GEFRAN

R-GCAN

**INSTALLATION AND
OPERATION MANUAL**

Software version: **1.0x**

Code: **80137** / Edition **01** - **03/08 ITA**

CE

INDEX

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1 • Description

R-GCANs is a communication module with CANopen protocol for the GILOGIKII family.

It has 1 CAN channel to control 1 GILOGIK II node with a maximum of 16 I/O modules.

It interfaces with any device equipped with CANopen DS301.

Maximum communication speed is 1 Mbaud configurable via software. The numbering of slaves up to 99 gives a total potential of approx. 25,000 I/O on the CAN network.

R-GCANs provides power to the entire GILOGIK II node.

The GILOGIKII node is configured by means of the Grafinet Studio package, a simple and intuitive tool that generates node composition.

R-GCANs is supplied complete with EDS configuration files.

2 • Main Characteristics

The R-GCAN board is a can open slave device with the following properties:

• NMT: Slave
• baud rate: 20 Kbits to 1Mbits (default: 500 Kbits)
• CANOpen Specification: CIA DS301 V4.0
• Device Profile: CIA DS401
• Control: Node Guarding, Heartbeat,
• PDO modes: Event triggered, Time triggered, Sync (cyclic), Sync (acyclic), RTR
• No. of PDOs: 20 RX + 20 TX
• PDO mapping: Dynamic
• SDO: 1 server 0 client
• Emergency message

3 • Example of CANOpen network with Gefran HMI as Master

DIGISTAR II

GFXTermo4

XVy Servodrive

R-GCAN

R-GCAN
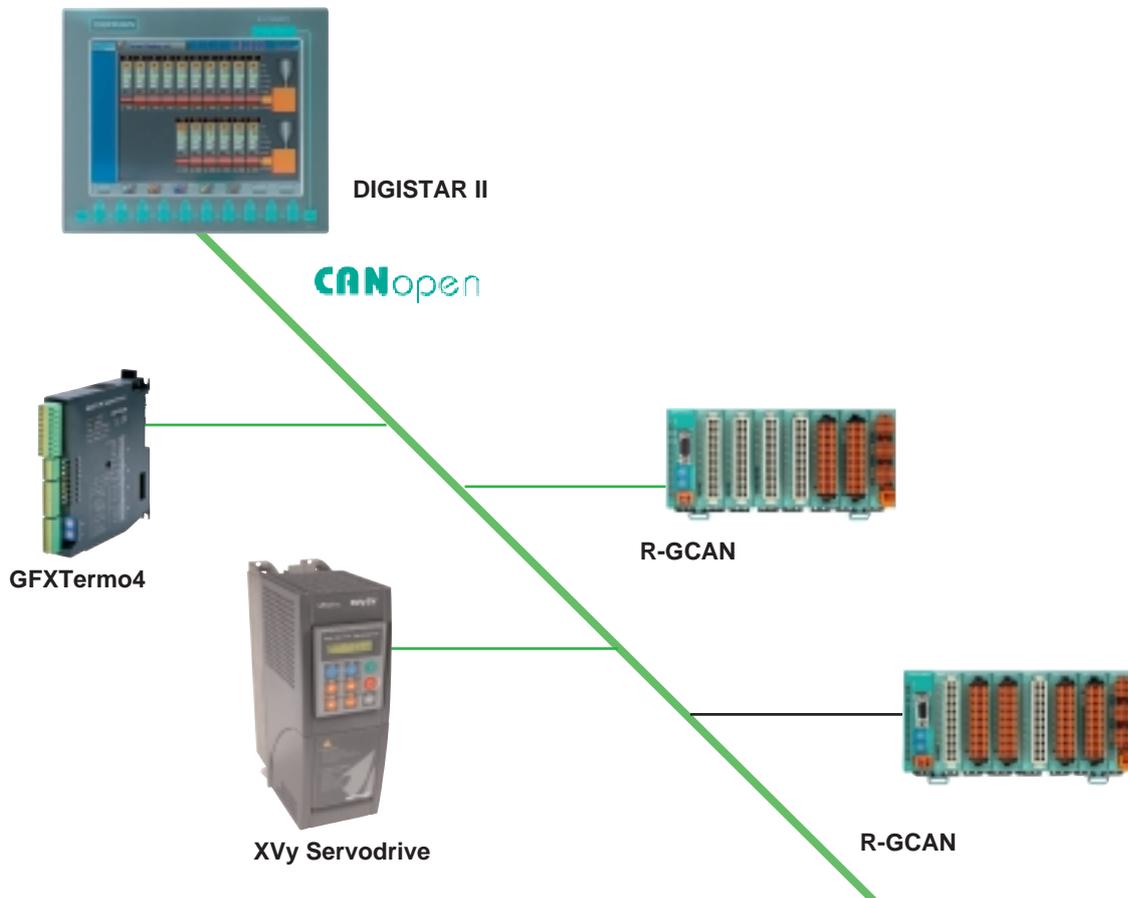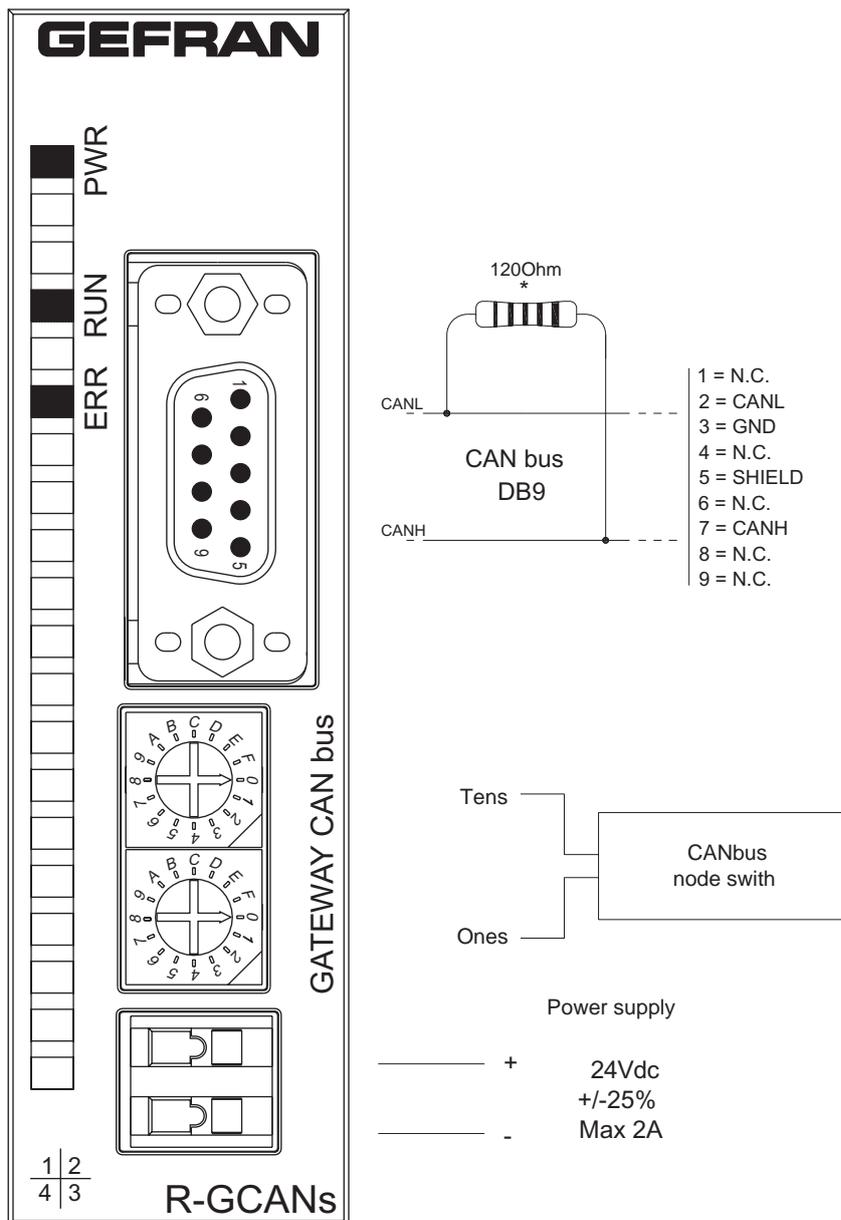
Figure 1

The board has 3 signal and diagnostics LEDs:

1. Yellow LED ON   presence of power supply
2. Red LED   OFF   no error
             Flashing   communication error;
             ON   manufacturer error, generic error
3. Green LED Flashing   non-operative state;
   Green LED ON   operative state

Data is accessed via SUB D9M connector, which serves as a can port on which the CanOpen Slave protocol is implemented.

