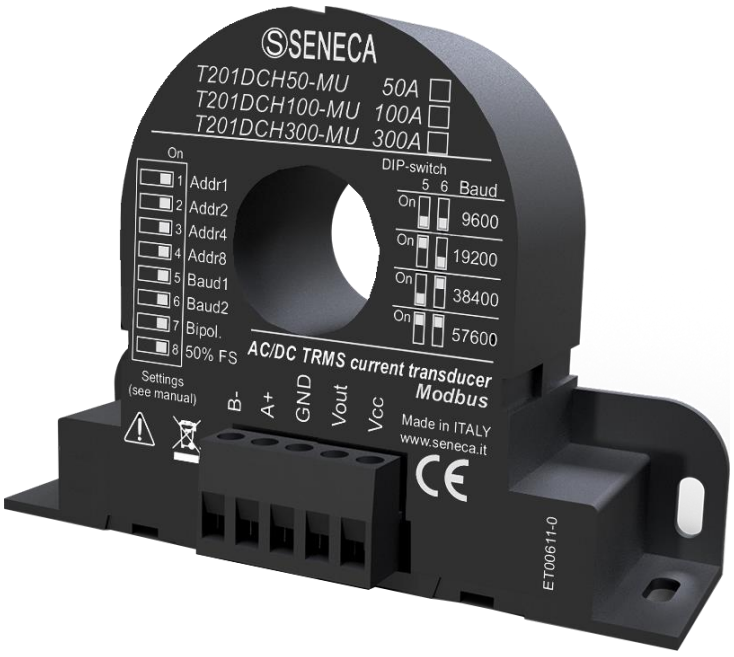
USER MANUAL

T201DCH50-MU
T201DCH100-MU
T201DCH300-MU
T201DCH600-MU

AC/DC TRUE RMS or DC BIPOLAR CURRENT TRANSFORMER WITH MODBUS RTU PROTOCOL AND ANALOG/DIGITAL OUTPUT



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ORIGINAL INSTRUCTIONS

www.seneca.it

Introduction

Contents of the present documentation refer to products and technologies described in it.
All technical data contained in the document may be modified without prior notice.
Content of this documentation is subject to periodical revision.
To use the product safely and effectively, read carefully the following instructions before use.
The product must be used only for the use for which it was designed and built: any other use must be considered with full responsibility of the user.
The installation, programming and set-up is allowed only to authorized operators, physically and intellectually suitable.
Set up shall be performed only after a correct installation and the user shall perform every operation described in the installation manual carefully.
Seneca is not considered liable for failure, breakdown, accident caused because of ignorance or failure to apply the indicated requirements.
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Seneca reserves the right to modify the device, for any commercial or construction requirements, without the obligation to promptly update the reference manuals.
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There may be errors and inaccuracies in this document that may of course be damaging to your system.
Proceed with caution, and although this is highly unlikely, the author(s) do not take any responsibility for that.
Technical features subject to change without notice.

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Document revisions

DATE	REVISION	NOTES
20/02/2019	0	First Revision
02/10/2020	1 / 2	Added T201DCH600-MU model
26/05/2021	3	Modiche a paragrafo Ingressi/Uscite digitali

TABLE OF CONTENTS

1. DEVICE DESCRIPTION AND INTENDED USE

WARNING!

This User Manual extend the information from the Installation Manual about the device configuration. Use the Installation Manual for more info.

WARNING!

Under any circumstances, SENECA s.r.l. or its suppliers shall not be responsible for loss of recording data/incomes or for consequential or incidental damage due to neglect or reckless mishandling of the device, even though SENECA is well aware of these possible damages.
SENECA, its subsidiaries, affiliates, companies of the group, its suppliers and retailers shall not guarantee that the functions will satisfy completely customer's expectations or that device, the firmware and the software shall have no errors or work continuously.

1.1. Description

The T201DCH50/100/300/600-MU are isolated, contact less loop powered AC/DC current transducers. The look and device's function are very similar to those of an active standard Current Transformer, but with the remarkable feature of measuring the DC and AC component. For its electrical endurance, ease of use and compact dimensions, the T201DCH50-MU, T201DCH100-MU and T201DCH300-MU and T201DCH600-MU fit every kind of current measurement: up to 50 Adc/Aac, 100 Adc/Aac and 300 Adc/Aac and 600 Adc/Aac (respectively).
A RS485 port and an USB port with a standard Modus RTU slave protocol are also available.

The device can measure a current in 2 different modes (using dip switches or the Easy Setup Software):
- TRUE RMS AC/DC CURRENT MEASURE
- DC BIPOLAR CURRENT MEASURE (used also for obtain the sign +/- of a DC current)

1.2. Features

- Similar usage to a standard alternating current active C.T.
- No shunt, no wasted power from the measure circuit
- High accuracy rating
- Analog 0/10V dc with configurable start/stop values
- Digital Output configurable Alarm (Max, Min, Window)
- Suitable for use with all Seneca modules that allow to power the device with at least 12 Vdc and having a 0 – 10Vdc input
- Simple configurable with dip switches or with the free Easy Setup software

- Two ranges, dip-switch selectable
- Damping filter availability to improve stable reading
- Modbus RTU protocol by RS485 and USB ports
- Modbus Address/Baud Rate/Range/Mode configurable also from dip switch
- Suitable for batteries, battery chargers, solar panels, power units and generic dc and ac loads.
- Compact size: overall dimensions less than 96,5 x 68 x 26 mm
- Baud rate for Modbus RTU: from 1200 baud up to 115200 baud
- Start/Stop Input/Output Alarm Values configurable with Easy Setup software
- I Max/Min Resettable by Modbus RTU registers
- Quick installation on DIN 46277 rail

Refer to the installation manual for more information.

