

ECAN 7188



- Field Bus data acquisition
 - CAN open protocol
- Baud rate and ID Node programmable by dip-switch
 - 8 digital inputs
 - 8 digital outputs, PNP type
- Led of signalling for inputs and outputs status
 - Four ways 2000 Vac galvanic isolation
 - EMC compliance – CE Mark
- In compliance with EN-5022 DIN rail mounting

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1.0 General description

The device ECAN 7188 is able to acquire up to 8 digital inputs and to drive up to 8 transistor outputs.

The data are transmitted by the CANopen protocol. The 2000 Vac galvanic isolation between inputs, outputs, power supply and data line eliminates the effects of all ground loops eventually existing and allows the use of the device in heavy environmental conditions found in industrial applications.

The ECAN 7188 is housed in a rough self-extinguishing plastic enclosure of 22.5 mm thickness, suitable for DIN rail mounting in compliance with the EN 50022 standard .

1.1 Communication protocols

On the ECAN7000 modules are implemented the following communication protocols: CANopen Protocol: one of the most used standard communication protocol; it allows to interface the modules of ECAN7000 series directly to the CAN Controllers that accept devices in compliance with the CiA DS 301 and CiA DS 401 standards. For communication setting, refer to the User manual.

1.2 Operating instructions

Before to install the device, please read carefully the “Installation instructions” section.

Connect the power supply, the data line and the Input signals as shown in the “Wiring” section.

Refer to the "Led signalling" section to verify the correct working of the device.

To make easy the maintenance or the substitution of the device, it is possible the “hot swap” of the terminals.

2.0 Technical specifications

Typical @ 25 °C and under nominal conditions

Device profile In compliance with the CiA DS 301 and CiA DS 401 standard.	Digital Inputs Channels 8 Input voltage (bipolar) OFF State 0 ÷ 3 V ON State 10 ÷ 30 V N° of counters 8 @ 300 Hz Min. Pulse width 1 ms Impedance 4.7 KΩ	Power supply Supply Voltage 10 .. 30 Vdc Current consumption 45 mA @ 24 Vdc Reverse Polarity protection 60 Vdc max Isolation Voltage 2000 Vac 50 Hz, 1 min. (Inputs/Outputs/Can Network/Power supply)	
	Digital Outputs Channels 8 Type PNP Voltage 10.5÷30 Vdc Max. Load 500 mA per channel(*) 1 A per module Inductive Load 48 Ω – 2H max (*) Protection against over-current and over-temperature Short circuit current 1.7 A max.	Environmental Conditions Operative Temperature -10°C .. +60°C Storage Temperature -40°C.. +85°C Humidity (not condensed) 0 .. 90 % Maximum Altitude 2000 m Installation Indoor Category of installation II Pollution Degree 2	Mechanical specifications Material Self-extinguish plastic IP Code IP20 Wiring wires with diameter 0.8÷2.1 mm ² /AWG 14-18 Tightening Torque 0.8 N m Mounting in compliance with DIN rail standard EN-50022 about 150 g.
	Sample time 5 ms Data Transmission Baud rate up to 1 Mbps Max. Distance in function of the Baud rate	Weight EMC (for industrial environments) Immunity EN 61000-6-2 Emission EN 61000-6-4	

2.1 Installation instructions

The device ECAN 7148 is suitable to be mounted on DIN rail, in vertical position. For a correct working and a long life of the device, read the following indications.

In case of the devices are mounted side by side, please leave about 5mm between in the following situations:

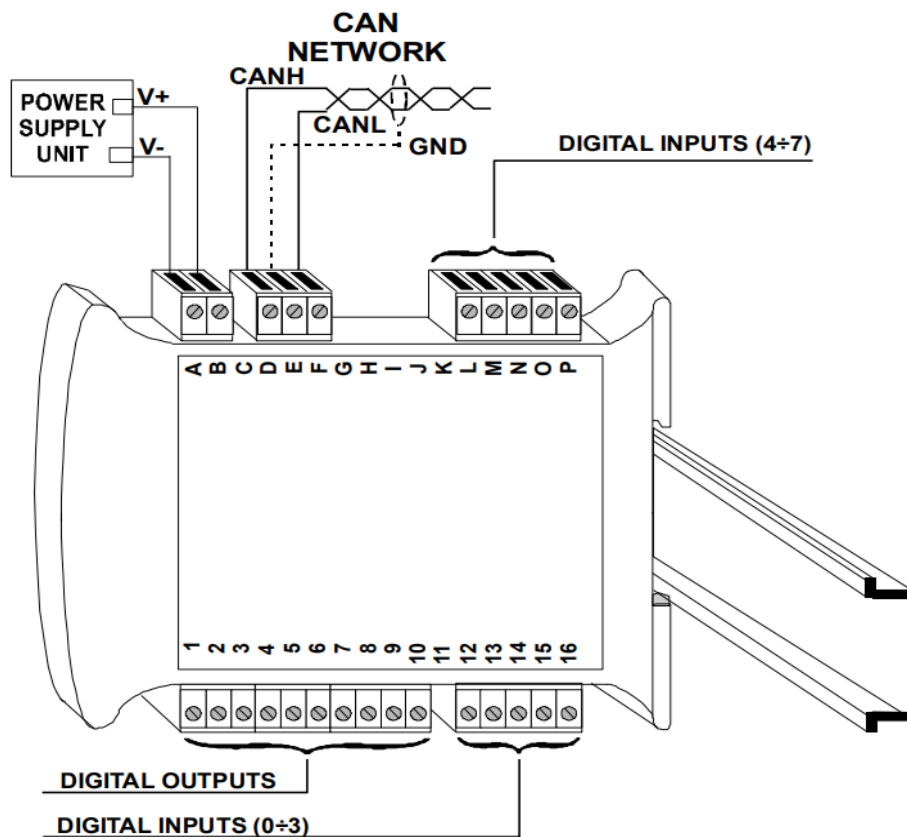
- Temperature in the cabinet higher than 45 °C and high supply voltage (>27Vdc).