The node is addressed with two rotary switches that set the can node number.
A 2 pin cage clamp connector powers the module and the BUS on which the module is mounted

5 • Setting the node number

The node number can be set via the two rotary switches on the front panel for addresses from 1 to 99.

Every change in attribution of the node number restarts the board with the new number. If you set a node number equal to 0 or greater than 99, the bridge enters off-line mode, shown by the simultaneous on/off of the green and red LEDs.

6 • Setting module baud rate

Set the baud rate according to the following procedure with the values shown in table 1

x10	x1	baud rate
A	0	1000KBit
A	1	800KBit
A	2	500KBit (Default)
A	3	250KBit
A	4	125KBit
A	5	100KBit
A	6	50 KBit
A	7	20Kbit

Table 1

Baud rate change procedure with rotary switches

| Set rotary **x1** to the required position | → | Set rotary **x10** to position **A** | → | The board restarts: wait 10 seconds |

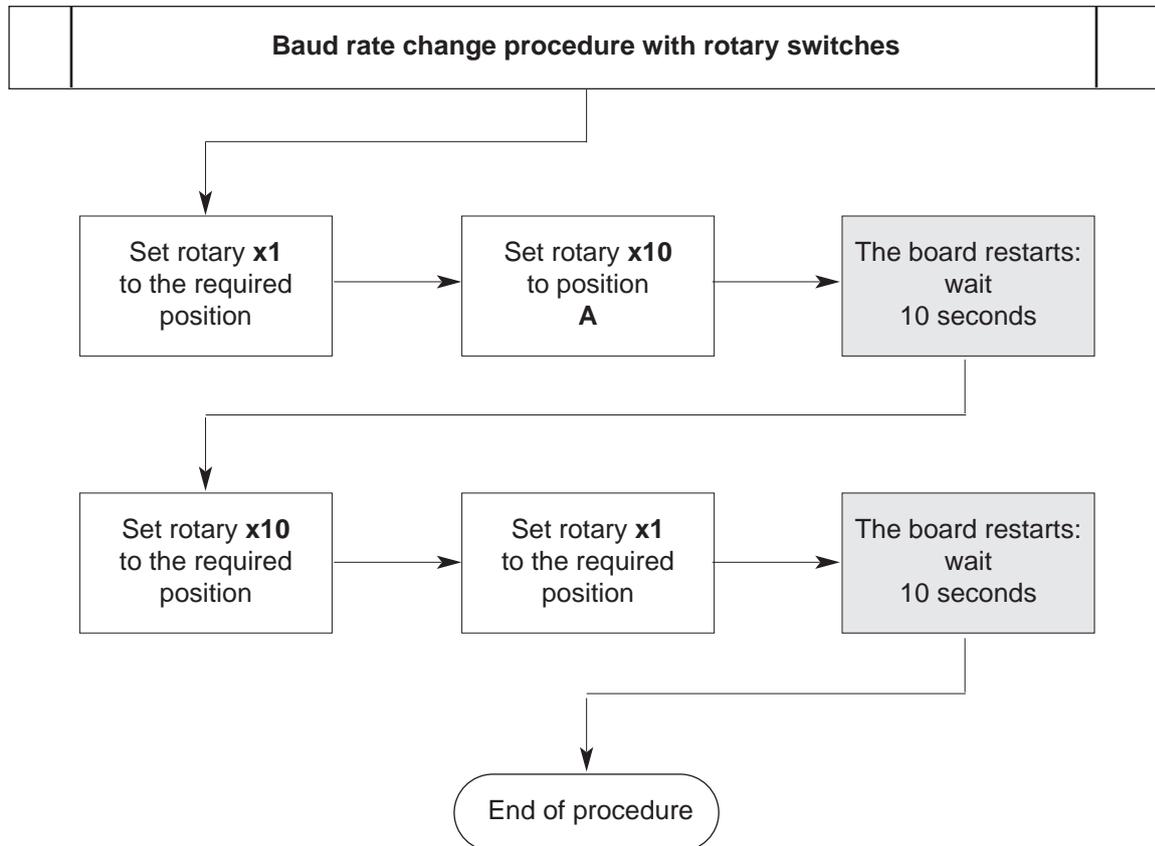| Set rotary **x10** to the required position | → | Set rotary **x1** to the required position | → | The board restarts: wait 10 seconds |

End of procedure

Figure 2

The baud rate can also be changed with an SDO control, followed by board reset (power-off, power-on).

7 • Special rotary switch functions

If the combination is 0 or greater than 99, the board acts as follows :

1. seeks a valid address for all of the different combinations (0 and greater than 99)

2. if the value is **0xAA** (hexadecimal), it enters "waiting for control to reset object dictionary" according to the flow chart

```
┌─────────────────────────────────────────────────────────────┐
│            Procedure for loading dictionary default values    │
└─────────────────────────────────────────────────────────────┘

  ┌──────────────┐      ┌──────────────┐      ┌──────────────────┐
  │ Set rotary x1│ ───> │Set rotary x10│ ───> │The board restarts:│
  │ to position  │      │ to position  │      │       wait        │
  │      A       │      │      A       │      │    10 seconds     │
  └──────────────┘      └──────────────┘      └──────────────────┘

  ┌──────────────┐      ┌──────────────┐      ┌──────────────────┐
  │Set rotary x10│ ───> │ Set rotary x1│ ───> │The board restarts:│
  │to the required│     │to the required│     │       wait        │
  │   position   │      │   position   │      │    10 seconds     │
  └──────────────┘      └──────────────┘      └──────────────────┘

                          ┌──────────────────┐
                          │  End of procedure │
                          └──────────────────┘
```
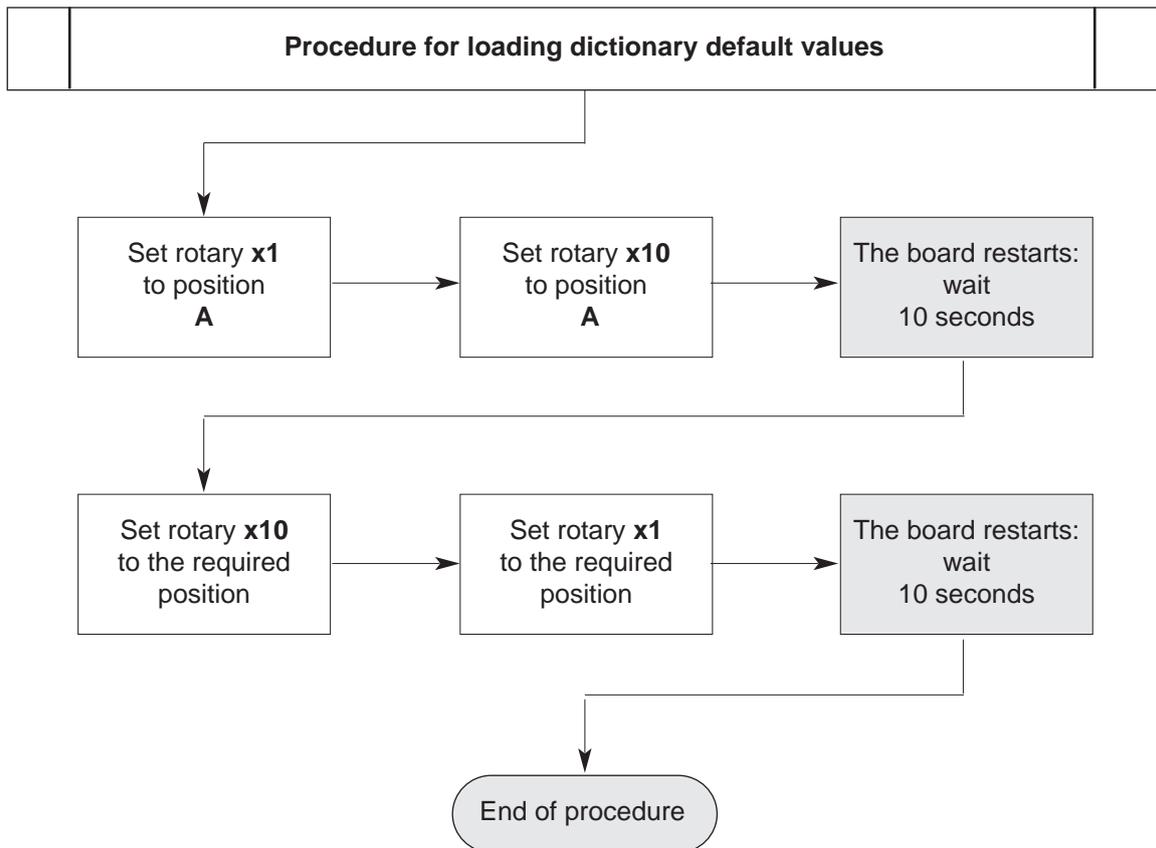
Figure 3

