USER MANUAL

ZC-8AI

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MI002731

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

The ZC-8AI module acquires up to 8 single-ended input signals (voltage or current type) and it converts them to a digital format (normalized measure), with two types of communication: CANopen protocol, ModBUS protocol (RS232 serial).

General characteristics

Hardware

- 8 analog inputs (4 isolation zones)
- Inputs: 0 -20.5mA; 0 - 10.5V
- 6 isolation zones, 1500 VAC isolation amongst every zone
- Protection against ESD discharge up to 4 kV.
- Simplified power supply and serial bus wiring by means of the bus housed in the DIN rail.
- Power up to 8 sensors, up to 22mA @ 16.5V each.
- Adjustable resolution: 14 or 15 bit
- Minimum refresh time: 20ms.

Software

- Adjustable rejection 50 or 60 Hz
- Variable input filtering
- Led Indications: Power Supply, CAN communication, MODBUS-RTU communication, Inputs fault.

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.

Features

INPUTS	
Type	Monopolar input: current or voltage
Full scale	0..20.5 mA; 0..10.5 V
Voltage input error 14 bit	0.046% end scale + 1.7 mV
Voltage input error 15 bit	0.039% end scale + 1.3 mV
Current input error 14 bit	0.046% end scale + 3.4 µA
Current input error 15 bit	0.039% end scale + 2.4 µA
CONVERSION/ACCURACY SPECIFICATIONS	
ADC	15 bit
Thermal drift	< 100 ppm/°C
Sampling frequency	Settable from 11 to 48 Hz
Disturbance rejection	Selectable either at 50 Hz or 60 Hz

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: 5 W (all sensors powered)

NOTE: "0x" means an exadecimal number interpretation.

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
Input supported	Voltage from 0 to 10.5 V Current from 0 to 20.5 mA
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

CANOpen TPDOs transmission type supported

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

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	

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 fail	0x2120 subindex 1
10	Channel 2 fail	0x2120 subindex 1
9	Channel 3 fail	0x2120 subindex 2
8	Channel 4 fail	0x2120 subindex 2
7	Channel 5 fail	0x2120 subindex 3
6	Channel 6 fail	0x2120 subindex 3
5	Channel 7 fail	0x2120 subindex 4
4	Channel 8 fail	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

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..18	NA
17	Channel 8 saturation error
16	Channel 7 saturation error
15	Channel 6 saturation error
14	Channel 5 saturation error
13	Channel 4 saturation error
12	Channel 3 saturation error
11	Channel 2 saturation error
10	Channel 1 saturation error
9	Good data value
8	Precision data value
7..1	NA
0	CPU EEPROM CRC ERROR

Object 0x1006: communication window lenght

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

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.

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 fail	0x2120 subindex 1
10	Channel 2 fail	0x2120 subindex 1
9	Channel 3 fail	0x2120 subindex 2
8	Channel 4 fail	0x2120 subindex 2
7	Channel 5 fail	0x2120 subindex 3
6	Channel 6 fail	0x2120 subindex 3
5	Channel 7 fail	0x2120 subindex 4
4	Channel 8 fail	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 CONFIGURATION	
Subindex	**Description**
0x2106	Channel 1/2 configuration
0x2107	Channel 3/4 configuration
0x2108	Channel 5/6 configuration
0x2109	Channel 7/8 configuration

SUBINDEX CHANNELS CONFIGURATION	
Subindex	**Description**
1	Channel A enable (1=enable, 0=disable)
2	Channel B enable (1=enable, 0=disable)
3	Channel A type (1=current, 0=voltage)
4	Channel B type (1=current, 0=voltage)
5	Frequency rejection (1=60 Hz, 0=50 Hz)
6	Filter

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

INTEGER SCALE PROCESS

Integer input objects can be scaled by a BEGIN (referred to 0 mV or 0 µA) for a 0 integer value and a END (referred to 10000mV or 20000 µA) for a 10000 integer value.

The formula is: Int16=((VAL-BGN)/(END-BGN))*10000

BEGIN FOR INTEGER SCALE: Object 0x2700

The object sets the customization of the associated mV or µA input value to the 0 integer value.

