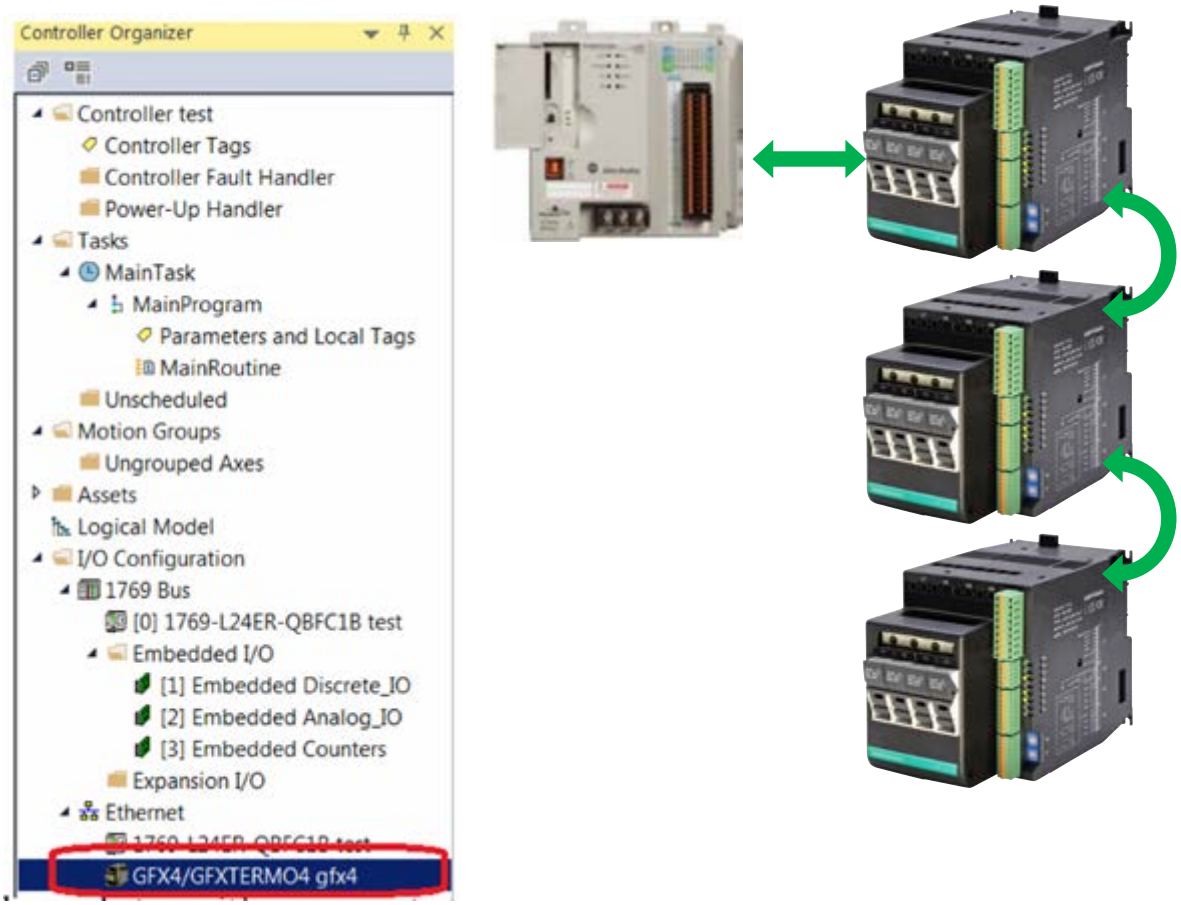
Available input variables (unless specified, variable size is 16 bits)		
Name Tag	**NB:**	**Default Modbus address**
gfx4:I.Adapter_Status (DINT 32bits) bit # 0 Base_Unit_ok bit # 1 Expansion_1_Unit_ok bit # 2 Expansion_2_Unit_ok bit # 3 Expansion_3_Unit_ok bit # 4 Base_Unit_write_error_word_1_16 bit # 5 Expansion_1_write_error_word_1_16 bit # 6 Expansion_2_write_error_word_1_16 bit # 7 Expansion_3_write_error_word_1_16 bit # 8 Base_Unit_write_error_word_17_24 bit # 9 Expansion_1_write_error_word_17_2 bit #10 Expansion_2_write_error_word_17_2 bit #11 Expansion_3_write_error_word_17_2	0=ok, 1 = error	
gfx4:I.Device_1_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_1st_Device	mappable	(468)
gfx4:I.Channel_2_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_1st_Device	mappable	(468)

Available input variables (unless specified, variable size is 16 bits)		
Name Tag	**NB:**	**Default Modbus address**
gfx4:I.Channel_3_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_1st_Device	mappable	(468)
gfx4:I.Channel_4_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_1st_Device	mappable	(468)
gfx4:I.Actual_Value_17_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_1st_Device	updated only if F.SIZE= 24	(12) AL.1
GFX4/GFXTERMO4/GFX4-IR Number 2 input variables		
gfx4:I.Device_2_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_2nd_Device	mappable	(468)
gfx4:I.Channel_2_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_2nd_Device	mappable	(468)
gfx4:I.Channel_3_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_2nd_Device	mappable	(468)
gfx4:I.Channel_4_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_2nd_Device	mappable	(468)
gfx4:I.Actual_Value_17_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_2nd_Device	updated only if F.SIZE= 24	(12) AL.1

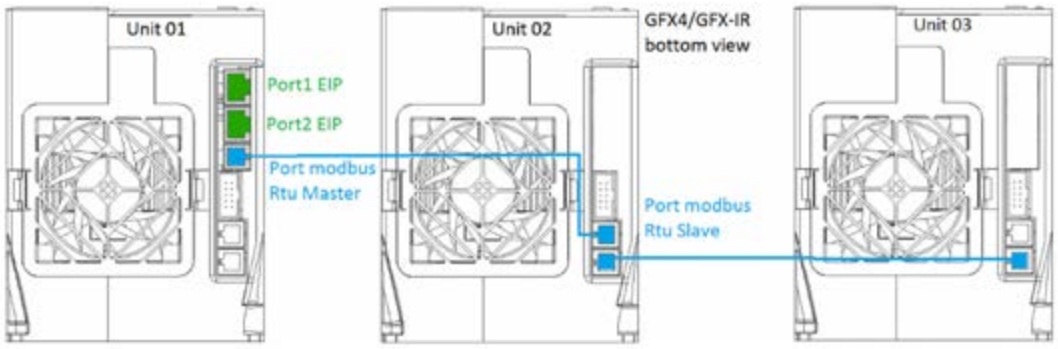
Available output variables (unless specified, variable size is 16 bits)		
Tag	**NB:**	**Default Modbus address**
gfx4:O.Adapter_Command DINT 32bit	dummy	
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_1st_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
GFX4/GFXTERMO4/GFX4-IR Number 2 output variables		
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_2nd_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4

Example with 3 GFX4/ GFXTERMO4/GFX4-IR:

set slave rotaries to value 01 and 02 and 03 and dip switch S7 in off position for all slave units. Record the eds file on the GFX4/GFXTERMO4/GFX4-IR device, add the desired slave to the project tree under the ethernet sheet as shown in the figure:

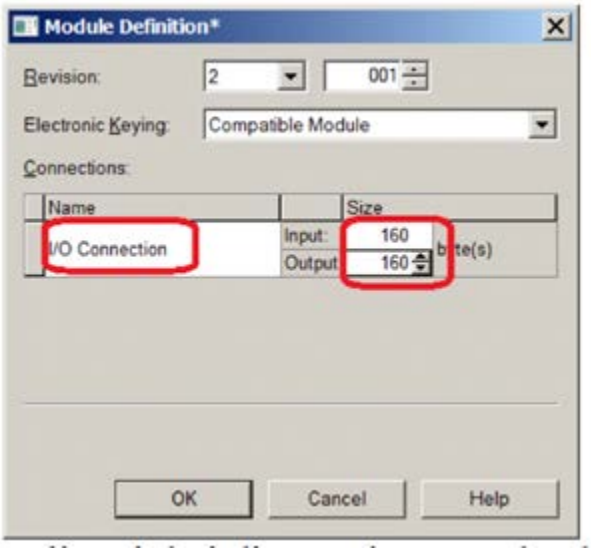


Connect the three units as shown in the figure



Open the Module properties window in the General submenu; define the name field (e.g. gfx4), assign the desired Ip address (e.g. 192.168.105.249) and click on the Change button … to define the size of input / output data. In this case, the usable word size is 72 words 16 bits input and 72 words 16 bits output.