8 • Description of objects dictionary

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1000	0	No	Device type	No	Unsigned32	RO	0x00000191

MSB	LSB
Additional information	Device profile
The last four bits (bbbb) identify the presence of:	
0000 0000 0000 bbbb 0bbb : device does not have analog output; 1bbb : device has analog output; b0bb : device does not have analog input; b1bb : device has analog input; bb0b : device does not have digital output; bb1b : device has digital output; bbb0 : device does not have digital input; bbb1: device has digital input;	401=0x191

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1001	0	No	Error Register	No	Unsigned8	RO	0x00

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Manufacturer Specific error			Communication error				Generic error condition

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1003	0	No	Predefined error store	No	Unsigned8	RW	0
	1	No	Actual error		Unsigned32	RO	
	…	…	…	…	…	…	…
	64			No	Unsigned32	RO	

MSW	LSW
Additional information	Error code

The predefined error field is a 32 bit variable divided into 16 bit words.

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1005	0	Yes	COB-ID SYNC	No	Unsigned32	RW	0x00000080
0x1008*	0	No	Manufacturer Device Name	No	Visible string	R0	0x6e616372 (r-CAN)
0x1009	0	No	Manufacturer Hw version	No	Visible string	R0	0x20203130(10)
0x100a	0	No	Manufacturer Sw version	No	Visible string	R0	0x3n302e31(1.0n)
0x100b	0	No	Node number	No	Unsigned8	R0	
0x100c	0	Yes	Guard time	No	Unsigned16	RW	0 msec
0x100d	0	Yes	Life time factor	No	Unsigned8	RW	0 Life time factor x guard time = Life Time
0x100e	0	Yes	Node Guarding identifier	No	Unsigned16	RW	0x00000700 + node number
0x1010	0	No	Store parameter	No	Unsigned8	R	1
	1	No	Store all parameters in non volatile memory	No	Unsigned32	RW	1(Device saves parameters on command)

By writing the datum with a value other than 'save' (in hexadecimal 0x65766173), you have the SDO reply message Abort SDO transfer.

The parameters can be saved with the device in pre-operational state.
The reply after saving may arrive after a few seconds

* The message has 4 bytes and can be read with a single SDO message

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1011	0	No	Restore parameter	No	Unsigned8	R	1
	1	No	Restore all parameters	No	Unsigned32	RW	1 (Device restore parameters)

By writing the datum with a value other than 'load' (in hexadecimal 0x 0x64616f6c), you have the SDO reply message Abort SDO transfer.

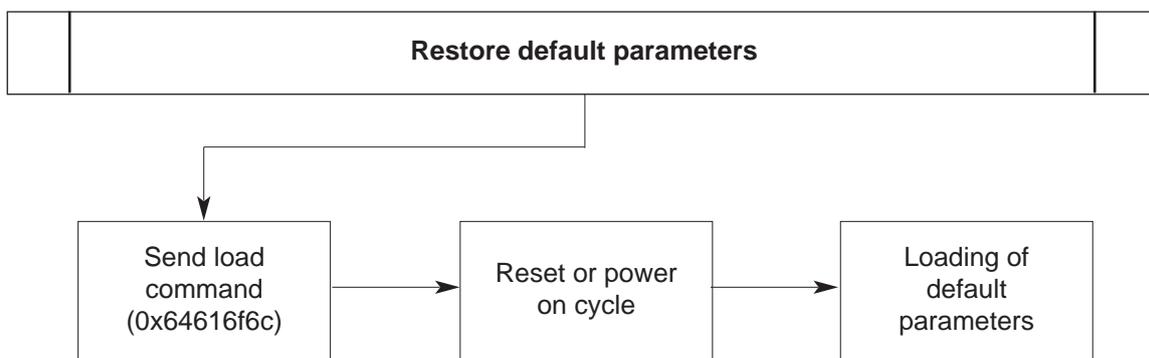The parameters are loaded according to the following flow chart:

Figure 4

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1014	0	Yes	Emergency COB-ID	No	Unsigned32	RW	0x00000080 + node number

Emergency code									
Error code	Meaning	Error code Low	Error code High	Error Register	Info 0	Info 1	Info 2	Info 3	Info 4
0x0000	Reset emergency	0	0	0	0	0	0	0	0
0x8100	Communication error	0x00	0x81	0x10	0	0	0	0	0
0x5000	Device hardware error (fault)	0x00	0x50	0x80	Board slot in bus (0÷15)	Id code board in fault	0	0	0
0x6000	Internal error Device (Config. boards not recognized)	0x00	0x60	0x80	Board slot in bus (0÷15)	Id code board request	Id board read	0	0
0x8330	Life Guard error	0x30	0x81	0x10	Guard time low	Guard time high	Life time	0	0
0x8330	Heartbeat consumer error	0x30	0x81	0x10	Time low	Time high	Node in error	0	0
0x8220	Pdo length exceed (PDO mapping error)	0x20	0x82	0x1	0 = PDO transmiss. error 1 = PDO reception error	PDO number error	0	0	0

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1016	0	No	Number consumer HB	No	Unsigned8	RO	0x01
	1	Yes	consumer HB - 0x00NNTTTT	No	Unsigned32	RW	0x000000

Where NN node number to monitor, TTTT = surveillance time in milliseconds.