BEGIN FOR INTEGER SCALE (Object 0x2700)	
SUBINDEX	**Description**
1	Begin value for channel 1 [mV] or [µA]
2	Begin value for channel 2 [mV] or [µA]
3	Begin value for channel 3 [mV] or [µA]
4	Begin value for channel 4 [mV] or [µA]
5	Begin value for channel 5 [mV] or [µA]
6	Begin value for channel 6 [mV] or [µA]
7	Begin value for channel 7 [mV] or [µA]
8	Begin value for channel 8 [mV] or [µA]

END FOR INTEGER SCALE: Object 0x2701

The object sets the customization of the associated mV or µA input value to the 10000 integer value.

BEGIN FOR INTEGER SCALE (Object 0x2700)	
SUBINDEX	**Description**
1	End value for channel 1 [mV] or [µA]
2	End value for channel 2 [mV] or [µA]
3	End value for channel 3 [mV] or [µA]
4	End value for channel 4 [mV] or [µA]
5	End value for channel 5 [mV] or [µA]
6	End value for channel 6 [mV] or [µA]
7	End value for channel 7 [mV] or [µA]
8	End value for channel 8 [mV] or [µA]

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

Object for analog data

Object 0x6401 contains the 16 bit (signed) values for channels 1..8.

16 BIT INTEGER INPUT (Object 0x6411)	
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.

Object 0x6430 assigns the measure unit for the analogic input measure. Subindex 1 is referred to input 1…subindex 8 is referred to input 8.

SI UNIT (Object 0x6430)	
Measure unit	**Value**
mV	0xFD260000
µA	0xFA040000

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 [mV] or [µA]
2	Channel 2 upper limit integer [mV] or [µA]
3	Channel 3 upper limit integer [mV] or [µA]
4	Channel 4 upper limit integer [mV] or [µA]
5	Channel 5 upper limit integer [mV] or [µA]
6	Channel 6 upper limit integer [mV] or [µA]
7	Channel 7 upper limit integer [mV] or [µA]
8	Channel 8 upper limit integer [mV] or [µA]

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 [mV] or [µA]
2	Channel 2 lower limit integer [mV] or [µA]
3	Channel 3 lower limit integer [mV] or [µA]
4	Channel 4 lower limit integer [mV] or [µA]
5	Channel 5 lower limit integer [mV] or [µA]
6	Channel 6 lower limit integer [mV] or [µA]
7	Channel 7 lower limit integer [mV] or [µA]
8	Channel 8 lower limit integer [mV] or [µA]

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 [mV] or [µA]
2	Channel 2 delta unsigned [mV] or [µA]
3	Channel 3 delta unsigned [mV] or [µA]
4	Channel 4 delta unsigned [mV] or [µA]
5	Channel 5 delta unsigned [mV] or [µA]
6	Channel 6 delta unsigned [mV] or [µA]
7	Channel 7 delta unsigned [mV] or [µA]
8	Channel 8 delta unsigned [mV] or [µA]

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 [mV] or [µA]
2	Channel 2 upper limit float [mV] or [µA]
3	Channel 3 upper limit float [mV] or [µA]
4	Channel 4 upper limit float [mV] or [µA]
5	Channel 5 upper limit float [mV] or [µA]
6	Channel 6 upper limit float [mV] or [µA]
7	Channel 7 upper limit float [mV] or [µA]
8	Channel 8 upper limit float [mV] or [µA]

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 [mV] or [µA]
2	Channel 2 lower limit float [mV] or [µA]
3	Channel 3 lower limit float [mV] or [µA]
4	Channel 4 lower limit float [mV] or [µA]
5	Channel 5 lower limit float [mV] or [µA]
6	Channel 6 lower limit float [mV] or [µA]
7	Channel 7 lower limit float [mV] or [µA]
8	Channel 8 lower limit float [mV] or [µA]