Avoid to place raceways or other objects which could obstruct the ventilation slits. It is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel.

Avoid to install the devices in a site where vibrations are present. It is recommended to use shielded cable for connecting signals.

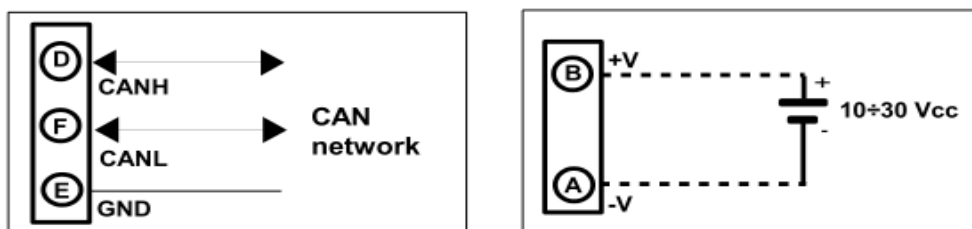
The shield must be connected to an earth wire provided for this purpose. Moreover it is suggested to avoid routing conductors near power signal cables.

2.2 Cabling

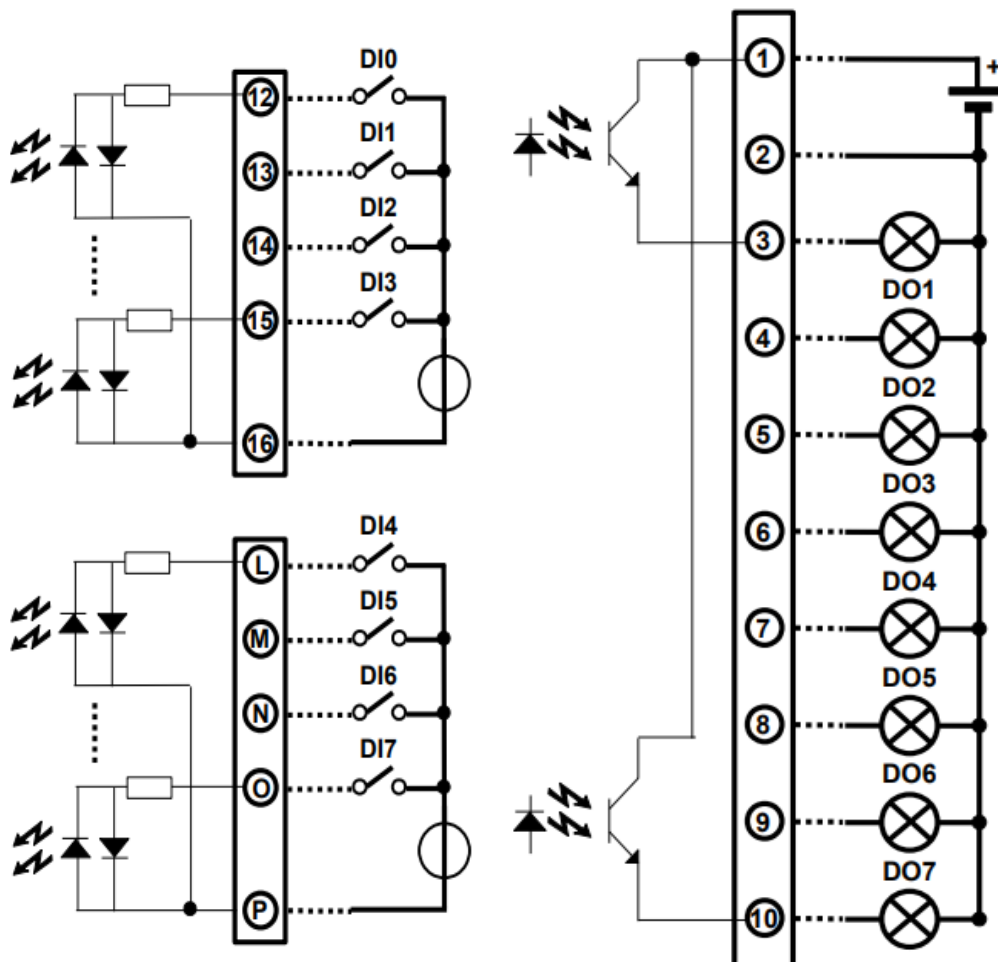


2.3 Wiring

2.3.1 CAN network wiring and power supply wiring



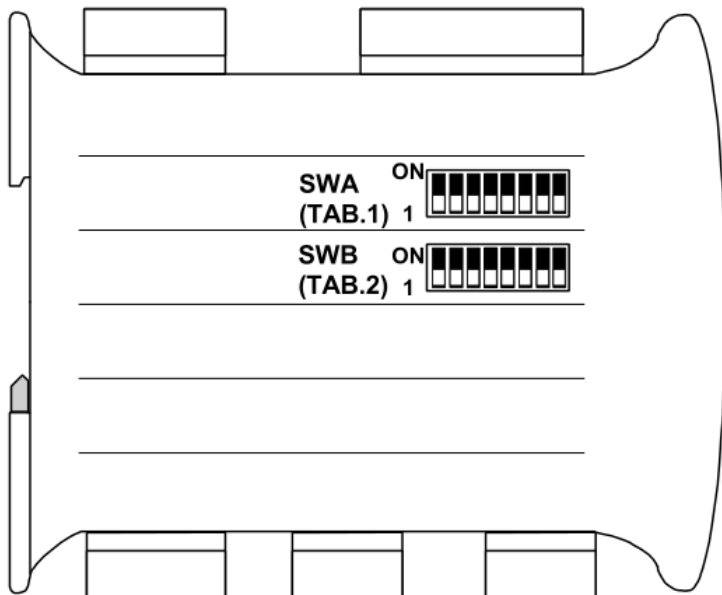
2.3.2 Digital Input and output wiring



NOTES: Input channels are not insulated between them
 Output channels are not insulated between them