If you try to write node number NN equal to device node you have SDO error code 0x06040443

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1017	0	Yes	Producer HB time	No	Unsigned16	RW	0x00000 msec
0x1018	0	No	Identity object	No	Unsigned8	RW	4
	1	No	Vendor Id	No	Unsigned32	RO	0x01000093
	2	No	Product Code	No	Unsigned32	RO	210
	3	No	Revision Number	No	Unsigned32	RO	0
	4	No	Serial Number	No	Unsigned32	RO	Product serial number
0x1029	0	No	Error behaviour	No	Unsigned8	RO	2
	1	Yes	Communication error	No	Unsigned8	RW	0 (preoperational)
	2	Yes	Manufacturer error	No	Unsigned8	RW	0 (preoperational)

This object defines device state in case of error

The values are • 0 = preoperational
   • 1 = no state change
   • 2 = stopped

SDO server parameter

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1200	0	No	Error behavior	No	Unsigned8	RO	2
	1	No	COB-ID Receive SDO	No	Unsigned32	RO	0x00000600+Node
	2	No	COB-ID Transmit SDO	No	Unsigned32	RO	0x00000580+Node

Receive PDO Communication Parameter RXPDO1

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1400	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000200+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff

The bits that make up the COB-ID have the following meanings:

bit number	value	meaning
31	0	Pdo exists / is valid
	1	Pdo does not exist / is invalid
30	0	RTR available
	1	RTR not available
29	0	CAN-ID a 11 bits
	1	CAN-ID a 29 bits
28+11	0	If bit 29 = 0
	x	Bits cob-id 28+11
10+0	x	Bits cob-id 10+0

Receive PDO Communication Parameter RXPDO2..5

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1401	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000300+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1402	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000400+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1403	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000500+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1404	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000780+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff

Receive PDO Communication Parameter RXPDO6..15   ! The node number must be below 64!

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1405	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000240+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1406	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000340+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1407	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000440+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1408	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000540+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1409	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc00007C0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x140a	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000220+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x140b	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000320+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x140c	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000420+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x140d	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000520+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x140e	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc00007a0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff

Receive PDO Communication Parameter RXPDO16..20   ! The node number must be below 32!

Index	Sub.	Store	Name	Map	Type	Access	Default
0x140f	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000260+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1410	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000360+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1411	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000460+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1412	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc0000560+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
0x1413	0	No	Number of elements	No	Unsigned8	RO	2
	1	Yes	COB-ID	No	Unsigned32	RW	0xc00007e0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff

The object contents depend on the boards inserted in the bus and on the automap object (with automap index 2064). If you want to customize object mapping you have to set :

- the value of object 2064 in automap off mode (value other than 0)
- values of congruent indices and sub-indices.

These procedures are run with the device in pre-operational state.

The following flow chart shows the calculation algorithm for mapping PDOs in reception. If you use the Grafinet configuration software, these data can be stored automatically in the eds file.

| PDORX automapping procedure |

Bus board code read → RxMap=1600 → 6200?

Yes

Insert objects in PDO mapping

No

6300? → Increment RxMap

6411? → Yes → Insert objects in PDO mapping

No

End mapping

Object 6200   =   8-bit digital output
Object 6300   =   16-bit digital output
Object 6411   =   16-bit analog output
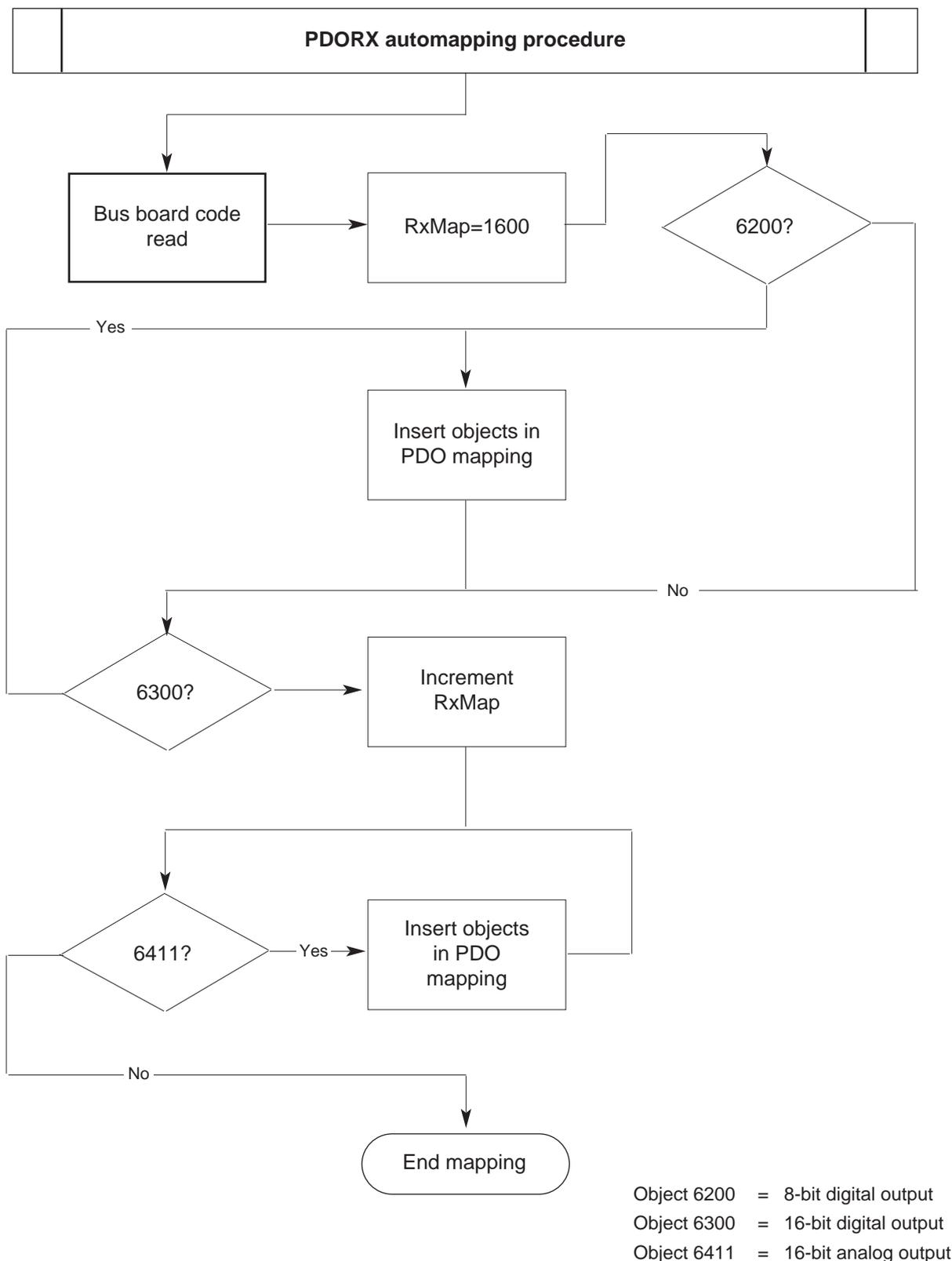
Figure 5

Receive PDO1 a 20 Mapping

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1600	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1601	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1602	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1603	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	Map	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1604	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1605	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	

Receive PDO1 a 20 Mapping

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1606	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1607	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1608	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1609	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	Access	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x160a	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x160b	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Stores	7° mapped object	Map	Unsigned32	ACRW	
	8	Yes	8° mapped object	No	Unsigned32	RW	

Receive PDO1 a 20 Mapping

Index	Sub.	Store	Name	Map	Type	Access	Default
0x160c	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x160d	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x160e	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x160f	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	Nap	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1610	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1611	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Stes	7° mapped object	Map	Unsigned32	RCW	
	8	Yes	8° mapped object	No	Unsigned32	RW	

Receive PDO1 a 20 Mapping

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1612	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	
0x1613	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	

Communication parameter Txpdo1.. 5

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1800	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x80000180+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RO	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1801	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x80000280+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RO	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1802	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x80000380+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RO	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1803	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x80000480+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RO	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1804	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x80000680+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)

Communication parameter Txpdo6..15   ! The node number must be below 64!