2. CONFIGURING THE DEVICE

The Device can be configured in two ways:

- A basic configuration from dip switches
- A full configuration from flash (using Easy Setup Software by the USB port)

WARNING!

Dip switches configuration are active only after a reboot!

WARNING!

The Dip Switch setting will overwrite the Flash setting so, if you need to use the flash configuration you MUST set ALL dip switches to "OFF".

3. DIP SWITCH CONFIGURATION

3.1. Loading configuration from flash

If ALL Dip Switch 1…8 are OFF, the device use the Flash configuration (you must use the Easy Setup Software for configure)

Load Configuration	*DIP1*	*DIP2*	*DIP3*	*DIP4*	*DIP5*	*DIP6*	*DIP7*	*DIP8*
FROM FLASH	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

3.2. Setting the RS485 Modbus RTU Station Address

Dip Switch 1..4 are using for configure the Modbus RTU Station Address:

Modbus RTU Address	*DIP1*	*DIP2*	*DIP3*	*DIP4*
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

3.3. Setting the RS485 Baud rate

Dip Switch 5..6 are used for setting the Baud Rate

Baud Rate	*DIP5*	*DIP6*
9600	OFF	OFF
19200	ON	OFF
38400	OFF	ON
57600	ON	ON

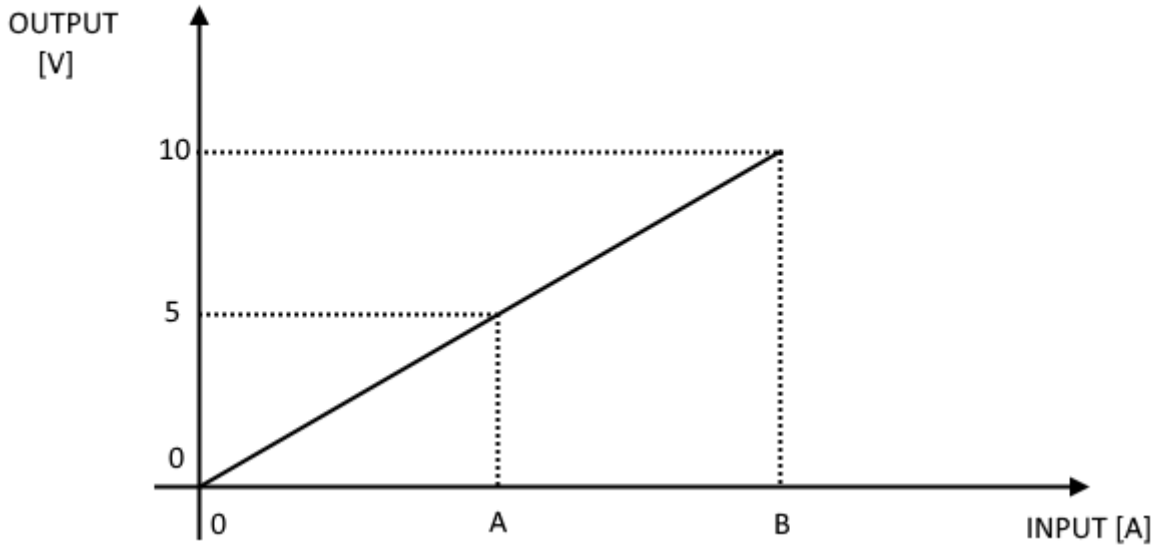
WARNING!

The Parity bit can not be configured with the dip switches configuration but only from the Easy Setup software. By setting the dip switches the parity is always set to "None" (8,N,1).

3.4. Setting the RMS/Bipolar mode and 50% - 100% full scale

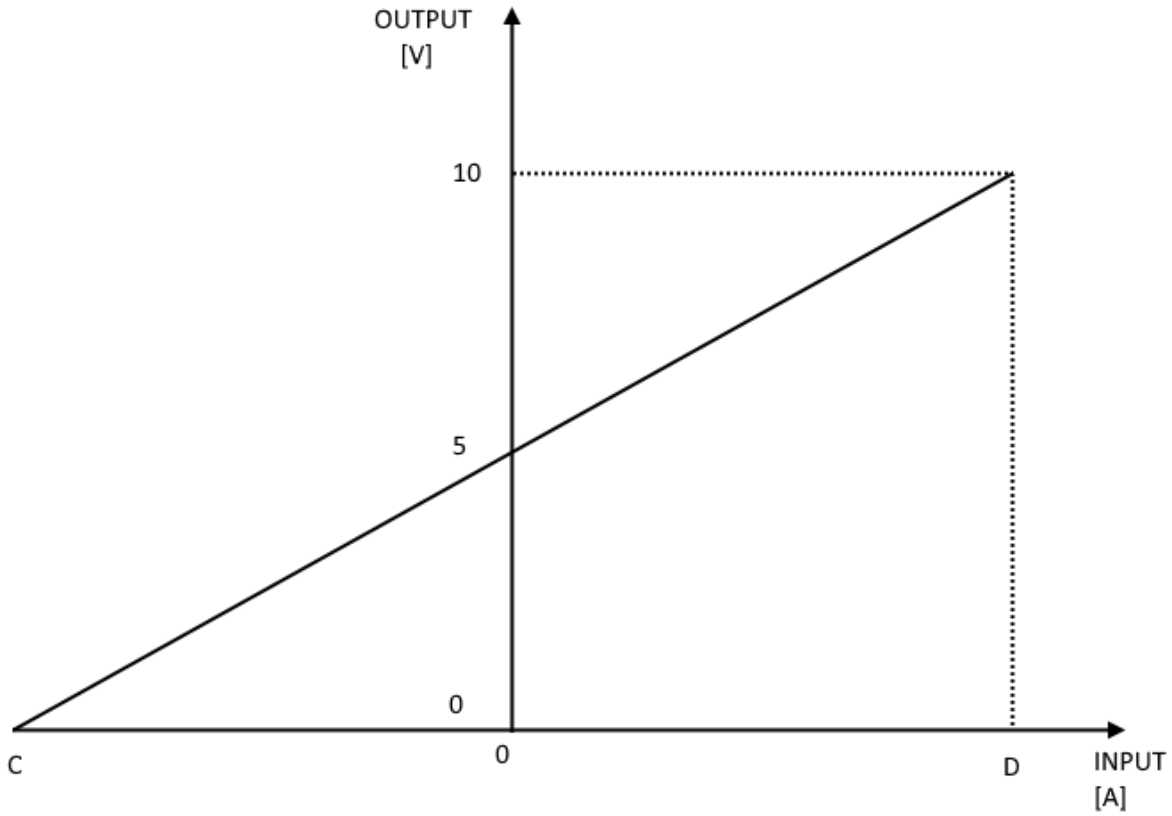
Dip Switch 7: Select from True RMS Measure / Bipolar DC Measure
Dip Switch 8: Select 50% of full scale

