USER MANUAL

Z-10-D-IN

HW2

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MI00253-9-EN

Date	Revision	Notes
22/02/2016	1	Rewriting
28/02/2018	2	Changed Upper Title
23/03/2018	3	Added measure unit for Measure 1 and 2 registers
06/06/2018	400	New hardware revision 2 New firmware with all 32 bits counters and new features
12/06/2018	401	Fix Table of contents
22/06/2018	402	Fix Register 40020 Bit[0]
19/11/2018	403	Fix Filter Register 40019
14/12/2018	404	Added new chapter Easy Setup Full configuration
28/02/2019	405	Added info from fw rev 4007 Added Chapter “Counters filter”
03/09/2019	406	Fix USB connection on Chapter 7

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Seneca **Z-10-D-IN “HW2”**

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THIS MANUAL REFERS ONLY TO “HW2” Z-10-D-IN HARDWARE REVISION

FOR EARLY REVISION REFERS TO MI002533 MANUAL

1. Introduction

The Z-10-D-IN module acquires 10 single-ended digital signals, then converts them to a digital format (IN 1-10 state).

The supported communication protocol is Modbus RTU.

The following counters are available:

All 10 counters are in 32 bits format (backupped on a Not volatile RAM)

For all 10 inputs TON/TOFF/Frequency measures are available.

1.1. Features

- Acquisition of digital signals from sensor: Reed, NPN, PNP, Proximity, contact, etc...
- Counters are saved to a non volatile memory (NVM FeRAM)
- Input signals can be filtered
- 32 bits Pulse counters for digital signals, with max frequency < 2500 Hz
- Measure of Frequency / Period / Ton and Toff
- Advanced pulse management for digital signals
- Up to 10 sensors power by internal supply voltage (Vaux=16V)
- Node address and baud-rate configurable from Dip-Switches
- RS485 serial communication with MODBUS-RTU protocol

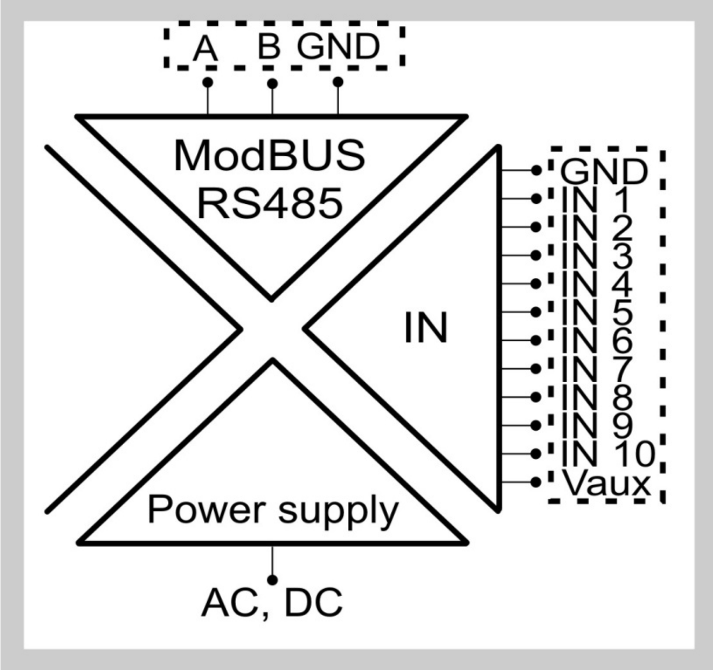
2. Features

INPUT	
Number	10
Input filter	Cut-off frequency configurable
Filter	Configurable
Protection	This module provides inputs and power supply (Vaux) protection against the overvoltage surge transient by transient suppressor TVS (600W/ms); max current supplied from Vaux is 100mA (limited by internal series PTC)
Sensor=closed	The sensor is detected «closed» if: acquired signal voltage >12 Vdc and acquired signal current > 3 mA
Sensor=open	The sensor is detected «open» if: acquired signal voltage <10 Vdc and acquired signal current < 2 mA
Internal supply Vaux	The screw terminal 12 (Vaux) supplies 16 V with reference to the screw terminal 1 (GND)

Measure error for frequency: 2% of measure +-1 Hz

Measure error for period, ton, toff:+- 1ms

CONNECTIONS	
RS485 interface	IDC10 connector for DIN 46277 rail (back-side panel)
ISOLATIONS	
1500 Vac	Between: power supply, ModBUS RS485, digital inputs

