# GEFRAN

## GFX4/GFX4IR - ETHERCAT



**INSTALLATION AND
OPERATION MANUAL**

codice: **80416C- 01-2021 - ENG**

## INDEX

# 1 · INTRODUCTION

The GFX4/GFX4-IR/GFXTERMO4 ordered with the option "E2", or equipped later with the option card GFX4-ETH2, support the EtherCAT Slave CoE ( canopen over EtherCAT) protocol.

The communication logic scheme can be simplified as shown below:

**EtherCAT | Master**

**EtherCAT**

**ETH0**

**ETH1**

**ETH0**

**ETH1**
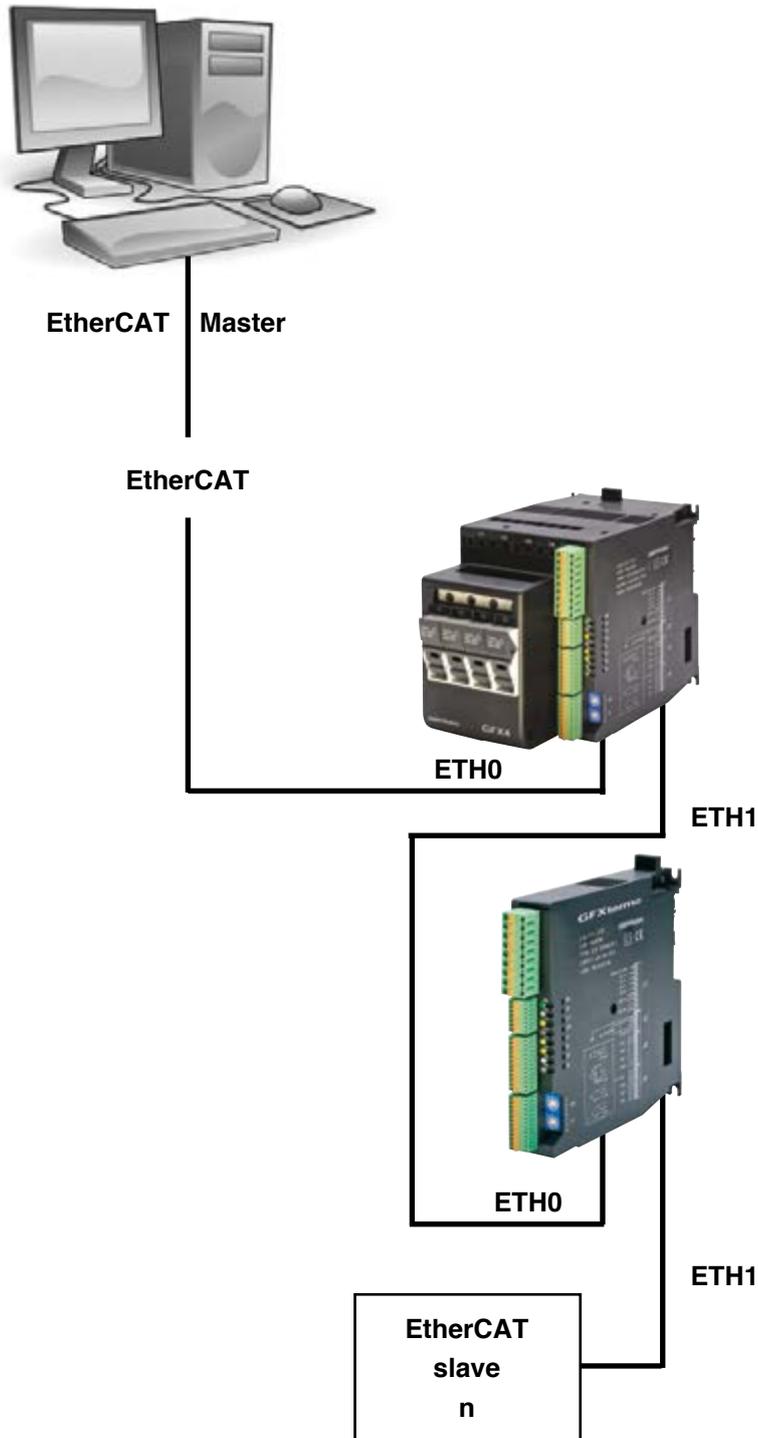
**EtherCAT slave n**

# 2 · MAIN CHARACTERISTICS

• Data transport layer Ethernet II , IEEE 802.3
• Two RJ45 connections: Eth 0 IN and Eth 1 Out
• Baud rate 100Mbit/s
• Supports Canopen over EtherCAT CoE
• Supports SDO Master- Slave communication
• Supports PDO communication
• Supports Object Dictionary via device description file (DDF)
• Complex slave device
• Ability to address via 3 rotaries

# 3 · PHYSICAL CONNECTION TO LAN NETWORK

The GFX4-ETH2 board has two RJ45 connections to connect to other slave devices or to a master.

Specifically:
• An Eth0 port for input connection
• An Eth1 port for output connections

In general, the following connection methods are possible:
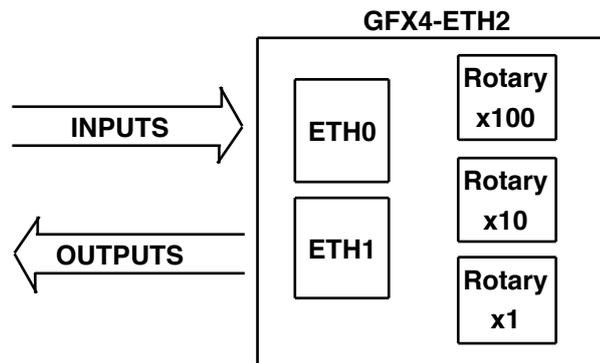


# 4 · CONNECTING HOST DEVICES

The internal connection to the host devices is realized by a serial communication ( by encapsulation of the information in a Modbus RTU protocol)

For a correct connection, some conditions must be verified:

• Connection speed is 19200 baud
• No parity
• 8 data bits
• modbus slaves must have node address from 1 to 20

In this connection, the slaves must be connected as shown in the figure.

Typical connections with GFX4 controllers:

**GFX4....E2**

**GFX4....0 (M)**

| |
|---|
| GFX4 Modbus slave and rotary addresses = 1 (answer to the Modbus node 1,2,3,4) |

**GFX4....0 (M)**

| |
|---|
| GFX4 Modbus slave and rotary addresses = 5 (answer to the Modbus node 5,6,7,8) |

**GFX4....0 (M)**

| |
|---|
| GFX4 Modbus slave and rotary addresses = 9 (answer to the Modbus node 9,10,11,12) |

**GFX4....0 (M)**

| |
|---|
| GFX4 Modbus slave and rotary addresses = 13 (answer to the Modbus node 13,14,15,16) |

**GFX4....0 (M)**

| |
|---|
| GFX4 Modbus slave and rotary addresses = 17 (answer to the Modbus node 17,18,19,20) |

**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).

## 5 · DESCRIPTION OF DATA EXCHANGED BY GFX4-ETH2

The etherCAT slave can exchange two types of data:

• Configuration data
• Process data

This data must be characterized by the DDF file of the connected device; the significance of the data is known only by the applications that have to handle the flow of bits at high level.

GFX4-ETH2 is a bridge that lets the data enter. At the etherCAT level, the data flow from the Master/Slave and vice versa via the Acyclic Mailbox mechanism (slow data) or via cyclic channels for fast data.

The GFX4-ETH2 has a template to contain the structure of fast PDO data and a few simple primitives to handle SDOs.

The description of fast PDO data is contained in the objects that describe pdo mapping in reception/transmission and are identical to those used in CanOpen.

These objects are "compiled" by the master in startup phase with a start procedure in which the slave is "initialized" so that it is ready to transfer the necessary data..

## 6 · FROM DDF DESCRIPTION FILE TO DATA EXCHANGE

We will now see how to start from a DDF file and exchange data with a supervisor system.

In the following example, we use a GFX4 controller with optional "E2" board, the DDF GFX4_001.xml file describing the device, and a PC with Twincat Manager software by Beckhoff.

We see the content of the process data of the GFX4_001.xml file loaded in the GFX4 controller: it includes a network composed of 20 zones (the maximum that the GFX4-ETH2 can manage) characterized by 20 PDOs, one for each zone, plus a PDO in which a modbus Master communication channel is encapsulated in the process data; in detail, we see the table with the data mapped in the PDOs. See the GFX4 SW manual and the Modbus protocol manual for a description of the items in the table.

# 7 · PROCESS DATA STRUCTURE (PDO)

## 7.1. Description of pdos in reception for GFX4 with 20 zone

| Nr. PDO in Rx | index | subindex | Size in bits | Comment |
|---|---|---|---|---|
| 0x1600<br>(size 7 bytes)<br>Optional fixed | 0x5c00 | 0 | 8 | Host request<br>Modbus Trigger |
| | 0x5c01 | 0 | 8 | Host request<br>Modbus Node |
| | 0x5c02 | 0 | 8 | Host request<br>Modbus Function Code |
| | 0x5c03 | 0 | 8 | Host request Modbus<br>Data 0 |
| | 0x5c04 | 0 | 8 | Host request Modbus<br>Data 0 |
| | 0x5c05 | 0 | 8 | Host request Modbus<br>Data 0 |
| | 0x5c06 | 0 | 8 | Host request Modbus<br>Data 0 |
| 0x1601<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 1 | 16 | Local Setpoin<br>zone 1 |
| | 0x20fc | 1 | 16 | Manual output power<br>zone 1 |
| | 0x2131 | 1 | 16 | Controller status<br>zone 1 |
| 0x1602<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 2 | 16 | Local Setpoin<br>zone 2 |
| | 0x20fc | 2 | 16 | Manual output power<br>zone 2 |
| | 0x2131 | 2 | 16 | Controller status<br>zone 2 |
| 0x1603<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 3 | 16 | Local Setpoin<br>zone 3 |
| | 0x20fc | 3 | 16 | Manual output power<br>zone 3 |
| | 0x2131 | 3 | 16 | Controller status<br>zone 3 |
| 0x1604<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 4 | 16 | Local Setpoin<br>zone 4 |
| | 0x20fc | 4 | 16 | Manual output power<br>zone 4 |
| | 0x2131 | 4 | 16 | Controller status<br>zone 4 |
| 0x1605<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 5 | 16 | Local Setpoin<br>zone 5 |
| | 0x20fc | 5 | 16 | Manual output power<br>zone 5 |
| | 0x2131 | 5 | 16 | Controller status<br>zone 5 |
| 0x1606<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 6 | 16 | Local Setpoin<br>zone 6 |
| | 0x20fc | 6 | 16 | Manual output power<br>zone 6 |
| | 0x2131 | 6 | 16 | Controller status<br>zone 6 |