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1805	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800001c0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1806	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800002c0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1807	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800003c0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1808	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800004c0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1809	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800006c0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x180a	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800001a0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x180b	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800002a0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x180c	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800003a0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x180d	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800004a0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x180e	0	No	Number of elements	No	Unsigned8	RO	5
	1	Stores	COB-ID	Map	Unsigned32	ΔRW	0x800006a0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)

Communication parameter Txpdo16..20   ! The node number must be below 32!

Index	Sub.	Store	Name	Map	Type	Access	Default
0x180f	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800001e0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1810	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800002e0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1811	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800003e0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1812	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800004e0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)
0x1813	0	No	Number of elements	No	Unsigned8	RO	5
	1	Yes	COB-ID	No	Unsigned32	RW	0x800006e0+Node
	2	Yes	Transmission type	No	Unsigned8	RW	0xff
	3	Yes	Inhibit	No	Unsigned16	RW	0 (x 100_µsec)
	4	Yes	Reserved	No	Unsigned8	RW	0
	5	Yes	Event timer	No	Unsigned16	RW	0 (in msec)

The object contents depend on the boards inserted in the bus and on the automap object (with automap index 2064).

If you want to customize object mapping you have to set:

- the value of object 2064 in automap off mode (value other than 0)
- values of congruent indices and sub-indices.

These procedures are run with the device in pre-operational state.

The following flow chart shows the calculation algorithm for mapping PDOs in transmission. If you use the Grafinet configuration software, these data can be stored automatically in the eds file.
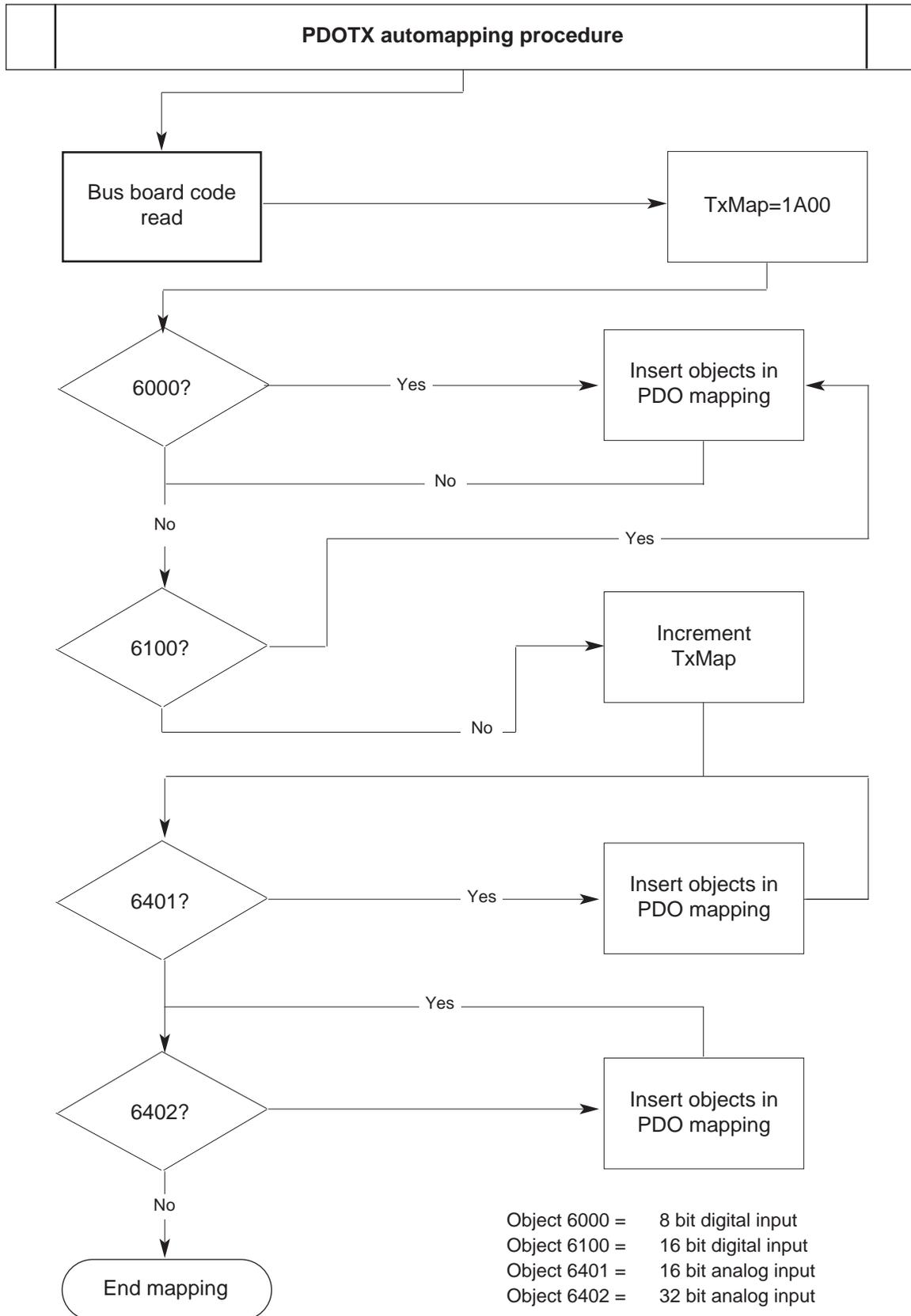

Object 6000 =   8 bit digital input
Object 6100 =   16 bit digital input
Object 6401 =   16 bit analog input
Object 6402 =   32 bit analog input

Figure 6

Transmit PDO1 to PDO20 Mapping

Index	Sub.	Store	Name	Map	Type	Access	Default
0x1a00 ... 0x1a013	0	Yes	Number of elements	No	Unsigned8	RW	0
	1	Yes	1° mapped object	No	Unsigned32	RW	
	2	Yes	2° mapped object	No	Unsigned32	RW	
	3	Yes	3° mapped object	No	Unsigned32	RW	
	4	Yes	4° mapped object	No	Unsigned32	RW	
	5	Yes	5° mapped object	No	Unsigned32	RW	
	6	Yes	6° mapped object	No	Unsigned32	RW	
	7	Yes	7° mapped object	No	Unsigned32	RW	
	8	Yes	8° mapped object	No	Unsigned32	RW	

CONFIGURATION OF GILOGIK II NODE SLOTS

The R-GCANs slave bridge controls the I/O modules that can be hosted on a bus system with:

- 4 slots
- 8 slots
- 12 slots
- 18 slots

Each slot can be occupied or not. The slots are identified as follows:

4 SLOT SYSTEM			
Slot 0	Slot 1	Slot 2	Slot 3
R-GCAN	I/O	I/O	I/O

8 SLOT SYSTEM							
Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
R-GCAN	I/O	I/O	I/O	I/O	I/O	I/O	I/O

12 SLOT SYSTEM											
Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11
R-GCAN	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O

18 SLOT SYSTEM																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
R-GCAN	-	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O	I/O

The boards are inserted into the slots and must be configured as needed with the **Grafinet Studio** software (See manual), a software tool that, based on the i/o selected, lets you write an eds file with the appropriate values of **User configuration** objects **(2000... 200f)** .

New configuration data are active after the next reset/power on cycle

The available board codes are:

List of Supported Board Codes			
Board name	**Function**	**Nr. Object**	**BOARD ID**
AD8	8 analog inputs	8 x 6401	0x41
TC8	8 temperature inputs	8 x 6401+	0x42
	1 frequency input (if enabled)	1 x 6401	
	16 digital outputs	1 x 6300	
C3	3 32-bit counter inputs	6 x 6402	0x43
	3 Speed / pulse / period		
MA6	6 analog inputs	6 x 6401	0x45
	6 analog outputs	6 x 6411	
E16	16 digital inputs	1 x 6100	0x61
U16	16 digital outputs	1 x 6300	0x62
U8	8 digital outputs	1 x 6200	0x63
DA8	8 analog outputs	8 x 6411	0x64
DA16	16 analog outputs	16 x 6411	0x65
DA4	4 analog outputs	4 x 6411	0x66
EU16	8 digital outputs	1 x 6200	0x70
	8 digital inputs	1 x 6000	

Any board code read on the bus or written in configuration that is not one of those listed above generates an error condition

The objects in sub-indices 2, 3 and 4 are specific for the function of each board.