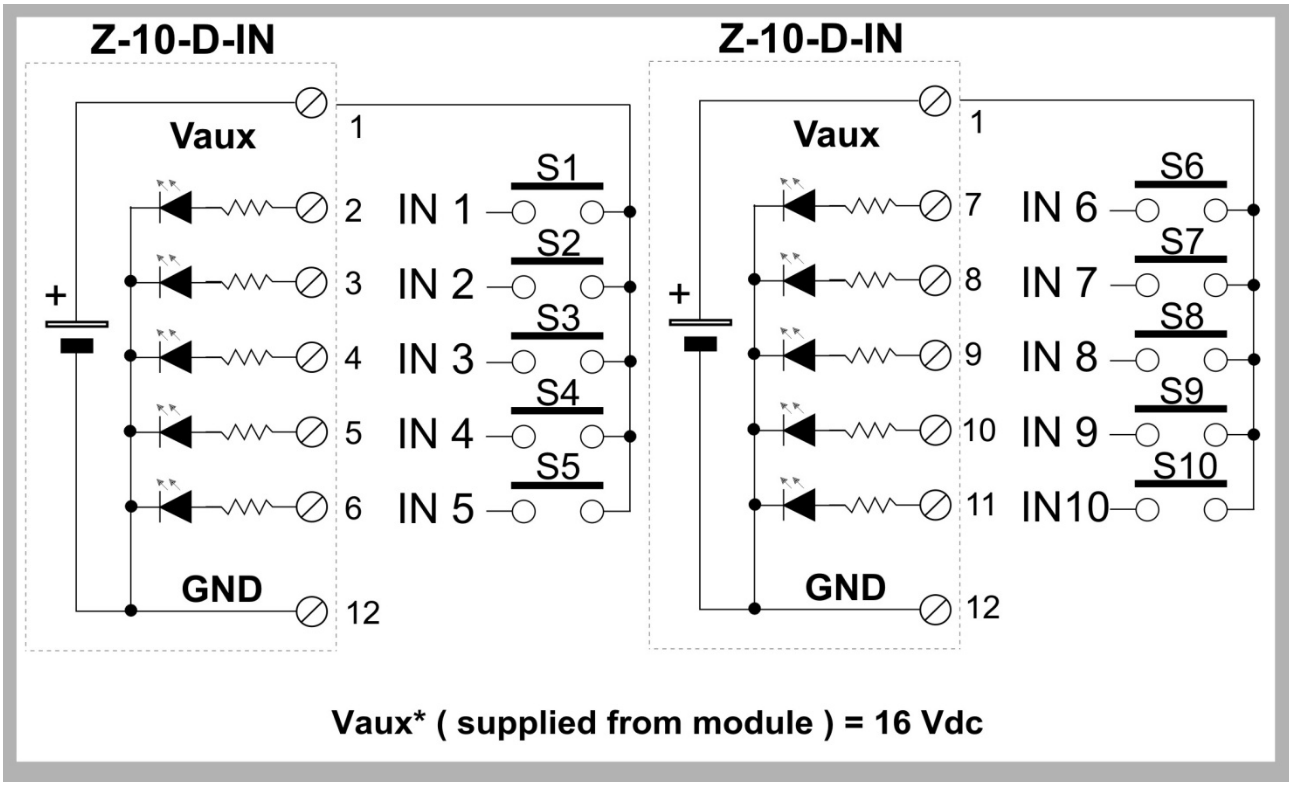


POWER SUPPLY	
Supply voltage	10 – 40 Vdc or 19 – 28 Vac (50Hz - 60Hz)
Power consumption	Typ: 1.5W; Max: 2.5W

The power supply transformer necessary to supply the module must comply with EN60742 (Isolated transformers and safety transformers requirements). To protect the power supply, is recommended to install a fuse.

3. Input connections

Power on the module with < 40 Vdc or < 28 Vac voltage supply. These upper limits must not be exceeded to avoid serious damage to the module.



4. Dip-switches table

Dip switch configuration is valid only at boot up.