2.4 DIP – SWITCH

2.4.1 DIP-SWITCH position



2.4.2 DIP-SWITCH configuration tables

TAB.1 Address setting 1+127
 (Pos.1 LSB; Pos.7 MSB)

SWA							
1	2	3	4	5	6	7	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Addr 1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Addr 2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Addr 3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Addr 4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Addr 5
⋮	⋮	⋮					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Addr 127

TAB.2 Bit rate setting
 (Pos.5 LSB; Pos.8 MSB)

SWB				
5	6	7	8	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	125 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	250 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	800 Kbps
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1 Mbps

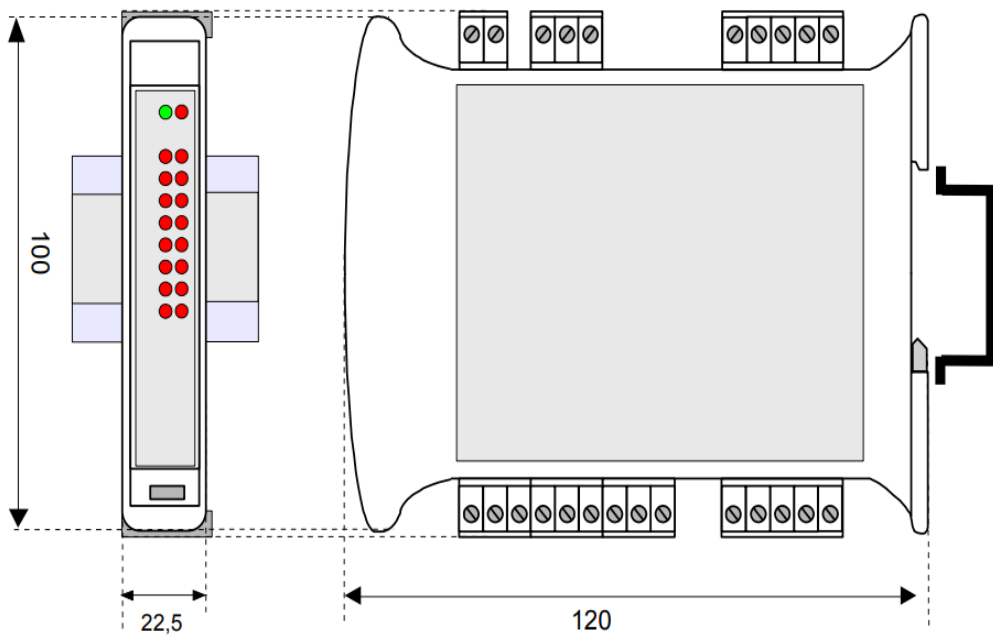
TAB.3 Safe mode setting

SWB	
1	
<input type="checkbox"/>	Normal Safe Mode
<input type="checkbox"/>	Fixed Safe Mode

2.5 LED signalling

LED	COLOR	STATE	DESCRIPTION
RUN	GREEN	ON	Device in Operational mode
		BLINKING	Device in Pre-Operational mode
		SLOW BLINKING	Device stopped
ERR	RED	OFF	No error
		ON	Bus off
		BLINKING	Invalid configuration
I n	RED	ON	State 1 Digital Inputs.
		OFF	State 0 Digital Inputs
O n	RED	ON	State 1 Digital Output.
		OFF	State 0 Digital Output

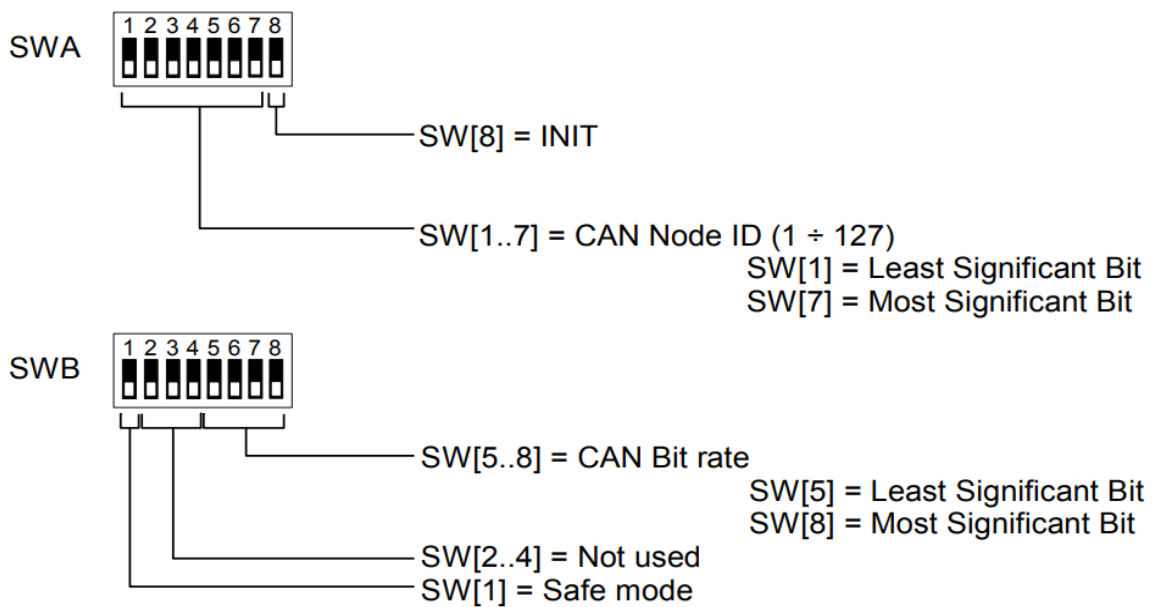
2.6 Mechanical dimensions (mm)