| **Nr. PDO in Rx** | **index** | **subindex** | **Size in bits** | **Comment** |
|---|---|---|---|---|
| 0x1607<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 7 | 16 | Local Setpoin<br>zone 7 |
|  | 0x20fc | 7 | 16 | Manual output power<br>zone 7 |
|  | 0x2131 | 7 | 16 | Controller status<br>zone 7 |
| 0x1608<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 8 | 16 | Local Setpoin<br>zone 8 |
|  | 0x20fc | 8 | 16 | Manual output power<br>zone 8 |
|  | 0x2131 | 8 | 16 | Controller status<br>zone 8 |
| 0x1609<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 9 | 16 | Local Setpoin<br>zone 9 |
|  | 0x20fc | 9 | 16 | Manual output power<br>zone 9 |
|  | 0x2131 | 9 | 16 | Controller status<br>zone 9 |
| 0x160a<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 10 | 16 | Local Setpoin<br>zone 10 |
|  | 0x20fc | 10 | 16 | Manual output power<br>zone 10 |
|  | 0x2131 | 10 | 16 | Controller status<br>zone 10 |
| 0x160b<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 11 | 16 | Local Setpoin<br>zone 11 |
|  | 0x20fc | 11 | 16 | Manual output power<br>zone 11 |
|  | 0x2131 | 11 | 16 | Controller status<br>zone 11 |
| 0x160c<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 12 | 16 | Local Setpoin<br>zone 12 |
|  | 0x20fc | 12 | 16 | Manual output power<br>zone 12 |
|  | 0x2131 | 12 | 16 | Controller status<br>zone 12 |
| 0x160d<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 13 | 16 | Local Setpoin<br>zone 13 |
|  | 0x20fc | 13 | 16 | Manual output power<br>zone 13 |
|  | 0x2131 | 13 | 16 | Controller status<br>zone 13 |
| 0x160e<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 14 | 16 | Local Setpoin<br>zone 14 |
|  | 0x20fc | 14 | 16 | Manual output power<br>zone 14 |
|  | 0x2131 | 14 | 16 | Controller status<br>zone 14 |
| 0x160f<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 15 | 16 | Local Setpoin<br>zone 15 |
|  | 0x20fc | 15 | 16 | Manual output power<br>zone 15 |
|  | 0x2131 | 15 | 16 | Controller status<br>zone 15 |

**7.1. Description of pdos in reception for GFX4 with 20 zone**

## 7.1. Description of pdos in reception for GFX4 with 20 zone

| Nr. PDO in Rx | index | subindex | Size in bits | Comment |
|---|---|---|---|---|
| 0x1610<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 16 | 16 | Local Setpoin<br>zone 16 |
| | 0x20fc | 16 | 16 | Manual output power<br>zone 16 |
| | 0x2131 | 16 | 16 | Controller status<br>zone 16 |
| 0x1611<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 17 | 16 | Local Setpoin<br>zone 17 |
| | 0x20fc | 17 | 16 | Manual output power<br>zone 17 |
| | 0x2131 | 17 | 16 | Controller status<br>zone 17 |
| 0x1612<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 18 | 16 | Local Setpoin<br>zone 18 |
| | 0x20fc | 18 | 16 | Manual output power<br>zone 18 |
| | 0x2131 | 18 | 16 | Controller status<br>zone 18 |
| 0x1613<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 19 | 16 | Local Setpoin<br>zone 19 |
| | 0x20fc | 19 | 16 | Manual output power<br>zone 19 |
| | 0x2131 | 19 | 16 | Controller status<br>zone 19 |
| 0x1614<br>(size 6 bytes)<br>Optional configurable | 0x2010 | 20 | 16 | Local Setpoin<br>zone 20 |
| | 0x20fc | 20 | 16 | Manual output power<br>zone 20 |
| | 0x2131 | 20 | 16 | Controller status<br>zone 20 |
| **TOTAL PDOs IN RECEPTION = 127 BYTES** | | | | |

| Nr. PDO in Tx | index | subindex | Size in bits | Comment |
|---|---|---|---|---|
| 0x1a00<br>(size 7 bytes)<br>Optional fixed | 0x5c00 | 0 | 8 | Host response<br>Modbus Trigger |
| | 0x5c01 | 0 | 8 | Host response<br>Modbus Node |
| | 0x5c02 | 0 | 8 | Host response<br>Modbus Function Code |
| | 0x5c03 | 0 | 8 | Host response<br>Modbus Data 0 |
| | 0x5c04 | 0 | 8 | Host response<br>Modbus Data 0 |
| | 0x5c05 | 0 | 8 | Host response<br>Modbus Data 0 |
| | 0x5c06 | 0 | 8 | Host response<br>Modbus Data 0 |
| 0x1a01<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 1 | 16 | Process variable<br>zone 1 |
| | 0x31d3 | 1 | 16 | Controller status<br>zone 1 |
| | 0x3002 | 1 | 16 | Output power<br>zone 1 |
| | 0x31d4 | 1 | 16 | Ammeter input On 1<br>zone 1 |
| 0x1a02<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 2 | 16 | Process variable<br>zone 2 |
| | 0x31d3 | 2 | 16 | Controller status<br>zone 2 |
| | 0x3002 | 2 | 16 | Output power<br>zone 2 |
| | 0x31d4 | 2 | 16 | Ammeter input On 1<br>zone 2 |
| 0x1a03<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 3 | 16 | Process variable<br>zone 3 |
| | 0x31d3 | 3 | 16 | Controller status<br>zone 3 |
| | 0x3002 | 3 | 16 | Output power<br>zone 3 |
| | 0x31d4 | 3 | 16 | Ammeter input On 1<br>zone 3 |
| 0x1a04<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 4 | 16 | Process variable<br>zone 4 |
| | 0x31d3 | 4 | 16 | Controller status<br>zone 4 |
| | 0x3002 | 4 | 16 | Output power<br>zone 4 |
| | 0x31d4 | 4 | 16 | Ammeter input On 1<br>zone 4 |

## 7.2. Description of pdos in transmission for GFX4 with 20 zone

| Nr. PDO in Tx | index | subindex | Size in bits | Comment |
|---|---|---|---|---|
| 0x1a05<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 5 | 16 | Process variable<br>zone 5 |
| | 0x31d3 | 5 | 16 | Controller status<br>zone 5 |
| | 0x3002 | 5 | 16 | Output power<br>zone 5 |
| | 0x31d4 | 5 | 16 | Ammeter input On 1<br>zone 5 |
| 0x1a06<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 6 | 16 | Process variable<br>zone 6 |
| | 0x31d3 | 6 | 16 | Controller status<br>zone 6 |
| | 0x3002 | 6 | 16 | Output power<br>zone 6 |
| | 0x31d4 | 6 | 16 | Ammeter input On 1<br>zone 6 |
| 0x1a07<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 7 | 16 | Process variable<br>zone 7 |
| | 0x31d3 | 7 | 16 | Controller status<br>zone 7 |
| | 0x3002 | 7 | 16 | Output power<br>zone 7 |
| | 0x31d4 | 7 | 16 | Ammeter input On 1<br>zone 7 |
| 0x1a08<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 8 | 16 | Process variable<br>zone 8 |
| | 0x31d3 | 8 | 16 | Controller status<br>zone 8 |
| | 0x3002 | 8 | 16 | Output power<br>zone 8 |
| | 0x31d4 | 8 | 16 | Ammeter input On 1<br>zone 8 |
| 0x1a09<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 9 | 16 | Process variable<br>zone 9 |
| | 0x31d3 | 9 | 16 | Controller status<br>zone 9 |
| | 0x3002 | 9 | 16 | Output power<br>zone 9 |
| | 0x31d4 | 9 | 16 | Ammeter input On 1<br>zone 9 |
| 0x1a0a<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 10 | 16 | Process variable<br>zone 10 |
| | 0x31d3 | 10 | 16 | Controller status<br>zone 10 |
| | 0x3002 | 10 | 16 | Output power<br>zone 10 |
| | 0x31d4 | 10 | 16 | Ammeter input On 1<br>zone 10 |
| 0x1a0b<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 11 | 16 | Process variable<br>zone 11 |
| | 0x31d3 | 11 | 16 | Controller status<br>zone 11 |
| | 0x3002 | 11 | 16 | Output power<br>zone 11 |
| | 0x31d4 | 11 | 16 | Ammeter input On 1<br>zone 11 |

## 7.2. Description of pdos in transmission for GFX4 with 20 zone

| Nr. PDO in Tx | index | subindex | Size in bits | Comment |
|---|---|---|---|---|
| 0x1a0c<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 12 | 16 | Process variable zone 12 |
| | 0x31d3 | 12 | 16 | Controller status zone 12 |
| | 0x3002 | 12 | 16 | Output power zone 12 |
| | 0x31d4 | 12 | 16 | Ammeter input On 1 zone 12 |
| 0x1a0d<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 13 | 16 | Process variable zone 13 |
| | 0x31d3 | 13 | 16 | Controller status zone 13 |
| | 0x3002 | 13 | 16 | Output power zone 13 |
| | 0x31d4 | 13 | 16 | Ammeter input On 1 zone 13 |
| 0x1a0e<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 14 | 16 | Process variable zone 14 |
| | 0x31d3 | 14 | 16 | Controller status zone 14 |
| | 0x3002 | 14 | 16 | Output power zone 14 |
| | 0x31d4 | 14 | 16 | Ammeter input On 1 zone 14 |
| 0x1a0f<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 15 | 16 | Process variable zone 15 |
| | 0x31d3 | 15 | 16 | Controller status zone 15 |
| | 0x3002 | 15 | 16 | Output power zone 15 |
| | 0x31d4 | 15 | 16 | Ammeter input On 1 zone 15 |
| 0x1a10<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 16 | 16 | Process variable zone 16 |
| | 0x31d3 | 16 | 16 | Controller status zone 16 |
| | 0x3002 | 16 | 16 | Output power zone 16 |
| | 0x31d4 | 16 | 16 | Ammeter input On 1 zone 16 |
| 0x1a11<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 17 | 16 | Process variable zone 17 |
| | 0x31d3 | 17 | 16 | Controller status zone 17 |
| | 0x3002 | 17 | 16 | Output power zone 17 |
| | 0x31d4 | 17 | 16 | Ammeter input On 1 zone 17 |
| 0x1a12<br>(size 8 bytes)<br>Optional configurable | 0x3000 | 18 | 16 | Process variable zone 18 |
| | 0x31d3 | 18 | 16 | Controller status zone 18 |
| | 0x3002 | 18 | 16 | Output power zone 18 |
| | 0x31d4 | 18 | 16 | Ammeter input On 1 zone 18 |