The following figure is related to RMS measure ("Bipol" dip switch 7 = OFF):



MODEL	*DIP7 BIPOL*	*DIP8 50% FS*	*A*	*B*
T201DCH50-MU	OFF	OFF	25 A	50 A
T201DCH50-MU	OFF	ON	12,5 A	25 A
T201DCH100-MU	OFF	OFF	50 A	100 A
T201DCH100-MU	OFF	ON	25 A	50 A
T201DCH300-MU	OFF	OFF	150 A	300 A
T201DCH300-MU	OFF	ON	75 A	150 A
T201DCH600-MU	OFF	OFF	300 A	600 A
T201DCH600-MU	OFF	ON	150 A	300 A

The following figure is related to Bipolar measure ("Bipol" dip switch 7 = ON):



MODEL	*BIPOL DIP7 SWITCH*	*50%FS DIP8 SWITCH*	*C*	*D*
T201DCH50-MU	ON	OFF	-50 A	+50 A
T201DCH50-MU	ON	ON	-25 A	+25 A
T201DCH100-MU	ON	OFF	-100 A	+100 A
T201DCH100-MU	ON	ON	-50 A	+50 A
T201DCH300-MU	ON	OFF	-300 A	+300 A

T201DCH300-MU	ON	ON	-150 A	+150 A
T201DCH600-MU	ON	OFF	-600 A	+600 A
T201DCH600-MU	ON	ON	-300 A	+300 A

WARNING!

Dip switches configuration is active only after a reboot!

So, for example using the RMS measure with 0 A input the Output voltage is 0V but using the Bipolar measure with 0 A input the Output voltage is 5V.

4. MODBUS RTU PROTOCOL

The Modbus protocol supported by the T201DCH50-100-300-600 MU is:

- Modbus RTU Slave

For more information about these protocols, please refer to the Modbus specification website:

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

4.1. Modbus RTU function code supported

The following Modbus RTU functions are supported:

- Read Holding Register (function 3) Max 5 Registers
- Write Single Register (function 6)
- Write Multiple registers (function 16) Max 2 Registers

WARNING!

All 32 bits values are stored into 2 consecutive registers

WARNING!

You can Read a Maximum of 5 Modbus Registers with the Read Holding Register function (function 3)

WARNING!

You can Write a Maximum of 2 Modbus Registers with the Write Multiple Register function (function 16)

WARNING!

The USB Modbus configuration is fixed to 38400 baud, 8bit , No parity, 1 stop bit
When the USB cable is inserted the RS485 will stop to communicate until the USB will be unplugged.

5. MODBUS REGISTER TABLE

The following abbreviations are used in the register tables:

MS = More significant
LS = Less significant
MSW = 16 most significant bits
LSW = 16 least significant bits
MSW* = 16 most significant or least significant bits depending on the configuration (most significant default)
LSW* = 16 less significant or more significant bits depending on the configuration (less significant default)
MSW = 8 most significant bits
LSW = 8 least significant bits
MSBIT = Most significant bit
MSBIT = Least significant bit
RO = Register in read-only
RW = Read/write register
RW** = Reading and writing register contained in flash memory, writable a maximum of 10000 times.
Unsigned 16 bit = unsigned integer register, can take values from 0 to 65535
Signed 16 bit = signed integer register can take values from -32768 to +32767
Float 32 bits = 32-bit single-precision floating point register (IEEE 754) https://en.wikipedia.org/wiki/IEEE_754
BIT = Boolean registry, can be 0 (false) or 1 (true)

5.1. "0-BASED" OR "1-BASED" MODBUS ADDRESSES

According to the Modbus standard the Holding Register registers are addressable from 0 to 65535, there are 2 different conventions for numbering the addresses: "0-BASED" and "1-BASED".
For greater clarity, Seneca shows its register tables in both conventions.

ATTENTION!

CAREFULLY READ THE DOCUMENTATION OF THE MODBUS MASTER DEVICE IN ORDER TO UNDERSTAND WHICH OF THE TWO CONVENTIONS THE MANUFACTURER HAS DECIDED TO USE

5.1.1. MODBUS ADDRESSES WITH "0-BASED" CONVENTION

The numbering is:

HOLDING REGISTER MODBUS ADDRESS (OFFSET)	*MEANING*
0	FIRST REGISTER
1	SECOND REGISTER
2	THIRD REGISTER
3	FOURTH REGISTER
4	FIFTH REGISTER

Therefore the first register is at address 0.
In the following tables, this convention is indicated with ***"ADDRESS OFFSET".***

5.1.2. MODBUS ADDRESSES WITH "1 BASED" CONVENTION (STANDARD)

The numbering is that established by the Modbus consortium and is of the type:

HOLDING REGISTER MODBUS ADDRESS 4x	*MEANING*
40001	FIRST REGISTER
40002	SECOND REGISTER
40003	THIRD REGISTER
40004	FOURTH REGISTER
40005	FIFTH REGISTER

In the following tables this convention is indicated with ***"ADDRESS 4x"*** since a 4 is added to the address so that the first Modbus register is 40001.