3.0 Profile description

- EDS file:
ECAN7188.eds
- Application layer:
CiA DS 301 Version 4.02
- Device profile:
CiA DS 401 Version 2.1
- Transmit PDO supported :4
- Receive PDO supported : 1

4.0 DIP-SWITCH configuration



5.0 The object dictionary (OD)

The Object Dictionary is the part of the device profile wherein are grouped the objects that have an influence on the device behaviour (application objects, communication objects and state objects). The structure of the Object Dictionary is predefined as in Draft Standard CiA301. How to read the Object Dictionary table present in this document.

Index	N° Sub-index	Name	Description	Object type	Default value	Access
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- Index: 16 bit number expressed in Hex format used to address the object inside the OD;
- Sub-index: 8 bit number expressed in Hex format used to indicate and address the sub parts of an object;
- Name: Defines which is the name of the object inside the OD;
- Description: Text strings that describe what is the function of the object;
- Object type: Indicates what is the data type of the object (Unsigned 32, Boolean, etc..).
- Default value: Indicates what is the default value for an object.
- Access: Indicates what is the type of access designed for an object:
 - RO: indicates an object that could only be read;
 - RW: indicates an object that could be read and written;
 - ---: indicates that the object is a complex object addressed by Sub-index.

6.0 Process data Object (PDO)

The real time data-transfer is performed by means of the Process Data Object (PDO).

The PDO is transmitted only from one Producer to one or more customer; the data capability of a PDO is included between 1 and 8 bytes. There are two kinds of PDOs: the first is used for data transmission (TPDO) and the second is used for data reception (RPDO).

The PDOs are described by the communication parameters and the mapping parameters. The communication parameters define the communication capability of the PDO; the mapping parameters define the content of PDO.

Data type and mapping of the application objects into a PDO is determined by the default structure specified in the Object Dictionary.

The communication parameter is composed of:

- COB-ID;
- Transmission type;
- Inhibit time;
- Event timer;

6.1 COB-ID

The COB-ID is the Connection Object Identifier and contains the unique CAN message Identifier of the object and additional configuration bits. For the PDOs the following 32 bit COB-ID are foreseen.

TPDO1: NODO ID + 0x00000180;
TPDO2: NODO ID + 0x00000280;
TPDO3: NODO ID + 0x00000380;
TPDO4: NODO ID + 0x00000480;
RPDO1: NODO ID + 0x00000200;
RPDO2: NODO ID + 0x00000300;
RPDO3: NODO ID + 0x00000400;
RPDO4: NODO ID + 0x00000500.

The NODE ID is the CAN node ID of the device. The range value is from 0x01 (decimal 1) up to 0x7F (decimal 127). If the first byte is 8 the PDO is not used; if it is 0, the PDO is used.

6.2 Transmission type

To transmit the PDO the following transmission modes can be used:

- Synchronous Transmission
- Asynchronous Transmission

The value of the parameter "Transmission type" defines how the PDO transmission is performed.

TPDO:

- Value **0**.

The TPDO is synchronous acyclic; it is transmitted after the receiving of a SYNC object when one or more parameters change.

- Value **1-240**.

The TPDO is synchronous cyclic. It is transmitted after every nth SYNC object within the "Synchronous Window Length" (object 0x1007). The value n is the value of the Transmission Type. **NOTE:** The Communication Cycle Period object (0x1006) express the time between two SYNC and must have the same value or a bigger value of the Synchronous Window Length.

- Value **255**.

The TPDO is asynchronous and it is transmitted in function of the parameter "Event timer".

RPDO:

- Value **0-240**.

The RPDO is synchronous and the actual value of transmission type is not relevant because the RPDO is processed on reception of the next SYNC object.

- Value **255**.

The RPDO is asynchronous and it is processed by the node as soon as the PDO arrives.