## 7.2. Description of pdos in transmission for GFX4 with 20 zone

| Nr. PDO in Tx | index | subindex | Size in bits | Comment |
|---|---|---|---|---|
| 0x1a13 (size 8 bytes) Optional configurable | 0x3000 | 19 | 16 | Process variable zone 19 |
| | 0x31d3 | 19 | 16 | Controller status zone 19 |
| | 0x3002 | 19 | 16 | Output power zone 19 |
| | 0x31d4 | 19 | 16 | Ammeter input On 1 zone 19 |
| 0x1a14 (size 8 bytes) Optional configurable | 0x3000 | 20 | 16 | Process variable zone 20 |
| | 0x31d3 | 20 | 16 | Controller status zone 20 |
| | 0x3002 | 20 | 16 | Output power zone 20 |
| | 0x31d4 | 20 | 16 | Ammeter input On 1 zone 20 |
| **TOTAL PDOs IN TRANSMISSION = 167 BYTES** | | | | |

The xml file also contains the initialization of the 0x5c07 object, which can have the following meanings:

| Safe Fault Mode Object in case of absence of network link | | | |
|---|---|---|---|
| Index | Subindex | Admitted values | Description |
| 0x5c07 | 0 | 0 (default) | No action |
| | | 1 | Controllers Software OFF |
| | | 2 | Controllers in manual |
| | | 3 | Sets value Sp2 |

# 8 · OBJECT DICTIONARY (SDO)

## 8.1. GFX4

| Index (Hex) | Sub Index | Description | Data Type | Acc. | Add. (Dec) |
|---|---|---|---|---|---|
| 1000 | | Device Type | uns16 | ro | - |
| 1008 | | Manufacturer device name | uns16 | ro | - |
| 1009 | | Manufacturer Hardware version | uns16 | ro | - |
| 100a | | Manufacturer Software version | uns16 | ro | - |
| 1018 | 0÷4 | Identity Object | uns16 | ro | - |
| 1600 | 0÷n [1] | 1st Receive PDO Mapping | uns16 | ro | - |
| 1601 | 0÷n [1] | 2nd Receive PDO Mapping | uns16 | rw | - |
| 1602 | 0÷n [1] | 3rd Receive PDO Mapping | uns16 | rw | - |
| 1603 | 0÷n [1] | 4th Receive PDO Mapping | uns16 | rw | - |
| 1604 | 0÷n [1] | 5th Receive PDO Mapping | uns16 | rw | - |
| 1605 | 0÷n [1] | 6th Receive PDO Mapping | uns16 | rw | - |
| 1606 | 0÷n [1] | 7th Receive PDO Mapping | uns16 | rw | - |
| 1607 | 0÷n [1] | 8th Receive PDO Mapping | uns16 | rw | - |
| 1608 | 0÷n [1] | 9th Receive PDO Mapping | uns16 | rw | - |
| 1609 | 0÷n [1] | 10th Receive PDO Mapping | uns16 | rw | - |
| 160A | 0÷n [1] | 11th Receive PDO Mapping | uns16 | rw | - |
| 160B | 0÷n [1] | 12th Receive PDO Mapping | uns16 | rw | - |
| 160C | 0÷n [1] | 13th Receive PDO Mapping | uns16 | rw | - |
| 160D | 0÷n [1] | 14th Receive PDO Mapping | uns16 | rw | - |
| 160E | 0÷n [1] | 15th Receive PDO Mapping | uns16 | rw | - |
| 160F | 0÷n [1] | 16th Receive PDO Mapping | uns16 | rw | - |
| 1610 | 0÷n [1] | 17th Receive PDO Mapping | uns16 | rw | - |
| 1611 | 0÷n [1] | 18th Receive PDO Mapping | uns16 | rw | - |
| 1612 | 0÷n [1] | 19th Receive PDO Mapping | uns16 | rw | - |
| 1613 | 0÷n [1] | 20th Receive PDO Mapping | uns16 | rw | - |
| 1614 | 0÷n [1] | 21th Receive PDO Mapping | uns16 | rw | - |
| 1A00 | 0÷n [1] | 1st Transmit PDO Mapping | uns16 | ro | - |
| 1A01 | 0÷n [1] | 2nd Transmit PDO Mapping | uns16 | rw | - |
| 1A02 | 0÷n [1] | 3rd Transmit PDO Mapping | uns16 | rw | - |
| 1A03 | 0÷n [1] | 4th Transmit PDO Mapping | uns16 | rw | - |
| 1A04 | 0÷n [1] | 5th Transmit PDO Mapping | uns16 | rw | - |
| 1A05 | 0÷n [1] | 6th Transmit PDO Mapping | uns16 | rw | - |
| 1A06 | 0÷n [1] | 7th Transmit PDO Mapping | uns16 | rw | - |
| 1A07 | 0÷n [1] | 8th Transmit PDO Mapping | uns16 | rw | - |
| 1A08 | 0÷n [1] | 9th Transmit PDO Mapping | uns16 | rw | - |
| 1A09 | 0÷n [1] | 10th Transmit PDO Mapping | uns16 | rw | - |
| 1A0A | 0÷n [1] | 11th Transmit PDO Mapping | uns16 | rw | - |
| 1A0B | 0÷n [1] | 12th Transmit PDO Mapping | uns16 | rw | - |
| 1A0C | 0÷n [1] | 13th Transmit PDO Mapping | uns16 | rw | - |
| 1A0D | 0÷n [1] | 14th Transmit PDO Mapping | uns16 | rw | - |
| 1A0E | 0÷n [1] | 15th Transmit PDO Mapping | uns16 | rw | - |
| 1A0F | 0÷n [1] | 16th Transmit PDO Mapping | uns16 | rw | - |
| 1A10 | 0÷n [1] | 17th Transmit PDO Mapping | uns16 | rw | - |
| 1A11 | 0÷n [1] | 18th Transmit PDO Mapping | uns16 | rw | - |
| 1A12 | 0÷n [1] | 19th Transmit PDO Mapping | uns16 | rw | - |
| 1A13 | 0÷n [1] | 20th Transmit PDO Mapping | uns16 | rw | - |
| 1A14 | 0÷n [1] | 21th Transmit PDO Mapping | uns16 | rw | - |

| Index (Hex) | Sub Index | Description | Data Type | Acc. | Add. (Dec) |
|---|---|---|---|---|---|
| | | **8.1. GFX4** | | | |
| 2005 | 0÷20 (2) | Heating proportional band | uns16 | rw | 5 |
| 2006 | 0÷20 (2) | Cooling proportional band | uns16 | rw | 6 |
| 2007 | 0÷20 (2) | Heating integral time | uns16 | rw | 7 |
| 2008 | 0÷20 (2) | Heating derivative time | uns16 | rw | 8 |
| 2009 | 0÷20 (2) | Cycle time Out1 (fast) | uns16 | rw | 9 |
| 200A | 0÷20 (2) | Scale minimum limit | int16 | rw | 10 |
| 200B | 0÷20 (2) | Scale maximum limit | int16 | rw | 11 |
| 200C | 0÷20 (2) | Alarm 1 set (if realitve) | int16 | rw | 12 |
| 200D | 0÷20 (2) | Alarm 2 set (if realitve) | int16 | rw | 13 |
| 200E | 0÷20 (2) | Alarm 3 set (if realitve) | int16 | rw | 14 |
| 2010 | 0÷20 (2) | Local setpoint | int16 | rw | 16 |
| 2012 | 0÷20 (2) | Remote setpoint type | uns16 | rw | 18 |
| 2014 | 0÷20 (2) | Lower limit for setting setpoint | int16 | rw | 20 |
| 2015 | 0÷20 (2) | Upper limit for setting setpoint | int16 | rw | 21 |
| 2016 | 0÷20 (2) | Set gradient | uns16 | rw | 22 |
| 2017 | 0÷20 (2) | Main input offset correction | int16 | rw | 23 |
| 2018 | 0÷20 (2) | Digital filter on Main input | int16 | rw | 24 |
| 201B | 0÷20 (2) | Hysteresis alarm1 | int16 | rw | 27 |
| 201E | 0÷20 (2) | Hysteresis alarm2 | int16 | rw | 30 |
| 201F | 0÷20 (2) | Enabling Selftuning,Autotuning,Softstart | uns16 | rw | 31 |
| 2027 | 0÷20 (2) | SetPoint for cooling relative to Heating | int16 | rw | 39 |
| 202A | 0÷20 (2) | Heating maximum power limit | uns16 | rw | 42 |
| 202B | 0÷20 (2) | Cooling maximum power limit | uns16 | rw | 43 |
| 202C | 0÷20 (2) | Waiting time for LBA alarm intervention | uns16 | rw | 44 |
| 202D | 0÷20 (2) | Baud rate selection of serial1 | uns16 | rw | 45 |
| 202F | 0÷20 (2) | Parity selection of serial1 | uns16 | rw | 47 |
| 2035 | 0÷20 (2) | Hysteresis alarm 3 | int16 | rw | 53 |
| 2036 | 0÷20 (2) | Alarm type 3 | uns16 | rw | 54 |
| 2037 | 0÷20 (2) | Alarm HB input1 | uns16 | rw | 55 |
| 2038 | 0÷20 (2) | Waiting time for HB alarm intervention | uns16 | rw | 56 |
| 2039 | 0÷20 (2) | Alarm type HB | uns16 | rw | 57 |
| 203A | 0÷20 (2) | Alarm 4 set (if realitve) | int16 | rw | 58 |
| 203B | 0÷20 (2) | Hysteresis alarm 4 | int16 | rw | 59 |
| 204C | 0÷20 (2) | Cooling integral time | uns16 | rw | 76 |
| 204D | 0÷20 (2) | Cooling derivative time | uns16 | rw | 77 |
| 204E | 0÷20 (2) | Manual reset | int16 | rw | 78 |
| 204F | 0÷20 (2) | Antireset | uns16 | rw | 79 |
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| 2056 | 0÷20 (2) | Custom scale point0 | int16 | rw | 86 |
| 2057 | 0÷20 (2) | Custom scale point1 | int16 | rw | 87 |
| 2058 | 0÷20 (2) | Custom scale point2 | int16 | rw | 88 |
| 2059 | 0÷20 (2) | Custom scale point3 | int16 | rw | 89 |
| 205A | 0÷20 (2) | Custom scale point4 | int16 | rw | 90 |
| 205B | 0÷20 (2) | Custom scale point5 | int16 | rw | 91 |
| 205C | 0÷20 (2) | Custom scale point6 | int16 | rw | 92 |
| 205D | 0÷20 (2) | Custom scale point7 | int16 | rw | 93 |
| 205E | 0÷20 (2) | Custom scale point8 | int16 | rw | 94 |
| 205F | 0÷20 (2) | Custom scale point9 | int16 | rw | 95 |

