USER MANUAL

Z-4TC

Models:

Z-4TC-0

Z-4TC-1

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Seneca **Z-4TC**

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1. Introduction

The Z-4TC module acquires up to 4 single-ended signals (voltage-type, from the: signal generator or thermocouple) and it converts them to a digital format using the Modbus RTU Protocol.

A double serial interface (RS232 or RS485) it's also available (Modbus RTU protocol).

1.1. Features

The information regarding technical specifications, electrical connections and functionality of the LEDs can be found in the installation manual for each product. To consult the installation manual use the link below:

- *Z-4TC:* **https://www.seneca.it/products/z-4tc/doc/installation_manualIEN**

2. MODBUS RTU PROTOCOL

The Modbus protocols supported by the Z-4TC is:

Modbus RTU Slave

for more information about this protocols please refer to Modbus specification website:

http://www.modbus.org/specs.php

2.1. MODBUS RTU DEFAULT CONFIGURATION

The RS232 port is always configured in:

Baud Rate: 2400, Data: 8Bit, Parity: None, Stop Bit 1, Modbus Station Address: 1

The RS485 port is configured from dip switch and from the Easy Setup Software.

2.2. MODBUS RTU FUNCTION CODE

The following Modbus functions are supported:

Read Holding Register (function 3)

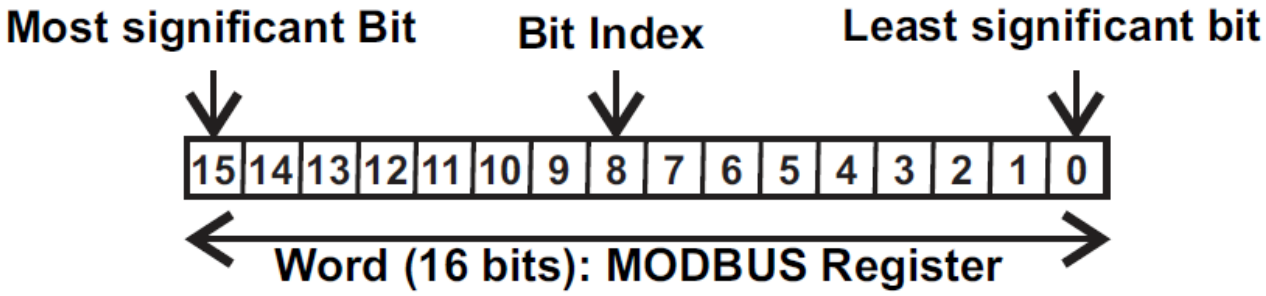
Write Single Register (function 6)

Write Multiple registers (function 16)

2.3. MODBUS RTU Register table

An Holding Register is composed by 16 bit from 0 to 15.

The Least significant bit is represented with BIT[0], the most significant bit with BIT[15]:



A single Floating point (32 bit) register is composed by two Holding Registers.

Register Name	Comment	Register Type	R/W	Default value or Start Value	Modbus Address	Offset
MachineID	Module ID code	Unsigned 16 bits	R	Internal code	40001	0
Baudrate / Address	Bit [15:8] Baud-rate for RS485 0=4800 1=9600 2=19200 3=38400 4=57600 5=115200 6=1200 7=2400 Bit [7:0] Station Address for RS485 Modbus RTU from 0x01=1 to 0xFF=255	Unsigned 16 bits	R/W	38400 BAUD Station address 1	40002	1
Eprflag	[Bit 5…16] Not used [Bit 4] Parity for RS485: 0=even parity 1=odd parity [Bit 3] 0 = no parity 1 = parity enabled [Bit 2] Delay on communication response: pauses between the end of Rx message and the start of Tx message: 0=disabled 1=enabled [Bit 1]	Unsigned 16 bits	R/W	No parity No delay on response	40003	2

	Sampling time: 0=120 ms for channel 1=60 ms for channel [Bit 0] Automatic detection if a TC interruption occurs 0=activated 1=deactivated					
INPUT 1 TYPE	0=Voltage (±160mV) 1=TC J 2=TC K 3=TC R 4=TC S 5=TC T 6=TC B 7=TC E 8=TC N	Unsigned 16 bits	R/W	Voltage	40004	3
INPUT 2 TYPE	0=Voltage (±160mV) 1=TC J 2=TC K 3=TC R 4=TC S 5=TC T 6=TC B 7=TC E 8=TC N	Unsigned 16 bits	R/W	Voltage	40005	4
INPUT 3 TYPE	0=Voltage (±160mV) 1=TC J 2=TC K	Unsigned 16 bits	R/W	Voltage	40006	5