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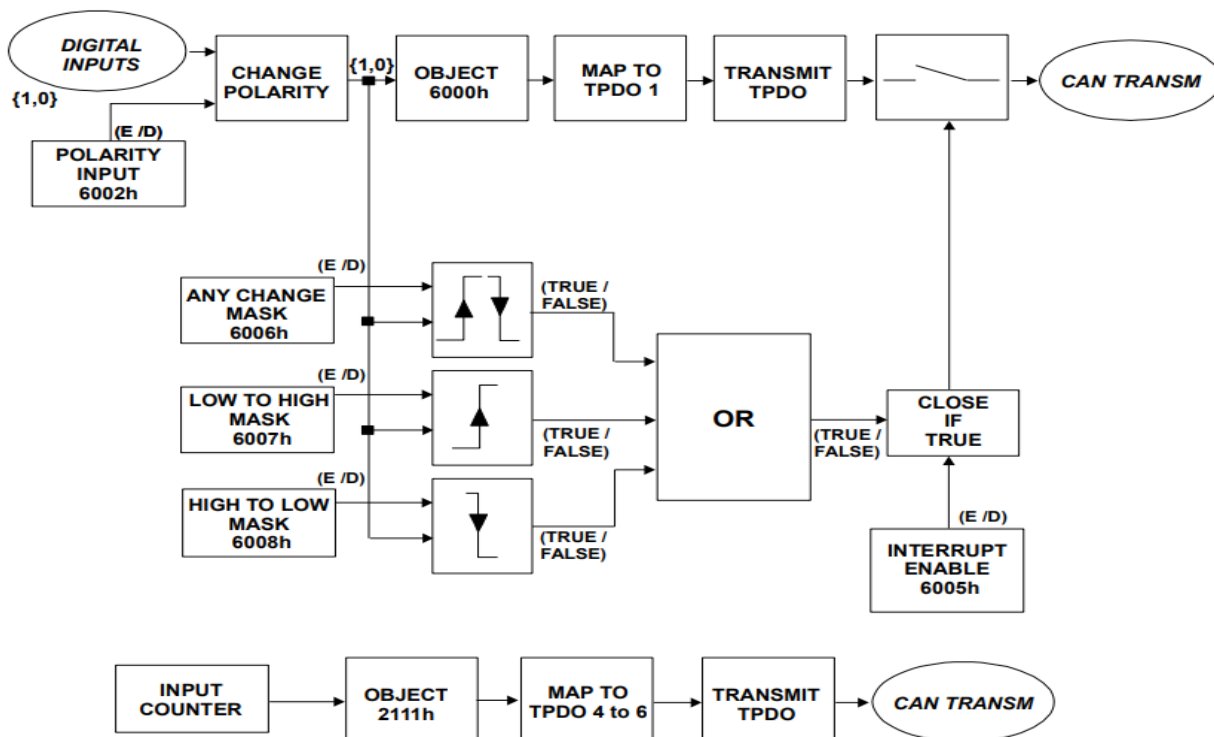
6.3 Inhibit time

This is the time within the PDO is not transmitted. The PDO is transmitted only when the time expires.

6.4 Event Timer

The PDO is transmitted on a fixed time base.

7.0 Functional diagram for digital inputs transmission



7.1 Interrupt triggering TPDO transmission

The digital inputs are processed and transferred to the object 6000h.

The data of this object are moved to the 1st TPDO in function of the mapping parameters set in the objects 1A00h. The communication parameters of TPDO are defined in the objects 1800h.

The system executes the boolean operation OR between the values of the masks contained in the objects 6006h (any change mask), 6007h (low to high mask) and 6008h (high to low mask).

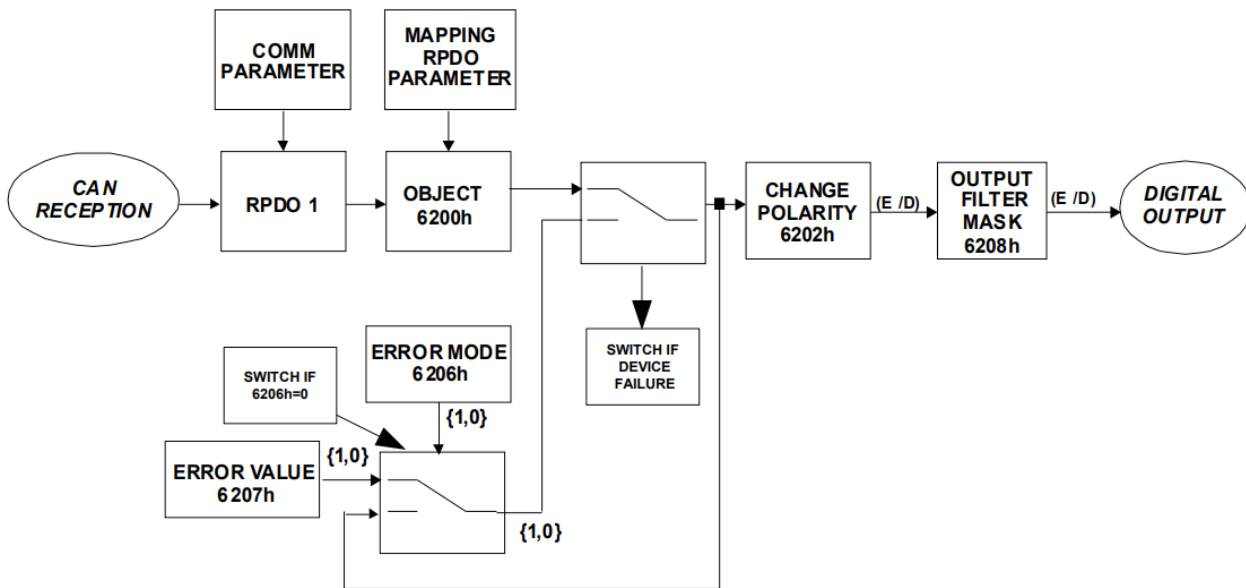
If the result of the operation OR is true, the transmission of the TPDO is performed only if the object 6005h has been enabled (value set as 1).

When the digital inputs change to the logic state 1, the associated counter mapped into the object 2111h is incremented.

The data of this object are moved to the TPDOs in function of the mapping parameters set in the objects from 1801h up to 1803h. The communication parameters of TPDOs are defined in the objects from 1A01h up to 1A03h.

To reset the value of the counter write 0 in the SubIndex of the counter selected in the object 2111h.

8.0 Functional diagram for digital outputs operation



8.1 RPDO and Digital Outputs

The digital outputs settings coming from the CAN bus are transferred to the 1st RPDO object in function of the mapping parameters set in the object 1600h. The communication parameters of RPDO are defined in the object 1400h. If there are not internal errors the information is processed as defined in the settings of the object 6202h (Change polarity output) and 6208h (Output filter mask) and transferred to the digital outputs of the device.

The device can work in two safe modalities. The behaviour of the device depends on the setting at the power on of the first position of SWB. If OFF the device will work as “Normal Safe Mode”, if ON as “Fixed Safe Mode”.