Set name = I/O Connection and size equal to 160 bytes



In this case you may select mapping data by accessing the Configuration submenu.

The data of significance for mapping is:

- **If F.SIZE of Gf_eXpress = 16 words:** param with ID 190 ÷ 205, 333 ÷ 348 and 381 ÷ 396 for input values and ID 216 ÷ 231, 357 ÷ 372 and 405 ÷ 420 for output.
- **If F.SIZE of Gf_eXpress = 24 words:** param with ID 190 ÷ 213, 333 ÷ 356 and 381 ÷ 404 for input values and ID 216 ÷ 239, 357 ÷ 330 and 405 ÷ 428 for output.

Available input variables (unless specified, variable size is 16 bits)		
Name Tag	**NB:**	**Default Modbus address**
gfx4:I.Adapter_Status (DINT 32bits) bit # 0 Base_Unit_ok bit # 1 Expansion_1_Unit_ok bit # 2 Expansion_2_Unit_ok bit # 3 Expansion_3_Unit_ok bit # 4 Base_Unit_write_error_word_1_16 bit # 5 Expansion_1_write_error_word_1_16 bit # 6 Expansion_2_write_error_word_1_16 bit # 7 Expansion_3_write_error_word_1_16 bit # 8 Base_Unit_write_error_word_17_24 bit # 9 Expansion_1_write_error_word_17_2 bit #10 Expansion_2_write_error_word_17_2 bit #11 Expansion_3_write_error_word_17_2	0=ok, 1 = error	
gfx4:I.Device_1_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_1st_Device	mappable	(468)
gfx4:I.Channel_2_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_1st_Device	mappable	(468)
gfx4:I.Channel_3_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_1st_Device	mappable	(2) Ou.P

gfx4:I.Actual_Value_3_Channel_3_1st_Device	mappable	(468)
gfx4:I.Channel_4_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_1st_Device	mappable	(468)
gfx4:I.Actual_Value_17_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_1st_Device	updated only if F.SIZE= 24	(12) AL.1
GFX4/GFXTERMO4/GFX4-IR Number 2 input variables		
gfx4:I.Device_2_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_2nd_Device	mappable	(468)
gfx4:I.Channel_2_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_2nd_Device	mappable	(468)
gfx4:I.Channel_3_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_2nd_Device	mappable	(468)
gfx4:I.Channel_4_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_2nd_Device	mappable	(468)
gfx4:I.Actual_Value_17_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
GFX4/GFXTERMO4/GFX4-IR Number 3 input variables		
gfx4:I.Device_3_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_3rd_Device	mappable	(468)
gfx4:I.Channel_2_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_3rd_Device	mappable	(468)
gfx4:I.Channel_3_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_3rd_Device	mappable	(468)
gfx4:I.Channel_4_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_3rd_Device	mappable	(468)

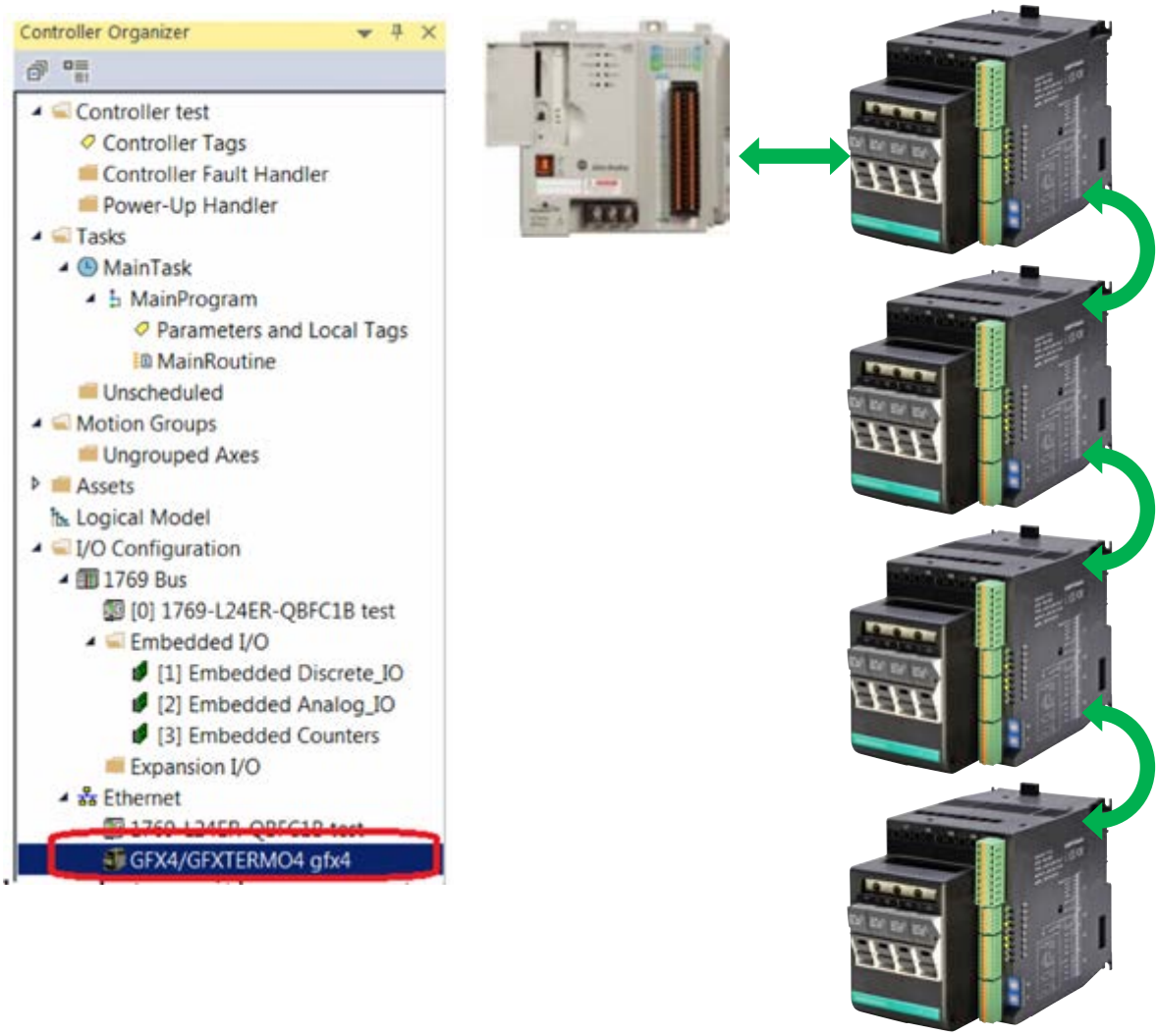
gfx4:I.Actual_Value_17_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_3rd_Device	updated only if F.SIZE= 24	(12) AL.1

Available output variables (unless specified, variable size is 16 bits)		
Tag	**NB:**	**Default Modbus address**
gfx4:O.Adapter_Command DINT 32bit	dummy	
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_1st_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
GFX4/GFXTERMO4/GFX4-IR Number 2 output variables		
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_2nd_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3