A further convention is also possible where the number 4 is omitted in front of the register address:

HOLDING MODBUS ADDRESS WITHOUT 4x	*MEANING*
1	FIRST REGISTER
2	SECOND REGISTER
3	THIRD REGISTER
4	FOURTH REGISTER
5	FIFTH REGISTER

5.2. BIT CONVENTION WITHIN A MODBUS HOLDING REGISTER

A Modbus Holding Register consists of 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 instance, if the value of the register in decimal is
12300
the value 12300 in hexadecimal is:
0x300C

the hexadecimal 0x300C in binary value is:
11 0000 0000 1100

So, using the above convention, we get:

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

5.3. MSB and LSB BYTE CONVENTION WITHIN A MODBUS HOLDING REGISTER

A Modbus Holding Register consists of 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

LSB Byte (Least Significant Byte) defines the 8 bits ranging from Bit 0 to Bit 7 included, we define MSB Byte (Most Significant Byte) the 8 bits ranging from Bit 8 to Bit 15 inclusive:

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
BYTE MSB								BYTE LSB							

5.4. REPRESENTATION OF A 32-BIT VALUE IN TWO CONSECUTIVE MODBUS HOLDING REGISTERS

The representation of a 32-bit value in the Modbus Holding Registers is made using 2 consecutive Holding Registers (a Holding Register is a 16-bit register). To obtain the 32-bit value it is therefore necessary to read two consecutive registers:

For example, if register 40064 contains the 16 most significant bits (MSW) while register 40065 contains the least significant 16 bits (LSW), the 32-bit value is obtained by composing the 2 registers:

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
40064 MOST SIGNIFICANT WORD															

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
40065 LEAST SIGNIFICANT WORD															

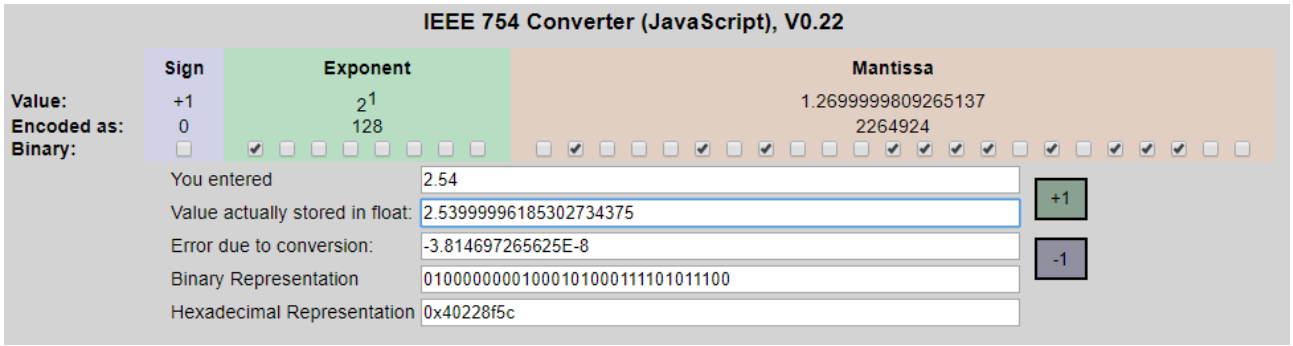
$$Value_{32bit} = Register_{LSW} + (Register_{MSW} * 65536)$$

In the reading registers it is possible to swap the most significant word with the least significant word, therefore it is possible to obtain 40064 as LSW and 40065 as MSW.

5.5. TYPE OF 32-BIT FLOATING POINT DATA (IEEE 754)

The IEEE 754 standard (https://en.wikipedia.org/wiki/IEEE_754) defines the format for representing floating point numbers.
As already mentioned, since it is a 32-bit data type, its representation occupies two 16-bit holding registers.
To obtain a binary / hexadecimal conversion of a floating point value it is possible to refer to an online converter at this address:

http://www.h-schmidt.net/FloatConverter/IEEE754.html



Using the last representation the value 2.54 is represented at 32 bits as:

0x40228F5C

Since we have 16-bit registers available, the value must be divided into MSW and LSW:

0x4022 (16418 decimal) are the 16 most significant bits (MSW) while 0x8F5C (36700 decimal) are the 16 least significant bits (LSW).

5.6. T201DCH-MU: MODBUS 4xxxx HOLDING REGISTERS TABLE (FUNCTION CODE 3)

REGISTER NAME	COMMENT	REGISTER TYPE	R/W	DEFAULT VALUE OR START VALUE	ADDRESS (4xxxx)	OFFSET ADDRESS
MACHINE ID	Module ID code	Unsigned 16 bits	R	-	40001	0
FIRMWARE REVISION	Firmware Revision Code	Unsigned 16 bits	R	-	40002	1
RESERVED	Reserved	Float32	R	-	40003 (LSW) 40004 (MSW)	2-3
RESERVED	Reserved	Unsigned 16 bits	R	-	40005	4
COMMAND	This register is used for sending commands to the device. The following commands are supported: 49600 Store configuration in Flash 49568 Reset the Module 49920 Reset I max Value 49921 Reset I min Value After the command is executed the register will return to 0 value	Unsigned 16 bits	R/W	0	40006	5
FLOAT CURRENT VALUE [A]	Current Measure Value in floating point LSW-MSW [A]	Float32	R	-	40049 (LSW) 40050 (MSW)	48-49