BAUD-RATE (Dip-Switches: DIP-SWITCH STATUS)		
1	2	Meaning
OFF	**OFF**	Baud-rate=9600 Baud
OFF	**ON**	Baud-rate=19200 Baud
ON	**OFF**	Baud-rate=38400 Baud
ON	**ON**	Baud-rate=57600 Baud

ADDRESS (Dip-Switches: DIP-SWITCH STATUS)						
3	4	5	6	7	8	Meaning
OFF	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Address and Baud-Rate are acquired from memory (EEPROM)**
OFF	**OFF**	**OFF**	**OFF**	**OFF**	**ON**	Address=1
OFF	**OFF**	**OFF**	**OFF**	**ON**	**ON**	Address=2
OFF	**OFF**	**OFF**	**OFF**	**ON**	**ON**	Address=3
OFF	**OFF**	**OFF**	**ON**	**OFF**	**OFF**	Address=4
-	**-**	**-**	**-**	**-**	**-**	……………………
ON	**ON**	**ON**	**ON**	**ON**	**ON**	Address=63

RS485 TERMINATOR (Dip-Switches: DIP-SWITCH STATUS)		
9	10	Meaning
OFF	**OFF**	RS485 terminator disabled
OFF	**ON**	RS485 terminator enabled

5. Counters Filter

The filter is applied to:

-Counters

-Frequency

-TON

-TOFF

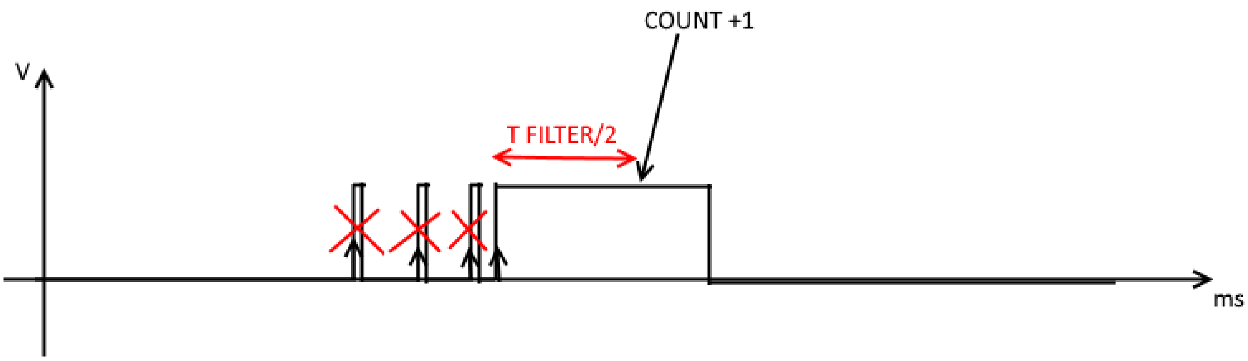
-PERIOD

The Input values (register 40002) are not filtered.

The filter will cut frequency up to:

f[Hz] = 1000/T Filter[ms]

A pulse is filtered if its duration is > Tfilter/2.
In the following example the first 3 pulse are filtered because their duration is lower than Tfilter/2.
The upgrading of the counter values is made after a rising edge and after Tfilter/2.



6. Modbus RTU Register Tables

In the following table this abbreviations are used:

MS = Most significant
LS = Less significant
MSW = Most significant Word (16 bits)
LSW = Less significant Word (16 bits)
R = Read only register
RW = Read and writeable register
RW* = registers in non-volatile memory writable infinite times
RW** = registers in non-volatile memory writable a maximum of 100000 times
Unsigned 16 bits = Unsigned 16 bits register (from 0 to 65535)
Signed 16 bits = 16 bits register with sign (from -32768 to +32767)
Float 32 bits = Floating point single precision 32 bits (IEEE 754) register
0x = Hexadecimal Value

Default communication parameters are 38400 baud, 8 bit data, parity None, 1 stop bit.

6.1. Bit Position Convention in the Holding Registers:

One Holding Register is composed by 16 bits with the following convention:

BIT 15	BIT 14	BIT 13	BIT 12	BIT 11	BIT 10	BIT 9	BIT 8	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0

For example, if the register decimal value is

12300

the binary value is:

0011 0000 0000 1100

So, using the Bit convention we obtain:

BIT 15	BIT 14	BIT 13	BIT 12	BIT 11	BIT 10	BIT 9	BIT 8	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0

6.2. Modbus Holding Registers Addresses (function code 3):

All registers are "Holding register" (Read Modbus function 3) with the convention that the first register (offset 0) is the 40001 address.

