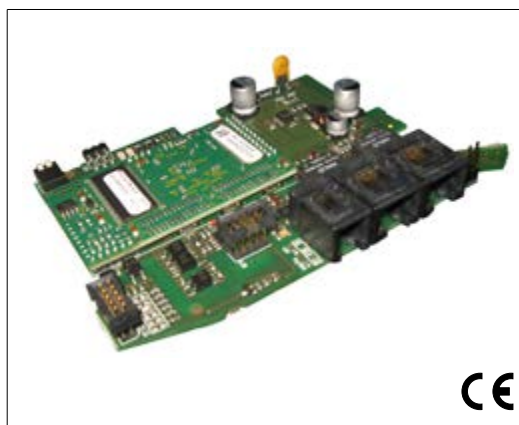# GEFRAN

Card for Ethernet communication with EtherCAT protocol

Main characteristics

- *EtherCAT slave- Modbus RTU Master*
- *Baud rate 100 Base-TX*
- *Auto-Crossover*
- *Internal installation*

CE

Code 80430B_01-2021

PROFILE

The card for Ethernet communication with EtherCAT protocol installs inside GFX4/ GFXTERMO4/GFX4-IR and to GFW power controller family, with different models, as described in ordination code.

Products and expands communication by providing EtherCAT protocol.

The module has two communication channels:

• Ethernet: 2 ports for IN/OUT connections

• Modbus Master: available only for GFX4-ETH2 allows communication with a maximum of 20 Slave devices.

Installation of the expansion can be requested when ordering the products or the expansion can be installed later.

Notes:

- The GFX4-ETH2 card **CANNOT** be inserted in GFX4 / GFXTERMO4 / GFX4-IR products equipped with the 4 auxiliary inputs option (mV/TC Aux).

- To set the 3 Rotary-Switches for addressing, you have to unscrew the fastening screw on the side cover of the GFX4 / GFXTERMO4 / GFX4-IR / GFW and temporarily remove the cover from the product.
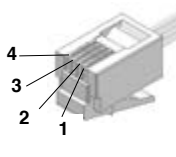
TECHNICAL DATA

ETHERNET Port	
Protocol	EtherCAT slave CoE (Can Open over EtherCAT)
GFX4-ETH2 Function	Connects GFX4 / GFXTERMO4 / GFX4-IR to an EtherCAT Master device
GFW-ETHx-xxx Function	Connects GFW to an EtherCAT Master device
Baud rate	10/100 Mbit/s automatic
Connector	RJ45 conforms CAT5 100 BaseT
Address	Implicit, via 3 rotary-switches, assigned to EtherCAT master
Msg. supported	Cyclical/Acyclical
Diagnostics GREEN Led On YELLOW Led On	for each ETHn port Packet activity Link integrity
Modbus Port	
Protocol	ModBus RTU (master) RS485 serial
GFX4-ETH2 Function	Connects GFX4 /GFXTERMO4/GFX4IR to ModBus RTU network
Baud rate	19200
Connector	RJ10 4-4 (max 20 nodes without repeater)
General characteristics	
Dimensions	106x76x17mm (A x L x P)
Installation	Inside module
Weight	35g
Power supply requirement	+24Vdc, 3W max. powered directly by GFX4 / GFXTERMO4 / GFX4-IR or GFW
Work/storage temperature	0...40°C/-20...70°C
Relative humidity	20...85% UR non-condensing
Ambient conditions for use	Internal use, altitude up to 2000m
Installation	Inside module (see manual "INSTRUCTIONS FOR USE AND WARNINGS")
Certifications	See GFX4 / GFXTERMO4 / GFX4-IR / GFW modules
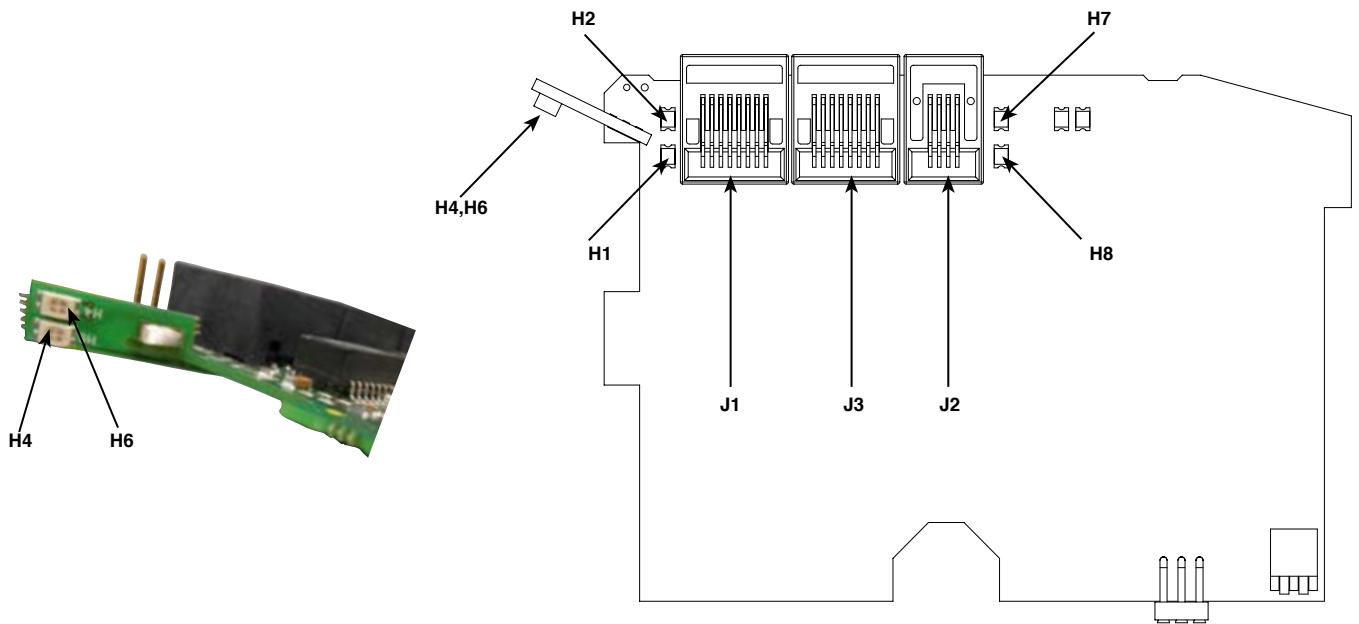
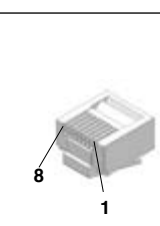| H1	Led GREEN LINK	Port ETH0
H2	Led RED signal	Port ETH0
H7	Led RED activity	Port ETH1
H8	Led GREEN LINK	Port ETH1
H4	Led bicolor GREEN (H1) RED (H2)	Port ETH
H6	Led bicolor GREEN (H8) RED (H7)	Port ETH
J1	Connector	Port ETH0 (IN)
J3	Connector	Port ETH1 (OUT)
J2	Connector	Modbus serial

