USER MANUAL

ZC-8TC

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MI002741

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Seneca Z-PC Line module: **ZC-8TC**

The Z-8TC module acquires up to 8 single-ended signals (voltage-type, from the: signal generator or thermocouple) and it converts them to a digital format (normalized measure), with two types of communication: CANopen protocol, ModBUS protocol (RS232 serial).

General characteristics

Hardware

- Three selectable acquisition speed (two at 14 bits, one at 15 bits)
- High acquisition speed.
- 1500 VAC isolation amongst inputs, power supply and CAN interface.
- Protection against ESD discharge up to 4 kV.
- Adjustable rejection at 50 and 60Hz.
- Measurement of thermocouples: J, K, E ,N ,S ,R, B, T.
- Simplified power supply and serial bus wiring by means of the bus housed in the DIN rail.
- Measurement in temperature or mV.
- Channels independently active.

Software

- Measurement of the inputs available in the following formats: floating-point representation, fixed dot at 16 bits, in tenths degrees with sign for temperature, tenths of mV for voltage.
- Cold junction compensation.
- Eight levels adjustable filter to stabilize reading.
- Led Indications: Power Supply, CAN communication, MODBUS-RTU communication, Inputs fault.
- Programmable value in case of fault or freezing of last reading.

Communication

- CAN Interface with CANopen protocol: up to 1 Mbps speed.
- CANopen Baud rate and Node ID configurability by DIP-switches or software.
- Node guarding or heartbeat
- RS232 Serial Communication with MODBUS-RTU protocol
- Complete configurability through specific software downloadable in the website www.seneca.it.

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Features

INPUTS	
Type	Thermocouples type: J, K, E, N, S, R, B, T
Tables	EN60584-1 (ITS-90)
Temperature range	Dependent on the thermocouple type (see Thermocouples range)
Span mV	From -10.1 mV to 81.4 mV
Input impedance	10 MΩ
Test current	< 50 nA
CMRR(1)	>155 dB (tested port towards all the other ones at GND)
DMRR(2)	> 60 dB
Total error	ADC 14 bit and 50 Hz rejection: ± (0.040% + 13 µV) ADC 15 bit and 50 Hz rejection: ± (0.035% + 10 µV) ADC 14 bit and 60 Hz rejection: ± (0.045% + 16 µV) ADC 15 bit and 60 Hz rejection: ± (0.045% + 16 µV)
CONVERSION/ACCURACY SPECIFICATIONS	
ADC	15 bit
Thermal drift	< 100 ppm/°C
Cold junction error	< 1°C
Disturbance rejection	Selectable either at 50 Hz or 60 Hz

(1) Values are valid at rejection frequency selected with the filter ON

(2) For disturbance values such as the input signal peak does not exceed the limit of acceptability

CONNECTIONS	
Removable terminals	Removable 4-way screw terminals, 3.5 mm pitch
IDC10 rear connector	CAN interface and power supply (for DIN rail)
Stereophonic frontal jack	3.5 mm for RS232 connection (COM)
1500 Vac ISOLATIONS	
	Between: power supply, CAN, inputs

POWER SUPPLY	
Supply voltage	10 – 40 Vdc or 19 – 28 Vac (50Hz - 60Hz)
Power consumption	Max: 0.6 W

NOTE: “0x” means an exadecimal number interpretation.

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CANOpen features

TECHNICAL DATA	
Baud rate	20, 50, 125, 250, 500, 800, 1000 kbps
Typical conversion time	20 ms for 4 channels/ 40 ms for 8 channels
Thermocouple supported	J, K, R, S, T, B, E, N
Range in mV mode	From -10.1 mV to +81.4 mV
Built-in Cold junction compensation	YES (configurable)
CANOpen TECHNICAL DATA	
NMT	Slave Node guarding, heartbeat
Node ID	HW switch or software
Number of PDO	4 TX
PDO modes	Event triggered, Sync (cyclic), Sync (acyclic)
PDO mapping	Variable
PDO linking	supported
Number of SDO	1 server
Error message	yes
Supported application	Cia 301 v4.02
Layer	Cia 401 v2.01

SUPPORTED THERMOCOUPLES		
TC TYPE	**RANGE**	**LINEARIZATION ERROR**
J	-210..1200°C	0.05°C
K	-200..1372°C	0.05°C
R	-50..1768°C	0.02°C
S	-50..1768°C	0.02°C
T	-200..400°C	0.04°C
B	250..1820°C	0.03°C
E	-200..1000°C	0.02°C
N	-200..1300°C	0.04°C

CANOpen TPDOs transmission type supported

Object Value 0x180x Sub 2	TRANSMISSION TYPE
0	Synchronous - acyclic
From 1 to 240	Synchronous - cyclic
255	Asynchronous

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CANOpen PDOs mapping

OBJECTS FOR DEFAULT MAPPING				
PDO NR	**COB-ID**	**MAPPED OBJECTS**	**INDEX**	**SUBINDEX**
TPDO2	0x40000280 + NodeId	Value CH1 16 bit	0x6401	1
		Value CH2 16 bit	0x6401	2
		Value CH3 16 bit	0x6401	3
		Value CH4 16 bit	0x6401	4
TPDO3	0x40000380 + NodeId	Value CH5 16 bit	0x6401	5
		Value CH6 16 bit	0x6401	6
		Value CH7 16 bit	0x6401	7
		Value CH8 16 bit	0x6401	8

Note that TPDO COB-ID must start with 0x4.