The following Modbus functions are supported:

Read Modbus Register (function 3)

Write Single Modbus Register (function 6)

Write Multiple Modbus Registers (function 16)

All values in 32bits are stored into 2 consecutive registers

For more info refers to:

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

Register Name	Comment	Register Type	R/W	Default value or Start Value	Modbus Address	Modbus Offset Address
MachineID	Module ID code	Unsigned 16 bits	R	-	40001	0
Inputs	Digital inputs 1..10 status value (not filtered) Bit 0 (LSB) = IN1 status Bit 1 = IN2 status Bit 2 = IN3 status Bit 3 = IN4 status Bit 4 = IN5 status Bit 5 = IN6 status Bit 6 = IN7 status Bit 7 = IN8 status Bit 8 = IN9 status Bit 9 = IN10 status Bit 10..14 = not used Bit 15 (MSB) = not used For example if the register value is: 813 decimal = (MSB)0000 0011 0010 1101(LSB) binary IN1 = 1 IN2 = 0 IN3 = 1 IN4 = 1 IN5 = 0 IN6 = 1 IN7 = 0 IN8 = 0 IN9 = 1 IN10 =1	Unsigned 16 bits	R	0	40002	1
First 16 bit Counter 1	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 1 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40003	2
First 16 bit Counter 2	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 2 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40004	3

First 16 bit Counter 3	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 3 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40005	4
First 16 bit Counter 4	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 4 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40006	5
First 16 bit Counter 5	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 5 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40007	6
First 16 bit Counter 6	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 6 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40008	7
First 16 bit Counter 7	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 7 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40009	8
First 16 bit Counter 8	16 bit counter (from 0 to 65535) The value is stored into a non volatile RAM (FeRAM). The Counter 8 value can be written (for example writing 0 for setting the counter)	Unsigned 16 bits	R/W**	-	40010	9
Full 32 bit Counter 9	32 bit counter (from 0 to 4294967295) The value is stored into a non volatile RAM (FeRAM). The Counter 9 value can be written (for example writing 0 for setting the counter)	Unsigned 32 bits	R/W**	-	40011 (MSW) 40012 (LSW)	10-11
Full 32 bit Counter 10	16 bit counter (from 0 to 4294967295) The value is stored into a non volatile RAM (FeRAM). The Counter 10 value can be written (for example writing 0 for setting the counter)	Unsigned 32 bits	R/W**	-	40013 (MSW) 40014 (LSW)	12-13

16 bits only Counters Overflow Flags	The flag is "1" if the first 16 bits of the counter has performed an overflow Bit 0 (LSB)= Overflow Counter 1 Bit 1 = Overflow Counter 2 Bit 2 = Overflow Counter 3 Bit 3 = Overflow Counter 4 Bit 4 = Overflow Counter 5 Bit 5 = Overflow Counter 6 Bit 6 = Overflow Counter 7 Bit 7 = Overflow Counter 8 Bit 8 = Overflow Counter 9 Bit 9 = Overflow Counter 10 Bit 10..14 = not used Bit 15 (MSB) = not used	Unsigned 16 bits	R/W	0	40015	14
Measure B	Input B measure value Measure units: Ton/Toff/Period [ms] Frequency [Hz]	Unsigned 16 bits	R	0	40016	15
Measure A	Input A measure value Measure units: Ton/Toff/Period [ms] Frequency [Hz]	Unsigned 16 bits	R	0	40017	16
Measure A/B Type	Bit [15..12] = 0b0000 Measure A frequency Bit[15..12] = 0b0001 Measure A period Bit[15..12] = 0b0010 Measure A Ton Bit[15..12] = 0b0011 Measure A Toff Bit[11..8] = 0b0001 Measure A from input 1 Bit[11..8] = 0b0010 Measure A from input 2 Bit[11..8] = 0b0011 Measure A from input 3 Bit[11..8] = 0b0100 Measure A from input 4 Bit[11..8] = 0b0101 Measure A from input 5 Bit[11..8] = 0b0110 Measure A from input 6 Bit[11..8] = 0b0111 Measure A from input 7 Bit[11..8] = 0b1000 Measure A from input 8 Bit[11..8] = 0b1001	Unsigned 16 bits	R/W*	0	40018	17