Connector J2 RJ10 4-4 spina

N°Pin	Name	Description	Note
1	GND1 (**)	-	(**) It is advisable to also connect the GND signal between Modbus devices with a line distance > 100 m
2	Rx/Tx+	Data reception/transmission (A)	
3	Rx/Tx-	Data reception/transmission (B)	
4	+V (riservato)	-	

Cable type: flat telephonic for 4-4 pin 28AWG conductor

Connector J1 e J3 RJ45

N°Pin	Name	Description	Note
1	TX+	Data transmission +	
2	TX-	Data transmission -	
3	RX+	Data reception +	
4	n.c.		
5	n.c.		
6	RX-	Data reception -	
7	n.c.		
8	n.c.		

Cable type: use standard category 5 cable according to TIA/EIA-568B

| PC/PLC (Master EtherCAT) | GFX4 / GFXTERMO4 / GFX4-IR / GFW (Slave EtherCAT) | GFX4 / GFXTERMO4 / GFX4-IR / GFW (Slave EtherCAT) | GFX4 / GFXTERMO4 / GFX4-IR / GFW (Slave EtherCAT) |

Modbus Sub-Net
available only for
GFX4 / GFXTERMO4 / GFX4-IR products

A Modbus Sub-Net

GFX / GFX4 / ..... (Slave Modbus) Address: **1**

GFX / GFX4 / ..... (Slave Modbus) Address: **2**

GFX / GFX4 / ..... (Slave Modbus) Address: **20**

B Modbus Sub-Net

GFX / GFX4 / ..... (Slave Modbus) Address: **1**

GFX / GFX4 / ..... (Slave Modbus) Address: **2**

GFX / GFX4 / ..... (Slave Modbus) Address: **20**

C Modbus Sub-Net

GFX / GFX4 / ..... (Slave Modbus) Address: **1**

GFX / GFX4 / ..... (Slave Modbus) Address: **2**

GFX / GFX4 / ..... (Slave Modbus) Address: **20**

To other Ethernet Nodes

INSTALLATION NOTE:
To apply to each Ethernet cable a ferrite (cod. 42509, supplied with board) close to the ETH0 and ETH1. connectors.

EtherCAT PROTOCOLS

It is possible order EtherCAT boards with protocol version 2.5 (products with E2 option), or with version 4.7 (products with E7 option). In the table are described the features of the new protocol.

ATTENTION: "In case of replacement and/or insertion of version E7 in network using previous version ["E2"] the PLC application must be recompiled with the respective files ESI, matched with communication module E7.
If application SW will not be recompiled, the product with option E7 will not be managed. To avoid this procedure, it is possible order an E2 device"

ETHERCAT: new function version E7 compared to E2.

FUNCTION	DESCRIPTION
Master autoscan support	It allows to detect the presence or absence of the target on the network from PLC by Autoscan function
2ndary station alias support	It allows addressing of the target by a value that can be set by the PLC and saved in EEPROM on the target, without acting on the rotary. It allows interfacing with some PLC that support only this type of addressing mode including Omron.
Bridge mode	Up to 12 zones - 4 GFW

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).

ORDER CODE

Code	Device	Interface	Description
F049411	GFX4	ETH2	for GFX4/GFXTERMO4/GFX4-IR
F059814	GFW	ETH2	for GFW 40A ... 300A
F074701	GFW	ETH2-600	for GFW 400A ... 600A
F074706	GFW	ETH7	for GFW 40A ... 300A
F074707	GFW	ETH7-600	for GFW 400A ... 600A

GEFRAN spa reserves the right to make aesthetic or functional changes at any time and without notice.

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