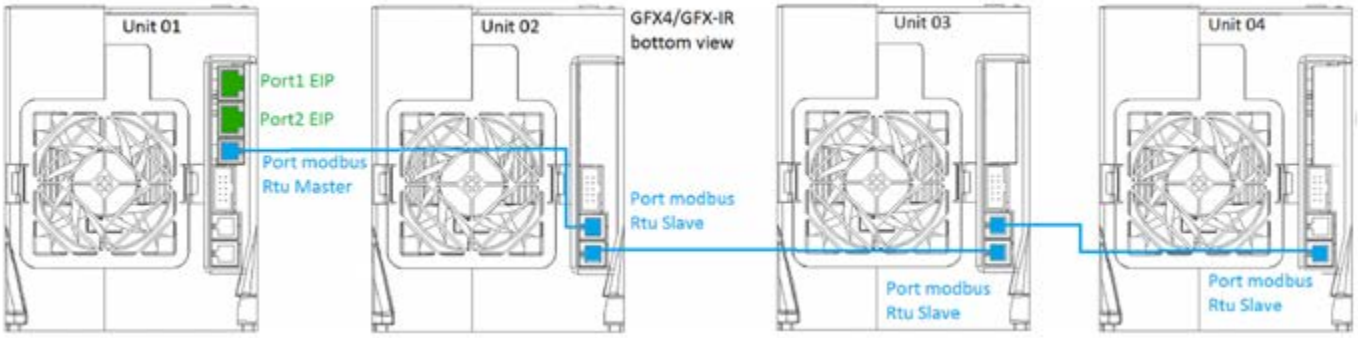
gfx4:O.Set_Value_18_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
GFX4/GFXTERMO4/GFX4-IR Number 3 output variables		
gfx4:O.Device_3_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_3rd_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_3rd_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_3rd_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_3rd_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4

Example with 4 GFX4/GFXTERMO4/GFX4-IR:

set slave rotaries to value 01, 02, 03 and 04 and dip switch S7 in off position for all slave units. Record the eds file on the GFX4/GFXTERMO4/GFX4-IR device, add the desired slave to the project tree under the ethernet sheet as shown in the figure:

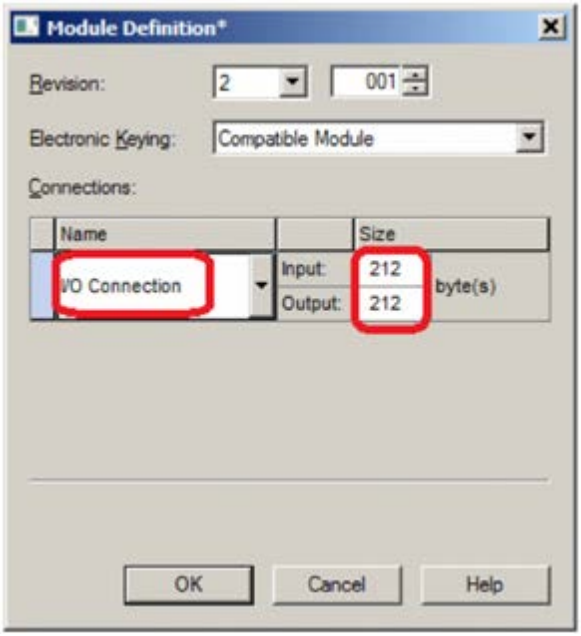


Connect the four units as shown in the figure:



Open the Module properties window in the General submenu; define the name field (e.g. gfx4), assign the desired Ip address (e.g. 192.168.105.249) and click on the Change … button to define the size of input / output data. In this case, the usable word size is 96 words 16 bits input and 96 words 16 bits output.

Set name = I/O Connection and size equal to 212 bytes



In this case you may select mapping data by accessing the Configuration submenu.

The data of significance for mapping is:

- **If F.SIZE of Gf_eXpress = 16 word:** param with ID 190 ÷ 205, 333 ÷ 348, 381 ÷ 396 and 429 ÷ 444 for input values and ID 216 ÷ 231, 357 ÷ 372, 405 ÷ 420 and 513 ÷ 528 for output.
- **If F.SIZE of Gf_eXpress = 24 word:** param with ID 190 ÷ 213, 333 ÷ 356, 381 ÷ 404 and 429 ÷ 452 for input values and ID 216 ÷ 239, 357 ÷ 330, 405 ÷ 428 and 513 ÷ 536 for output.

Available input variables (unless specified, variable size is 16 bits)		
Name Tag	**NB:**	**Default Modbus address**
gfx4:I.Adapter_Status (DINT 32bits) bit # 0 Base_Unit_ok bit # 1 Expansion_1_Unit_ok bit # 2 Expansion_2_Unit_ok bit # 3 Expansion_3_Unit_ok bit # 4 Base_Unit_write_error_word_1_16 bit # 5 Expansion_1_write_error_word_1_16 bit # 6 Expansion_2_write_error_word_1_16 bit # 7 Expansion_3_write_error_word_1_16 bit # 8 Base_Unit_write_error_word_17_24 bit # 9 Expansion_1_write_error_word_17_2 bit #10 Expansion_2_write_error_word_17_2 bit #11 Expansion_3_write_error_word_17_2	0=ok, 1 = error	
gfx4:I.Device_1_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_1st_Device	mappable	(468)
gfx4:I.Channel_2_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_1st_Device	mappable	(468)
gfx4:I.Channel_3_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_1st_Device	mappable	(468)
gfx4:I.Channel_4_Status_1st_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_1st_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_1st_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_1st_Device	mappable	(468)
gfx4:I.Actual_Value_17_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_1st_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_1st_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_1st_Device	updated only if F.SIZE= 24	(12) AL.1
GFX4/GFXTERMO4/GFX4-IR Number 2 input variables		
gfx4:I.Device_2_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_2nd_Device	mappable	(468)
gfx4:I.Channel_2_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_2nd_Device	mappable	(468)
gfx4:I.Channel_3_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_2nd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_2nd_Device	mappable	(468)
gfx4:I.Channel_4_Status_2nd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_2nd_Device	mappable	(0) P.V.

gfx4:I.Actual_Value_2_Channel_4_2nd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_2nd_Device	mappable	(468)
gfx4:I.Actual_Value_17_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_2nd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_2nd_Device	updated only if F.SIZE= 24	(12) AL.1
GFX4/GFXTERMO4/GFX4-IR Number 3 input variables		
gfx4:I.Device_3_Status (DINT 32bits)	dummy	
gfx4:I.Channel_1_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_3rd_Device	mappable	(468)
gfx4:I.Channel_2_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_3rd_Device	mappable	(468)
gfx4:I.Channel_3_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_3rd_Device	mappable	(468)
gfx4:I.Channel_4_Status_3rd_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_3rd_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_3rd_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_3rd_Device	mappable	(468)
gfx4:I.Actual_Value_17_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_20_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_3rd_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_3rd_Device	updated only if F.SIZE= 24	(12) AL.1
GFX4/GFXTERMO4/GFX4-IR Number 4 input variables		
gfx4:I.Device_4_Status	dummy	
gfx4:I.Channel_1_Status_4th_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_1_4th_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_1_4th_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_1_4th_Device	mappable	(468)
gfx4:I.Channel_2_Status_4th_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_2_4th_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_2_4th_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_2_4th_Device	mappable	(468)
gfx4:I.Channel_3_Status_4th_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_3_4th_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_3_4th_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_3_4th_Device	mappable	(468)
gfx4:I.Channel_4_Status_4th_Device	mappable	(467) Status
gfx4:I.Actual_Value_1_Channel_4_4th_Device	mappable	(0) P.V.
gfx4:I.Actual_Value_2_Channel_4_4th_Device	mappable	(2) Ou.P
gfx4:I.Actual_Value_3_Channel_4_4th_Device	mappable	(468)
gfx4:I.Actual_Value_17_4th_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_18_4th_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_19_4th_Device	updated only if F.SIZE= 24	(1)SPA

gfx4:I.Actual_Value_20_4th_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_21_4th_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_22_4th_Device	updated only if F.SIZE= 24	(12) AL.1
gfx4:I.Actual_Value_23_4th_Device	updated only if F.SIZE= 24	(1)SPA
gfx4:I.Actual_Value_24_4th_Device	updated only if F.SIZE= 24	(12) AL.1

Available output variables (unless specified, variable size is 16 bits)		
Tag	**NB:**	**Default Modbus address**
gfx4:O.Adapter_Command DINT 32bit	dummy	
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_1st_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_1st_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_1st_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_1st_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_1st_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_1st_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_1st_Device	(updated only if F.SIZE= 24	(14) AL.4
GFX4/GFXTERMO4/GFX4-IR Number 2 output variables		
gfx4:O.Device_1_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_2nd_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_2nd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_2nd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_2nd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_2nd_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4