	Measure A from input 9 (only frequency) Bit[11..8] = 0b1010 Measure A from input 10 (only frequency) Bit [7..4] = 0b0000 Measure B frequency Bit[7..4] = 0b0001 Measure B period Bit[7..4] = 0b0010 Measure B Ton Bit[7..4] = 0b0011 Measure B Toff Bit[3..0] = 0b0001 Measure B from input 1 Bit[3..0] = 0b0010 Measure B from input 2 Bit[3..0] = 0b0011 Measure B from input 3 Bit[3..0] = 0b0100 Measure B from input 4 Bit[3..0] = 0b0101 Measure B from input 5 Bit[3..0] = 0b0110 Measure B from input 6 Bit[3..0] = 0b0111 Measure B from input 7 Bit[3..0] = 0b1000 Measure B from input 8 Bit[3..0] = 0b1001 Measure B from input 9 (only frequency) Bit[3..0] = 0b1010 Measure B from input 10 (only frequency)					
FILTER	Filter value from 1 ms to 65535 ms (valid for all 10 inputs) For example with filter = 1 ms cutoff frequency = 1/1ms = 1000 Hz With filter = 20 ms cutoff frequency = 1/20ms=50 Hz Use value 0 for disable the filter. For more info see chapter 5	Unsigned 16 bits	R/W*	3 ms (enabled for all 10 inputs)	40019	18
IN9..IN10 COUNT MODE / RS485 PARITY	Bit [12:8] = 0b00000 IN9 Upcounter IN10 Upcounter Bit [12:8] = 0b00001 IN9 Downcounter IN10 Upcounter	Unsigned 16 bits	R/W*	0	40020	19

	Bit [12:8] = 0b00010 IN9 Upcounter IN10 Downcounter Bit [12:8] = 0b00100 IN9 Downcounter IN10 Downcounter Bit [12:8] = 0b01000 Count+1 from IN9 and Count-1 from IN10. Only Count 9 Is active Bit [12:8] = 0b10000 if IN10=1 Count9 Upcounter, if IN10=0 Counter9 Downcounter Bit[4] = 0 Port RS485 Parity Even Bit[4] = 1 Port RS485 Parity Odd Bit[3] = 0 Port RS485 Parity Not Active Bit[3] = 1 Port RS485 Parity Active Bit[2] = 0 Delay Between Rs485 Port TX and RX disabled Bit[2] = 1 Delay Between Rs485 Port TX and RX enabled Bit[1] = 0 IN1..IN8 Upcounter Bit[1] = 1 IN1..IN8 Downcounter Bit[0] = 0 IN1..IN10 Normal Logic Bit[0] = 1 IN1..IN10 Reverse Logic					
ADDRESS BAUDRATE	Bit[15..8] = 0b00000000 RS485 use 4800baud Bit[15..8] = 0b00000001 RS485 use 9600baud Bit[15..8] = 0b00000010 RS485 use 19200baud Bit[15..8] = 0b00000011 RS485 use 38400baud Bit[15..8] = 0b00000100 RS485 use 57600baud Bit[15..8] = 0b00000101 RS485 use 115200baud Bit[15..8] = 0b00000110 Not Used Bit[15..8] = 0b00000111	Unsigned 16 bits	R/W*	0b0000010000000001 (38400 baud, station address 1)	40021	20

	RS485 use 2400baud Bit[7:0] = Station Node Address (if all dip switched are set to OFF)					
COMMAND	If set to 1: Copy the actual contents of registers R/W* into EEPROM. 2: Perform a Reset	Unsigned 16 bits	R/W	0	40022	21
FW BUILD	Fw build revision	Unsigned 16 bits	R	-	40023	22
FW REVISION	Fw internal code	Unsigned 16 bits	R	-	40024	23
32 bit Counter 1	Full 32 bit Counter 1 Value	Unsigned 32 bits	RW**	0	40101 (MSW) 40102 (LSW)	100-101
32 bit Counter 2	Full 32 bit Counter 2 Value	Unsigned 32 bits	RW**	0	40103 (MSW) 40104 (LSW)	102-103
32 bit Counter 3	Full 32 bit Counter 3 Value	Unsigned 32 bits	RW**	0	40105 (MSW) 40106 (LSW)	104-105
32 bit Counter 4	Full 32 bit Counter 4 Value	Unsigned 32 bits	RW**	0	40107 (MSW) 40108 (LSW)	106-107
32 bit Counter 5	Full 32 bit Counter 5 Value	Unsigned 32 bits	RW**	0	40109 (MSW) 40110 (LSW)	108-109
32 bit Counter 6	Full 32 bit Counter 6 Value	Unsigned 32 bits	RW**	0	40111 (MSW) 40112 (LSW)	110-111
32 bit Counter 7	Full 32 bit Counter 7 Value	Unsigned 32 bits	RW**	0	40113 (MSW) 40114 (LSW)	112-113
32 bit Counter 8	Full 32 bit Counter 8 Value	Unsigned 32 bits	RW**	0	40115 (MSW) 40116 (LSW)	114-115
32 bit Counter 9	Full 32 bit Counter 9 Value	Unsigned 32 bits	RW**	0	40117 (MSW) 40118 (LSW)	116-117
32 bit Counter 10	Full 32 bit Counter 10 Value	Unsigned 32 bits	RW**	0	40119 (MSW) 40120 (LSW)	118-119
Period Input 1	Input 1 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40121	120
Period Input 2	Input 2 Period [ms]	Unsigned	R	0	40122	121