CANOpen emergency message

The Emergency message is composed by:

2 bytes of EEC (Emergency error code)

1 bytes of ER (Error register)

Max of 4 bytes of MEF (Manufacturer error filled)

For EEC code 0xFF10, the emergency message is:

EMERGENCY MESSAGE				
BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4
0xFF10		0x81	MEF	

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With this MEF:

MEF (Manufacturer-specific Error Field) for EEC 0xFF10		
BIT	**DESCRIPTION**	**OBJECT FOR ERROR DETAILS**
15	Channel 1/2 fail	0x2120 subindex 1
14	Channel 3/4 fail	0x2120 subindex 2
13	Channel 5/6 fail	0x2120 subindex 3
12	Channel 7/8 fail	0x2120 subindex 4
11	Channel 1 not connected or acquisition error	0x2120 subindex 1
10	Channel 2 not connected or acquisition error	0x2120 subindex 1
9	Channel 3 not connected or acquisition error	0x2120 subindex 2
8	Channel 4 not connected or acquisition error	0x2120 subindex 2
7	Channel 5 not connected or acquisition error	0x2120 subindex 3
6	Channel 6 not connected or acquisition error	0x2120 subindex 3
5	Channel 7 not connected or acquisition error	0x2120 subindex 4
4	Channel 8 not connected or acquisition error	0x2120 subindex 4
3	Channel 1/2 communication fail	0x2121 subindex 1
2	Channel 3/4 communication fail	0x2121 subindex 2
1	Channel 5/6 communication fail	0x2121 subindex 3
0	Channel 7/8 communication fail	0x2121 subindex 4

For “voltage error”, the emergency message is:

EMERGENCY MESSAGE				
BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4
0xFF10		0x85	Object 0x2100	

For a “timeout command” or “error command”, the emergency message is:

EMERGENCY MESSAGE					
BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5
0xFF11		0x81	Channel ID	Object 0x2103 subindex channelID	

Where the meaning of CHANNEL ID is:

CHANNEL ID	
CHANNEL ID	**DESCRIPTION**
0x01	Channel 1/2
0x02	Channel 3/4
0x03	Channel 5/6
0x04	Channel 7/8

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For “CPU ERROR” the Emergency message will be:

EMERGENCY MESSAGE						
BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6
0xFF20		0x81	Object 0x1002			

EEC	
CODE	**DESCRIPTION**
0x0000	No error
0x1000	Generic error
0x4201	CPU temperature over HOT STOP ERROR
0x4202	CPU temperature over HOT STOP
0x4203	CPU temperature under COLD ERROR
0x8110	Communication Can Overrun
0x8120	Error passive
0x8130	Life Guard error
0x8140	Recovered from bus off
0xFF10	General input channels error
0xFF11	Command for input channel error
0xFF20	CPU error

ER							
BIT 7	**BIT 6**	**BIT 5**	**BIT 4**	**BIT 3**	**BIT 2**	**BIT 1**	**BIT 0**
Generic	0	Voltage	temperature	communication	0	0	Manufacture

Where bit equal to “0” means “no error”.

Object 0x1002: manufacturer status register

Object 0x1002 is the CPU status.

OBJECT 1002	
BIT	**DESCRIPTION**
31..10	NA
9	Good data value
8	Precision data value
7..1	NA
0	FLASH CRC ERROR

Object 0x1006: communication window lenght

OBJECT 1006	
MIN VAL [ms]	**MAX VAL [ms]**
10	10000

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Object 0x1007: synchronous window lenght

OBJECT 1007	
MIN VAL [ms]	**MAX VAL [ms]**
2	2000

CANOpen manufacturer specific profile

If dip-switches are in “from memory” mode, the node address is selectable by **Object 0x2001**.

NODE ADDRESS (Object 0x2001)	
Object value	**Description**
0..127	Node address

If dip-switches are in “from memory” mode, the baud rate is selectable by **Object 0x2002**.

BAUDRATE (Object 0x2002)	
Object value	**Description**
1	20 kbit/s
2	50 kbit/s
3	125 kbit/s
4	250 kbit/s
5	500 kbit/s
6	800 kbit/s
7	1 Mbit/s

Object 0x2030 can be used to monitor the CPU temperature.

CPU TEMPERATURE (Object 0x2030)	
Subindex	**Description**
1	Actual temperature [°C/10]
2	Temperature for HOT STOP ERROR [°C/10] 95.0°C
3	Temperature for HOT ERROR [°C/10] 90.0°C
4	Temperature for COLD ERROR [°C/10] -25.0°C

The HOT STOP temperature sends in pre-operational the station.

The HOT ERROR and the COLD ERROR temperature sends the Emergency Object.

The Object is Read Only.

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Object 0x2100 contains the channel status:

CHANNEL STATUS (Object 0x2100)		
BIT	**Description**	**Object for error details**
15	Channel 1/2 fail	0x2120 subindex 1
14	Channel 3/4 fail	0x2120 subindex 2
13	Channel 5/6 fail	0x2120 subindex 3
12	Channel 7/8 fail	0x2120 subindex 4
11	Channel 1 not connected or acquisition error	0x2120 subindex 1
10	Channel 2 not connected or acquisition error	0x2120 subindex 1
9	Channel 3 not connected or acquisition error	0x2120 subindex 2
8	Channel 4 not connected or acquisition error	0x2120 subindex 2
7	Channel 5 not connected or acquisition error	0x2120 subindex 3
6	Channel 6 not connected or acquisition error	0x2120 subindex 3
5	Channel 7 not connected or acquisition error	0x2120 subindex 4
4	Channel 8 not connected or acquisition error	0x2120 subindex 4
3	Channel 1/2 communication fail	0x2121 subindex 1
2	Channel 3/4 communication fail	0x2121 subindex 2
1	Channel 5/6 communication fail	0x2121 subindex 3
0	Channel 7/8 communication fail	0x2121 subindex 4

Object 0x2106, **0x2107**, **0x2108**, **0x2109** contain the channels configuration:

CHANNELS 1-2 CONFIGURATION (Object 0x2106)	
Subindex	**Description**
1	Channel A enable (1=enable, 0=disable)
2	Channel B enable (1=enable, 0=disable)
3	Data type (1=mV, 0=temperature)
4	Cold junction enable (1=enable, 0=disable)
5	Frequency rejection (1=60 Hz, 0=50 Hz)
6	Filter
7	Channel A thermocouple type
8	Channel B thermocouple type

Objects 0x2107, 0x2108, 0x2109 contain respective the channels 3-4, 5-6, 7-8 configurations.