REGISTER NAME	COMMENT	REGISTER TYPE	R/W	DEFAULT VALUE OR START VALUE	ADDRESS (4xxxx)	OFFSET ADDRESS
INTEGER CURRENT VALUE [A X100] [A X10] (T201DCH600A)	Current Measure Value in signed integer [A x100] For example: 18534 = 185.34 A -2500 = -25.00 A [A x10] for 600A model For example: 60000 = 600.0 A	Signed 16 Bits	R	-	40051	50
CURRENT MIN [A]	Minimum Current Value (use register Command for reset the value) The value is set to 0 at startup	Float32	R	-	40059 (LSW) 40060 (MSW)	58-59
CURRENT MAX [A]	Maximum Current Value (use register Command for reset the value) The value is set to 0 at startup	Float32	R	-	40061 (LSW) 40062 (MSW)	60-61
OUTPUT VOLTAGE [V]	Output Voltage	Float32	R	-	40063 (LSW) 40064 (MSW)	62-63
INVERSE FLOAT CURRENT VALUE [A]	Current Measure Value in floating point MSW-LSW [A] Copy of Float Current Value Registers with Inverse (MSW-LSW) Floating Point	Float32	R	-	40065 (MSW) 40066 (LSW)	64-65

REGISTER NAME	COMMENT	REGISTER TYPE	R/W	DEFAULT VALUE OR START VALUE	ADDRESS (4xxxx)	OFFSET ADDRESS
ALARM STATUS	Alarm status flag: BIT 0 = Max Pre-Alarm BIT 1 = Min Pre-Alarm BIT 2 = Internal Window Pre-Alarm BIT 3 = External Window Pre-Alarm Bit 4..Bit 7 = Not Used BIT 8 = Max Alarm BIT 9 = Min Alarm BIT 10 = Internal Window Alarm BIT 11 = External Window Alarm BIT 12..15 = Not Used	Unsigned 16 bits	R	0	40067	66
MODBUS STATION ADDRESS	Modbus RTU station address	Unsigned 16 bits	RW*	1	40101	100
BAUD RATE	RS485 Port Baud rate 0 = 4800 baud 1 = 9600 baud 2 = 19200 baud 3 = 38400 baud 4 = 57600 baud 5 = 115200 baud 6 = 1200 baud 7 = 2400 baud	Unsigned 16 bits	RW*	3	40102	101
PARITY	Communication Parity Bit 0 = None (8,N,1) 1 = Even (8,E,1) 2 = Odd (8,O,1)	Unsigned 16 bits	RW*	0	40103	102

REGISTER NAME	COMMENT	REGISTER TYPE	R/W	DEFAULT VALUE OR START VALUE	ADDRESS (4xxxx)	OFFSET ADDRESS
OUT MODE TRUE RMS/BIPOLAR	MSB (OUT MODE) Select from Digital or Analog output: 0 = Select Analog Output 1 = Select Digital Output (Alarm) LSB (TRUE RMS/BIPOLAR) Select from True RMS or Bipolar DC measurement mode 0 = True RMS 1 = Bipolar DC	Unsigned 16 bits	RW*	0	40104	103
RESERVED	Reserved	Unsigned 16 bits	R	0	40105	104
FILTER	Select Filter level 0 = LOW RMS =1400 ms response Time BIPOLAR = 78 ms response Time 1 = HIGH RMS = 2900 ms response Time BIPOLAR = 650 ms response Time	Unsigned 16 bits	RW*	0	40106	105
MODEL	Select the model 0 = T201DCH50-MU 1 = T201DCH100-MU 2 = T201DCH300-MU 3 = T201DCH300-MU HW2 4 = T201DCH600-MU	Unsigned 16 bits	R	According to the model	40107	106

REGISTER NAME	COMMENT	REGISTER TYPE	R/W	DEFAULT VALUE OR START VALUE	ADDRESS (4xxxx)	OFFSET ADDRESS
ALARM TYPE	Select the Alarm linked to the Digital Output: 0 = NONE 1 = MAX (Alarm if the Current is above the High Threshold) 2 = MIN (Alarm if the Current is below the Low Threshold) 3 = Window INT (Alarm if the Current > Low Threshold but < High Threshold) 4 = Window EXT (Alarm if the Current is > High Threshold or < Low Threshold)	Unsigned 16 bits	RW*	0	40108	107
DOUT MODE	0 = Digital Output is normally Low 1 = Digital Output is normally High	Unsigned 16 bits	RW*	0	40109	108
ALARM DELAY	Alarm delay in x 10ms (for example write 1000 for obtain 10 seconds of delay)	Unsigned 16 bits	RW*	0	40110	109
START INPUT SCALE	Select the Start Input Scale [A]	Float32	RW*	According to the model	40111 (LSW) 40112 (MSW)	110-111
STOP INPUT SCALE	Select the Stop Input Scale [A]	Float32	RW*	According to the model	40113 (LSW) 40114 (MSW)	112-113
START OUTPUT SCALE	Select the Start output Scale [V]	Float32	RW*	0.0 V	40115 (LSW) 40116 (MSW)	114-115
STOP OUTPUT SCALE	Select the Stop output Scale [V]	Float32	RW*	10.0 V	40117 (LSW) 40118 (MSW)	116-117
ALARM HYSTERESIS	Select the Hysteresis for the Alarm in [A]	Float32	RW*	10.0 A	40119 (LSW) 40120 (MSW)	118-119

REGISTER NAME	COMMENT	REGISTER TYPE	R/W	DEFAULT VALUE OR START VALUE	ADDRESS (4xxxx)	OFFSET ADDRESS
THRESHOLD HIGH	Select the High Threshold for the Alarm in [A]	Float32	RW*	According to the model	40121 (LSW) 40122 (MSW)	120-121
THRESHOLD LOW	Select the Low Threshold for the Alarm in [A]	Float32	RW*	According to the model	40123 (LSW) 40124 (MSW)	122-123