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| | | **8.1. GFX4** | | | |
| 2060 | 0÷20 [2] | Custom scale point10 | int16 | rw | 96 |
| 2061 | 0÷20 [2] | Custom scale point11 | int16 | rw | 97 |
| 2062 | 0÷20 [2] | Custom scale point12 | int16 | rw | 98 |
| 2063 | 0÷20 [2] | Custom scale point13 | int16 | rw | 99 |
| 2064 | 0÷20 [2] | Custom scale point14 | int16 | rw | 100 |
| 2065 | 0÷20 [2] | Custom scale point15 | int16 | rw | 101 |
| 2066 | 0÷20 [2] | Custom scale point16 | int16 | rw | 102 |
| 2067 | 0÷20 [2] | Custom scale point17 | int16 | rw | 103 |
| 2068 | 0÷20 [2] | Custom scale point18 | int16 | rw | 104 |
| 2069 | 0÷20 [2] | Custom scale point19 | int16 | rw | 105 |
| 206A | 0÷20 [2] | Custom scale point20 | int16 | rw | 106 |
| 206B | 0÷20 [2] | Custom scale point21 | int16 | rw | 107 |
| 206C | 0÷20 [2] | Custom scale point22 | int16 | rw | 108 |
| 206D | 0÷20 [2] | Custom scale point23 | int16 | rw | 109 |
| 206E | 0÷20 [2] | Custom scale point24 | int16 | rw | 110 |
| 206F | 0÷20 [2] | Custom scale point25 | int16 | rw | 111 |
| 2070 | 0÷20 [2] | Custom scale point26 | int16 | rw | 112 |
| 2071 | 0÷20 [2] | Custom scale point27 | int16 | rw | 113 |
| 2072 | 0÷20 [2] | Custom scale point28 | int16 | rw | 114 |
| 2073 | 0÷20 [2] | Custom scale point29 | int16 | rw | 115 |
| 2074 | 0÷20 [2] | Custom scale point30 | int16 | rw | 116 |
| 2075 | 0÷20 [2] | Custom scale point31 | int16 | rw | 117 |
| 2076 | 0÷20 [2] | Custom scale point32 | int16 | rw | 118 |
| 2077 | 0÷20 [2] | Power limit for LBA alarm | int16 | rw | 119 |
| 208C | 0÷20 [2] | Digital input function | uns16 | rw | 140 |
| 209F | 0÷20 [2] | Cycle time Out2 (fast) | uns16 | rw | 159 |
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| 20A3 | 0÷20 [2] | RL.2 allocation of reference signal | uns16 | rw | 163 |
| 20A6 | 0÷20 [2] | RL.3 allocation of reference signal | uns16 | rw | 166 |
| 20AA | 0÷20 [2] | RL.4 allocation of reference signal | uns16 | rw | 170 |
| 20AB | 0÷20 [2] | RL.5 allocation of reference signal | uns16 | rw | 171 |
| 20AC | 0÷20 [2] | RL.6 allocation of reference signal | uns16 | rw | 172 |
| 20B3 | 0÷20 [2] | Main input digital filter | uns16 | rw | 179 |
| 20B4 | 0÷20 [2] | Control type | uns16 | rw | 180 |
| 20B5 | 0÷20 [2] | Auxiliary analogue input function | uns16 | rw | 181 |
| 20BF | 0÷20 [2] | Hardware configuration1 | uns16 | rw | 191 |
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| 20C5 | 0÷20 [2] | Function of status led RUN | uns16 | rw | 197 |
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| 20E6 | 0÷20 (2) | Setpoint1 | int16 | rw | 230 |
| 20E7 | 0÷20 (2) | Setpoint2 | int16 | rw | 231 |
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| 2196 | 0÷20 (2) | Alarm type1 | uns16 | rw | 406 |
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| 2198 | 0÷20 (2) | Alarm type3 | uns16 | rw | 408 |
| 2199 | 0÷20 (2) | Alarm type4 | uns16 | rw | 409 |
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| 219B | 0÷20 (2) | Auxiliary input TV offset correction | int16 | rw | 411 |
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| 21A0 | 0÷20 (2) | Auxiliary input offset correction TA2 of | int16 | rw | 416 |
| 21A1 | 0÷20 (2) | Auxiliary input maximum range TV2 of | uns16 | rw | 417 |
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| 21F6 | 0÷20 (2) | Alarm HB input2 | uns16 | rw | 502 |
| 21F7 | 0÷20 (2) | Alarm HB input3 | uns16 | rw | 503 |
| 21F9 | 0÷20 (2) | Reference voltage for manual power correction | uns16 | rw | 505 |
| 21FA | 0÷20 (2) | Manual power correction | uns16 | rw | 506 |
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| 2261 | 0÷20 [2] | Allocation of output OUT3 | uns16 | rw | 609 |
| 2262 | 0÷20 [2] | Allocation of output OUT4 | uns16 | rw | 610 |
| 2263 | 0÷20 [2] | Allocation of output OUT5 | uns16 | rw | 611 |
| 2264 | 0÷20 [2] | Allocation of output OUT6 | uns16 | rw | 612 |
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| 2267 | 0÷20 [2] | Allocation of output OUT9 | uns16 | rw | 615 |
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| 2294 | 0÷20 [2] | Hardware configuration 2:diagnostic alarms | uns16 | rw | 660 |
| 2295 | 0÷20 [2] | Frequency for alarms: SCR_SHORT and NO_CURRENT | uns16 | rw | 661 |
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| 22BC | 0÷20 [2] | Software off mode | uns16 | rw | 700 |
| 3000 | 0÷20 [2] | Process Value | int16 | ro | 0 |
| 3001 | 0÷20 [2] | Active SetPoint | int16 | ro | 1 |
| 3002 | 0÷20 [2] | Output power | int16 | ro | 2 |
| 3004 | 0÷20 [2] | Deviation | uns16 | ro | 4 |
| 3055 | 0÷20 [2] | Self-Diagnostic error code | uns16 | ro | 85 |
| 307A | 0÷20 [2] | Software Version | uns16 | ro | 122 |
| 308B | 0÷20 [2] | TA1 input value | uns16 | ro | 139 |
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| 30E3 | 0÷20 [2] | Ammeter input1 | uns16 | ro | 227 |
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| 313D | 0÷20 [2] | Digital input status | uns16 | ro | 317 |
| 313F | 0÷20 [2] | Digital output status | uns16 | ro | 319 |
| 3142 | 0÷20 [2] | Voltm. input1 f. | uns16 | ro | 322 |
| 31D3 | 0÷20 [2] | Controller Status | uns16 | ro | 467 |
| 31D4 | 0÷20 [2] | Ammeter Input 1 On | uns16 | ro | 468 |
| 31D5 | 0÷20 [2] | Alarm HB Status | uns16 | ro | 469 |
| 31EA | 0÷20 [2] | Ammeter Input 2 | uns16 | ro | 490 |

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| | | **8.1. GFX4** | | | |
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| 31EC | 0÷20 [2] | Voltmetric input 2 | uns16 | ro | 492 |
| 31ED | 0÷20 [2] | Voltmetric input 3 | uns16 | ro | 493 |
| 31EE | 0÷20 [2] | Ammeter input2 f. | uns16 | ro | 494 |
| 31EF | 0÷20 [2] | Ammeter input3 f. | uns16 | ro | 495 |
| 31F0 | 0÷20 [2] | Voltm. input2 f. | uns16 | ro | 496 |
| 31F1 | 0÷20 [2] | Voltm. input3 f. | uns16 | ro | 497 |
| 31F2 | 0÷20 [2] | Ammeter Input 2 On | uns16 | ro | 498 |
| 31F3 | 0÷20 [2] | Ammeter Input 3 On | uns16 | ro | 499 |
| 31F8 | 0÷20 [2] | Alarm status HB | uns16 | ro | 504 |
| 31FB | 0÷20 [2] | Power saved in ON-OFF=OFF | int16 | ro | 507 |
| 31FD | 0÷20 [2] | GFX 15A fuse status | uns16 | ro | 509 |
| 3200 | 0÷20 [2] | Alstate | uns16 | ro | 512 |
| 325A | 0÷20 [2] | Auxiliary Input | int16 | ro | 602 |
| 325E | 0÷20 [2] | Auxiliary Input self-diagnostic error code | uns16 | ro | 606 |
| 3278 | 0÷20 [2] | Status_strumento2 | uns16 | ro | 632 |
| 3279 | 0÷20 [2] | Status_strumento3 | uns16 | ro | 633 |
| 327A | 0÷20 [2] | Status_strumento4 | uns16 | ro | 634 |
| 328F | 0÷20 [2] | INPTC | uns16 | ro | 655 |
| 3298 | 0÷20 [2] | Output out.x status MASKOUT | uns16 | ro | 664 |
| 3299 | 0÷20 [2] | IN_TA_ON_DIAG | uns16 | ro | 665 |
| 329A | 0÷20 [2] | IN_TA_OFF_DIAG | uns16 | ro | 666 |
| 329B | 0÷20 [2] | IN_TV_ON_DIAG | uns16 | ro | 667 |
| 329C | 0÷20 [2] | IN_TV_OFF_DIAG | uns16 | ro | 668 |
| 32F4 | 0÷20 [2] | Ammeter input1 f. | int16 | ro | 756 |
| 5C07 | 0 | Safe Fault mode | uns16 | ro | |