FILTER	
Value	**Filter type**
0	disabled
1	Average filter
2	Hires+average filter
3	Hires+average+exponential (level1) filter
..	..
7	Hires+average+exponential (level5) filter

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THERMOCOUPLE TYPE	
Value	**Thermocouple type**
0	Type J
1	Type K
2	Type R
3	Type S
4	Type T
5	Type B
6	Type E
7	Type N

Object 0x2125: Fault actions

Object 0x2125 sets the fault actions.

FAULT ACTIONS	
Value	**Description**
15	Fault action CH1 0=load 0x2360, 1=last good
14	Fault action CH2 0=load 0x2360, 1=last good
13	Fault action CH3 0=load 0x2360, 1=last good
12	Fault action CH4 0=load 0x2360, 1=last good
11	Fault action CH5 0=load 0x2360, 1=last good
10	Fault action CH6 0=load 0x2360, 1=last good
9	Fault action CH7 0=load 0x2360, 1=last good
8	Fault action CH8 0=load 0x2360, 1=last good

Object 0x2354: Cold junction temperature

Object 0x2354 contains the cold junction temperature for each channel:

COLD JUNCTION TEMPERATURE (Object 0x2354)	
Subindex	**Description**
1	Channels 1-2 cold junction temperature [°C/10]
2	Channels 3-4 cold junction temperature [°C/10]
3	Channels 5-6 cold junction temperature [°C/10]
4	Channels 7-8 cold junction temperature [°C/10]

Object 0x2360: Fault values

Object 0x2360 contains the floating point value (32 bit) to use in fault case (in agreement with object 0x2125). In agreement with object 0x2106, the measure unit can be in °C or mV.

BEGIN FOR INTEGER SCALE (Object 0x2360)	
SUBINDEX	**Description**
1	Channel 1 fault value
2	Channel 2 fault value
3	Channel 3 fault value
4	Channel 4 fault value
5	Channel 5 fault value
6	Channel 6 fault value
7	Channel 7 fault value
8	Channel 8 fault value

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DIP-SWITCH configuration

BAUD-RATE (Dip-Switches: SW1)			
1	2	3	Meaning
			Only Baud-Rate is acquired from memory(EEPROM)
		●	20 kbps
	●		50 kbps
	●	●	125 kbps
●			250 kbps
●		●	500 kbps
●	●		800 kbps
●	●	●	1 Mbps

ADDRESS (Dip-Switches: SW1)							
4	5	6	7	8	9	10	Meaning
							Only address is acquired from memory(EEPROM)
						●	Address=1
					●		Address=2
					●	●	Address=3
				●			Address=4
				●		●	Address=5
X	X	X	X	X	X	X	……
●	●	●	●	●	●	●	Address=127

CANOpen LED description

SERVICE (DIAGNOSTIC) LED DESCRIPTION		
LED	**LED status**	**Meaning**
RUN	Blinking light	Pre-operational mode
	Single flash	Stop mode
	ON	Operational mode
ERROR	Single flash	At least one error counter has reached or exceed the warning level
	Double flash	Guard event
	Triple flash	The SYNC has not received within the configurated communication cycle timeout period
	ON	The CAN controller is bus off
	OFF	No error
FAIL	Blinking	Data receiving from RS232
	ON	At least one channel is in error mode
POWER	ON	Power supply

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Object for analog data

Object 0x6401 contains the 16 bit (signed) values for channels 1..8 in [°C/10] or [mV/100] (in agreement with object 0x2106).

16 BIT INTEGER INPUT (Object 0x6401)	
Subindex	**Description**
1	Channel 1 16 bit input value
2	Channel 2 16 bit input value
3	Channel 3 16 bit input value
4	Channel 4 16 bit input value
5	Channel 5 16 bit input value
6	Channel 6 16 bit input value
7	Channel 7 16 bit input value
8	Channel 8 16 bit input value

Object 0x6403 contains the floating point (32 bit) values for channel 1..8.

32 BIT REAL INPUT (Object 0x6403)	
Subindex	**Description**
1	Channel 1 floating point value
2	Channel 2 floating point value
3	Channel 3 floating point value
4	Channel 4 floating point value
5	Channel 5 floating point value
6	Channel 6 floating point value
7	Channel 7 floating point value
8	Channel 8 floating point value

Object 0x6423 interrupt enable:

If the value is “1”, the station can generate asynchronous TxPDO.

If the value is “0”, the station can not generate asynchronous TxPDO.

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Object 0x6424 interrupt upper limit integer

If enabled (see object 0x6423), an interrupt is triggered when the analogue input is equal or rises above the given value.

As long as the trigger condition is met, every change of the analogue input data generates a new interrupt.

INTERRUPT UPPER LIMIT 16 BIT INTEGER (OBJECT 0X6424)	
Subindex	**Description**
1	Channel 1 upper limit integer [°C/10] or [mV/100]
2	Channel 2 upper limit integer [°C/10] or [mV/100]
3	Channel 3 upper limit integer [°C/10] or [mV/100]
4	Channel 4 upper limit integer [°C/10] or [mV/100]
5	Channel 5 upper limit integer [°C/10] or [mV/100]
6	Channel 6 upper limit integer [°C/10] or [mV/100]
7	Channel 7 upper limit integer [°C/10] or [mV/100]
8	Channel 8 upper limit integer [°C/10] or [mV/100]

Object 0x6425 interrupt lower limit integer

If enabled (see object 0x6423), an interrupt is triggered when the analogue input falls below the given value.

As long as the trigger condition is met, every change of the analogue input data generates a new interrupt.

INTERRUPT LOWER LIMIT 16 BIT INTEGER (OBJECT 0X6425)	
Subindex	**Description**
1	Channel 1 lower limit integer [°C/10] or [mV/100]
2	Channel 2 lower limit integer [°C/10] or [mV/100]
3	Channel 3 lower limit integer [°C/10] or [mV/100]
4	Channel 4 lower limit integer [°C/10] or [mV/100]
5	Channel 5 lower limit integer [°C/10] or [mV/100]
6	Channel 6 lower limit integer [°C/10] or [mV/100]
7	Channel 7 lower limit integer [°C/10] or [mV/100]
8	Channel 8 lower limit integer [°C/10] or [mV/100]

Object 0x6426 interrupt delta unsigned

The object sets the delta value (rising or falling above or below the last communicated value) for interrupt-enabled analogue inputs (if object 0x6423 enables the interrupt).