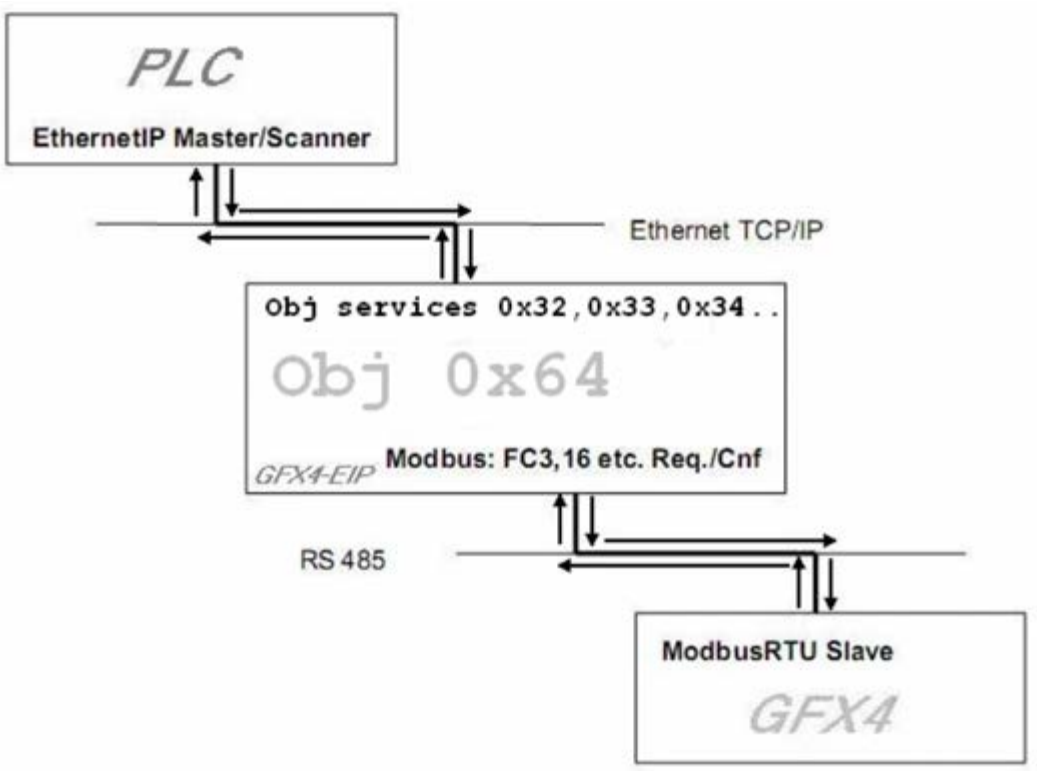
gfx4:O.Set_Value_21_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_2nd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_2nd_Device	(updated only if F.SIZE= 24	(14) AL.4
GFX4/GFXTERMO4/GFX4-IR Number 3 output variables		
gfx4:O.Device_3_Command DINT 32bit	dummy	
gfx4:O.Channel_1_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_3rd_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_3rd_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_3rd_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_3rd_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_3rd_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_3rd_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_3rd_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_3rd_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_3rd_Device	(updated only if F.SIZE= 24	(14) AL.4
GFX4/GFXTERMO4/GFX4-IR Number 4 output variables		
gfx4:O.Device_4_Command	dummy	
gfx4:O.Channel_1_Command_4th_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_1_4th_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_1_4th_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_1_4th_Device	mappable	(12) AL.1
gfx4:O.Channel_2_Command_4th_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_2_4th_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_2_4th_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_2_4th_Device	mappable	(12) AL.1
gfx4:O.Channel_3_Command_4th_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_3_4th_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_3_4th_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_3_4th_Device	mappable	(12) AL.1
gfx4:O.Channel_4_Command_4th_Device	mappable	(305) StatusW
gfx4:O.Set_Value_1_Channel_4_4th_Device	mappable	(16) _SPlocal
gfx4:O.Set_Value_2_Channel_4_4th_Device	mappable	(252) Man_Power
gfx4:O.Set_Value_3_Channel_4_4th_Device	mappable	(12) AL.1
gfx4:O.Set_Value_17_4th_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_18_4th_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_19_4th_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_20_4th_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_21_4th_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_22_4th_Device	(updated only if F.SIZE= 24	(14) AL.4
gfx4:O.Set_Value_23_4th_Device	(updated only if F.SIZE= 24	(13)AL.3
gfx4:O.Set_Value_24_4th_Device	(updated only if F.SIZE= 24	(14) AL.4

7 • ACCESSING DATA VIA GEFRAN_MODBUS CLASS (100)

Gefran_modbus Class 100, (0x64 hex) is a class permitting access to data on GFX4/GFXTERMO4/GFX4-IR devices by the explicit messages method. The figure shows that:

- The PLC makes a request, invoking class 0x64
- The request is received by the Ethernet/ip interface of the GFX4/GFXTERMO4/GFX4-IR device
- The request is converted from the Ethernet/ip protocol to the Modbus/RTU master protocol
- The Modus/RTU slave sends the data to the Modbus/RTU master
- The data is received by the Modbus/RTU master and converted into a frame of Ethernet/Ip response to the PLC

Class 0x64 implements the following service codes:



Service Code	Class	Service Name	Description of Service
0x32	0x64	Read Discrete Inputs	Reads one or more contiguous discrete input(s)
0x33		Read Coils	Reads one or more contiguous coil(s)
0x34		Read Input Registers	Reads one or more contiguous input register(s)
0x35		Read Holding Registers	Reads one or more contiguous holding register(s)
0x36		Write Coils	Write one or more contiguous coil(s)
0x37		Write Holding Registers	Write one or more contiguous holding register(s)

The service codes listed above correspond to the modbus services listed below

Vendor Service	Corresponding Modbus Function Code	Supported	NB:
0x32	FC 2	Yes	FC 1/2 commands equivalent for GFX4/GFXTERMO4/GFX4-IR
0x33	FC 1	Yes	
0x34	FC 4	Yes	FC 3/4 commands equivalent for GFX4/GFXTERMO4/GFX4-IR
0x35	FC 3	Yes	
0x36	FC 15	Yes	
0x37	FC 16	Yes	

Example for Service Code37/ Modbus Function Code 16: Preset Multiple Register

In the example below, we wish to write the value = 20 of SetPoint SP_1 for zone 1 of a GFX4 device. The modbus address of the datum is 1040.

We add tags in the controller

- FC16Req type INT[3], destined to contain the data to be written, and specifically:
  - FC16Req[0] = 1040, modbus address of the datum
  - FC16Req[1] = 1, number of registers to be written
  - FC16Req[2] = 20, value to be written

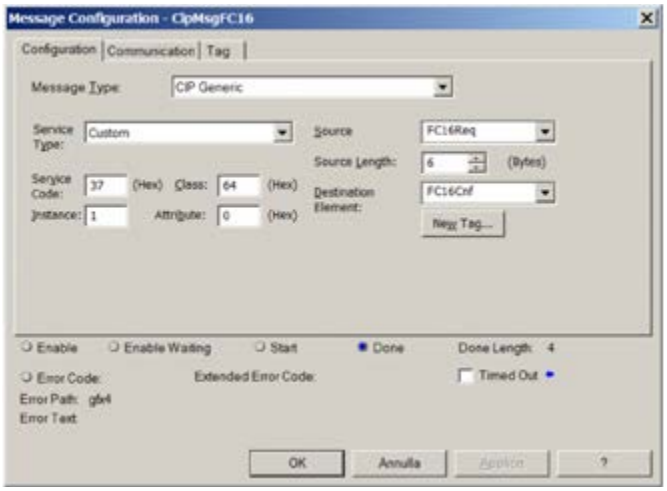
- FC16Cnf of type INT[2], destined to contain the response to the command
- EnableFC16 type BOOL to enable writing on command once only
- CipMsgFC16 type MESSAGE supervising sending/receiving of communications