	Period = Ton + Toff	16 bits				
Period Input 3	Input 3 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40123	122
Period Input 4	Input 4 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40124	123
Period Input 5	Input 5 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40125	124
Period Input 6	Input 6 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40126	125
Period Input 7	Input 7 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40127	126
Period Input 8	Input 8 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40128	127
Period Input 9	Input 9 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40129	128
Period Input 10	Input 10 Period [ms] Period = Ton + Toff	Unsigned 16 bits	R	0	40130	129
Frequency Input 1	Input 1 Frequency [Hz]	Unsigned 16 bits	R	0	40131	130
Frequency Input 2	Input 2 Frequency [Hz]	Unsigned 16 bits	R	0	40132	131
Frequency Input 3	Input 3 Frequency [Hz]	Unsigned 16 bits	R	0	40133	132
Frequency Input 4	Input 4 Frequency [Hz]	Unsigned 16 bits	R	0	40134	133
Frequency Input 5	Input 5 Frequency [Hz]	Unsigned 16 bits	R	0	40135	134
Frequency Input 6	Input 6 Frequency [Hz]	Unsigned 16 bits	R	0	40136	135
Frequency Input 7	Input 7 Frequency [Hz]	Unsigned 16 bits	R	0	40137	136
Frequency Input 8	Input 8 Frequency [Hz]	Unsigned 16 bits	R	0	40138	137
Frequency Input 9	Input 9 Frequency [Hz]	Unsigned 16 bits	R	0	40139	138
Frequency Input 10	Input 10 Frequency [Hz]	Unsigned 16 bits	R	0	40140	139
T ON Input 1	Input 1 High Time [ms]	Unsigned 16 bits	R	0	40141	140
T ON Input 2	Input 2 High Time [ms]	Unsigned 16 bits	R	0	40142	141
T ON Input 3	Input 3 High Time [ms]	Unsigned 16 bits	R	0	40143	142
T ON Input 4	Input 4 High Time [ms]	Unsigned 16 bits	R	0	40144	143
T ON Input 5	Input 5 High Time [ms]	Unsigned 16 bits	R	0	40145	144
T ON Input 6	Input 6 High Time [ms]	Unsigned 16 bits	R	0	40146	145
T ON Input 7	Input 7 High Time [ms]	Unsigned 16 bits	R	0	40147	146
T ON Input 8	Input 8 High Time [ms]	Unsigned 16 bits	R	0	40148	147
T ON Input 9	Input 9 High Time [ms]	Unsigned 16 bits	R	0	40149	148
T ON Input 10	Input 10 High Time [ms]	Unsigned 16 bits	R	0	40150	149
T OFF Input 1	Input 1 Low Time [ms]	Unsigned 16 bits	R	0	40151	150
T OFF Input 2	Input 2 Low Time [ms]	Unsigned	R	0	40152	151

		16 bits				
T OFF Input 3	Input 3 Low Time [ms]	Unsigned 16 bits	R	0	40153	152
T OFF Input 4	Input 4 Low Time [ms]	Unsigned 16 bits	R	0	40154	153
T OFF Input 5	Input 5 Low Time [ms]	Unsigned 16 bits	R	0	40155	154
T OFF Input 6	Input 6 Low Time [ms]	Unsigned 16 bits	R	0	40156	155
T OFF Input 7	Input 7 Low Time [ms]	Unsigned 16 bits	R	0	40157	156
T OFF Input 8	Input 8 Low Time [ms]	Unsigned 16 bits	R	0	40158	157
T OFF Input 9	Input 9 Low Time [ms]	Unsigned 16 bits	R	0	40159	158
T OFF Input 10	Input 10 Low Time [ms]	Unsigned 16 bits	R	0	40160	159