INTERRUPT DELTA UNSIGNED INTEGER 16 BIT (OBJECT 0X6426)	
Subindex	**Description**
1	Channel 1 delta unsigned [°C/10] or [mV/100]
2	Channel 2 delta unsigned [°C/10] or [mV/100]
3	Channel 3 delta unsigned [°C/10] or [mV/100]
4	Channel 4 delta unsigned [°C/10] or [mV/100]
5	Channel 5 delta unsigned [°C/10] or [mV/100]
6	Channel 6 delta unsigned [°C/10] or [mV/100]
7	Channel 7 delta unsigned [°C/10] or [mV/100]
8	Channel 8 delta unsigned [°C/10] or [mV/100]

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Object 0x6429 interrupt upper limit float

This object sets the converted upper limits for interrupt-enabled analogue inputs (see 0x6423 object). As long as the trigger condition is met, every change of the analogue input data generates a new interrupt.

INTERRUPT UPPER LIMIT 32BIT FLOAT (OBJECT 0X6429)	
Subindex	**Description**
1	Channel 1 upper limit float [°C] or [mV]
2	Channel 2 upper limit float [°C] or [mV]
3	Channel 3 upper limit float [°C] or [mV]
4	Channel 4 upper limit float [°C] or [mV]
5	Channel 5 upper limit float [°C] or [mV]
6	Channel 6 upper limit float [°C] or [mV]
7	Channel 7 upper limit float [°C] or [mV]
8	Channel 8 upper limit float [°C] or [mV]

Object 0x642A interrupt lower limit float

This object sets the lower limits for interrupt-enabled analogue inputs (see 0x6423 object). As long as the trigger condition is met, every change of the analogue input data generates a new interrupt.

INTERRUPT LOWER LIMIT 32BIT FLOAT (OBJECT 0X6425)	
Subindex	**Description**
1	Channel 1 lower limit float [°C] or [mV]
2	Channel 2 lower limit float [°C] or [mV]
3	Channel 3 lower limit float [°C] or [mV]
4	Channel 4 lower limit float [°C] or [mV]
5	Channel 5 lower limit float [°C] or [mV]
6	Channel 6 lower limit float [°C] or [mV]
7	Channel 7 lower limit float [°C] or [mV]
8	Channel 8 lower limit float [°C] or [mV]

Object 0x642B interrupt delta float

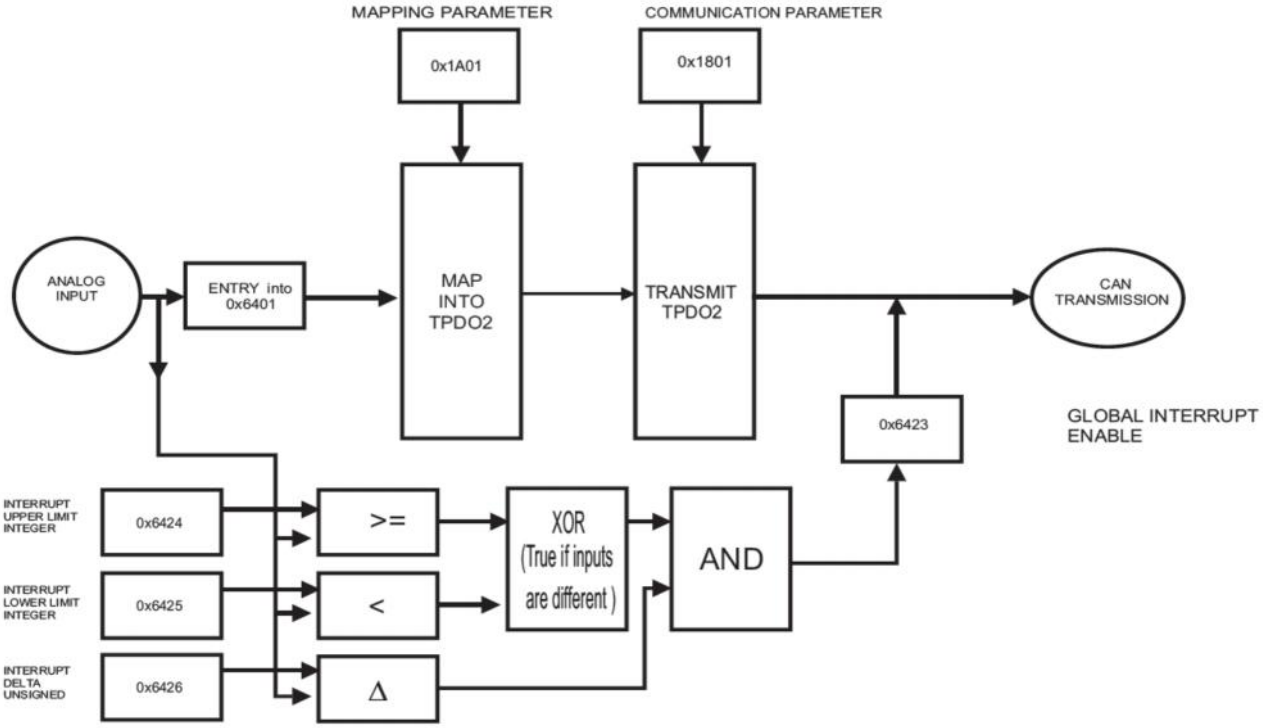
The object sets the delta value (rising or falling above or below the last sample) in float format for interrupt-enabled analogue inputs (if object 0x6423 enables the interrupt).