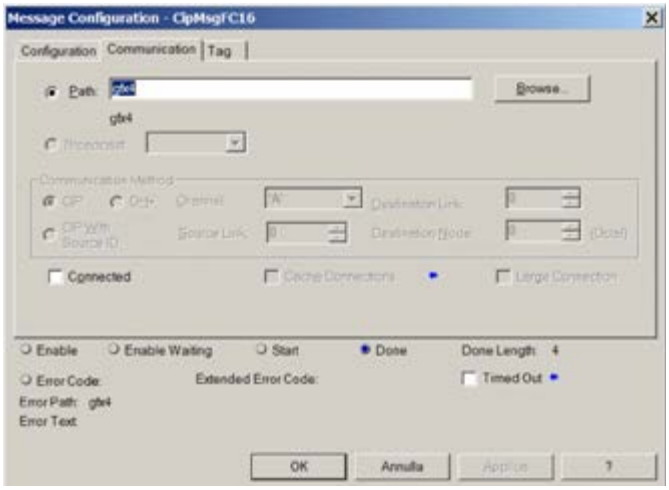
▸ FC16Req			INT[3]
▸ FC16Cnf			INT[2]
EnableFC16			BOOL
▸ CipMsgFC16			MESSAGE

We add the following row of code, using:

- XIC Examine If Closed (EnableFC16)
- MSG Message (CipMsgFC16)

The CipMsgFC16 component must be set as shown in the figure:





Example for Service Code34/ Modbus Function Code 04: Read Multiple register

In the example below, we want to read the value of SetPoint SP_1 for zone 1 of a GFX4 device. The modbus address of the datum to be read is 1040.

We add tags in the controller

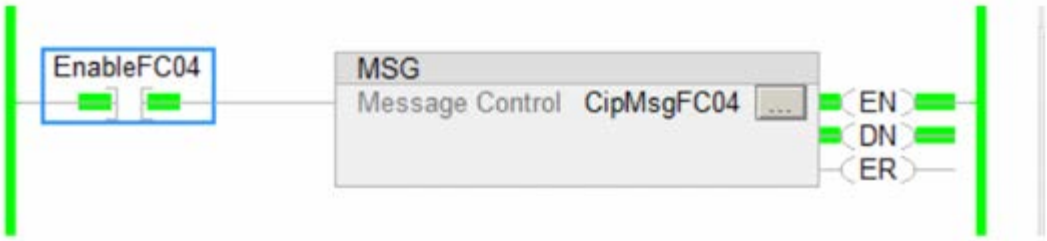
- FC04Req type INT[2], destined to contain the data to be written, and specifically:
  - FC04Req[0] = 1040, modbus address of the datum
  - FC04Req[1] = 1, number of registries to be read

- FC04Cnf type INT[0], destined to contain the reading of the register, which is in our case equal to 20
- EnableFC04 type BOOL to enable writing on command once only
- CipMsgFC04 type MESSAGE supervising sending/receiving of communications

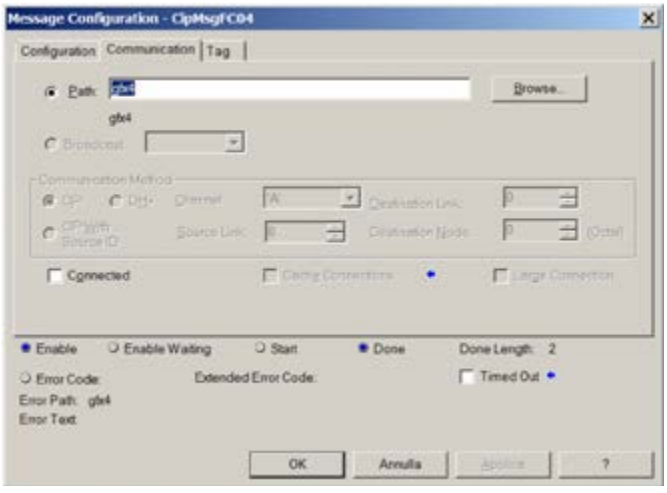
▸ FC16Req			INT[3]
▸ FC16Cnf			INT[2]
EnableFC16			BOOL
▸ CipMsgFC16			MESSAGE

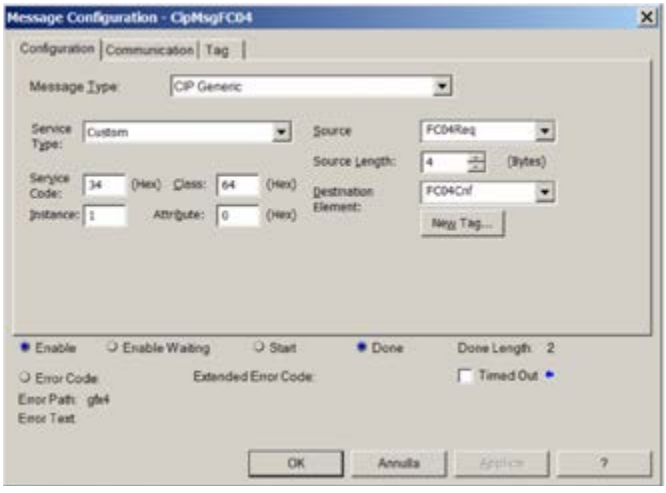
We add the following row of code, using:

- XIC Examine If Closed (EnableFC04)
- MSG Message (CipMsgFC04))



The CipMsgFC04 component must be set as shown in the figure:





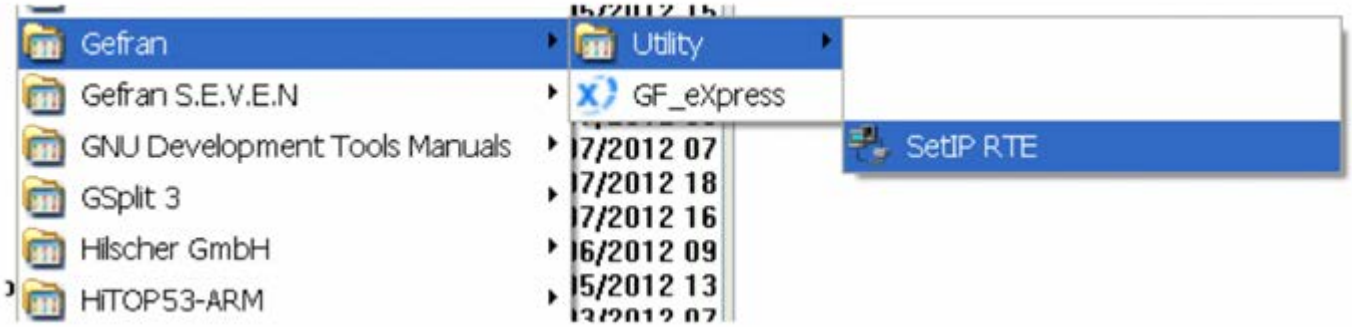
8 • SETIPTOOLS 1.3 CONFIGURATION TOOL SETUP

This tool can be used to set:

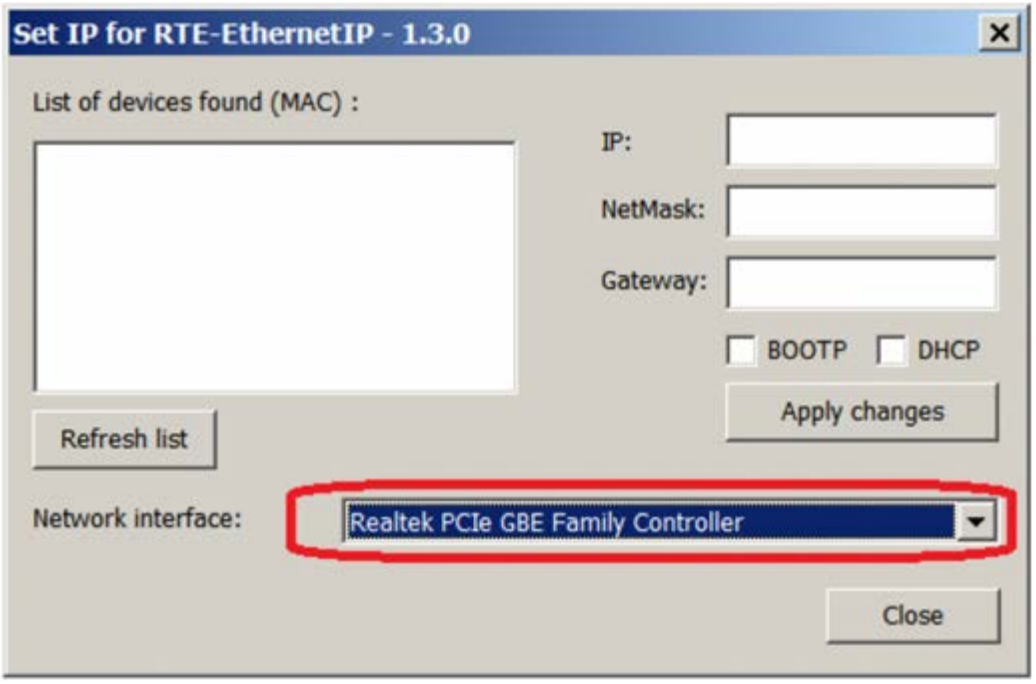
- Ip address
- Netmask
- Gateway
- DHCP / BOOTP / Fixed IP mode