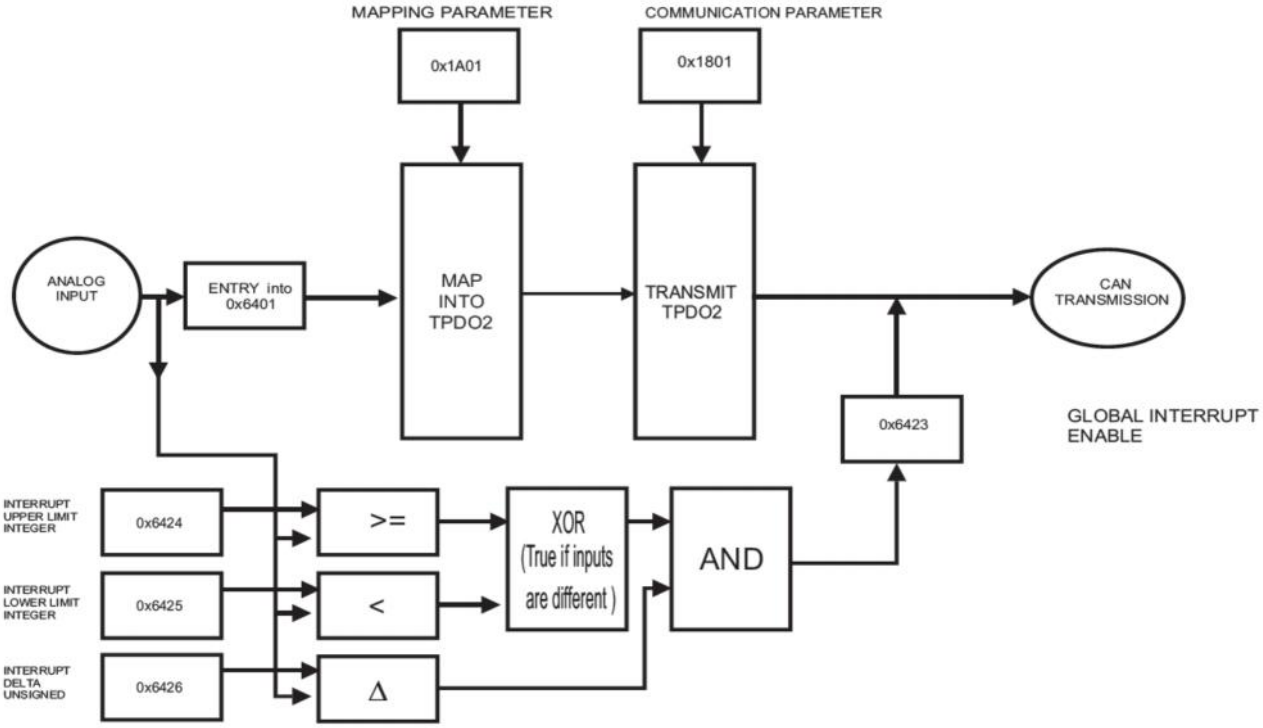
Object 0x642B interrupt delta float

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).