6. FULL CONFIGURATION WITH EASY SETUP

For configure all the device parameters you must use the RS485 Port and the Easy T201DCH-MU software included in the Easy Setup Suite.
You can download the Easy Setup software for free from:

www.seneca.it

6.1. Easy Setup Menu

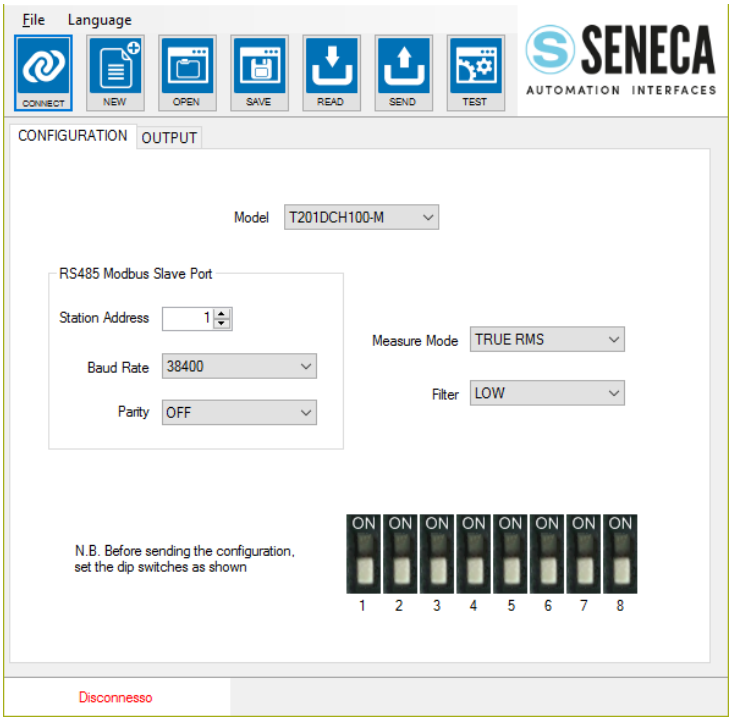
Connect: Use the connect icon for connect the PC to the Device. Note that you need a RS485 to USB converter like Seneca S117P1 or S107USB for connect the device to a PC.
New: Load the default parameters in the actual project
Open: Open a stored project
Save: Save the actual project
Read: Read the actual configuration from the device (if the dip switches are not ALL OFF the configuration is read from dip switches)

WARNING!

If you read a configuration from the device with at least one dip switch to "ON" the software will read the dip switch configuration because overwrite the flash configuration.

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, you can also reset the MIN/MAX values and start/stop a Datalogger

6.2. Creating a Project Configuration



WARNING!

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

The parameters in the "Configuration" section that can be configured are:

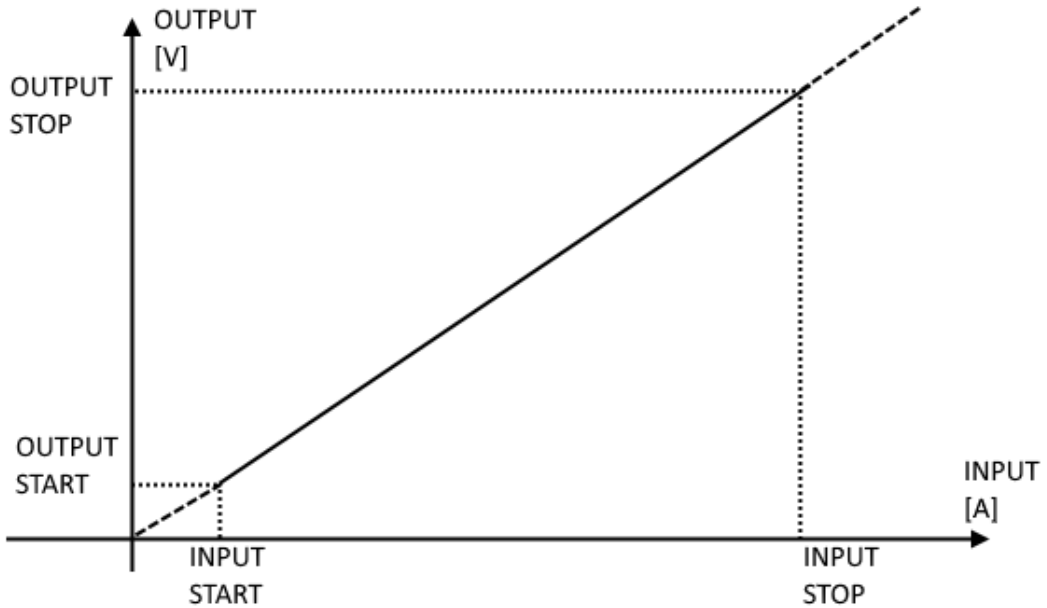
Model: Select between T201DCH50-MU, T201DCH100-MU, T201DCH300-MU, T201DCH300-MU HW2 or T201DCH600-MU model.
Station Address: Select The Modbus RTU station address
Baud Rate: Select the Baud rate from 1200 to 115200 baud
Parity: Select NONE, ODD or EVEN
Mode: Select the current measure mode: True RMS or DC Bipolar
Filter: Select between LOW or HIGH:

FILTER	*RMS RESPONSE TIME (10%-90% F.S.)*	*BIPOLAR DC RESPONSE TIME (10%-90% F.S.)*
LOW	1400 ms	78 ms
HIGH	2900 ms	650 ms