Note: UDP broadcast traffic must not be blocked

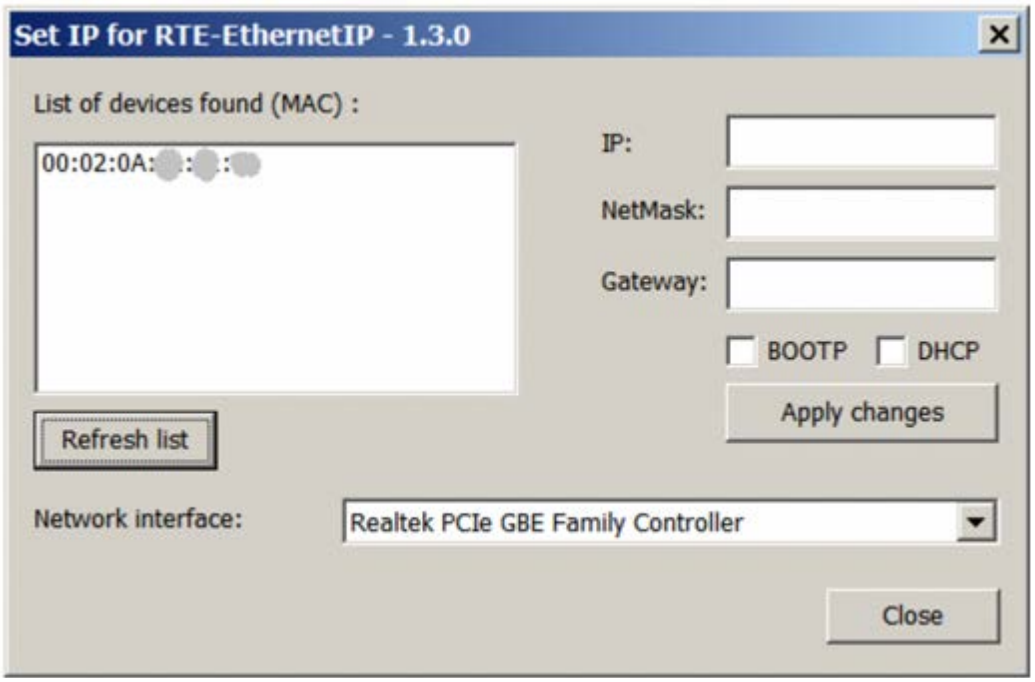
After installation, we will have:



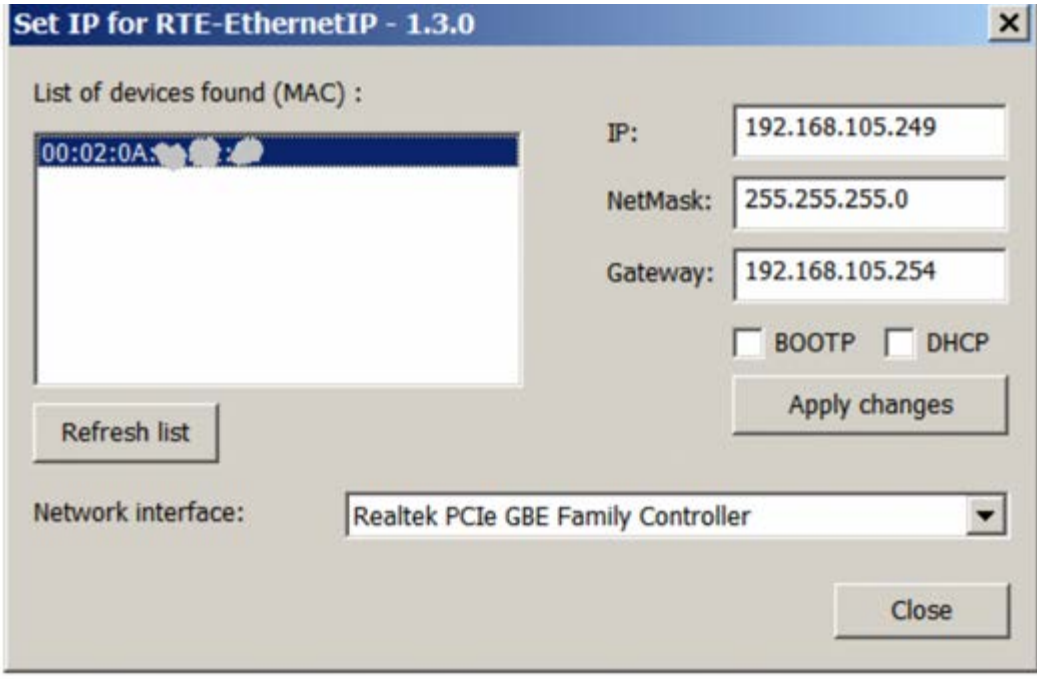
Step 1:
Select the network board used to physically connect the devices and click on Refresh list



Step 2:
List of devices found

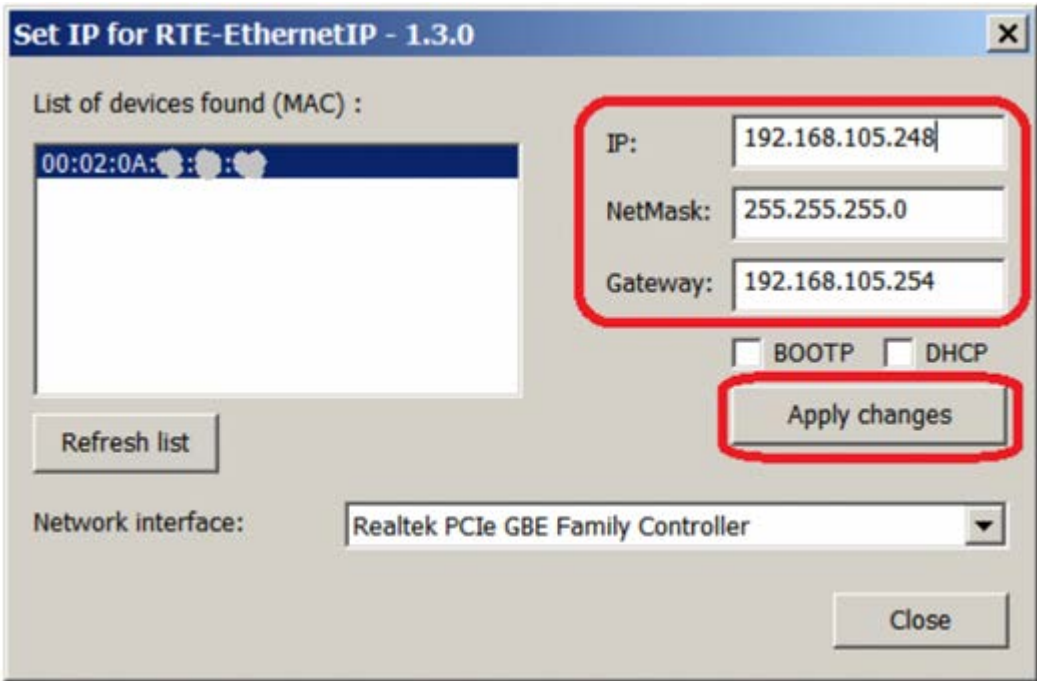


Step 3:
Click on the mac address of the device



Step 4:

Set the desired addresses and then click on **Apply changes**

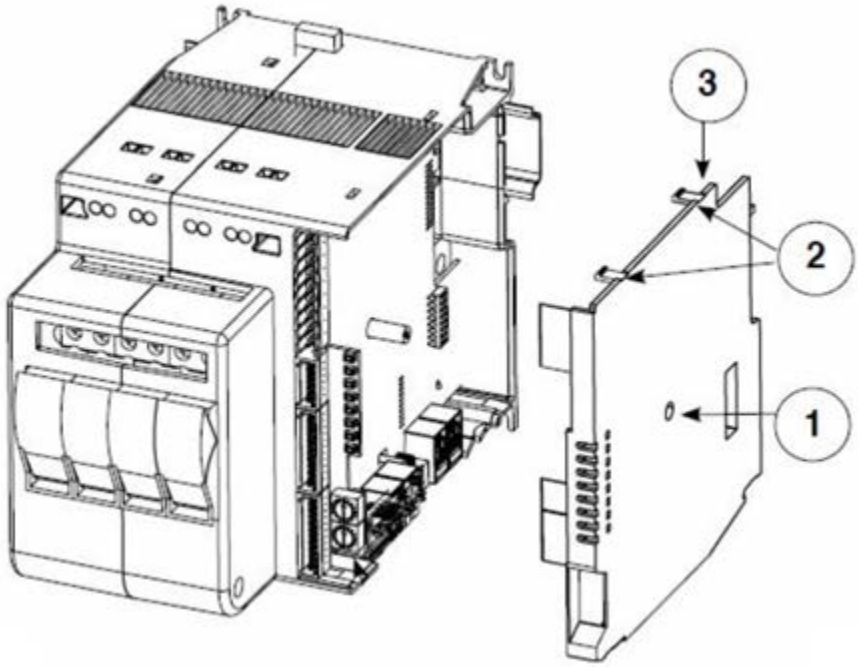


9 • RESETTING PARAMETERS TO FACTORY DEFAULT VALUES

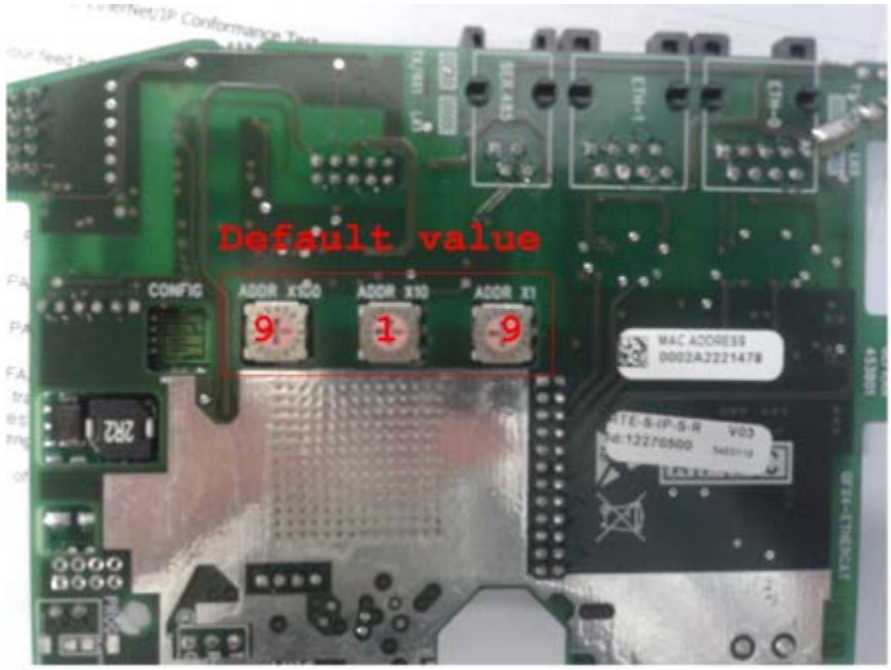
If necessary, you can reset the default IP address of the device at any time. Follow these steps:

1. Turn off the GFX4/GFXTERMO4/GFX4-IR

2. Slacken screw 1e using an appropriate screwdriver, gently using points 2 as a lever; remove lid 3



3. Set the Rotary Switch addr X100 = 9 and the Rotary Switch addr X10 = 1 and the Rotary Switch addr X1 = 9



4. Turn the device on again, being careful not to touch the electric parts of the board. Wait 30 seconds

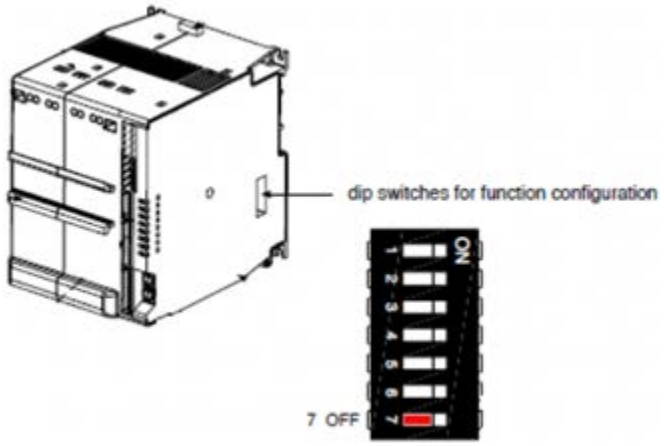
5. Turn off the GFX4/GFXTERMO4/GFX4-IR

6. Set the Rotary Switch addr X100 other than 9 and the Rotary Switch addr X10 other than 1 and the Rotary Switch addr X1 other than 9

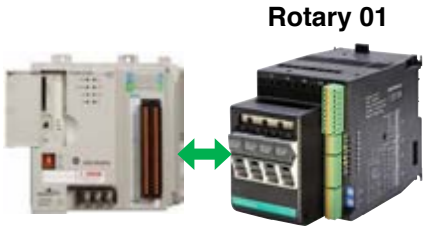
7. Put the cover back on, and turn on the device. The default values will be: ip address 192.168.1.100 net mask 255.255.255.0

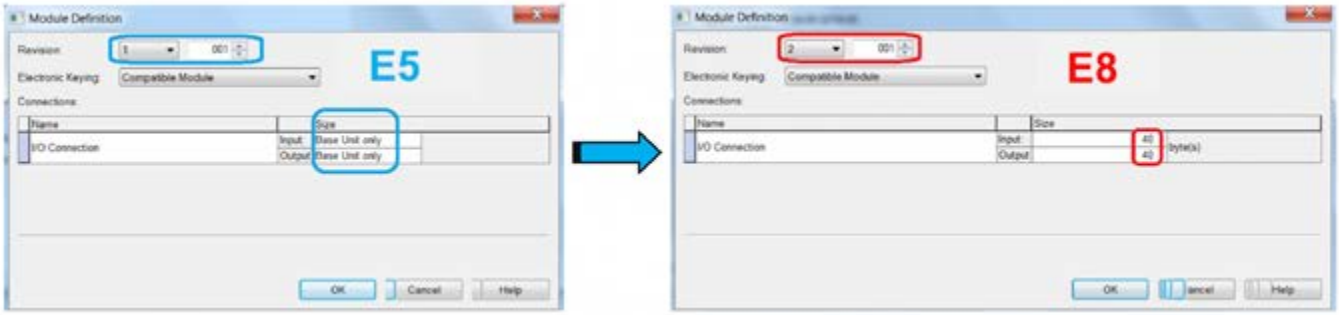
How to migrate GFX4-IR from version E5 to version E8

This chapter explains how to perform porting of an application created in the RA environment using version GFX4-IR EIP “E5” (Ver 1.1) to version “E8” (Ver 2.1). All the examples were performed in the RA and PLC CompatcLogix 1769-L24ER-QBFC1B environment