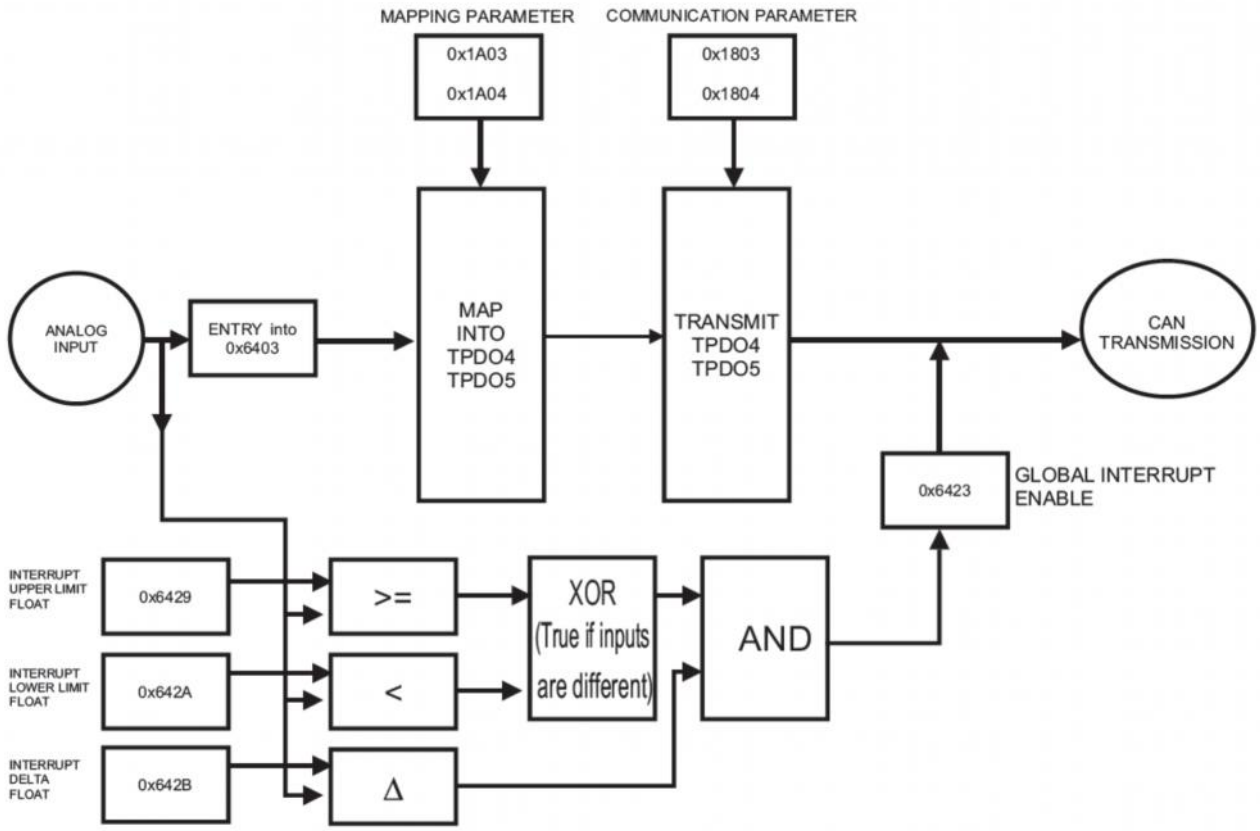
INTERRUPT DELTA 323 BIT FLOAT (OBJECT 0X6426)	
Subindex	**Description**
1	Channel 1 delta float [mV] or [µA]
2	Channel 2 delta float [mV] or [µA]
3	Channel 3 delta float [mV] or [µA]
4	Channel 4 delta float [mV] or [µA]
5	Channel 5 delta float [mV] or [µA]
6	Channel 6 delta float [mV] or [µA]
7	Channel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

CANOpen functional diagram

For integer values



For float values



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	
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-8AI”
0x1009	0	Manufacturer HW version	Hardware version	VISIBLE STRING	RO	“SC000000”
0x100A	0	Manufacturer SW version	Software version	VISIBLE STRING	RO	“SW001142”
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

	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

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-8AI Machine ID Code	UNSIGNED 32	RO	0x00001D00
	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

	1	COB-ID used by PDO	COB-ID of TxPDO4	UNSIGNED 32	RW	$NODEID+ 0x40000480
	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	0x80000000
	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
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
	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	4
	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	4
	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	
0x2030	0	Device temperature/ number of parameters	Max subindex number	UNSIGNED 8	RO	4
	1	Internal temperature	Station internal temperature [°C/10]	INTEGER 16	RO	0
	2	Hi Hi temperature	Critical hot temperature (all operations stop)	INTEGER 16	RO	950

			[°C/10]			
	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
0x2100	0	Channel 1..8 global status		UNSIGNED 16	RO	
0x2106	0	Channel 1-2 configuration	Number of parameters	UNSIGNED 8	RO	6
	1	CH1 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH2 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH1 – type	0=V 1=mA	UNSIGNED 8	RW	0
	4	CH2 – type	0=V 1=mA	UNSIGNED 8	RW	0
	5	CH1-2 line frequency rejection	0=50 Hz, 1=60 Hz	UNSIGNED 8	RW	0
	6	Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
0x2107	0	Channel 3-4 configuration	Number of parameters	UNSIGNED 8	RO	6
	1	CH3 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH4 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH3 – type	0=V 1=mA	UNSIGNED 8	RW	0
	4	CH4 – type	0=V 1=mA	UNSIGNED 8	RW	0
	5	CH3-4 line frequency rejection	0=50 Hz, 1=60 Hz	UNSIGNED 8	RW	0
	6	Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
0x2108	0	Channel 5-6 configuration	Number of parameters	UNSIGNED 8	RO	6
	1	CH5 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH6 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH5 – type	0=V 1=mA	UNSIGNED 8	RW	0
	4	CH6 – type	0=V 1=mA	UNSIGNED 8	RW	0
	5	CH5-6 line frequency rejection	0=50 Hz, 1=60 Hz	UNSIGNED 8	RW	0