User configuration for Slots 0 ...15

Index	Sub.	Store	Name	Map	Type	Access	Default
2000 .. 200F	0	No	Number of elements	No	Unsigned8	RO	4
	1	Yes	Board code	No	Unsigned16	RW	BOARD ID set
	2	Yes	1° configuration word	No	Unsigned16	RW	Value required
	3	Yes	2° configuration word	No	Unsigned16	RW	Value required
	4	Yes	3° configuration word	No	Unsigned16	RW	Value required

Default configuration for Slots 0 .. 15

Index	Sub.	Store	Name	Map	Type	Access	Default
2010... 201f	0	No	Number of elements	No	Unsigned8	RO	4
	1	No	Board code	No	Unsigned16	RO	BOARD ID set
	2	No	1° configuration word	No	Unsigned16	RO	Default configuration value
	3	No	2° configuration word	No	Unsigned16	RO	Default configuration value
	4	No	3° configuration word	No	Unsigned16	RO	Default configuration value

Objects with index 2010÷201f contain the default data with which the boards inserted in the bus are activated.

If a fault is detected for the boards in the slots, you can reset the fault by writing a value in the identifying object of the slot

Index	Sub.	Store	Name	Map	Type	Access	Default
2020÷202f (slot 0 ÷ slot15)	0	No	Reset fault for board in slot	No	Unsigned16	WO	-
2030÷ 204f (slot 0 ÷ slot15)	0	No	Logic release on boards	No	Unsigned8	RO	-
2050÷ 205f (slot 0 ÷ slot15)	0	No	Program release installed on boards	No	Unsigned8	RO	-

* Automapping

Index	Sub.	Store	Name	Map	Type	Access	Default
2064	0	Yes	Enable PDO automapping	No	Unsigned16	RW	<> than 0 Automapping of pdo mapping disabled via configuration software = 0 enabled according to Figure 4 and 5

This variable enables/disables PDO data mapping automatically according to the rules shown above.
If you choose custom mapping mode, the data are saved in retentive memory

Deleting configuration values

Index	Sub.	Store	Name	Map	Type	Access	Default
2070	0	No	Invalidates contents of user configuration objects in indices 2000...200f	No	Unsigned32	WO	-

Write value **0x6c6c696b** (kill) in the object to launch the command.
The new configuration data are active after the next reset/power on cycle

In a fault condition, the words are significant in number and size based on board type.

In case of fault, sub-index 0 contains the significant number of words containing fault information.

Index	Sub.	Store	Name	Map	Type	Access	Default
2080...208f	0	No	Number of elements	No	Unsigned8	RO	10
	1	No	1° word fault	No	Unsigned16	RO	
	2	No	2° word fault	No	Unsigned16	RO	
	3	No	3° word fault	No	Unsigned16	RO	
	4	No	4° word fault	No	Unsigned16	RO	
	5	No	5° word fault	No	Unsigned16	RO	
	6	No	6° word fault	No	Unsigned16	RO	
	7	No	7° word fault	No	Unsigned16	RO	
	8	No	8° word fault	No	Unsigned16	RO	
	9	No	9° word fault	No	Unsigned16	RO	
	10	No	10° word fault	No	Unsigned16	RO	

ADDITIONAL DATA FOR FAULT BOARD U16/TC8																
Valid index	1 WORD (bit 1 = output in fault)															
1	out 16	out 15	out 14	out 13	out 12	out 11	out 10	out 9	out 8	out 7	out 6	out 5	out 4	out 3	out 2	out 1
(OUT in cc)	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

ADDITIONAL DATA FOR FAULT BOARD U8																
Valid index	1 WORD (bit 1 = output in fault)															
1	out 16	out 15	out 14	out 13	out 12	out 11	out 10	out 9	out 8	out 7	out 6	out 5	out 4	out 3	out 2	out 1
(OUT in cc)	-	-	-	-	-	-	-	-	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

ADDITIONAL DATA FOR FAULT BOARD C3																
Valid index	1 WORD (bit 1 = output in fault)															
1	-	-	-	-	-	-	-	-	FILO CH3	FILO CH2	FILO CH1	NO POWER	-	-	-	-
	-	-	-	-	-	-	-	-	0/1	0/1	0/1	0/1	-	-	-	-

ADDITIONAL DATA FOR FAULT BOARD EU16																
Valid index	1 WORD (bit 1 = output in fault)															
1	out 16	out 15	out 14	out 13	out 12	out 11	out 10	out 9	out 8	out 7	out 6	out 5	out 4	out 3	out 2	out 1
(OUT in cc)	-	-	-	-	-	-	-	-	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

ADDITIONAL DATA FOR FAULT BOARD AD8

Valid index	0 WORD
none	Board AD8 has only signal of external power failure

ADDITIONAL DATA FOR FAULT BOARD E16

Valid index	0 WORD
none	Board E16 has no fault information

ADDITIONAL DATA FOR FAULT BOARD DA16

Valid index	10 WORDs															
1 alarm bit	A16 0/1	A15 0/1	A14 0/1	A13 0/1	A12 0/1	A11 0/1	A10 0/1	A9 0/1	A8 0/1	A7 0/1	A6 0/1	A5 0/1	A4 0/1	A3 0/1	A2 0/1	A1 0/1
2 alarm cc x group	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- 9,11 13,15	Alarm cc x group 10,12, 14,16	2,4 6,8	1,3, 5,7
3	CH2	Reread 8 bits channel 2							CH1	Reread 8 bits channel 1						
4	CH4	Reread 8 bits channel 4							CH3	Reread 8 bits channel 3						
5	CH6	Reread 8 bits channel 6							CH5	Reread 8 bits channel 5						
6	CH8	Reread 8 bits channel 8							CH7	Reread 8 bits channel 7						
7	CH10	Reread 8 bits channel 10							CH9	Reread 8 bits channel 9						
8	CH12	Reread 8 bits channel 12							CH11	Reread 8 bits channel 11						
9	CH14	Reread 8 bits channel 14							CH13	Reread 8 bits channel 13						
10	CH16	Reread 8 bits channel 16							CH15	Reread 8 bits channel 14						

ADDITIONAL DATA FOR FAULT BOARD DA8

Valid index	6 WORDs															
1 alarm bit	A16 -	A15 -	A14 -	A13 -	A12 -	A11 -	A10 -	A9 -	A8 0/1	A7 0/1	A6 0/1	A5 0/1	A4 0/1	A3 0/1	A2 0/1	A1 0/1
2 Alarm cc x group	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	5,6, 7,8	- -	1,2, 3,4
3	CH2	Reread 8 bits channel 2							CH1	Reread 8 bits channel 1						
4	CH4	Reread 8 bits channel 4							CH3	Reread 8 bits channel 3						
5	CH6	Reread 8 bits channel 6							CH5	Reread 8 bits channel 5						
6	CH8	Reread 8 bits channel 8							CH7	Reread 8 bits channel 7						

ADDITIONAL DATA FOR FAULT BOARD DA4

Valid index	4 WORDs															
1 alarm bit	A16 -	A15 -	A14 -	A13 -	A12 -	A11 -	A10 -	A9 -	A8 -	A7 -	A6 -	A5 -	A4 0/1	A3 0/1	A2 0/1	A1 0/1
2 alarm cc x group	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	Alarm cc x group -	- -	1,2, 3,4
3	CH2	Reread 8 bits channel 2							CH1	Read 8 bits channel 1						
4	CH4	Reread 8 bits channel 4							CH3	Reread 8 bits channel 3						