INTERRUPT DELTA 323 BIT FLOAT (OBJECT 0X6426)	
Subindex	**Description**
1	Channel 1 delta float [°C] or [mV]
2	Channel 2 delta float [°C] or [mV]
3	Channel 3 delta float [°C] or [mV]
4	Channel 4 delta float [°C] or [mV]
5	Channel 5 delta float [°C] or [mV]
6	Channel 6 delta float [°C] or [mV]
7	Channel 7 delta float [°C] or [mV]
8	Channel 8 delta float [°C] or [mV]

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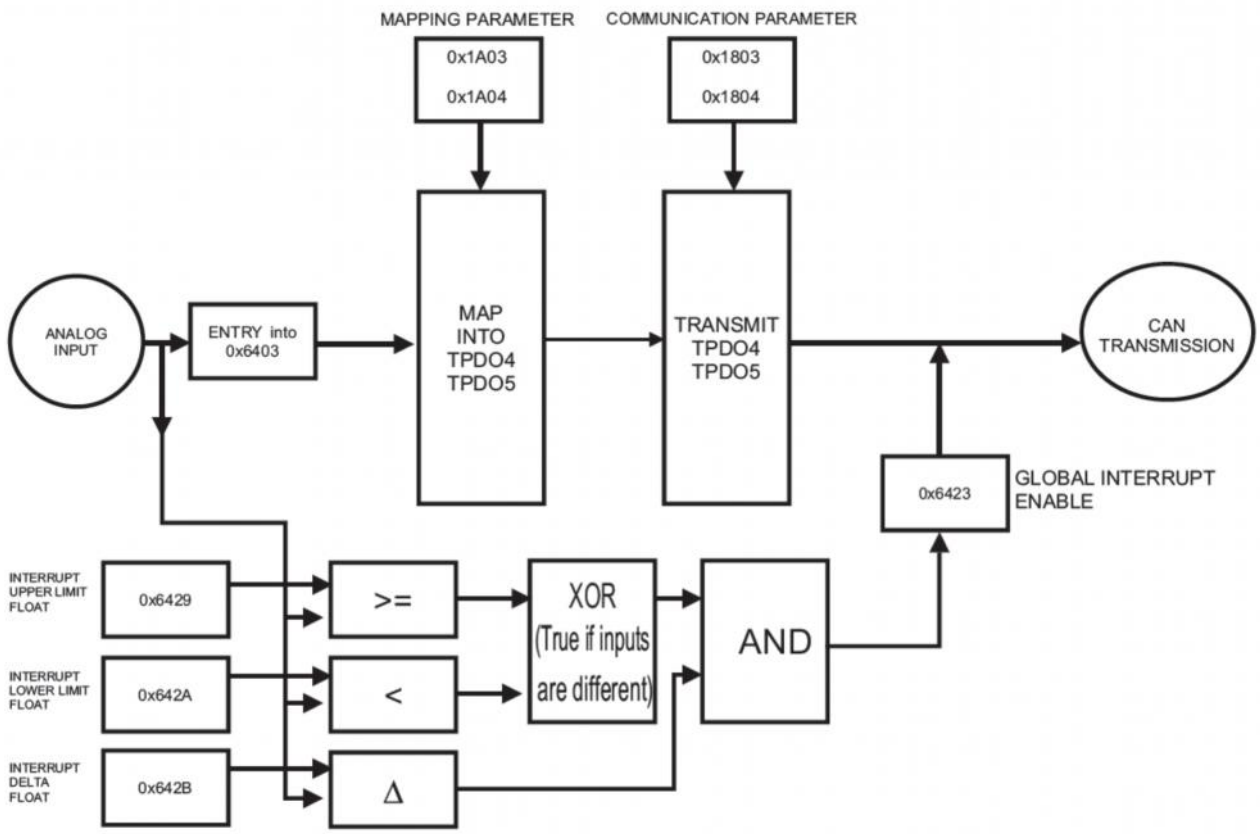
CANOpen functional diagram

For integer values



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For float values



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CANOpen Object dictionary

COMMUNICATION PROFILE AREA						
INDEX	**SUB INDEX**	**NAME**	**DESCRIPTION**	**TYPE**	**ACCESS**	**DEFAULT**
0x1000	0	Device type	Profile 401=0x191	UNSIGNED 32	RO	0x00040191
0x1001	0	Error register	Error register (DS401)	UNSIGNED 8	RO	0
0x1002	0	Manufacturer Status register	Status register	UNSIGNED 32	RO	0
0x1005	0	SYNC COB-ID	The device consumes the SYNC message	UNSIGNED 32	RW	0x00000080
0x1006	0	Comm. window lenght	Sync interval [us]	UNSIGNED 32	RW	0
0x1007	0	Synchronous window lenght	The window [us] for the PDO transmission after the SYNC	UNSIGNED 32	RW	0
0x1008	0	Manufacturer Device name	Device name	VISIBLE STRING	RO	“ZC-8TC”
0x1009	0	Manufacturer HW version	Hardware version	VISIBLE STRING	RO	“SC000000”
0x100A	0	Manufacturer SW version	Software version	VISIBLE STRING	RO	“SW001130”
0x100C	0	Guard Time	[ms]	UNSIGNED 16	RW	0
0x100D	0	Life time factor	Max delay between two guarding telegrams= Guard_Time · Life_Time_Factor	UNSIGNED 8	RW	0
0x1010	0	Store parameters/ number of mapped object	Max subindex number	UNSIGNED 8	RO	8
	1	Save all parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
	2	Save communication parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
	3	Save application parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
	4	Save manufacturer parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
	5	Save CH1-2 parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1

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	6	Save CH3-4 parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
	7	Save CH5-6 parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
	8	Save CH7-8 parameters	Store not volatile parameters (write in ASCII “save” for store process MSB 0x65766173 LSB)	UNSIGNED 32	RW	1
0x1011	0	Restore default/ number of mapped object	Max subindex number	UNSIGNED 8	RO	8
	1	Restore all parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	2	Restore communication parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	3	Restore application parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	4	Restore Manufacturer parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	5	Restore CH1-2 parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	6	Restore CH3-4 parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	7	Restore CH5-6 parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0
	8	Restore CH7-8 parameters	Restore not volatile parameters (write in ASCII “load” for store process MSB 0x64616F6C LSB)	UNSIGNED 32	RW	0