- Mode “Normal Safe Mode” If an internal error occurs and if the object 6206h is set as 0 all the output values are set as defined from the object 6207h (Error value); if the object 6206h is set as 255 all the output values are kept. When the device exits from the error condition the outputs will return as originally set in the object 6200h.
- Mode “Fixed Safe Mode” If an internal error occurs and if the object 6206h is set as 0 all the output values are set as defined from the object 6207h (Error value); if the object 6206h is set as 255 all the output values are kept. When the device exits from the error condition the outputs will remain as set in the object 6207h.

To allow the device to set the output safe value it is necessary to set the object “Consumer Time” Subindex 1 or the object Producer Heartbeat Time. Linking this object to the generation of an Heartbeat by the device or from another node, if the transmission (if Producer) or reception (if Consumer) of this object is missed the outputs will be set as defined in the object 6207h.

- Example with object Consumer Heartbeat Time :
Master unit: NodeID 1
Device NodeID 3
Producer Heartbeat time Master : 500 ms (01F4 hex.)
Consumer Heartbeat time device : Node 1, 1000 ms (000103E8 hex.)
Object 6207h = 0 (00 hex) – all the outputs in OFF.
If the Master unit does not send the Heartbeat on the line for 1000 ms, the outputs of the device will be set as defined in the object 6207h.
- Example with object Producer Heartbeat Time :
Master unit: NodeID 1
Device NodeID 3
Producer Heartbeat time Master : 500 ms (01F4 hex.)
Object 6207h = 0 (00 hex) – all the outputs in OFF.
If the CAN line of the device is interrupted the outputs of the device will be set as defined in the object 6207h.

9.0 Set the operative state at the device's startup

Follow the next procedure to set-up the device's operative state at the startup (Operational or Pre-Operational).

9.1 “Operational” state setting

1. Write the decimal value 0 (0x00) in the object 1F80h (NMT startup).
2. Execute the command “Save all parameters” as described in the object 1010h.
3. Execute the command “Restore all parameters” as described in the object 1011h.
4. Power-off and then power-on again the device.
5. After this operation the device will always start in Operational.

9.2 “Pre-Operational” state setting

1. Write the decimal value 4 (0x04) in the object 1F80h (NMT startup).
2. Execute the command “Save all parameters” as described in the object 1010h.
3. Execute the command “Restore all parameters” as described in the object 1011h.
4. Power-off and then power-on again the device.
5. After this operation the device will always start in Pre-Operational.

As default the device starts up in “Operational”.

10.0 Object dictionary (OD)

Index	N° Sub-index	Name	Description	Object type	Default value	Access
0x1000	0	Device Type	Identifies the type of device (analog input) and its Device Profile (CiA 401)	Unsigned 32	0x00030191	RO
0x1001	0	Error register	Register used to monitor eventual internal errors	Unsigned 8	0x00	RO
0x1002	0	Manufacturers status register	Status register	Unsigned 32	0x00000000	RO
0x1003	2	Predefined error field	Contains the list of the recent errors	Array	-----	----
	Sub Index 0	Number of errors	Contains the number of errors occurred	Unsigned 8	0x00	RW
	Sub Index 1	Standard error field 1	Stores the recent errors occurred	Unsigned 32	0x00000000	RO
0x1005	0	SYNC COB-ID	Defines the COB-ID of the Synchronism Object consumed	Unsigned 32	0x00000080	RW
0x1006	0	Communication cycle period	Defines the SYNC interval and it is expressed as μ s	Unsigned 32	0x00000000	RW
0x1007	0	Synchronous window length	Defines the time window expressed as μ s to transmit the synchronous PDO after the SYNC object	Unsigned 32	0x00000000	RW
0x1008	0	Manufacturer device name	Contains the device's name	Visible String	"ECAN 7188"	RO
0x1009	0	Manufacturer hardware Version	Indicates the hardware version of the device	Visible String	"1.00"	RO
0x100A	0	Manufacturer software Version	Indicates the version of the device's firmware	Visible String	"2.10"	RO
0x1010	2	Store parameters	Supports the saving of the parameters	Array	-----	----
	Sub Index 0	Maxsub-index number	Contains the number of sub index supported	Unsigned 8	0x01	RO
	Sub Index 1	Save all parameters	Saves all the parameters	Unsigned 32	0x00000000	RW
	Write the value 65766173 Hex, 1702257011 Decimal (ASCII "save") in sub-index to save data.					
0x1011	2	Restore default	Restore the default values of the parameters	Array	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub index supported	Unsigned 8	0x01	RO
	Sub Index 1	Restore all parameters	Restores all the parameters	Unsigned 32	0x00000000	RW
	Write the value 64616F6C Hex, 1684107116 Decimal (ASCII "load") in sub-index to restore data. Type of reset caused at the restore of default: -restore of sub index 1 : Node reset					