ADDITIONAL DATA FOR FAULT BOARD MA6																
Valid index	5 WORDs															
1 alarm bit	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
	-	-	-	-	-	-	-	-	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
2 alarm cc x group	-	-	-	-	-	-	-	-	-	-	-	-	Alarm cc x group			
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,4 6,8	1,3, 3,7
3	CH2	Reread 8 bits channel 2						CH1	Reread 8 bits channel 1							
4	CH4	Reread 8 bits channel 4						CH3	Reread 8 bits channel 3							
5	CH6	Reread 8 bits channel 6						CH5	Reread 8 bits channel 5							

RESTART R-GCAN

Writing value 0x1234 in this object generates a watch dog condition and the board restarts from power-on condition

Index	Sub.	Store	Name	Map	Type	Access	Default
2090	0	No	Activates watch dog condition for board	No	Unsigned16	WO	-
2100	0	Yes	Changes baud rate according to values shown on table	No	Unsigned8	WO	2 (500Kbits)

Value	Baud rate
0	1 Mbits
1	800 kbits
2	500 kbits
3	250 kbits
4	125 kbits
5	100 kbits
6	50 kbits
7	20 kbits

The new baud rate is activated at the next restart

MAPPING I/O

8 BITS DIGITAL INPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6000	0	No	Number of elements	No	Unsigned8	RO	Function of 8-bit boards inserted in bus
	1	No	1° block digital inputs	Yes	Unsigned8	RO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	16° block digital inputs	Yes	Unsigned8	RO	

These 8-bit objects map the resources of boards   **• EU16**

16 BITS DIGITAL INPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6100	0	No	Number of elements	No	Unsigned8	RO	Function of 16-bit boards inserted in bus
	1	No	1° block digital inputs	Yes	Unsigned16	RO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	16° block digital inputs	Yes	Unsigned16	RO	

These 8-bit objects map the resources of boards   **• E16**

8 BITS DIGITAL OUTPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6200	0	No	Number of elements	No	Unsigned8	RO	Function of 8-bit boards inserted in bus
	1	No	1° block digital outputs	Yes	Unsigned8	WO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	16° block digital outputs	Yes	Unsigned8	WO	

These 8-bit objects map the resources of boards   **• EU16**

                                                    • U8

ERROR MANAGEMENT 8 BITS DIGITAL OUTPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6206	0	No	Number of elements	No	Unsigned8	RO	Function of 8-bit boards inserted in bus
	1	No	Error mode Output for bit1...8	Yes	Unsigned8	RW	0xff (0 = keeps value 1= takes value programmed in 6207)
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	Error mode Output per bit n...n+7	Yes	Unsigned8	RW	0xff
6207	0	No	Number of elements	No	Unsigned8	RO	Function of 8-bit boards inserted in bus
	1	No	Error value Output per bit1...8	Yes	Unsigned8	RW	0
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	Error value Output per bit n...n+7	Yes	Unsigned8	RW	0

16 BITS DIGITAL OUTPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6300	0	No	Number of elements	No	Unsigned8	RO	Function of 16-bit boards inserted in bus
	1	No	1° block digital outputs	Yes	Unsigned16	WO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	16° block digital outputs	Yes	Unsigned16	WO	

These 16-bit objects map the resources of boards   **• U16**

                                                       • TC8

ERROR MANAGEMENT 16 BITS DIGITAL OUTPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6306	0	No	Number of elements	No	Unsigned8	RO	Function of 8-bit boards inserted in bus
	1	No	Error mode Output for bit1...16	Yes	Unsigned16	RW	0xff (0 = keeps value 1= takes value programmed in 6307)
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	Error mode Output per bit n...n+15	Yes	Unsigned16	RW	0xff
6307	0	No	Number of elements	No	Unsigned8	RO	Function of 8-bit boards inserted in bus
	1	No	Error value Output per bit1...16	Yes	Unsigned16	RW	0
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	16	No	Error value Output per bit n...n+15	Yes	Unsigned16	RW	0

16 BITS ANALOG INPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6401	0	No	Number of elements	No	Unsigned8	RO	Function of 16-bit boards inserted in bus
	1	No	1° block analog inputs	Yes	Unsigned16	RO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	128	No	16° block analog inputs	Yes	Unsigned16	RO	

These 16-bit objects map the resources of boards

• AD8

• MA6

• TC8 with frequency input enabled

32 BITS ANALOG INPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6402	0	No	Number of elements	No	Unsigned8	RO	Function of 32-bit boards inserted in bus
	1	No	1° block analog inputs	Yes	Signed 32	RO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	96	No	16° block analog inputs	Yes	Signed 32	RO	

These 32-bit objects map the resources of boards   **• C3**

16 BITS ANALOG OUTPUTS

Index	Sub.	Store	Name	Map	Type	Access	Default
6411	0	No	Number of elements	No	Unsigned8	RO	Function of 16-bit boards inserted in bus
	1	No	1° block analog outputs	Yes	Integer16	WO	
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	240	No	16° block analog inputs	Yes	Integer16	WO	

These 32-bit objects map the resources of boards

- **DA16**   • **DA8**
- **DA4**   • **MA6**

EXAMPLE OF OBJECT ATTRIBUTION

Let's consider a bus composed of four EU16 boards in positions

- 4 (slot 1) object CanOpen index 6000, sub-index 1
- 8 (slot 5) object CanOpen index 6000, sub-index 2
- 12 (slot 9) object CanOpen index 6000, sub-index 3
- 16 (slot 13) object CanOpen index 6000, sub-index 4

DIGITAL INPUTS AT 8 BITS

In total we have 4 objects 6000 8 bits digital inputs

16 SLOT SYSTEM (18 positions)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	EU16 ↑ **Object 6000 Sub-index 1**	-	-	-	EU16 ↑ **Object 6000 Sub-index 2**	-	-	-	EU16 ↑ **Object 6000 Sub-index 3**	-	-	-	EU16 ↑ **Object 6000 Sub-index 4**	-	-

DIGITAL INPUTS AT 16 BITS

In total we have 4 objects 6100 16 bits digital inputs

16 SLOT SYSTEM (18 positions)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	E16 ↑ **Object 6100 Sub-index 1**	-	-	-	E16 ↑ **Object 6100 Sub-index 2**	-	-	-	E16 ↑ **Object 6100 Sub-index 3**	-	-	-	E16 ↑ **Object 6100 Sub-index 4**	-	-

DIGITAL OUTPUTS AT 8BITS

In total we have 4 objects 6200 8 bits digital outputs

16 SLOT SYSTEM (18 positions)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	EU16	-	-	-	U8	-	-	-	U8	-	-	-	EU16	-	-
			↑ Object 6200 Sub-index 1				↑ Object 6200 Sub-index 2				↑ Object 6200 Sub-index 3				↑ Object 6200 Sub-index 4		

EXAMPLE OF ATTRIBUTION OF 16 BIT DIGITAL OUTPUT OBJECTS

Let's consider a bus composed of four boards, 2 U16 and 2 TC8, in positions:

- 4 (slot 1) object CanOpen index 6300, sub-index 1
- 8 (slot 5) object CanOpen index 6300, sub-index 2
- 12 (slot 9) object CanOpen index 6300, sub-index 3
- 16 (slot 13) object CanOpen index 6300, sub-index 4

In total we have 4 objects 6300 16 bits digital outputs

16 SLOT SYSTEM (18 position)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	U16	-	-	-	U16	-	-	-	TC8	-	-	-	TC8	-	-
			↑ Object 6300 Sub-index 1				↑ Object 6300 Sub-index 2				↑ Object 6300 Sub-index 3				↑ Object 6300 Sub-index 4		