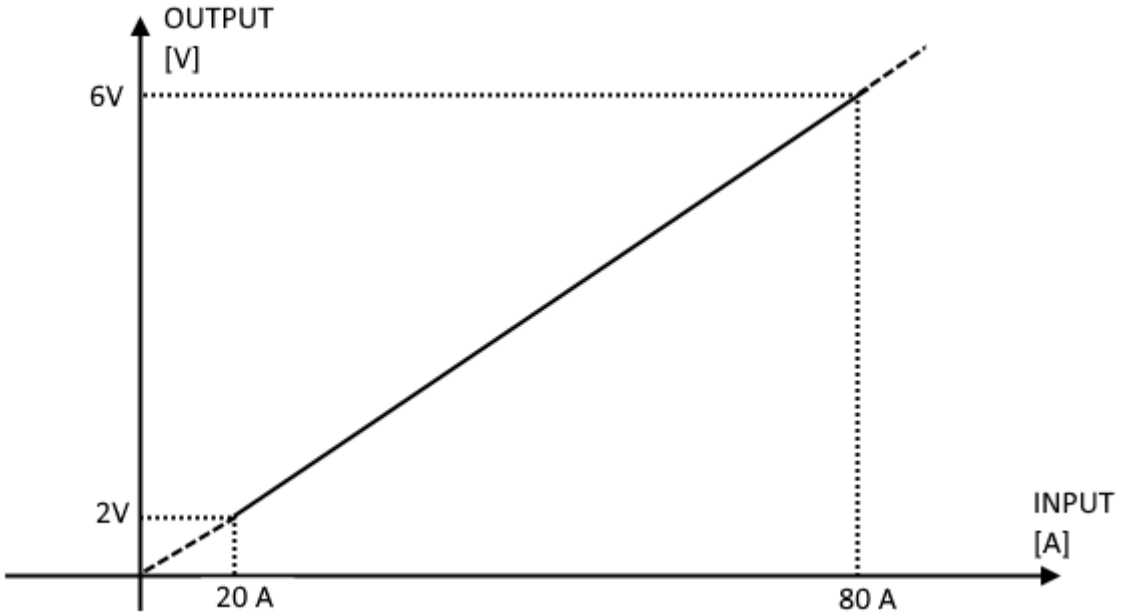
The parameters in the “OUTPUT” section that can be configured depends by the Output Type if is selected “Analogic” or “Digital” (Only for T201DCH50/100/300-MU models)
If The Output is configured in “Analogic”:

Note: The T201DCH600-MU allows the use of both the analogue and digital output simultaneously.

Input Start/Stop Scale and Output Start/Stop Scale: Select the Start/Stop input and Output Start/Stop scale see figure:



For example:
INPUT START = 20 A
INPUT STOP = 80 A
OUTPUT START = 2 V
OUTPUT STOP = 6 V



Note that with an input of 0 A the output is 0 V and over 80 A the output is over 6V (6V and 2V are not a limit).

WARNING!

The Output Voltage is limited to about 10.8V

If The Output is configured in “Digital”:

Digital Ouput Type: Select between Normally Low or Normally High.

Alarm Type: Select Between:

NONE: No Alarm active

MAXIMUM: Alarm if the Current is above the High Threshold

MINIMUM: Alarm if the Current is below the Low Threshold

ACTIVE IF INTO THE WINDOW: (Alarm if the Current > Low Threshold but < High Threshold)

ACTIVE IF OUT THE WINDOW: (Alarm if the Current is > High Threshold or < Low Threshold)

Alarm Delay: Select the Alarm delay in x 10 ms (for example write 100 for 1 second delay)

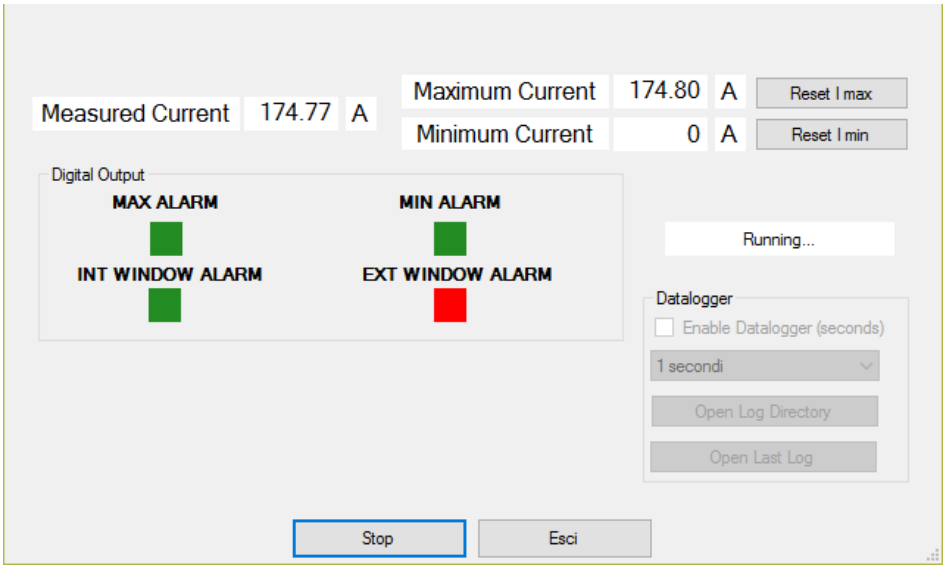
Hysteresis: Select the Alarm Hysteresis in [A]

High Alarm: Select the High Threshold for the Alarm in [A]

Low Alarm: Select the Low Threshold for the Alarm in [A]