6.3. Modbus Coil Registers Addresses (function code 1):

Register Name	Comment	Register Type	R/W	Default value or Start Value	Modbus Address	Register Offset
Input 1	Input 1 Value	Bit	R	0	1	0
Input 2	Input 2 Value	Bit	R	0	2	1
Input 3	Input 3 Value	Bit	R	0	3	2
Input 4	Input 4 Value	Bit	R	0	4	3
Input 5	Input 5 Value	Bit	R	0	5	4
Input 6	Input 6 Value	Bit	R	0	6	5
Input 7	Input 7 Value	Bit	R	0	7	6
Input 8	Input 8 Value	Bit	R	0	8	7
Input 9	Input 9 Value	Bit	R	0	9	8
Input 10	Input 10 Value	Bit	R	0	10	9

6.4. Modbus Input Registers (read only) Addresses (function code 2):

Register Name	Comment	Register Type	R/W	Default value or Start Value	Modbus Address	Register Offset
Input 1	Input 1 Value	Bit	R	0	10001	0
Input 2	Input 2 Value	Bit	R	0	10002	1
Input 3	Input 3 Value	Bit	R	0	10003	2
Input 4	Input 4 Value	Bit	R	0	10004	3
Input 5	Input 5 Value	Bit	R	0	10005	4
Input 6	Input 6 Value	Bit	R	0	10006	5
Input 7	Input 7 Value	Bit	R	0	10007	6
Input 8	Input 8 Value	Bit	R	0	10008	7
Input 9	Input 9 Value	Bit	R	0	10009	8
Input 10	Input 10 Value	Bit	R	0	10010	9

7. FULL configuration with EASY SETUP

For configure all the device parameters you can use the RS485 Port (with a Seneca RS485 to USB converter) and the “Easy Z-10-D-IN HW2” software included in the Easy Setup Suite.

You can download the Easy Setup software for free from:

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

Easy Setup Menu

Connect: Use the connect icon for connect the PC to the Device.

New: Load the default parameters in the actual project

Open: Open a stored project

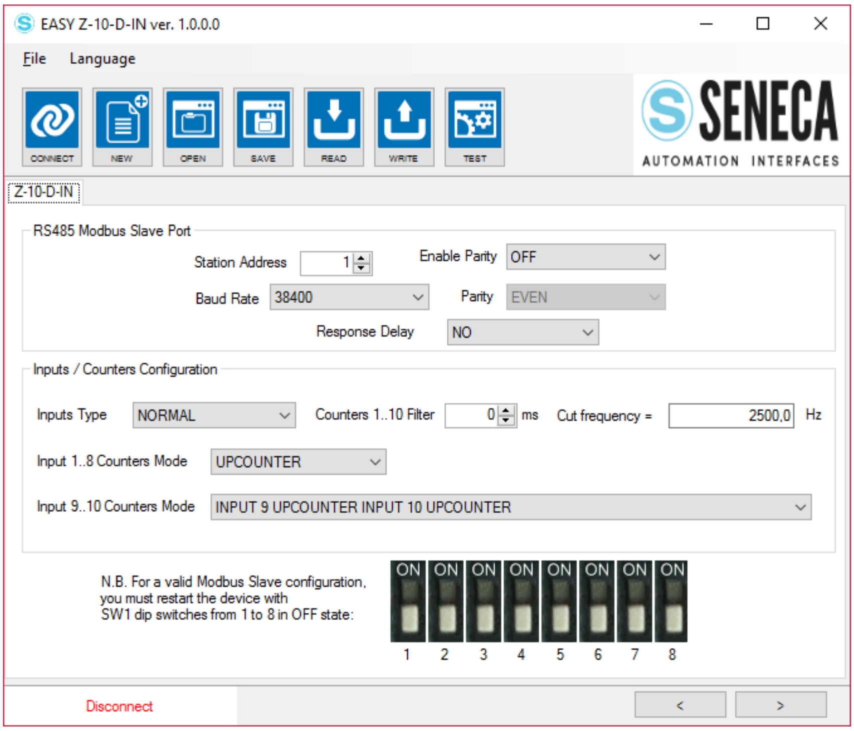
Save: Save the actual project

Read: Read the actual configuration from the device (if the dip switches are not ALL OFF the configuration is read from dip switches)

Send: Send the project configuration (if the dip switches are NOT ALL OFF the device use the dip switch configuration and NOT the sent configuration)

Test: Start a Registers read, open the Datalogger or send command to the device

7.1. Creating a Project Configuration



WARNING!

You must set all dip switches to OFF after sending the configuration to the device or the actual configuration will be overwritten from the dip switches configuration!

The parameters that can be configured are:

RS485 MODBUS SLAVE PORT

Station Address: Select The Modbus RTU station address for the RS485 Port

Baud Rate: Select the Baud rate from 2400 to 115200 baud for the RS485 Port

Enable Parity: Select between Enable or Disable if Enable you must select ODD or Even Parity for the RS485 Port.