**Note:**

[1] Depending on number of PDOs you intend to use

[2] Depending on number of connected zone

| | | 8.2. GFX4-IR | | | |
|---|---|---|---|---|---|
| Index (Hex) | Sub Index | Description | Data Type | Acc. | Add. (Dec) |
| 1000 | 0 | Device Type | uns16 | ro | - |
| 1008 | 0 | Manufacturer device name | uns16 | ro | - |
| 1009 | 0 | Manufacturer Hardware version | uns16 | ro | - |
| 100A | 0 | Manufacturer Software version | uns16 | ro | - |
| 1018 | 0÷4 | Identity Object | uns16 | ro | - |
| 1600 | 0÷n [1] | 1st Receive PDO Mapping | uns16 | ro | - |
| 1601 | 0÷n [1] | 2nd Receive PDO Mapping | uns16 | rw | - |
| 1602 | 0÷n [1] | 3rd Receive PDO Mapping | uns16 | rw | - |
| 1603 | 0÷n [1] | 4th Receive PDO Mapping | uns16 | rw | - |
| 1604 | 0÷n [1] | 5th Receive PDO Mapping | uns16 | rw | - |
| 1605 | 0÷n [1] | 6th Receive PDO Mapping | uns16 | rw | - |
| 1606 | 0÷n [1] | 7th Receive PDO Mapping | uns16 | rw | - |
| 1607 | 0÷n [1] | 8th Receive PDO Mapping | uns16 | rw | - |
| 1608 | 0÷n [1] | 9th Receive PDO Mapping | uns16 | rw | - |
| 1609 | 0÷n [1] | 10th Receive PDO Mapping | uns16 | rw | - |
| 160A | 0÷n [1] | 11th Receive PDO Mapping | uns16 | rw | - |
| 160B | 0÷n [1] | 12th Receive PDO Mapping | uns16 | rw | - |
| 160C | 0÷n [1] | 13th Receive PDO Mapping | uns16 | rw | - |
| 160D | 0÷n [1] | 14th Receive PDO Mapping | uns16 | rw | - |
| 160E | 0÷n [1] | 15th Receive PDO Mapping | uns16 | rw | - |
| 160F | 0÷n [1] | 16th Receive PDO Mapping | uns16 | rw | - |
| 1610 | 0÷n [1] | 17th Receive PDO Mapping | uns16 | rw | - |
| 1611 | 0÷n [1] | 18th Receive PDO Mapping | uns16 | rw | - |
| 1612 | 0÷n [1] | 19th Receive PDO Mapping | uns16 | rw | - |
| 1613 | 0÷n [1] | 20th Receive PDO Mapping | uns16 | rw | - |
| 1614 | 0÷n [1] | 21th Receive PDO Mapping | uns16 | rw | - |
| 1A00 | 0÷n [1] | 1st Transmit PDO Mapping | uns16 | ro | - |
| 1A01 | 0÷n [1] | 2nd Transmit PDO Mapping | uns16 | rw | - |
| 1A02 | 0÷n [1] | 3rd Transmit PDO Mapping | uns16 | rw | - |
| 1A03 | 0÷n [1] | 4th Transmit PDO Mapping | uns16 | rw | - |
| 1A04 | 0÷n [1] | 5th Transmit PDO Mapping | uns16 | rw | - |
| 1A05 | 0÷n [1] | 6th Transmit PDO Mapping | uns16 | rw | - |
| 1A06 | 0÷n [1] | 7th Transmit PDO Mapping | uns16 | rw | - |
| 1A07 | 0÷n [1] | 8th Transmit PDO Mapping | uns16 | rw | - |
| 1A08 | 0÷n [1] | 9th Transmit PDO Mapping | uns16 | rw | - |
| 1A09 | 0÷n [1] | 10th Transmit PDO Mapping | uns16 | rw | - |
| 1A0A | 0÷n [1] | 11th Transmit PDO Mapping | uns16 | rw | - |
| 1A0B | 0÷n [1] | 12th Transmit PDO Mapping | uns16 | rw | - |
| 1A0C | 0÷n [1] | 13th Transmit PDO Mapping | uns16 | rw | - |
| 1A0D | 0÷n [1] | 14th Transmit PDO Mapping | uns16 | rw | - |
| 1A0E | 0÷n [1] | 15th Transmit PDO Mapping | uns16 | rw | - |
| 1A0F | 0÷n [1] | 16th Transmit PDO Mapping | uns16 | rw | - |
| 1A10 | 0÷n [1] | 17th Transmit PDO Mapping | uns16 | rw | - |
| 1A11 | 0÷n [1] | 18th Transmit PDO Mapping | uns16 | rw | - |
| 1A12 | 0÷n [1] | 19th Transmit PDO Mapping | uns16 | rw | - |
| 1A13 | 0÷n [1] | 20th Transmit PDO Mapping | uns16 | rw | - |
| 1A14 | 0÷n [1] | 21th Transmit PDO Mapping | uns16 | rw | - |
| 2005 | 0÷20 [2] | Heating proportional band | uns16 | rw | 5 |