6.3. Testing the Device

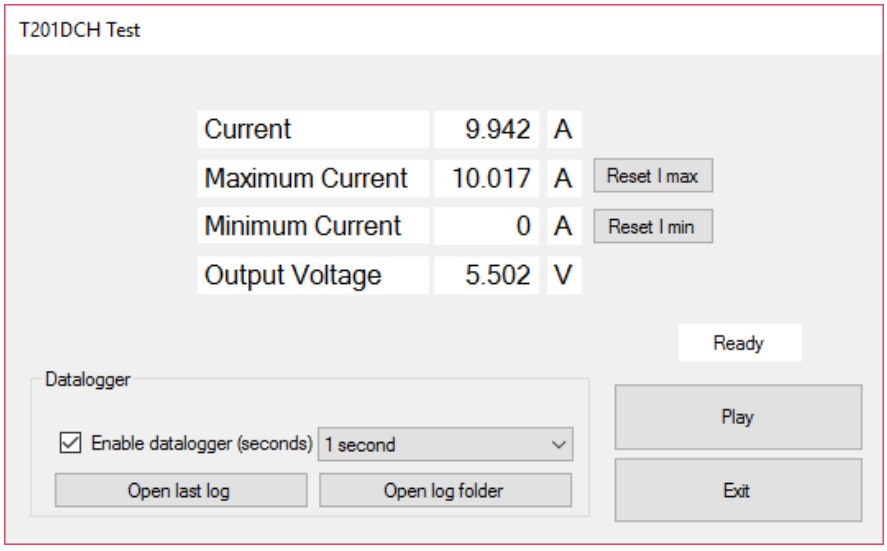
When the configuration is sent to the device you can test the actual configuration by using the  icon:



The test configuration will acquire the measure from the Modbus registers, you can also reset the MIN/MAX values.

6.3.1. 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 with external tools:

	A	B	C	D	E	F	G
1	INDEX	TYPE	TIMESTAMP	I	IMAX	IMIN	VOUT
2	1	LOG	18/07/2017 17:37:16	9,94183	10,01664	0	5,501532
3	2	LOG	18/07/2017 17:37:17	9,984209	10,0598	0	5,502169
4	3	LOG	18/07/2017 17:37:18	10,04912	10,06021	0	5,46909
5	4	LOG	18/07/2017 17:37:19	9,9916	10,06021	0	5,500545
6	5	LOG	18/07/2017 17:37:20	10,0064	10,06021	0	5,49997
7	6	LOG	18/07/2017 17:37:21	10,00188	10,06021	0	5,503278
8	7	LOG	18/07/2017 17:37:22	9,944716	10,07788	0	5,501326
9	8	LOG	18/07/2017 17:37:23	9,977228	10,07788	0	5,502477
10	9	LOG	18/07/2017 17:37:24	10,06232	10,07788	0	5,50186
11	10	LOG	18/07/2017 17:37:25	9,991206	10,07788	0	5,501265
12	11	LOG	18/07/2017 17:37:26	10,03309	10,07788	0	5,500669
13	12	LOG	18/07/2017 17:37:27	10,03637	10,07788	0	5,500587
14	13	LOG	18/07/2017 17:37:29	10,00598	10,07788	0	5,501203
15	14	LOG	18/07/2017 17:37:30	9,976815	10,07788	0	5,50338
16	15	LOG	18/07/2017 17:37:31	10,01295	10,07788	0	5,50225
17	16	LOG	18/07/2017 17:37:32	10,01624	10,07788	0	5,500751
18	17	LOG	18/07/2017 17:37:33	10,0615	10,07788	0	5,502066
19	18	LOG	18/07/2017 17:37:34	10,03803	10,07788	0	5,502476
20	19	LOG	18/07/2017 17:37:35	10,01379	10,07788	0	5,503421
21	20	LOG	18/07/2017 17:37:36	10,0105	10,07788	0	5,502476
22	21	LOG	18/07/2017 17:37:37	10,00846	10,07788	0	5,501059
23	22	LOG	18/07/2017 17:37:38	10,05898	10,08692	0	5,500854
24	23	LOG	18/07/2017 17:37:39	10,03637	10,08692	0	5,501983
25	24	LOG	18/07/2017 17:37:40	10,03022	10,08692	0	5,501552
26	25	LOG	18/07/2017 17:37:41	10,00187	10,08692	0	5,502662
27	26	LOG	18/07/2017 17:37:42	10,00558	10,08692	0	5,502969

The file can also be open with a text editor:

INDEX;TYPE;TIMESTAMP;I;IMAX;IMIN;VOUT
1;LOG;18/07/2017 17:37:16;9,94182968139648;10,0166397094727;0;5,50153207778931
2;LOG;18/07/2017 17:37:17;9,98420906066895;10,0598001480103;0;5,50216913223267
3;LOG;18/07/2017 17:37:18;10,0491199493408;10,0602102279663;0;5,4690899848938
4;LOG;18/07/2017 17:37:19;9,99160003662109;10,0602102279663;0;5,50054502487183
5;LOG;18/07/2017 17:37:20;10,0064001083374;10,0602102279663;0;5,49996995925903
6;LOG;18/07/2017 17:37:21;10,0018796920776;10,0602102279663;0;5,50327777862549
7;LOG;18/07/2017 17:37:22;9,94471645355225;10,0778799057007;0;5,50132608413696
8;LOG;18/07/2017 17:37:23;9,97722816467285;10,0778799057007;0;5,50247716903687
9;LOG;18/07/2017 17:37:24;10,0623197555542;10,0778799057007;0;5,50186014175415
10;LOG;18/07/2017 17:37:25;9,99120616912842;10,0778799057007;0;5,50126504898071
11;LOG;18/07/2017 17:37:26;10,0330896377563;10,0778799057007;0;5,50066900253296
12;LOG;18/07/2017 17:37:27;10,0363702774048;10,0778799057007;0;5,50058698654175
13;LOG;18/07/2017 17:37:29;10,0059795379639;10,0778799057007;0;5,50120306015015
14;LOG;18/07/2017 17:37:30;9,97681522369385;10,0778799057007;0;5,50337982177734
15;LOG;18/07/2017 17:37:31;10,0129499435425;10,0778799057007;0;5,50225019454956
16;LOG;18/07/2017 17:37:32;10,0162401199341;10,0778799057007;0;5,50075101852417
17;LOG;18/07/2017 17:37:33;10,0614995956421;10,0778799057007;0;5,50206613540649