	6	Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
0x2109	0	Channel 7-8 configuration	Number of parameters	UNSIGNED 8	RO	6
	1	CH7 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	2	CH8 enable	0=disable 1=enable	UNSIGNED 8	RW	1
	3	CH7 – type	0=V 1=mA	UNSIGNED 8	RW	0
	4	CH8 – type	0=V 1=mA	UNSIGNED 8	RW	0
	5	CH7-8 line frequency rejection	0=50 Hz, 1=60 Hz	UNSIGNED 8	RW	0
	6	Filter	0=disable, 1=average, 2=hires+average, 3=exp lev1,...7=exp lev5	UNSIGNED 8	RW	2
0x2700	0	Begin integer scale	Begin value nr	UNSIGNED 8	RO	8
	1	Begin scale CH1	Channel 1 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	2	Begin scale CH2	Channel 2 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	3	Begin scale CH3	Channel 3 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	4	Begin scale CH4	Channel 4 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	5	Begin scale CH5	Channel 5 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	6	Begin scale CH6	Channel 6 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	7	Begin scale CH7	Channel 7 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
	8	Begin scale CH8	Channel 8 begin integer scale [mV] or [µA]	INTEGER 16	RW	0
0x2701	0	End scale integer		UNSIGNED 8	RO	8
	1	End scale CH1	Channel 1 end integer scale [mV] or [µA]	INTEGER 16	RW	10000
	2	End scale CH2	Channel 2 end integer scale [mV] or [µA]	INTEGER 16	RW	10000
	3	End scale CH3	Channel 3 end integer scale [mV] or [µA]	INTEGER 16	RW	10000

	4	End scale CH4	Channel 4 end integer scale [mV] or [µA]	INTEGER 16	RW	10000
	5	End scale CH5	Channel 5 end integer scale [mV] or [µA]	INTEGER 16	RW	10000
	6	End scale CH6	Channel 6 end integer scale [mV] or [µA]	INTEGER 16	RW	10000
	7	End scale CH7	Channel 7 end integer scale [mV] or [µA]	INTEGER 16	RW	10000
	8	End scale CH8	Channel 8 end integer scale [mV] or [µA]	INTEGER 16	RW	10000

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 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	2	CH2 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	3	CH3 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	4	CH4 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	5	CH5 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	6	CH6 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	7	CH7 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
	8	CH8 value 16 bits	[mV] or [µA]	INTEGER 16	RO	
0x6403	0	Float input	Number of input float	UNSIGNED 8	RO	8
	1	CH1 value real	[mV] or [µA]	REAL 32	RO	
	2	CH2 value real	[mV] or [µA]	REAL 32	RO	
	3	CH3 value real	[mV] or [µA]	REAL 32	RO	
	4	CH4 value real	[mV] or [µA]	REAL 32	RO	
	5	CH5 value real	[mV] or [µA]	REAL 32	RO	
	6	CH6 value real	[mV] or [µA]	REAL 32	RO	
	7	CH7 value real	[mV] or [µA]	REAL 32	RO	
	8	CH8 value real	[mV] or [µA]	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
	1	Analogue interrupt upper limit CH1 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	2	Analogue interrupt upper limit CH2 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	3	Analogue interrupt upper limit CH3 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	4	Analogue interrupt upper limit CH4 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	5	Analogue interrupt upper limit CH5 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	6	Analogue interrupt upper limit CH6 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	7	Analogue interrupt upper limit CH7 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	8	Analogue interrupt upper limit CH8 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
0x6425	0	Analogue interrupt lower limit – 16bit		UNSIGNED 8	RO	8
	1	Analogue interrupt lower limit CH1 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	2	Analogue interrupt lower limit CH2 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	3	Analogue interrupt lower limit CH3 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	4	Analogue interrupt lower limit CH4 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	5	Analogue interrupt lower limit CH5 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	6	Analogue interrupt lower limit CH6 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	7	Analogue interrupt lower limit CH7 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	8	Analogue interrupt lower limit CH8 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0