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0x1014	0	COB-ID emergency Object		UNSIGNED 32	RO	$NODEID+ 0x80
0x1017	0	Heartbeat producer time	Time (ms) 0x0000=there is not heartbeat service	UNSIGNED 16	RW	0
0x1018	0	Identity object/ number of mapped object	Max subindex number	UNSIGNED 8	RO	4
	1	Vendor ID	Seneca srl	UNSIGNED 32	RO	0x00000249
	2	Product code	ZC-8TC Machine ID Code	UNSIGNED 32	RO	0x0000001C
	3	Revision number		UNSIGNED 32	RO	0
	4	Serial number		UNSIGNED 32	RO	0
0x1200	0	1st SDO port/ number of mapped object	Max subindex number	UNSIGNED 8	RO	2
	1	COB-ID SDO Client-> Server	COB-ID of receive SDO	UNSIGNED 32	RO	$NODEID+ 0x600
	2	COB-ID SDO Server-> Client	COB-ID of transmit SDO	UNSIGNED 32	RO	$NODEID+ 0x580
0x1801	0	2nd transmit PDO parameters	Number of mapped objects	UNSIGNED 8	RO	3
	1	COB-ID used by PDO	COB-ID of TxPDO2	UNSIGNED 32	RW	$NODEID+ 0x40000280
	2	Transmission type	Transmission type for TxPDO2 0x00=synchronous – acyclic 0x01 to 0xF0=synchronous – cyclic 0xFF=asynchronous	UNSIGNED 8	RW	0xFF
	3	Inhibit time	Min delay for the next PDO (ms/10)	UNSIGNED 16	RW	0x0000
0x1802	0	3rd transmit PDO parameters	Max subindex number	UNSIGNED 8	RO	3
	1	COB-ID used by PDO	COB-ID of TxPDO3	UNSIGNED 32	RW	$NODEID+ 0x40000380
	2	Transmission type	Transmission type for TxPDO3 0x00=synchronous – acyclic 0x01 to 0xF0=synchronous – cyclic 0xFF=asynchronous	UNSIGNED 8	RW	0xFF
	3	Inhibit time	Min delay for the next PDO (ms/10)	UNSIGNED 16	RW	0x0000
0x1803	0	4th transmit PDO parameters	Max subindex number	UNSIGNED 8	RO	3

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	1	COB-ID used by PDO	COB-ID of TxPDO4	UNSIGNED 32	RW	$NODEID+ 0xC0000480
	2	Transmission type	Transmission type for TxPDO4 0x00=synchronous – acyclic 0x01 to 0xF0=synchronous – cyclic 0xFF=asynchronous	UNSIGNED 8	RW	0xFF
	3	Inhibit time	Min delay for the next PDO (ms/10)	UNSIGNED 16	RW	0x0000
0x1804	0	5th transmit PDO parameters	Max subindex number	UNSIGNED 8	RO	3
	1	COB-ID used by PDO	COB-ID of TxPDO5	UNSIGNED 32	RW	0xC0000000
	2	Transmission type	Transmission type for TxPDO5 0x00=synchronous – acyclic 0x01 to 0xF0=synchronous – cyclic 0xFF=asynchronous	UNSIGNED 8	RW	0xFF
	3	Inhibit time	Min delay for the next PDO (ms/10)	UNSIGNED 16	RW	0x0000
0x1A00	0	1st transmit PDO mapping parameter	Number of mapped objects	UNSIGNED 8	RO	0
0x1A01	0	2nd transmit PDO mapping parameter	Number of mapped objects	UNSIGNED 8	RW	4
	1	1st object to be mapped	First object (default: CHANNEL 1 16 bits input)	UNSIGNED 32	RW	0x64010110 Object=0x6401 Subindex=1 Length=16bit
	2	2nd object to be mapped	Second object (default: CHANNEL 2 16 bits input)	UNSIGNED 32	RW	0x64010210 Object=0x6401 Subindex=2 Length=16bit
	3	3rd object to be mapped	Third object (default: CHANNEL 3 16 bits input)	UNSIGNED 32	RW	0x64010310 Object=0x6401 Subindex=3 Length=16bit
	4	4th object to be mapped	Fourth object (default: CHANNEL 4 16 bits input)	UNSIGNED 32	RW	0x64010410 Object=0x6401 Subindex=4 Length=16bit
0x1A02	0	3rd transmit PDO mapping parameter	Number of mapped objects	UNSIGNED 8	RW	4
	1	1st object to be mapped	First object (default: CHANNEL 5 16 bits input)	UNSIGNED 32	RW	0x64010510 Object=0x6401 Subindex=5 Length=16bit

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	2	2nd object to be mapped	Second object (default: CHANNEL 6 16 bits input)	UNSIGNED 32	RW	0x64010610 Object=0x6401 Subindex=6 Length=16bit
	3	3rd object to be mapped	Third object (default: CHANNEL 7 16 bits input)	UNSIGNED 32	RW	0x64010710 Object=0x6401 Subindex=7 Length=16bit
	4	4th object to be mapped	Fourth object (default: CHANNEL 8 16 bits input)	UNSIGNED 32	RW	0x64010810 Object=0x6401 Subindex=8 Length=16bit
0x1A03	0	4th transmit PDO mapping parameter	Number of mapped object	UNSIGNED 8	RW	0
	1	1st object to be mapped	First object (default: NONE)	UNSIGNED 32	RW	0
	2	2nd object to be mapped	Second object (default: NONE)	UNSIGNED 32	RW	0
	3	3rd object to be mapped	Third object (default: NONE)	UNSIGNED 32	RW	0
	4	4th object to be mapped	Fourth object (default: NONE)	UNSIGNED 32	RW	0
0x1A04	0	5th transmit PDO mapping parameter	Number of mapped object	UNSIGNED 8	RW	0
	1	1st object to be mapped	First object (default: NONE)	UNSIGNED 32	RW	0
	2	2nd object to be mapped	Second object (default: NONE)	UNSIGNED 32	RW	0
	3	3rd object to be mapped	Third object (default: NONE)	UNSIGNED 32	RW	0
	4	4th object to be mapped	Fourth object (default: NONE)	UNSIGNED 32	RW	0