- Error Mode 16 bits digital outputs

EXAMPLE OF ATTRIBUTION OF 16 BIT ANALOG INPUT OBJECTS

Let's consider a bus composed of four boards 1 AD8, 1 MA6, 1 TC8, and 1 MA6 in positions:

- 4 (slot 1) objects CanOpen index 6401, sub-index 1...8 (8 ANALOG INPUTS)
- 8 (slot 5) objects CanOpen index 6401, sub-index 9...14 (6 ANALOG INPUTS)
- 12 (slot 9) objects CanOpen index 6401, sub-index 15...23 (8 TEMPERATURE INPUTS, 1 FREQUENCY INPUT)
- 16 (slot 13) objects CanOpen index 6401, sub-index 24...29 (6 ANALOG INPUTS)

In total we have 29 objects 6401 16 bits analog inputs

16 SLOT SYSTEM (18 position)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	AD8	-	-	-	MA6	-	-	-	TC8	-	-	-	MA6	-	-
			Object 6401 Sub-index 1...8				Object 6401 Sub-index 9...14				Object 6401 Sub-index 15...23				Object 6401 Sub-index 24...29		

EXAMPLE OF ATTRIBUTION OF 32 BIT ANALOG INPUT OBJECTS

Let's consider a bus composed of four C3 boards in positions:
- 4 (slot 1) objects CanOpen index 6402, sub-index 1...6 (6 ANALOG INPUTS)
- 8 (slot 5) objects CanOpen index 6402, sub-index 7...12 (6 ANALOG INPUTS)
- 12 (slot 9) objects CanOpen index 6402, sub-index 13...18 (6 ANALOG INPUTS)
- 16 (slot 13) objects CanOpen index 6402, sub-index 19...24 (6 ANALOG INPUTS)

In total we have 24 objects 6402 32 bits ANALOG inputs

16 SLOT SYSTEM (18 position)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	C3	-	-	-	C3	-	-	-	C3	-	-	-	C3	-	-
			Object 6402 Sub-index 1...6				Object 6402 Sub-index 7...12				Object 6402 Sub-index 13...18				Object 6402 Sub-index 19...24		

EXAMPLE OF ATTRIBUTION OF 16 BIT ANALOG OUTPUT OBJECTS

Let's consider a bus composed of four boards 1 DA16, 1 DA8 , 1 DA4 and 1 MA6 in positions:

- 4 (slot 1) objects CanOpen index 6411, sub-index 1...16 (16 ANALOG OUTPUTS)
- 8 (slot 5) objects CanOpen index 6411, sub-index 17...24 (8 ANALOG OUTPUTS)
- 12 (slot 9) objects CanOpen index 6411, sub-index 25...28 (4 ANALOG OUTPUTS)
- 16 (slot 13) objects CanOpen index 6411, sub-index 29...34 (6 ANALOG OUTPUTS)

In total we have 24 objects 6411 16 bits ANALOG outputs

16 SLOT SYSTEM (18 position)																	
-	-	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RGCAN	-	-	DA16	-	-	-	DA8	-	-	-	DA4	-	-	-	MA6	-	-
			↑				↑				↑				↑		
			Object 6411 Sub-index 1...16				Object 6411 Sub-index 17...24				Object 6411 Sub-index 25...28				Object 6411 Sub-index 29...34		

• analog inputs interrupt trigger slection

Index	Sub.	Store	Name	Map	Type	Access	Default
6421	0	No	Number of elements	No	Unsigned8	RO	Function of boards with analog inputs inserted in bus
	1	Yes	Trigger 1° analog channel	No	Unsigned8	RW	0
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	96	Yes	Trigger 96° analog channel	No	Unsigned8	RW	0

This object contains event mode for generation of a software interrupt for the assigned analog channel. The values are:

Possible values for object 6421	
0	Event if the analog channel is greater than the value set in 6424
1	Event if the analog channel is less than the value set in 6425
2	Event if the analog channel varies (increases or decreases) from the value set in 6426
3...7	No event

The total number of objects 6421 is the sum of objects 6401 (analog inputs at 16 bits) + 6402 (analog inputs at 32 bits). For example, if we have 20 analog input objects at 16 bits and 6 analog input objects at 32 bits, the total is 26 objects 6421.
Therefore:

Example of allocation of objects 6421 (20 analog inputs 16 bits , 6 analog inputs 32 bits)			
Objects 6401	Index 1	Objects 6421	Index 1
	…		…
	Index 20		Index 20
Objects 6402	Index 1		Index 21
	…		…
	Index 6		Index 26

• Analog input global interrupt enable

Index	Sub.	Store	Name	Map	Type	Access	Default
6423	0	Yes	Analog input global interrupt enable	No	Unsigned8	RW	0 (disabled)

Before enabling this object, pay maximum attention to programming of the analog PDOs, setting an appropriate inhibit time value (objects 1800 ...1813 , sub-index 3) and an appropriate limit (6424, 6425) and variation (6426) value.

• Analog input interrupt Upper Limit

Index	Sub.	Store	Name	Map	Type	Access	Default
6424	0	No	Number of elements	No	Unsigned8	RO	Function of boards with analog inputs inserted in bus
	1	Yes	Trigger 1° analog channel	No	Unsigned32	RW	0
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	96	Yes	Trigger 96° analog channel	No	Unsigned32	RW	0

The total number of objects 6424 is the sum of objects 6401 (analog inputs at 16 bits) + 6402 (analog inputs at 32 bits). For example, if we have 20 analog input objects at 16 bits and 6 analog input objects at 32 bits, the total is 26 objects 6424.

• Analog input interrupt Lower Limit

Index	Sub.	Store	Name	Map	Type	Access	Default
6425	0	No	Number of elements	No	Unsigned8	RO	Function of boards with analog inputs inserted in bus
	1	Yes	Trigger 1° analog channel	No	Unsigned32	RW	0
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	96	Yes	Trigger 96° analog channel	No	Unsigned32	RW	0

The total number of objects 6425 is the sum of objects 6401 (analog inputs at 16 bits) + 6402
(analog inputs at 32 bits).
For example, if we have 20 analog input objects at 16 bits and 6 analog input objects at 32 bits, the total is
26 objects 6425.

• **Analog input interrupt Delta Unsigned**

Index	Sub.	Store	Name	Map	Type	Access	Default
6426	0	No	Number of elements	No	Unsigned8	RO	Function of boards with analog inputs inserted in bus
	1	Yes	Trigger 1° analog channel	No	Unsigned32	RW	5
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	96	Yes	Trigger 96° analog channel	No	Unsigned32	RW	5

The total number of objects 6426 is the sum of objects 6401 (analog inputs at 16 bits) + 6402 (analog inputs at 32 bits).
For example, if we have 20 analog input objects at 16 bits and 6 analog input objects at 32 bits, the total is 26 objects 6426.

• **Analog output Error Mode**

Index	Sub.	Store	Name	Map	Type	Access	Default
6443	0	No	Number of elements	No	Unsigned8	RO	Function of boards with analog inputs inserted in bus
	1	Yes	Error mode analog channel	No	Unsigned8	RW	1 (1 = sets value of 6444 0 = does not change output)
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	80	Yes	Error mode analog channel	No	Unsigned8	RW	1

• **Analog output Error Value**

Index	Sub.	Store	Name	Map	Type	Access	Default
6444	0	No	Number of elements	No	Unsigned8	RO	Function of boards with analog inputs inserted in bus
	1	Yes	Trigger 1° analog channel	No	Unsigned16	RW	0
	…	…	…	…	…	…	
	…	…	…	…	…	…	
	80	Yes	Trigger 80° analog channel	No	Unsigned16	RW	0

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