	3=TC R 4=TC S 5=TC T 6=TC B 7=TC E 8=TC N					
INPUT 4 TYPE	0=Voltage (±160mV) 1=TC J 2=TC K 3=TC R 4=TC S 5=TC T 6=TC B 7=TC E 8=TC N	Unsigned 16 bits	R/W	Voltage	40007	6
IN1-FILTER	0 = not active 1= minimum filter … 6 = maximum filter	Unsigned 16 bits	R/W	Not active	40008	7
IN2-FILTER	0 = not active 1= minimum filter … 6 = maximum filter	Unsigned 16 bits	R/W	Not active	40009	8
IN3-FILTER	0 = not active 1= minimum filter … 6 = maximum filter	Unsigned 16 bits	R/W	Not active	40010	9
IN4-FILTER	0 = not active	Unsigned 16 bits	R/W	Not active	40011	10

	1= minimum filter … 6 = maximum filter					
Status	[BIT15] Input 4 burn-out error [BIT14] Input 3 burn-out error [BIT13] Input 2 burn-out error [BIT12] Input 1 burn-out error [BIT 11] Input 4 acquisition error [BIT 10] Input 3 acquisition error [BIT 9] Input 2 acquisition error [BIT 8] Input 1 acquisition error [BIT 7] Save Configuration in Flash memory (if bit =1) [BIT 6..4] Not used [BIT 3] Configuration error [BIT 2] Data-configuration acquisition error	Unsigned 16 bits	R/W	\	40012	11

	[BIT 1] Generic error (linked to led blinking) [BIT 0] Reset, if set to 1 the device will reboot					
Channel 1 Integer Measure	Channel 1 Measure in °C*10 or mV/0.005 Example (TC) 220 = 22.0°C Example (Voltage) 1848 = 9.24 mV	Signed 16 bits	R	/	40013	12
Channel 2 Integer Measure	Channel 2 Measure in °C*10 or mV/0.005 Example (TC) 220 = 22.0°C Example (Voltage) 1848 = 9.24 mV	Signed 16 bits	R	/	40014	13
Channel 3 Integer Measure	Channel 3 Measure in °C*10 or mV/0.005 Example (TC) 220 = 22.0°C Example (Voltage) 1848 = 9.24 mV	Signed 16 bits	R	/	40015	14
Channel 4 Integer Measure	Channel 4 Measure in °C*10 or mV/0.005 Example (TC) 220 = 22.0°C Example (Voltage) 1848 = 9.24 mV	Signed 16 bits	R	/	40016	15

FIRMWARE REVISION	Firmware revision internal code	Unsigned 16	R	/	40017	16
Errors	BIT[15:12] Not Used BIT[11] ADC Zero error BIT[10] Not Used BIT[9] Setting error BIT[8] Calibration Error BIT[7..3] Not Used BIT[2] Cold Junction TC 3-4 Error BIT[1] Cold Junction TC 1-2 Error BIT[0] ADC Error	Unsigned 16 bits	R	/	40019	18
Channel 1 Floating Point Measure	Channel 1 Measure in °C or mV Available only from revision firmware 667	Floating Point 32 Bit	R	/	40027-40028	26-27
Channel 2 Floating Point Measure	Channel 2 Measure in °C or mV Available only from revision firmware 667	Floating Point 32 Bit	R	/	40029-40030	28-29
Channel 3 Floating Point Measure	Channel 3 Measure in °C or mV Available only from revision firmware 667	Floating Point 32 Bit	R	/	40031-40032	30-31

Channel 4 Floating Point Measure	Channel 4 Measure in °C or mV Available only from revision firmware 667	Floating Point 32 Bit	R	/	40033-40034	32-33
Channel 1 Floating Point Offset	Channel 1 Offset Measure in °C Available only from revision firmware 668	Floating Point 32 Bit	R/W	-1.000	40037-40038	36-37
Channel 2 Floating Point Offset	Channel 2 Offset Measure in °C Available only from revision firmware 668	Floating Point 32 Bit	R/W	-1.000	40039-40040	38-39
Channel 3 Floating Point Offset	Channel 3 Offset Measure in °C Available only from revision firmware 668	Floating Point 32 Bit	R/W	-1.000	40041-40042	40-41
Channel 4 Floating Point Offset	Channel 4 Offset Measure in °C Available only from revision firmware 668	Floating Point 32 Bit	R/W	-1.000	40043-40044	42-43

3. Easy-SETUP

To configure the Seneca Z-PC Line modules, you can use the Easy-SETUP software, download the software from:

https://www.seneca.it/en/linee-di-prodotto/software/easy/easy-setup/