MANUFACTURER PROFILE AREA

INDEX	SUB INDEX	NAME	DESCRIPTION	TYPE	ACCESS	DEFAULT
0x2001	0	Module address	Station address (only if dip switch 4,5,6,7,8,9,10 are OFF)	UNSIGNED 8	RW	0x7F=127
0x2002	0	Baudrate	Station Baudrate (only if dip switch 1,2,3 are OFF) 1=20kbps 2=50kbps 3=125kbps 4=250kbps 5=500kbps 6=800kbps 7=1Mbps	UNSIGNED 8	RW	0x01
0x2003	0	Firmware release		UNSIGNED 16	RO	1132
0x2030	0	Device temperature/ number of parameters	Max subindex number	UNSIGNED 8	RO	4

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	1	Internal temperature	Station internal temperature [°C/10]	INTEGER 16	RO	0
	2	Hi Hi temperature	Critical hot temperature (all operations stop) [°C/10]	INTEGER 16	RO	950
	3	Hi temperature	Warning for too hot temperature [°C/10]	INTEGER 16	RO	900
	4	Low temperature	Critical low temperature (all operations stop) [°C/10]	INTEGER 16	RO	-250
0x2104	0	Channel CMD	Number of parameters	UNSIGNED 8	RO	4
	1	CMD CH1-2	Writing 0xC0DE will return the channel fw code into 0x2105	UNSIGNED 16	RW	0
	2	CMD CH3-4	Writing 0xC0DE will return the channel fw code into 0x2105	UNSIGNED 16	RW	0
	3	CMD CH5-6	Writing 0xC0DE will return the channel fw code into 0x2105	UNSIGNED 16	RW	0
	4	CMD CH7-8	Writing 0xC0DE will return the channel fw code into 0x2105	UNSIGNED 16	RW	0
0x2105	0	Channel aux CMD	Number of parameters	UNSIGNED 8	RO	
	1	AUX CMD CH1-2	FW Code return value	UNSIGNED 16	RW	0
	2	AUX CMD CH3-4	FW Code return value	UNSIGNED 16	RW	0
	3	AUX CMD CH5-6	FW Code return value	UNSIGNED 16	RW	0
	4	AUX CMD CH7-8	FW Code return value	UNSIGNED 16	RW	0
0x2106	0	Channel 1-2 parameters	Number of parameters	UNSIGNED 8	RO	8
	1	CH1 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH2 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH1 – CH2 Data type	0=°C 1=mV	UNSIGNED 8	RW	0
	4	CH1-CH2 cold junction compensation enable	0=disable, 1=enable	UNSIGNED 8	RW	1
	5	CH1-CH2 Line frequency rejection	0=50 Hz, 1= 60 Hz	UNSIGNED 8	RW	0

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	6	CH1-CH2 Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
	7	CH1-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
	8	CH2-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
0x2107	0	Channel 3-4 parameters	Number of parameters	UNSIGNED 8	RO	8
	1	CH3 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH4 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH3 – CH4 Data type	0=°C 1=mV	UNSIGNED 8	RW	0
	4	CH3-CH4 cold junction compensation enable	0=disable, 1=enable	UNSIGNED 8	RW	1
	5	CH3-CH4 Line frequency rejection	0=50 Hz, 1= 60 Hz	UNSIGNED 8	RW	0
	6	CH3-CH4 Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
	7	CH3-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
	8	CH4-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
0x2108	0	Channel 5-6 parameters	Number of parameters	UNSIGNED 8	RO	8
	1	CH5 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH6 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH5 – CH6 Data type	0=°C 1=mV	UNSIGNED 8	RW	0
	4	CH5-CH6 cold junction compensation enable	0=disable, 1=enable	UNSIGNED 8	RW	1
	5	CH5-CH6 Line frequency rejection	0=50 Hz, 1= 60 Hz	UNSIGNED 8	RW	0
	6	CH5-CH6 Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2

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	7	CH5-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
	8	CH6-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
0x2109	0	Channel 7-8 parameters	Number of parameters	UNSIGNED 8	RO	8
	1	CH7 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH8 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH7 – CH8 Data type	0=°C 1=mV	UNSIGNED 8	RW	0
	4	CH7-CH8 cold junction compensation enable	0=disable, 1=enable	UNSIGNED 8	RW	1
	5	CH7-CH8 Line frequency rejection	0=50 Hz, 1= 60 Hz	UNSIGNED 8	RW	0
	6	CH7-CH8 Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
	7	CH7-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
	8	CH8-thermocouple type	0=J, 1=K, 2=R, 3=S, 4=T, 5=B, 6=E, 7=N	UNSIGNED 8	RW	0
0x2120	0	Channel status	Number of parameters	UNSIGNED 8	RO	4
	1	CH1-2 STATUS		UNSIGNED 16	RO	
	2	CH3-4 STATUS		UNSIGNED 16	RO	
	3	CH5-6 STATUS		UNSIGNED 16	RO	
	4	CH7-8 STATUS		UNSIGNED 16	RO	
0x2125	0	Fault actions	1=last good 0=load object 0x2360 Bit 7..0 not used	UNSIGNED 16	RW	0xFF00
0x2354	0	Cold junction temperature	Number of parameters	UNSIGNED 8	RO	4
	1	CH1-2 Cold junction value	[°C/10]	INTEGER 16	RO	
	2	CH3-4 Cold junction value	[°C/10]	INTEGER 16	RO	
	3	CH5-6 Cold junction value	[°C/10]	INTEGER 16	RO	
	4	CH7-8 Cold junction value	[°C/10]	INTEGER 16	RO	
0x2360	0	Fault values	Number of parameters	UNSIGNED 8	RO	8

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	1	CH1 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	2	CH2 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	3	CH3 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	4	CH4 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	5	CH5 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	6	CH6 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	7	CH7 Fault value	[°C] or [mV]	REAL 32	RW	2000.0
	8	CH8 Fault value	[°C] or [mV]	REAL 32	RW	2000.0