Response Delay: Select to add about 10 ms to a Modbus RTU query response.

INPUTS/COUNTERS CONFIGURATIONS

Inputs Type: Select between Normal or Inverted

Counters Filter: Select the filter to be applied to all the 10 Counters. Insert the value in steps of 1 ms.

The Filter is a low pass filter with cut frequency calculated from the software.

If Counter Filter = 0 the Filter is disabled.

Input Counter Mode 1..8 : Select between UPCOUNTER or DOWNCOUNTER.

Input Counter Mode 9..10 : Select between:

IN9/IN10 COUNTER 9/10 UPCOUNTER/DOWNCOUNTER

IF IN9 IS HIGH THEN COUNTER 10 UPCOUNTER, IF IN9 IS LOW THEN COUNTER 10 DOWNCOUNTER

IF IN9/10 IS HIGH THEN COUNTER 9/10 UPCOUNTER, IF IN9/10 LOW THEN COUNTER 9/10 DOWNCOUNTER

WARNING!

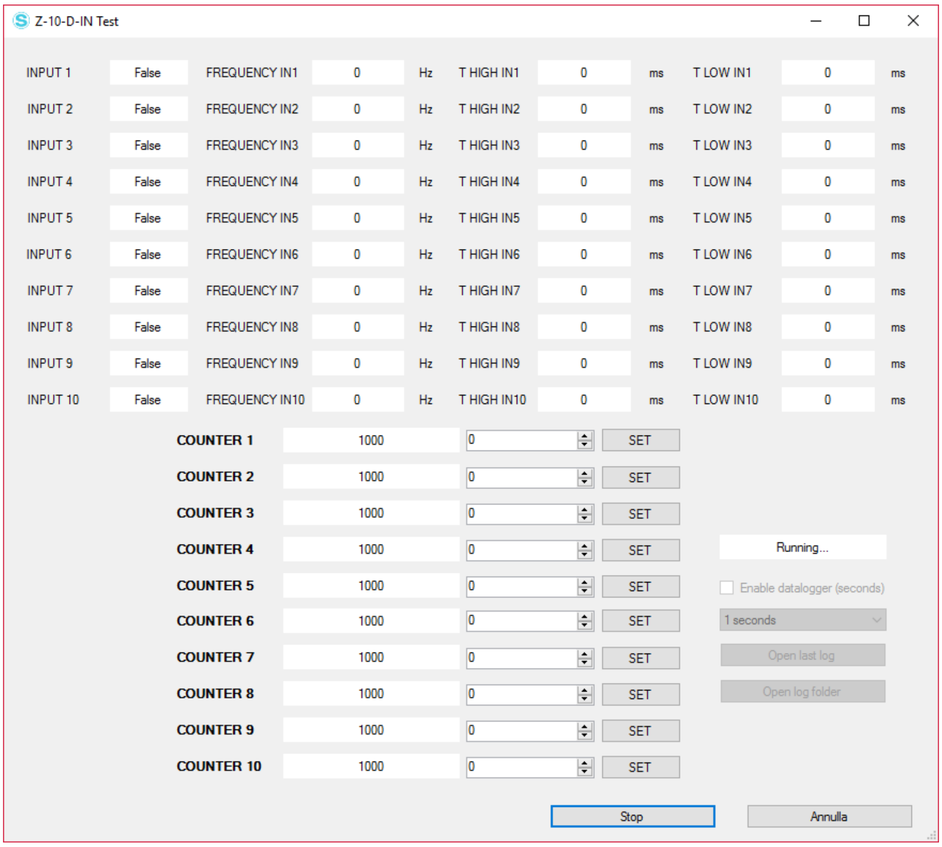
If the counter is set in "Upcounter" when reach the 4294967295 (that means $2^{32} - 1$)

a pulse to the counter will bring the value to 0

If the counter is set in "Downcounter" and the value is 0 then a pulse will bring the value to 4294967295 (that means $2^{32} - 1$)

7.2. Testing the Device

When the configuration is sent to the device you can test the actual configuration by using the  icon:



The test configuration will acquire the measure from the Modbus registers, you can also load/reset the counters

7.2.1. The datalogger

The datalogger can be used for acquire data that can be used with an external software (for example Microsoft Excel ™). It is possible to set how much time to acquire the samples (minimum 1 second).

The datalogger will create a file in a standard .csv format that can be open also with Microsoft Excel ™.