Index	N° Sub-index	Name	Description	Object type	Default value	Access
0x1014	0	COB-ID Emergency Object (EMCY)	Defines the COB-ID of the Emergency Object	Unsigned 32	Nodo ID + 0x80	RW
0x1015	0	Inhibit time (EMCY)	Defines the inhibit time for the Emergency Object (multiple of 100 µs)	Unsigned 32	0x00000000	RW
0x1016	2	Consumer heartbeat time	Defines the heartbeat cycle time (multiple of 1 ms)	Array	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub index supported	Unsigned 8	0x01	RO
	Sub Index 1	Consumer heartbeat time	Heartbeat time	Unsigned 32	0x00000000	RW
0x1017	0	Producer heartbeat time	Defines the heartbeat cycle time (multiple of 1 ms)	Unsigned 16	0x00000000	RW
0x1018	5	Identity	Contains the general information about the device	Record	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub index supported	Unsigned 8	0x04	RO
	Sub Index 1	Vendor ID	Unique code manufacturer	Unsigned 32	0x000003CD	RO
	Sub Index 2	Product code	ECAN7188 ID code	Unsigned 32	0x00000006	RO
	Sub Index 3	Revision number	Revision number	Unsigned 32	0x00000000	RO
	Sub Index 4	Serial number	Serial number code	Unsigned 32	0x00000000	RO
0x1029	2	Error behaviour	Defines the behaviour of the device in case of error encountered	Array	-----	----
	Sub Index 0	Max sub-index number	Contains the number of error classes	Unsigned 8	0x01	RO
	Sub Index 1	Communication error	Defines the device condition for a communication error	Unsigned 8	0x00	RW
0x1200	3	Server SDO parameters	Describes the SDO communication channel for the node	Array	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x02	RO
	Sub Index 1	COB ID Client to Server (Receive SDO)	Defines the COB ID in case of receiving SDO	Unsigned 32	Nodo ID + 0x600	RO
	Sub Index 2	COB ID Server to Client (Transmit SDO)	Defines the COB ID in case of transmitting SDO	Unsigned 32	Nodo ID + 0x580	RO
0x1400	3	1 st RPDO communication parameters	List of the parameters of the 1 st RPDO	Record	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x02	RO
	Sub Index 1	COB ID	Defines the COB ID of the PDO	Unsigned 32	Node ID + 0x200	RO
	Sub Index 2	Transmission type	Defines the transmission type for the RPDO	Unsigned 8	0xFF	RW

Index	N° Sub-Index	Name	Description	Object type	Default value	Access
0x1600	2	1 st RPDO mapping parameters	List of mapping parameters of the 1 st RPDO	Array	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x02	RW
	Sub Index 1	Mapped Object 1	Defines the 1 st object mapped into RPDO	Unsigned 32	0x62000108	RW
0x1800	5	1 st TPDO communication parameters	List of the parameters of the 1 st TPDO	Record	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x05	RO
	Sub Index 1	COB ID	Defines the COB ID of the PDO	Unsigned 32	Node ID + 0x180	RW
	Sub Index 2	Transmission type	Defines the transmission type for the TPDO	Unsigned 8	0xFF	RW
	Sub Index 3	Inhibit timer	Defines the delay to transmit the next PDO (multiple of 100 µs)	Unsigned 16	0x0000	RW
	Sub Index 5	Event timer	Transmits the PDO when the timer is expired (multiple of 1 ms)	Unsigned 16	0x0000	RW
0x1801	5	4 th PDO communication parameters	List of the parameters of the 4 th TPDO	Record	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x05	RO
	Sub Index 1	COB ID	Defines the COB ID of the PDO	Unsigned 32	Node ID + 0x280	RW
	Sub Index 2	Transmission type	Defines the transmission type for the TPDO	Unsigned 8	0xFF	RW
	Sub Index 3	Inhibit timer	Defines the delay to transmit the next PDO (multiple of 100 µs)	Unsigned 16	0x0000	RW
	Sub Index 5	Event timer	Transmits the PDO when the timer is expired (multiple of 1 ms)	Unsigned 16	0x0000	RW
0x1802	5	5 th TPDO communication parameters	List of the parameters of the 5 th TPDO	Record	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x05	RO
	Sub Index 1	COB ID	Defines the COB ID of the PDO	Unsigned 32	Node ID + 0x380	RW
	Sub Index 2	Transmission type	Defines the transmission type for the TPDO	Unsigned 8	0xFF	RW
	Sub Index 3	Inhibit timer	Defines the delay to transmit the next PDO (multiple of 100 µs)	Unsigned 16	0x0000	RW
	Sub Index 5	Event timer	Transmits the PDO when the timer is expired (multiple of 1 ms)	Unsigned 16	0x0000	RW
0x1803	5	6 nd TDO communication parameters	List of the parameters of the 6 th TPDO	Record	-----	----
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x04	RO
	Sub Index 1	COB ID	Defines the COB ID of the PDO	Unsigned 32	Nodo ID +0x480	RW
	Sub Index 2	Transmission type	Defines the transmission type for the TPDO	Unsigned 8	0xFF	RW
	Sub Index 3	Inhibit timer	Defines the delay to transmit the next PDO (multiple of 100 µs)	Unsigned 16	0x0000	RW
	Sub Index 5	Event timer	Transmits the PDO when the timer is expired (multiple of 1ms)	Unsigned 16	0x0000	RW