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| | | **8.2. GFX4-IR** | | | |
| 2006 | 0÷20 (2) | Cooling proportional band | uns16 | rw | 6 |
| 2007 | 0÷20 (2) | Heating integral time | uns16 | rw | 7 |
| 2008 | 0÷20 (2) | Heating derivative time | uns16 | rw | 8 |
| 2009 | 0÷20 (2) | Cycle time Out1 (fast) | uns16 | rw | 9 |
| 200A | 0÷20 (2) | Scale minimum limit | int16 | rw | 10 |
| 200B | 0÷20 (2) | Scale maximum limit | int16 | rw | 11 |
| 200C | 0÷20 (2) | Alarm 1 set (if realitve) | int16 | rw | 12 |
| 200D | 0÷20 (2) | Alarm 2 set (if realitve) | int16 | rw | 13 |
| 200E | 0÷20 (2) | Alarm 3 set (if realitve) | int16 | rw | 14 |
| 2010 | 0÷20 (2) | Local setpoint | int16 | rw | 16 |
| 2012 | 0÷20 (2) | Remote setpoint type | uns16 | rw | 18 |
| 2014 | 0÷20 (2) | Lower limit for setting setpoint | int16 | rw | 20 |
| 2015 | 0÷20 (2) | Upper limit for setting setpoint | int16 | rw | 21 |
| 2016 | 0÷20 (2) | Set gradient | uns16 | rw | 22 |
| 2017 | 0÷20 (2) | Main input offset correction | int16 | rw | 23 |
| 2018 | 0÷20 (2) | Digital filter on Main input | int16 | rw | 24 |
| 201B | 0÷20 (2) | Hysteresis alarm1 | int16 | rw | 27 |
| 201E | 0÷20 (2) | Hysteresis alarm2 | int16 | rw | 30 |
| 201F | 0÷20 (2) | Enabling Selftuning,Autotuning,Softstart | uns16 | rw | 31 |
| 2027 | 0÷20 (2) | SetPoint for cooling relative to Heating | int16 | rw | 39 |
| 202A | 0÷20 (2) | Heating maximum power limit | uns16 | rw | 42 |
| 202B | 0÷20 (2) | Cooling maximum power limit | uns16 | rw | 43 |
| 202C | 0÷20 (2) | Waiting time for LBA alarm intervention | uns16 | rw | 44 |
| 202D | 0÷20 (2) | Baud rate selection of serial1 | uns16 | rw | 45 |
| 202F | 0÷20 (2) | Parity selection of serial1 | uns16 | rw | 47 |
| 2035 | 0÷20 (2) | Hysteresis alarm 3 | int16 | rw | 53 |
| 2036 | 0÷20 (2) | Alarm type 3 | uns16 | rw | 54 |
| 2037 | 0÷20 (2) | Alarm HB input1 | uns16 | rw | 55 |
| 2038 | 0÷20 (2) | Waiting time for HB alarm intervention | uns16 | rw | 56 |
| 2039 | 0÷20 (2) | Alarm type HB | uns16 | rw | 57 |
| 203A | 0÷20 (2) | Alarm 4 set (if realitve) | int16 | rw | 58 |
| 203B | 0÷20 (2) | Hysteresis alarm 4 | int16 | rw | 59 |
| 204C | 0÷20 (2) | Cooling integral time | uns16 | rw | 76 |
| 204D | 0÷20 (2) | Cooling derivative time | uns16 | rw | 77 |
| 204E | 0÷20 (2) | Manual reset | int16 | rw | 78 |
| 204F | 0÷20 (2) | Antireset | uns16 | rw | 79 |
| 2050 | 0÷20 (2) | Feedforward | int16 | rw | 80 |
| 2056 | 0÷20 (2) | Custom scale point0 | int16 | rw | 86 |
| 2057 | 0÷20 (2) | Custom scale point1 | int16 | rw | 87 |
| 2058 | 0÷20 (2) | Custom scale point2 | int16 | rw | 88 |
| 2059 | 0÷20 (2) | Custom scale point3 | int16 | rw | 89 |
| 205A | 0÷20 (2) | Custom scale point4 | int16 | rw | 90 |
| 205B | 0÷20 (2) | Custom scale point5 | int16 | rw | 91 |
| 205C | 0÷20 (2) | Custom scale point6 | int16 | rw | 92 |
| 205D | 0÷20 (2) | Custom scale point7 | int16 | rw | 93 |
| 205E | 0÷20 (2) | Custom scale point8 | int16 | rw | 94 |
| 205F | 0÷20 (2) | Custom scale point9 | int16 | rw | 95 |
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| | | **8.2. GFX4-IR** | | | |
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| 2062 | 0÷20 (2) | Custom scale point12 | int16 | rw | 98 |
| 2063 | 0÷20 (2) | Custom scale point13 | int16 | rw | 99 |
| 2064 | 0÷20 (2) | Custom scale point14 | int16 | rw | 100 |
| 2065 | 0÷20 (2) | Custom scale point15 | int16 | rw | 101 |
| 2066 | 0÷20 (2) | Custom scale point16 | int16 | rw | 102 |
| 2067 | 0÷20 (2) | Custom scale point17 | int16 | rw | 103 |
| 2068 | 0÷20 (2) | Custom scale point18 | int16 | rw | 104 |
| 2069 | 0÷20 (2) | Custom scale point19 | int16 | rw | 105 |
| 206A | 0÷20 (2) | Custom scale point20 | int16 | rw | 106 |
| 206B | 0÷20 (2) | Custom scale point21 | int16 | rw | 107 |
| 206C | 0÷20 (2) | Custom scale point22 | int16 | rw | 108 |
| 206D | 0÷20 (2) | Custom scale point23 | int16 | rw | 109 |
| 206E | 0÷20 (2) | Custom scale point24 | int16 | rw | 110 |
| 206F | 0÷20 (2) | Custom scale point25 | int16 | rw | 111 |
| 2070 | 0÷20 (2) | Custom scale point26 | int16 | rw | 112 |
| 2071 | 0÷20 (2) | Custom scale point27 | int16 | rw | 113 |
| 2072 | 0÷20 (2) | Custom scale point28 | int16 | rw | 114 |
| 2073 | 0÷20 (2) | Custom scale point29 | int16 | rw | 115 |
| 2074 | 0÷20 (2) | Custom scale point30 | int16 | rw | 116 |
| 2075 | 0÷20 (2) | Custom scale point31 | int16 | rw | 117 |
| 2076 | 0÷20 (2) | Custom scale point32 | int16 | rw | 118 |
| 2077 | 0÷20 (2) | Power limit for LBA alarm | int16 | rw | 119 |
| 208C | 0÷20 (2) | Digital input function | uns16 | rw | 140 |
| 209F | 0÷20 (2) | Cycle time Out2 (fast) | uns16 | rw | 159 |
| 20A0 | 0÷20 (2) | RL.1 allocation of reference signal | uns16 | rw | 160 |
| 20A3 | 0÷20 (2) | RL.2 allocation of reference signal | uns16 | rw | 163 |
| 20A6 | 0÷20 (2) | RL.3 allocation of reference signal | uns16 | rw | 166 |
| 20AA | 0÷20 (2) | RL.4 allocation of reference signal | uns16 | rw | 170 |
| 20AB | 0÷20 (2) | RL.5 allocation of reference signal | uns16 | rw | 171 |
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| 20B3 | 0÷20 (2) | Main input digital filter | uns16 | rw | 179 |
| 20B4 | 0÷20 (2) | Control type | uns16 | rw | 180 |
| 20B5 | 0÷20 (2) | Auxiliary analogue input function | uns16 | rw | 181 |
| 20BF | 0÷20 (2) | Hardware configuration1 | uns16 | rw | 191 |
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| 20C3 | 0÷20 (2) | Select number of enabled alarms | uns16 | rw | 195 |
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| 20D7 | 0÷20 (2) | Select signal for alarm1 | uns16 | rw | 215 |
| 20D8 | 0÷20 (2) | Select signal for alarm2 | uns16 | rw | 216 |
| 20D9 | 0÷20 (2) | Select signal for alarm3 | uns16 | rw | 217 |
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| 20E0 | 0÷20 (2) | Virtual instrument inputs | uns16 | rw | 224 |
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| | | 8.2. GFX4-IR | | | |
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| 20E6 | 0÷20 (2) | Setpoint1 | int16 | rw | 230 |
| 20E7 | 0÷20 (2) | Setpoint2 | int16 | rw | 231 |
| 20FA | 0÷20 (2) | Remote setpoint from serial line | uns16 | rw | 250 |
| 20FC | 0÷20 (2) | Manual Output power | int16 | rw | 252 |
| 2103 | 0÷20 (2) | Auxiliary set gradient for SP2 | uns16 | rw | 259 |
| 2104 | 0÷20 (2) | Power alarm delay time | uns16 | rw | 260 |
| 2105 | 0÷20 (2) | Steady band (hot runners) | uns16 | rw | 261 |
| 2106 | 0÷20 (2) | Power alarm band (hot runners) | uns16 | rw | 262 |
| 2107 | 0÷20 (2) | Set point soft start (hot runners) | int16 | rw | 263 |
| 2108 | 0÷20 (2) | Soft start power | int16 | rw | 264 |
| 2109 | 0÷20 (2) | Hot | uns16 | rw | 265 |
| 2125 | 0÷20 (2) | Custom scale point33 | int16 | rw | 293 |
| 2126 | 0÷20 (2) | Custom scale point34 | int16 | rw | 294 |
| 2127 | 0÷20 (2) | Custom scale point35 | int16 | rw | 295 |
| 2131 | 0÷20 (2) | Controller status | uns16 | rw | 305 |
| 2158 | 0÷20 (2) | Digital output | uns16 | rw | 344 |
| 215B | 0÷20 (2) | Analog input1 | int16 | rw | 347 |
| 215C | 0÷20 (2) | Analog input2 | int16 | rw | 348 |
| 2190 | 0÷20 (2) | Probe Type | uns16 | rw | 400 |
| 2193 | 0÷20 (2) | Decimal point position | uns16 | rw | 403 |
| 2194 | 0÷20 (2) | Auxiliary input minimum range | int16 | rw | 404 |
| 2195 | 0÷20 (2) | TA1 input maximum scale limit (for GFX4IR | uns16 | rw | 405 |
| 2196 | 0÷20 (2) | Alarm type1 | uns16 | rw | 406 |
| 2197 | 0÷20 (2) | Alarm type2 | uns16 | rw | 407 |
| 2198 | 0÷20 (2) | Alarm type3 | uns16 | rw | 408 |
| 2199 | 0÷20 (2) | Alarm type4 | uns16 | rw | 409 |
| 219A | 0÷20 (2) | Auxiliary input TV scale maximum limit | uns16 | rw | 410 |
| 219B | 0÷20 (2) | Auxiliary input TV offset correction | int16 | rw | 411 |
| 219C | 0÷20 (2) | TV inputs digital filter | uns16 | rw | 412 |
| 219D | 0÷20 (2) | Auxiliary input maximum range TA2 of | uns16 | rw | 413 |
| 219E | 0÷20 (2) | Auxiliary input maximum range TA3 of | uns16 | rw | 414 |
| 219F | 0÷20 (2) | Auxiliary input offset correction TA2 of | int16 | rw | 415 |
| 21A0 | 0÷20 (2) | Auxiliary input offset correction TA2 of | int16 | rw | 416 |
| 21A1 | 0÷20 (2) | Auxiliary input maximum range TV2 of | uns16 | rw | 417 |
| 21A2 | 0÷20 (2) | Auxiliary input maximum range TV3 of | uns16 | rw | 418 |
| 21A3 | 0÷20 (2) | Auxiliary input offset correction TV2 of | int16 | rw | 419 |
| 21A4 | 0÷20 (2) | Auxiliary input offset correction TV3 of | int16 | rw | 420 |
| 21F6 | 0÷20 (2) | Alarm HB input2 | uns16 | rw | 502 |
| 21F7 | 0÷20 (2) | Alarm HB input3 | uns16 | rw | 503 |
| 21F9 | 0÷20 (2) | Reference voltage for manual power correction | uns16 | rw | 505 |
| 21FA | 0÷20 (2) | Manual power correction | uns16 | rw | 506 |
| 2201 | 0÷20 (2) | Cooling medium | uns16 | rw | 513 |
| 2204 | 0÷20 (2) | Reset power | int16 | rw | 516 |
| 2205 | 0÷20 (2) | Power set (hot runners) | int16 | rw | 517 |
| 225B | 0÷20 (2) | Auxiliary input max scale | int16 | rw | 603 |
| 225C | 0÷20 (2) | Auxiliary input digital filter | uns16 | rw | 604 |
| 225D | 0÷20 (2) | Auxiliary input offset correction | int16 | rw | 605 |
| 225F | 0÷20 (2) | Allocation of output OUT1 | uns16 | rw | 607 |

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| 2260 | 0÷20 [2] | Allocation of output OUT2 | uns16 | rw | 608 |
| 2261 | 0÷20 [2] | Allocation of output OUT3 | uns16 | rw | 609 |
| 2262 | 0÷20 [2] | Allocation of output OUT4 | uns16 | rw | 610 |
| 2263 | 0÷20 [2] | Allocation of output OUT5 | uns16 | rw | 611 |
| 2264 | 0÷20 [2] | Allocation of output OUT6 | uns16 | rw | 612 |
| 2265 | 0÷20 [2] | Allocation of output OUT7 | uns16 | rw | 613 |
| 2266 | 0÷20 [2] | Allocation of output OUT8 | uns16 | rw | 614 |
| 2267 | 0÷20 [2] | Allocation of output OUT9 | uns16 | rw | 615 |
| 2268 | 0÷20 [2] | Allocation of output OUT10 | uns16 | rw | 616 |
| 2269 | 0÷20 [2] | Selection of zone process variable / reference | uns16 | rw | 617 |
| 226A | 0÷20 [2] | Allocation of digital inpt 2 status | uns16 | rw | 618 |
| 2275 | 0÷20 [2] | Minimum no-conduction time for restart | uns16 | rw | 629 |
| 2276 | 0÷20 [2] | Max phase softstart | uns16 | rw | 630 |
| 2294 | 0÷20 [2] | Hardware configuration 2:diagnostic alarms | uns16 | rw | 660 |
| 2295 | 0÷20 [2] | Frequency for alarms: SCR_SHORT and | uns16 | rw | 661 |
| 2296 | 0÷20 [2] | Time filter for alarms: NO_VOLTAGE, | uns16 | rw | 662 |
| 2297 | 0÷20 [2] | Min power for NO_CURRENT alarm | uns16 | rw | 663 |
| 22A5 | 0÷20 [2] | Auxiliary input decimal point position | uns16 | rw | 677 |
| 22A8 | 0÷20 [2] | Heuristic power managing enable | uns16 | rw | 680 |
| 22A9 | 0÷20 [2] | Heuristic power managing max current | uns16 | rw | 681 |
| 22AA | 0÷20 [2] | Heterogeneous power managing enable | uns16 | rw | 682 |
| 22AB | 0÷20 [2] | Heterogeneous power managing max current | uns16 | rw | 683 |
| 22AD | 0÷20 [2] | Ammeter input serial | uns16 | rw | 685 |
| 22BB | 0÷20 [2] | Power-on mode | uns16 | rw | 699 |
| 22BC | 0÷20 [2] | Software off mode | uns16 | rw | 700 |
| 22BF | 0÷20 [2] | Firing mode config | uns16 | rw | 703 |
| 22C0 | 0÷20 [2] | Number of minimum cycles in BF mode | uns16 | rw | 704 |
| 22C1 | 0÷20 [2] | Lenght of the phase softstart ramp | uns16 | rw | 705 |
| 22C2 | 0÷20 [2] | Max peak current during softstart | uns16 | rw | 706 |
| 22C3 | 0÷20 [2] | Max rms current during full working | uns16 | rw | 707 |
| 22C4 | 0÷20 [2] | Delay triggering | uns16 | rw | 708 |
| 22DA | 0÷20 [2] | Feedback mode config | uns16 | rw | 730 |
| 22DB | 0÷20 [2] | Max feedback voltage correction | uns16 | rw | 731 |
| 22DC | 0÷20 [2] | Max feedback current correction | uns16 | rw | 732 |
| 22DD | 0÷20 [2] | Max feedback power correction | uns16 | rw | 733 |
| 22DE | 0÷20 [2] | feedback voltage correction | uns16 | rw | 734 |
| 22DF | 0÷20 [2] | feedback current correction | uns16 | rw | 735 |
| 22E0 | 0÷20 [2] | feedback power correction | uns16 | rw | 736 |
| 22E1 | 0÷20 [2] | Current threshold percentage of the HB | uns16 | rw | 737 |
| 22E2 | 0÷20 [2] | Min no-conduction time for delay triggering | uns16 | rw | 738 |
| 22E4 | 0÷20 [2] | Feedback proportional band | uns16 | rw | 740 |
| 22E5 | 0÷20 [2] | Feedback speed response | uns16 | rw | 741 |
| 22E6 | 0÷20 [2] | TA input of HB calibration | uns16 | rw | 742 |
| 22E7 | 0÷20 [2] | Power of HB calibration | uns16 | rw | 743 |
| 22EA | 0÷20 [2] | TA1 input min scale limit | uns16 | rw | 746 |
| 22EB | 0÷20 [2] | TA2 input min scale limit | uns16 | rw | 747 |
| 22EC | 0÷20 [2] | TA3 input min scale limit | uns16 | rw | 748 |
| 22F6 | 0÷20 [2] | TA input point 00 of HB calibration | uns16 | rw | 758 |