0x6426	0	Analogue interrupt delta limit – 16bit		UNSIGNED 8	RO	8
	1	Analogue interrupt delta limit CH1 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	2	Analogue interrupt delta limit CH2 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	3	Analogue interrupt delta limit CH3 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	4	Analogue interrupt delta limit CH4 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	5	Analogue interrupt delta limit CH5 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	6	Analogue interrupt delta limit CH6 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	7	Analogue interrupt delta limit CH7 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
	8	Analogue interrupt delta limit CH8 – 16bit	[mV] or [µA]	UNSIGNED 16	RW	0
0x6429	0	analogue interrupt upper limit – float		UNSIGNED 8	RO	8
	1	Analogue interrupt upper limit CH1 – float	[mV] or [µA]	REAL 32	RW	0
	2	Analogue interrupt upper limit CH2 – float	[mV] or [µA]	REAL 32	RW	0
	3	Analogue interrupt upper limit CH3 – float	[mV] or [µA]	REAL 32	RW	0
	4	Analogue interrupt upper limit CH4 – float	[mV] or [µA]	REAL 32	RW	0
	5	Analogue interrupt upper limit CH5 – float	[mV] or [µA]	REAL 32	RW	0
	6	Analogue interrupt upper limit CH6 – float	[mV] or [µA]	REAL 32	RW	0
	7	Analogue interrupt upper limit CH7 – float	[mV] or [µA]	REAL 32	RW	0
	8	Analogue interrupt upper limit CH8 – float	[mV] or [µA]	REAL 32	RW	0

0x642A	0	Analogue interrupt lower limit – float		REAL 32	RO	8
	1	Analogue interrupt lower limit CH1 – float	[mV] or [µA]	REAL 32	RW	0
	2	Analogue interrupt lower limit CH2 – float	[mV] or [µA]	REAL 32	RW	0
	3	Analogue interrupt lower limit CH3 – float	[mV] or [µA]	REAL 32	RW	0
	4	Analogue interrupt lower limit CH4 – float	[mV] or [µA]	REAL 32	RW	0
	5	Analogue interrupt lower limit CH5 – float	[mV] or [µA]	REAL 32	RW	0
	6	Analogue interrupt lower limit CH6 – float	[mV] or [µA]	REAL 32	RW	0
	7	Analogue interrupt lower limit CH7 – float	[mV] or [µA]	REAL 32	RW	0
	8	Analogue interrupt lower limit CH8 – float	[mV] or [µA]	REAL 32	RW	0
0x642B	0	Analogue interrupt delta limit – float		UNSIGNED 8	RO	8
	1	Analogue interrupt delta limit CH1 – float	[mV] or [µA]	REAL 32	RW	0
	2	Analogue interrupt delta limit CH2 – float	[mV] or [µA]	REAL 32	RW	0
	3	Analogue interrupt delta limit CH3 – float	[mV] or [µA]	REAL 32	RW	0
	4	Analogue interrupt delta limit CH4 – float	[mV] or [µA]	REAL 32	RW	0
	5	Analogue interrupt delta limit CH5 – float	[mV] or [µA]	REAL 32	RW	0
	6	Analogue interrupt delta limit CH6 – float	[mV] or [µA]	REAL 32	RW	0
	7	Analogue interrupt delta limit CH7 – float	[mV] or [µA]	REAL 32	RW	0
	8	Analogue interrupt delta limit CH8 – float	[mV] or [µA]	REAL 32	RW	0

0x6430	0	SI unit		UNSIGNED 8	RO	8
	1	SI unit CH1	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	2	SI unit CH2	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	3	SI unit CH3	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	4	SI unit CH4	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	5	SI unit CH5	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	6	SI unit CH6	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	7	SI unit CH7	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000
	8	SI unit CH8	0xFD260000=mV 0xFD040000=µA	UNSIGNED 32	RW	0xFD260000

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.