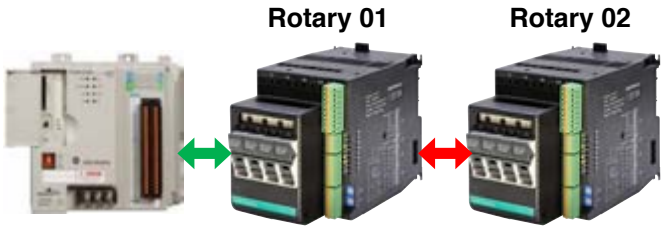


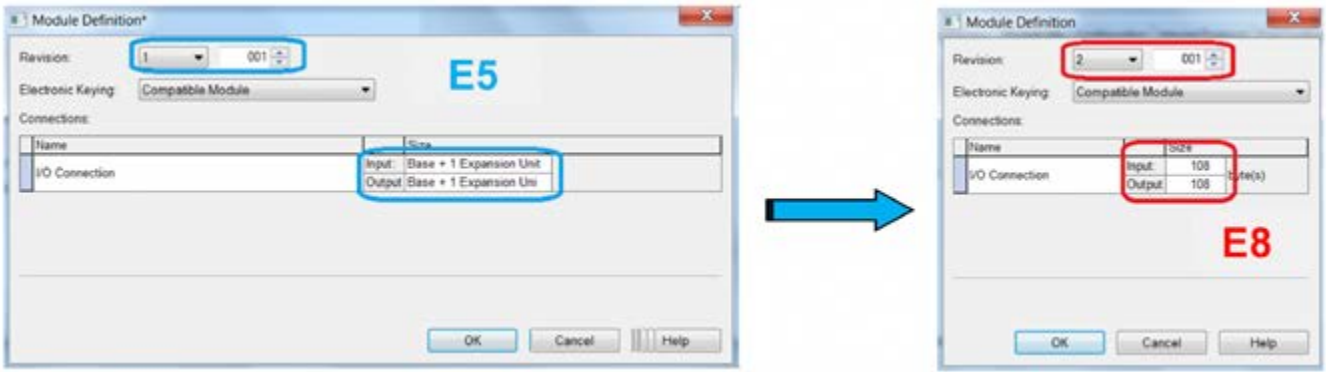
1. **Example 1**: connection of 1 GFX4-IR to the PLC. In this case we have up to 4 zones



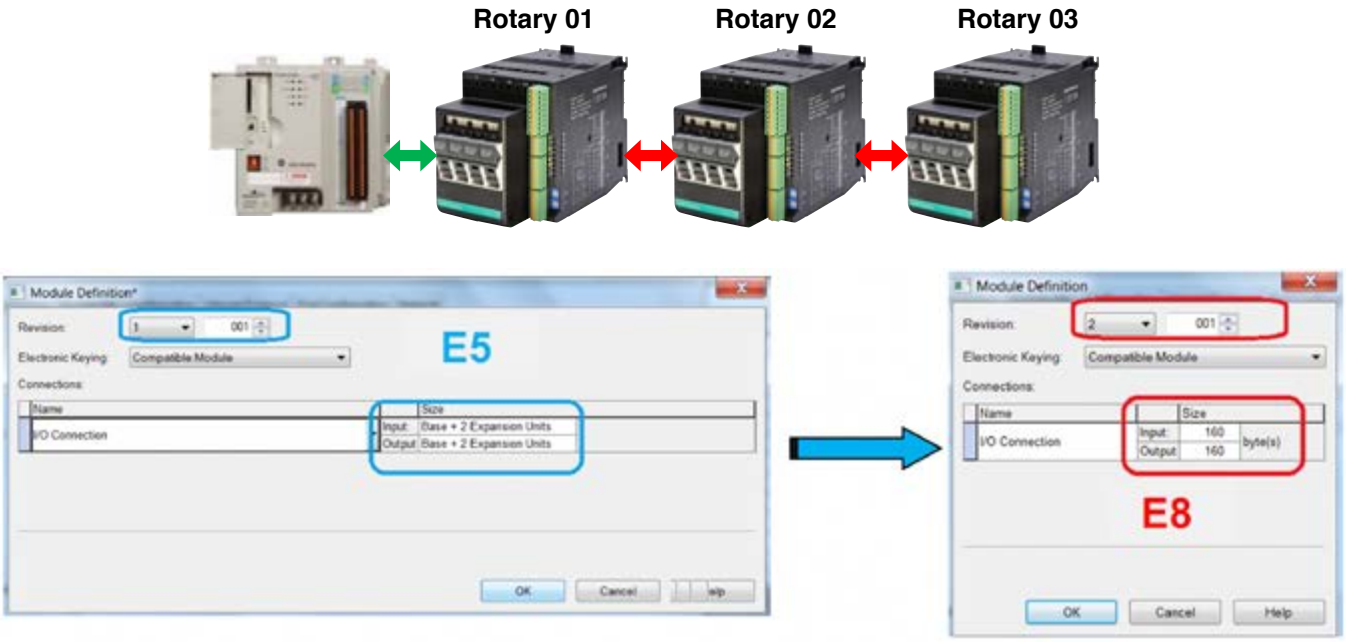


2. **Example 2**: connection of 2 GFX4-IR to the PLC. In this case we have 8 zones

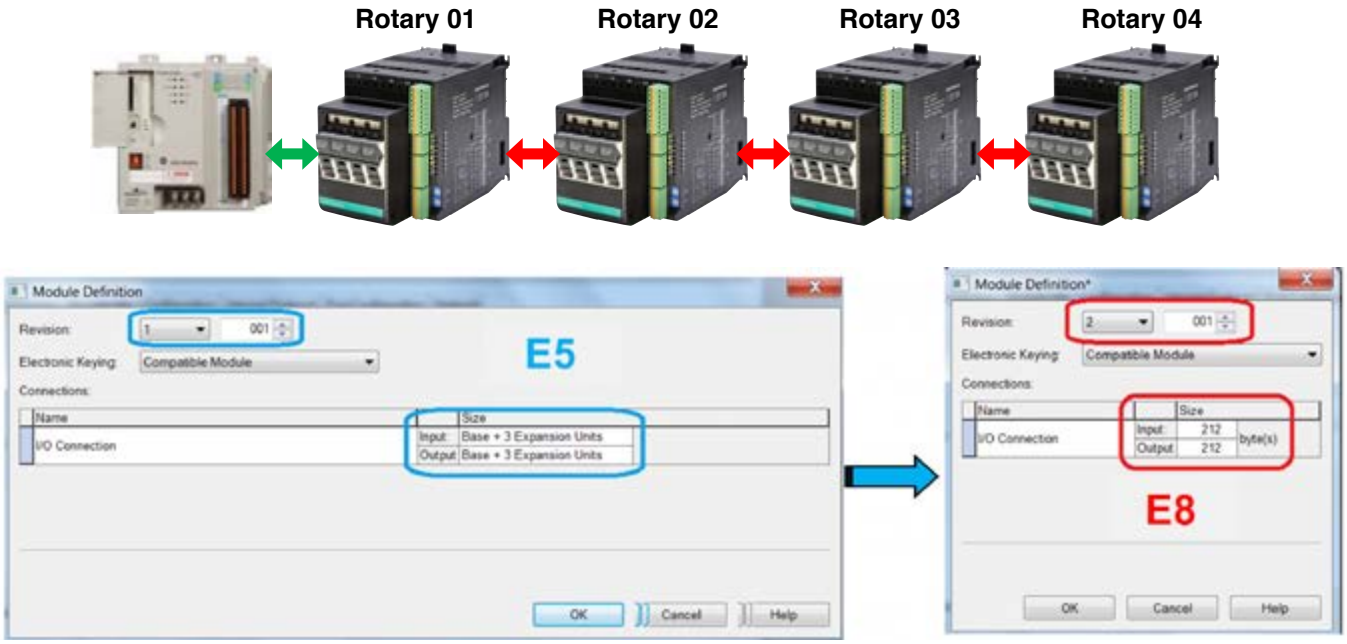




3. Example 3: connection of 3 GFX4-IR to the PLC. In this case we have 12 zones



4. Example 4: connection of 3 GFX4-IR to the PLC. In this case we have 16 zones



Summary Table

Module Configuration		
# of GFX4-IR	**"E5" (Fw Version 1.1)**	**"E8" (Fw Version 2.1)**
1	Input/Output = Base Unit	Input/Output = 40
2	Input/Output = Base Unit + 1 Expansion unit	Input/Output = 108
3	Input/Output = Base Unit + 2 Expansion unit	Input/Output = 160
4	Input/Output = Base Unit + 3 Expansion unit	Input/Output = 212

GEFRAN

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