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| 22F7 | 0÷20 (2) | TA input point 01 of HB calibration | uns16 | rw | 759 |
| 22F8 | 0÷20 (2) | TA input point 02 of HB calibration | uns16 | rw | 760 |
| 22F9 | 0÷20 (2) | TA input point 03 of HB calibration | uns16 | rw | 761 |
| 22FB | 0÷20 (2) | Gradient for control output | uns16 | rw | 763 |
| 22FC | 0÷20 (2) | Min firing output power | uns16 | rw | 764 |
| 22FD | 0÷20 (2) | Output power % | uns16 | rw | 765 |
| 22FE | 0÷20 (2) | Output power offset | int16 | rw | 766 |
| 3000 | 0÷20 (2) | Process Value | int16 | ro | 0 |
| 3001 | 0÷20 (2) | Active SetPoint | int16 | ro | 1 |
| 3002 | 0÷20 (2) | Output power | int16 | ro | 2 |
| 3004 | 0÷20 (2) | Deviation | uns16 | ro | 4 |
| 3055 | 0÷20 (2) | Self-Diagnostic error code | uns16 | ro | 85 |
| 307A | 0÷20 (2) | Software Version | uns16 | ro | 122 |
| 308B | 0÷20 (2) | TA1 input value | uns16 | ro | 139 |
| 30BE | 0÷20 (2) | Hardware configuration | uns16 | ro | 190 |
| 30E3 | 0÷20 (2) | Ammeter input1 | uns16 | ro | 227 |
| 30E8 | 0÷20 (2) | Voltmetric input1 | int16 | ro | 232 |
| 3128 | 0÷20 (2) | Self/autotuning status | uns16 | ro | 296 |
| 3134 | 0÷20 (2) | Output rL.x X_OUTVAL status | uns16 | ro | 308 |
| 313B | 0÷20 (2) | Frequency | uns16 | ro | 315 |
| 313D | 0÷20 (2) | Digital input status | uns16 | ro | 317 |
| 313F | 0÷20 (2) | Digital output status | uns16 | ro | 319 |
| 3142 | 0÷20 (2) | Voltm. input1 f. | uns16 | ro | 322 |
| 31D3 | 0÷20 (2) | Controller Status | uns16 | ro | 467 |
| 31D4 | 0÷20 (2) | Ammeter Input 1 On | uns16 | ro | 468 |
| 31D5 | 0÷20 (2) | Alarm HB Status | uns16 | ro | 469 |
| 31EA | 0÷20 (2) | Ammeter Input 2 | uns16 | ro | 490 |
| 31EB | 0÷20 (2) | Ammeter Input 3 | uns16 | ro | 491 |
| 31EC | 0÷20 (2) | Voltmetric input 2 | uns16 | ro | 492 |
| 31ED | 0÷20 (2) | Voltmetric input 3 | uns16 | ro | 493 |
| 31EE | 0÷20 (2) | Ammeter input2 f. | uns16 | ro | 494 |
| 31EF | 0÷20 (2) | Ammeter input3 f. | uns16 | ro | 495 |
| 31F0 | 0÷20 (2) | Voltm. input2 f. | uns16 | ro | 496 |
| 31F1 | 0÷20 (2) | Voltm. input3 f. | uns16 | ro | 497 |
| 31F2 | 0÷20 (2) | Ammeter Input 2 On | uns16 | ro | 498 |
| 31F3 | 0÷20 (2) | Ammeter Input 3 On | uns16 | ro | 499 |
| 31F8 | 0÷20 (2) | Alarm status HB | uns16 | ro | 504 |
| 31FB | 0÷20 (2) | Power saved in ON-OFF=OFF | int16 | ro | 507 |
| 31FD | 0÷20 (2) | GFX 15A fuse status | uns16 | ro | 509 |
| 3200 | 0÷20 (2) | Alstate | uns16 | ro | 512 |
| 325A | 0÷20 (2) | Auxiliary Input | int16 | ro | 602 |
| 325E | 0÷20 (2) | Auxiliary Input self-diagnostic error code | uns16 | ro | 606 |
| 3278 | 0÷20 (2) | Status_strumento2 | uns16 | ro | 632 |
| 3279 | 0÷20 (2) | Status_strumento3 | uns16 | ro | 633 |
| 327A | 0÷20 (2) | Status_strumento4 | uns16 | ro | 634 |
| 328F | 0÷20 (2) | INPTC | uns16 | ro | 655 |
| 3298 | 0÷20 (2) | Output out.x status MASKOUT | uns16 | ro | 664 |
| 3299 | 0÷20 (2) | IN_TA_ON_DIAG | uns16 | ro | 665 |

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| | | **8.2. GFX4-IR** | | | |
| 329A | 0÷20 (2) | IN_TA_OFF_DIAG | uns16 | ro | 666 |
| 329B | 0÷20 (2) | IN_TV_ON_DIAG | uns16 | ro | 667 |
| 329C | 0÷20 (2) | IN_TV_OFF_DIAG | uns16 | ro | 668 |
| 32BE | 0÷20 (2) | Status5 | uns16 | ro | 702 |
| 32C5 | 0÷20 (2) | Peak current during softstart phase | uns16 | ro | 709 |
| 32C6 | 0÷20 (2) | Phase-to-phasevoltage V21 | uns16 | ro | 710 |
| 32C7 | 0÷20 (2) | Phase-to-phasevoltage V32 | uns16 | ro | 711 |
| 32C8 | 0÷20 (2) | Phase-to-phasevoltage V13 | uns16 | ro | 712 |
| 32C9 | 0÷20 (2) | I.F21 Phase-to-phasevoltage F21 | uns16 | ro | 713 |
| 32CA | 0÷20 (2) | I.F32 Phase-to-phasevoltage F32 | uns16 | ro | 714 |
| 32CB | 0÷20 (2) | I.F13 Phase-to-phasevoltage F13 | uns16 | ro | 715 |
| 32CC | 0÷20 (2) | Power Factor | uns16 | ro | 716 |
| 32CD | 0÷20 (2) | Lag.F | uns16 | ro | 717 |
| 32CE | 0÷20 (2) | Int_adc_peak | uns16 | ro | 718 |
| 32CF | 0÷20 (2) | Load Power | uns16 | ro | 719 |
| 32D0 | 0÷20 (2) | 3 Phase load power | uns16 | ro | 720 |
| 32E3 | 0÷20 (2) | Feedback power correction | int16 | ro | 739 |
| 32E8 | 0÷20 (2) | Current threshold for HB alarm | uns16 | ro | 744 |
| 32E9 | 0÷20 (2) | Current power correction | uns16 | ro | 745 |
| 32ED | 0÷20 (2) | Load Impedence | uns16 | ro | 749 |
| 32EE | 0÷20 (2) | 3-phase load impedence | uns16 | ro | 750 |
| 32EF | 0÷20 (2) | Load voltage | uns16 | ro | 751 |
| 32F0 | 0÷20 (2) | 3-phase load voltage | uns16 | ro | 752 |
| 32F1 | 0÷20 (2) | Load current | uns16 | ro | 753 |
| 32F2 | 0÷20 (2) | 3-phase load current | uns16 | ro | 754 |
| 32F3 | 0÷20 (2) | Phase angle power | uns16 | ro | 755 |
| 32F4 | 0÷20 (2) | Ammeter input1 f. | int16 | ro | 756 |
| 5C07 | 0 | Safe Fault mode | uns16 | ro | |

**Note:**

[1] Depending on number of PDOs you intend to use

[2] Depending on number of connected zone

## 8.3. Installation and configuration example with TwinCAT environment

After installing the Twincat SW in a computer equipped with a compatible ethernet controller (see the list of controllers compatible with the Beckhoff Information System > TwinCAT > TwinCAT System Manager > Reference > I/O Devices > EtherCAT(Direct Mode) > Supported network controller ), run the following steps:

- Obtain the GFX4_001.xml/GFX4IR_001.xml file
- Relocate the file in the Twincat default directory c:\TwinCAT\Io\EtherCAT as shown in the figure
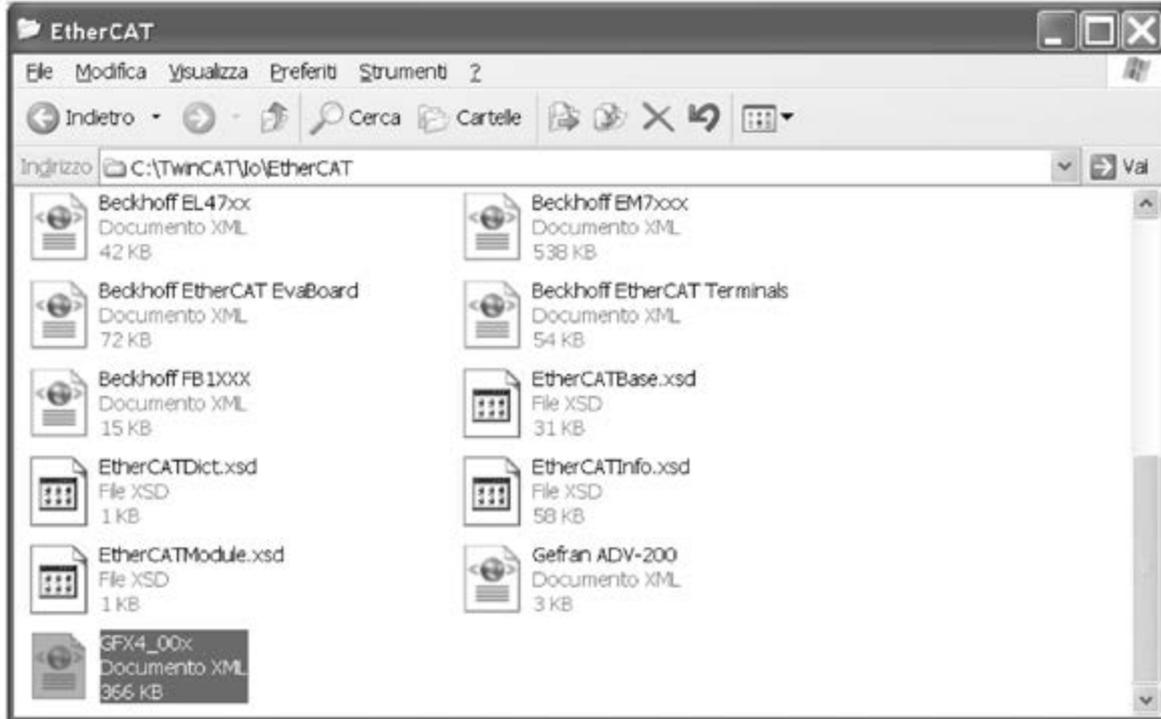


- Reboot the PC to ensure updating of the Twincat XML catalog
- Launch the Twincat system in configuration mode.

The program should appear as shown in the figure
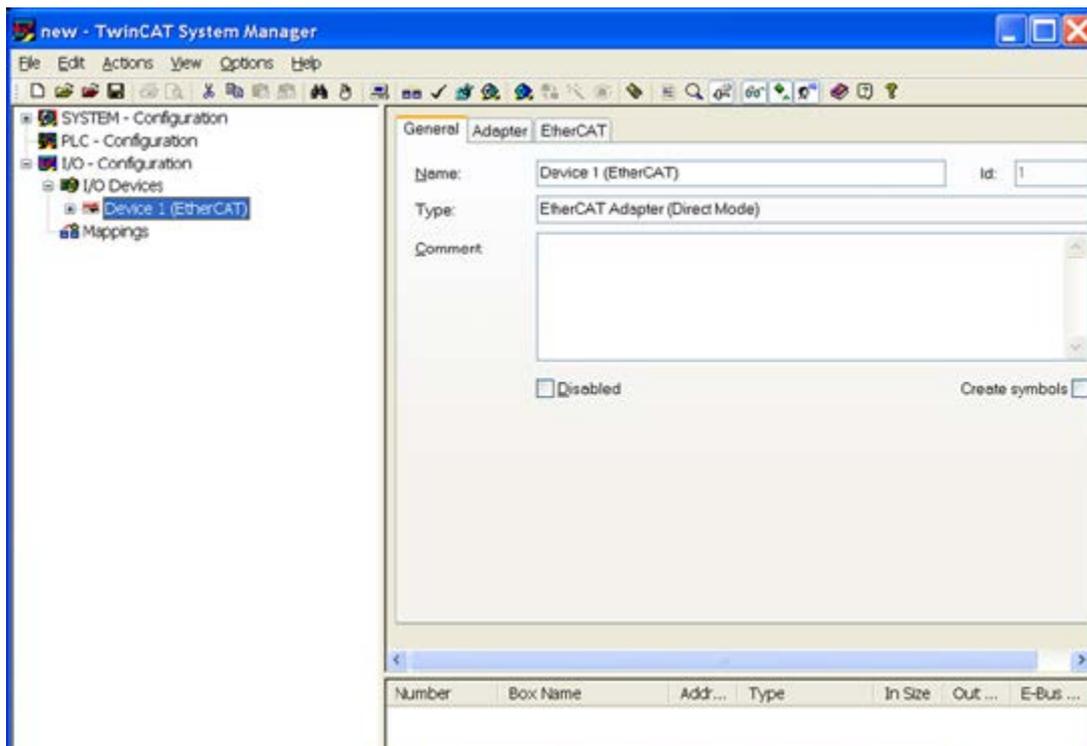
We now add a box from the I/O devices menu
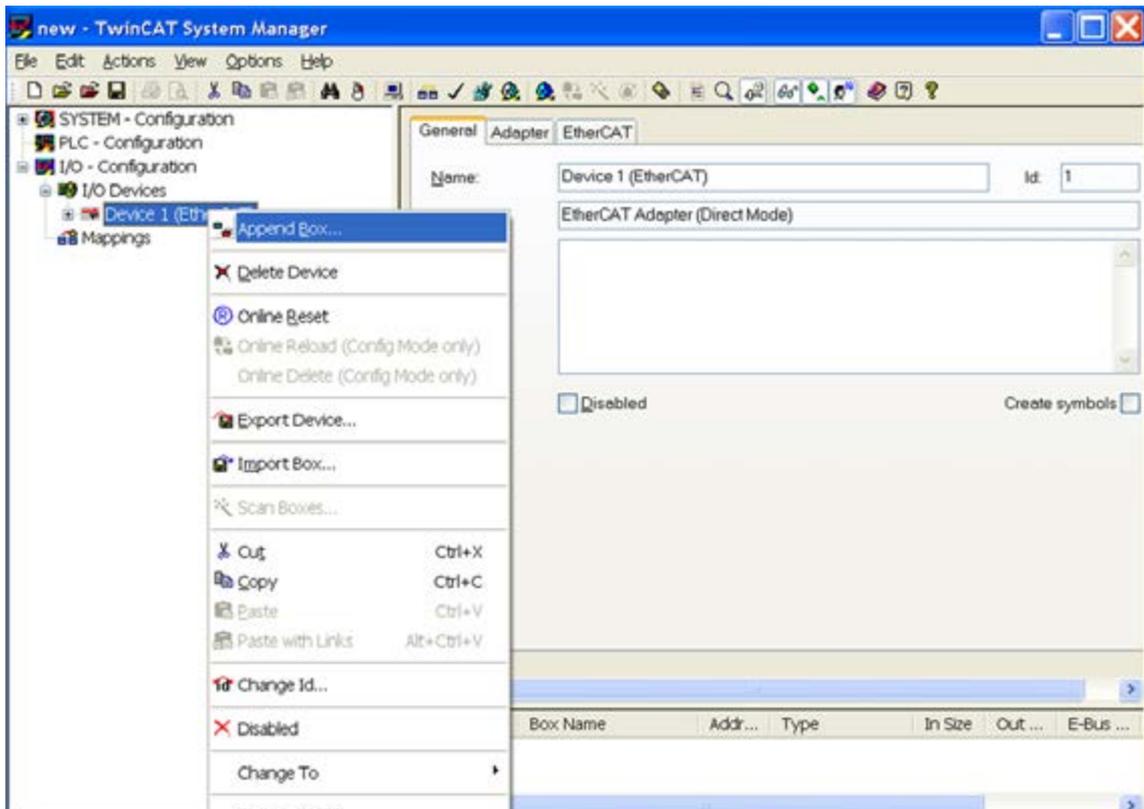


Select GFX4 20 zones



We have the following structure
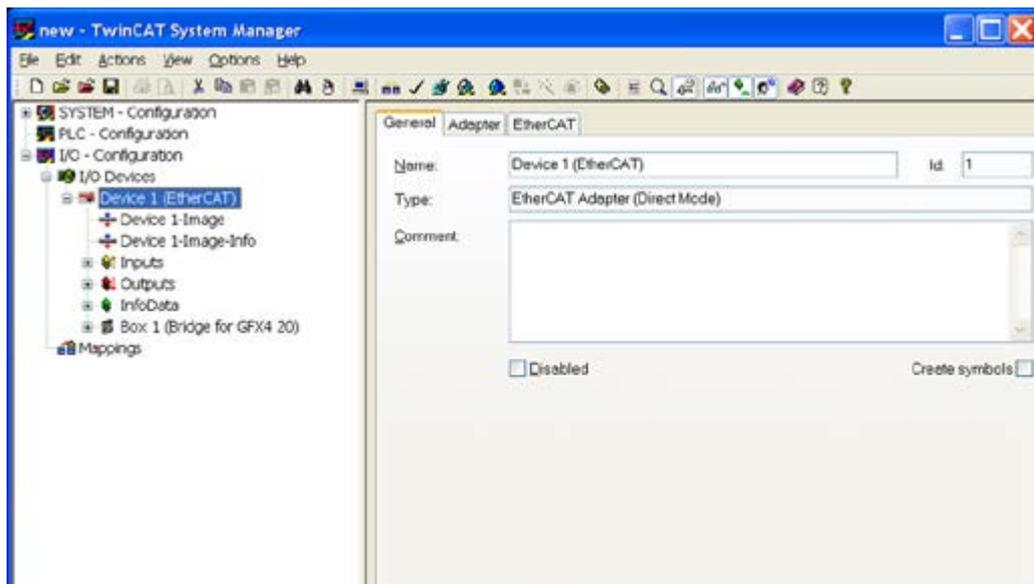


At the end of the procedure, we can activate the system in Run-Mode

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