STANDARD DEVICE PROFILE AREA

INDEX	SUB INDEX	NAME	DESCRIPTION	TYPE	ACCESS	DEFAULT
0x6401	0	16 bit input	Number of input float	UNSIGNED 8	RO	8
	1	CH1 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	2	CH2 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	3	CH3 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	4	CH4 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	5	CH5 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	6	CH6 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	7	CH7 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
	8	CH8 measure 16 bits	[°C/10] or [mV/100]	INTEGER 16	RO	
0x6403	0	Float input	Number of input float	UNSIGNED 8	RO	8
	1	CH1 measure real	[mV] or [°C]	REAL 32	RO	
	2	CH2 measure real	[mV] or [°C]	REAL 32	RO	
	3	CH3 measure real	[mV] or [°C]	REAL 32	RO	
	4	CH4 measure real	[mV] or [°C]	REAL 32	RO	
	5	CH5 measure real	[mV] or [°C]	REAL 32	RO	
	6	CH6 measure real	[mV] or [°C]	REAL 32	RO	
	7	CH7 measure real	[mV] or [°C]	REAL 32	RO	
	8	CH8 measure real	[mV] or [°C]	REAL 32	RO	
0x6423	0	Analogue input interrupt global enable	0=disable asynchronous TxPDO 1=enable asynchronous TxPDO	BOOLEAN	RW	0
0x6424	0	analogue interrupt upper limit – 16bit		UNSIGNED 8	RO	8

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	1	Analogue interrupt upper limit CH1 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	2	Analogue interrupt upper limit CH2 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	3	Analogue interrupt upper limit CH3 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	4	Analogue interrupt upper limit CH4 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	5	Analogue interrupt upper limit CH5 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	6	Analogue interrupt upper limit CH6 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	7	Analogue interrupt upper limit CH7 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	8	Analogue interrupt upper limit CH8 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
0x6425	0	Analogue interrupt lower limit – 16bit		UNSIGNED 8	RO	8
	1	Analogue interrupt lower limit CH1 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	2	Analogue interrupt lower limit CH2 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	3	Analogue interrupt lower limit CH3 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	4	Analogue interrupt lower limit CH4 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	5	Analogue interrupt lower limit CH5 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	6	Analogue interrupt lower limit CH6 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	7	Analogue interrupt lower limit CH7 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
	8	Analogue interrupt lower limit CH8 – 16bit	[°C/10] or [mV/100]	INTEGER 16	RW	0
0x6426	0	Analogue interrupt delta limit – 16bit		UNSIGNED 8	RO	8
	1	Analogue interrupt delta	[°C/10] or [mV/100]	UNSIGNED 16	RW	0

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		limit CH1 – 16bit				
	2	Analogue interrupt delta limit CH2 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
	3	Analogue interrupt delta limit CH3 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
	4	Analogue interrupt delta limit CH4 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
	5	Analogue interrupt delta limit CH5 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
	6	Analogue interrupt delta limit CH6 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
	7	Analogue interrupt delta limit CH7 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
	8	Analogue interrupt delta limit CH8 – 16bit	[°C/10] or [mV/100]	UNSIGNED 16	RW	0
0x6429	0	Analogue interrupt upper limit – float		UNSIGNED 8	RO	8
	1	Analogue interrupt upper limit CH1 – float	[°C] or [mV]	REAL 32	RW	0
	2	Analogue interrupt upper limit CH2 – float	[°C] or [mV]	REAL 32	RW	0
	3	Analogue interrupt upper limit CH3 – float	[°C] or [mV]	REAL 32	RW	0
	4	Analogue interrupt upper limit CH4 – float	[°C] or [mV]	REAL 32	RW	0
	5	Analogue interrupt upper limit CH5 – float	[°C] or [mV]	REAL 32	RW	0
	6	Analogue interrupt upper limit CH6 – float	[°C] or [mV]	REAL 32	RW	0
	7	Analogue interrupt upper limit CH7 – float	[°C] or [mV]	REAL 32	RW	0
	8	Analogue interrupt upper limit CH8 – float	[°C] or [mV]	REAL 32	RW	0
0x642A	0	Analogue interrupt lower limit – float		REAL 32	RO	8
	1	Analogue interrupt lower limit CH1 – float	[°C] or [mV]	REAL 32	RW	0

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	2	Analogue interrupt lower limit CH2 – float	[°C] or [mV]	REAL 32	RW	0
	3	Analogue interrupt lower limit CH3 – float	[°C] or [mV]	REAL 32	RW	0
	4	Analogue interrupt lower limit CH4 – float	[°C] or [mV]	REAL 32	RW	0
	5	Analogue interrupt lower limit CH5 – float	[°C] or [mV]	REAL 32	RW	0
	6	Analogue interrupt lower limit CH6 – float	[°C] or [mV]	REAL 32	RW	0
	7	Analogue interrupt lower limit CH7 – float	[°C] or [mV]	REAL 32	RW	0
	8	Analogue interrupt lower limit CH8 – float	[°C] or [mV]	REAL 32	RW	0
0x642B	0	Analogue interrupt delta limit – float		UNSIGNED 8	RO	8
	1	Analogue interrupt delta limit CH1 – float	[°C] or [mV]	REAL 32	RW	0
	2	Analogue interrupt delta limit CH2 – float	[°C] or [mV]	REAL 32	RW	0
	3	Analogue interrupt delta limit CH3 – float	[°C] or [mV]	REAL 32	RW	0
	4	Analogue interrupt delta limit CH4 – float	[°C] or [mV]	REAL 32	RW	0
	5	Analogue interrupt delta limit CH5 – float	[°C] or [mV]	REAL 32	RW	0
	6	Analogue interrupt delta limit CH6 – float	[°C] or [mV]	REAL 32	RW	0
	7	Analogue interrupt delta limit CH7 – float	[°C] or [mV]	REAL 32	RW	0
	8	Analogue interrupt delta limit CH8 – float	[°C] or [mV]	REAL 32	RW	0

Easy-SETUP

To configure the Seneca Z-PC Line modules, it is possible to use Easy-SETUP software, free-downloadable from the www.seneca.it; the configuration can be performed by RS232 or RS485 bus communication.

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