Index	N° Sub-Index	Name	Description	Object type	Default value	Access	
0x1A00	2	1 nd TPDO mapping parameters	List of mapped parameters of the 1 st TPDO	Array	-----	----	
	Sub Index 0	Number of mapped objects	Contains the number of sub-index supported	Unsigned 8	0x01	RO	
	Sub Index 1	Mapped Object 1	Defines the 1 st object mapped into TPDO	Unsigned 32	0x60000108	RW	
0x1A01	3	4 nd TPDO mapping parameters	List of mapped parameters of the 4 th PDO	Array	-----	----	
	Sub Index 0	Number of mapped objects	Contains the number of sub-index supported	Unsigned 8	0x02	RW	
	Sub Index 1	Mapped Object 1	Defines the 1 st object mapped into TPDO	Unsigned 32	0x21110120	RW	
	Sub Index 2	Mapped Object 2	Defines the 2 nd object mapped into TPDO	Unsigned 32	0x21110220	RW	
0x1A02	3	5 nd TPDO mapping parameters	List of mapped parameters of the 5 th TPDO	Array	-----	----	
	Sub Index 0	Number of mapped objects	Contains the number of sub-index supported	Unsigned 8	0x02	RW	
	Sub Index 1	Mapped Object 1	Defines the 1 st object mapped into TPDO	Unsigned 32	0x21110320	RW	
	Sub Index 2	Mapped Object 2	Defines the 2 nd object mapped into TPDO	Unsigned 32	0x21110420	RW	
0x1A03	3	6 nd TPDO mapping parameters	List of mapped parameters of the 6 th TPDO	Array	-----	----	
	Sub Index 0	Number of mapped objects	Contains the number of sub-index supported	Unsigned 8	0x02	RO	
	Sub Index 1	Mapped Object 1	Defines the 1 st object mapped into TPDO	Unsigned 32	0x21110520	RW	
	Sub Index 2	Mapped Object 2	Defines the 2 nd object mapped into TPDO	Unsigned 32	0x21110620	RW	
0x1F80	0	NMT Startup	Defines the operative state of the device at the startup	Unsigned 32	0x00000000	RW	
	Value available: Dec. 0 = Device in Operational. Dec. 4 = Device in Pre-Operational						
0x2101	0	Can Node ID	Defines which is the default CAN node number of the device	Unsigned 8	0x7F	RO	
	Values available: from Dec.1 (0x01) up to Dec 127 (0x7F). The values are programmable only from dip switch.						
0x2102	0	Can bit rate	Defines which is the default bit rate value	Unsigned 8	0x03	RO	
	Decimal and Hex value to select the Bit rate parameter.						
			Bit rate	Value (Dec)	Value (Hex)		
			10 Kbps	0	0x00		
			20 Kbps	1	0x01		
			50 Kbps	2	0x02		
			125 Kbps	3	0x03		
			250 Kbps	4	0x04		
			500 Kbps	5	0x05		
			800 Kbps	6	0x06		
		1 Mbps	7	0x07			

Index	N° Sub-index	Name	Description	Object type	Default value	Access
0x2111	9	Input Counter Value	Contains the value of 8 input counter available	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 32	0x08	RO
	Sub Index 1	Input 1 counter	Contains the value of the counter associated to the digital input 1	Unsigned 32	0x00000000	RW
	Sub Index 2	Input 2 counter	Contains the value of the counter associated to the digital input 2	Unsigned 32	0x00000000	RW
	Sub Index 3	Input 3 counter	Contains the value of the counter associated to the digital input 3	Unsigned 32	0x00000000	RW
	Sub Index 4	Input 4 counter	Contains the value of the counter associated to the digital input 4	Unsigned 32	0x00000000	RW
	Sub Index 5	Input 5 counter	Contains the value of the counter associated to the digital input 5	Unsigned 32	0x00000000	RW
	Sub Index 6	Input 6 counter	Contains the value of the counter associated to the digital input 6	Unsigned 32	0x00000000	RW
	Sub Index 7	Input counter	Contains the value of the counter associated to the digital input 7	Unsigned 32	0x00000000	RW
	Sub Index 8	Input 8 counter	Contains the value of the counter associated to the digital input 8	Unsigned 32	0x00000000	RW
0x6000	3	Read Input 8 bit	Contains the measure of the Digital Input Channels	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x02	RO
	Sub Index 1	Digital Inputs 1 to 8	Digital input channel measure	Unsigned 8	0x00	RO
0x6002	2	Polarity Input 8 bit	Contains the settings of the polarity of each single input bit	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Polarity bit 1 to 8	Digital input polarity settings 0=input not inverted; 1=input inverted	Unsigned 8	0x00	RW
0x6005	0	Global Interrupt Enable Digital	Allows to enable / disable the global interrupt behaviour 0 = global interrupt disabled 255 = global interrupt enabled	Unsigned 8	255	RW
0x6006	2	Interrupt Mask Any Change 8 bit	Defines which input port shall activate an interrupt on positive / negative edge detection	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Mask bit 1 to 8	Mask bit settings 0=interrupt disable; 1=interrupt enabled	Unsigned 8	0xFF	RW

Index	N° Sub-index	Name	Description	Object type	Default value	Access
0x6007	2	Interrupt Mask Low-to-High 8 bit	Defines which input port shall activate an interrupt on positive edge detection	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Mask bit 1 to 8	Mask bit settings 0=interrupt disable; 1=interrupt enabled	Unsigned 8	0xFF	RW
0x6008	2	Interrupt Mask High-to-Low 8 bit	Defines which input port shall activate an interrupt on negative edge detection	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Mask bit 1 to 8	Mask bit settings 0=interrupt disable; 1=interrupt enabled	Unsigned 8	0xFF	RW
0x6200	2	Write Output bits	Contains the programming for the digital outputs bits	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Digital Outputs 1 to 8	Digital output programming	Unsigned 8	0x00	WO
0x6202	2	Change Polarity Output bits	Contains the settings of the polarity of each single output bit	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Polarity outputs 1 to 8	Digital outputs polarity settings 0=output not inverted; 1=output inverted	Unsigned 8	0x00	RW
0x6206	2	Error mode outputs 8 bits	Defines the condition of each output bit when an internal error occurs	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Error mode outputs 1 to 8	Digital output condition 0=output value set as defined in object 6207 1=output value kept	Unsigned 8	0xFF	RW
0x6207	2	Error value outputs 8 bits	Defines the value of each output bit when an internal error occurs	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Error value outputs 1 to 8	Digital output value 0 = output value set to 0 1 = output value set to 1	Unsigned 8	0x00	RW
0x6208	2	Filter Mask outputs 8 bits	Defines which output port will be set to the received out value	Array	-----	---
	Sub Index 0	Max sub-index number	Contains the number of sub-index supported	Unsigned 8	0x01	RO
	Sub Index 1	Mask outputs 1 to 8	Digital output enabled	Unsigned 8	0xFF	RW