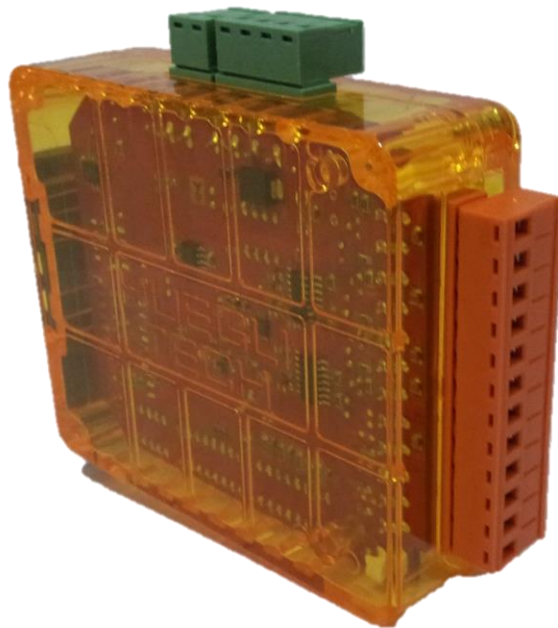


CuteLine

AOUT4 - Voltage Current

Manual



Doc.-No. : CL_AOUT4_MN_EN_07.2017

Version : 1.4

Date of Issue : 05.07.2017

HUEGLI TECH Switzerland

This document, and the information contained herein is the intellectual property of HUEGLI TECH. It is to be used only in conjunction with the specific system or the specific equipment for which it was meant, and may not be used for any other purpose. The copyright has been applied to every page. We reserve all rights for this document, also in the event of application for patents or registry of patterns or designs. None of the information contained herein may be disclosed to third parties, nor may it be reproduced, copied or transmitted in any way, shape or form, or by any means, electronic, mechanical, or otherwise, without the prior written permission of HUEGLI TECH.

Unless otherwise stated, masculine nouns and pronouns do not refer exclusively to men.

All trademarks used in this document are properties of their respective owners.

Table of Contents

1	General Guidelines.....	3
1.1	What describes this manual?	3
1.2	!! Warning !!.....	3
2	Mounting	4
3	Electrical Connection.....	4
3.1	Power Supply	4
3.2	General Communication Configuration.....	4
3.3	Wiring Input/ Output Signals.....	5
4	Serial Connection	6
4.1	CAN Bus Connection	6
4.2	Can Bus Connection to IG-NT / IS-NT.....	7
4.3	Can Bus Connection to HT Controller (DST Mode)	10
4.4	Mod Bus RTU Connection.....	11
4.5	Sensor type setting when using HT Controller or Mod Bus RTU.....	13
4.6	Alert Status Configuration.....	13
	Technical Data	14

1 General Guidelines

1.1 What describes this manual?

This manual describes the function of the Cuteline module, which is designed for use with different gen-set controllers.

What is the purpose of the manual?

This manual provides general information how to install and operate the Cuteline module.

1.2 !! Warning !!

Some of the Cuteline functions are subjected to changes depending on SW version.
The data in this manual only describes the product and are not warranty of performance or characteristic.

Note:

Huegli Tech believes that all information provided herein is correct and reliable and reserves the right to update at any time. Huegli Tech does not assume any responsibility for its use unless otherwise expressly undertaken.

!!! CAUTION !!!

Dangerous voltage

In no case touch the *terminals for voltage and current* measurement!
Always connect grounding terminals!

All parameters are pre-adjusted to their typical values. But the set points in the “**Basic settings**” settings group **!!must!!** be adjusted before the first startup of the gen-set.

!!! WRONG ADJUSTMENT OF BASIC PARAMETERS CAN DESTROY THE GEN-SET !!!

The following instructions are for qualified personnel only. To avoid personal injury do not perform any action not specified in this User guide !!!

2 Mounting

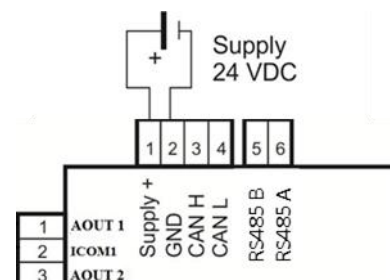
The CuteLine modules are designed to be mounted on a 35 mm DIN Rail and can be easily attached and detached from the DIN rail.

To mount the module on the DIN rail, attached the upper portion of the module onto the DIN rail and press down the module until the hook clicks itself.

To remove the module from the DIN rail, simply unhook the lower part using a screwdriver and lift the enclosure from the DIN rail.

3 Electrical Connection

All connectors can be pulled out from the board for easier wiring.



3.1 Power Supply

The nominal supply input for CuteLine AOUT4 Module is 24 VDC power supply but it can also work from a voltage range of 9-30VDC. The green LED on the front is turned on when the device is connected to the power supply. The supply input is reverse polarity protected.

3.2 General Communication Configuration

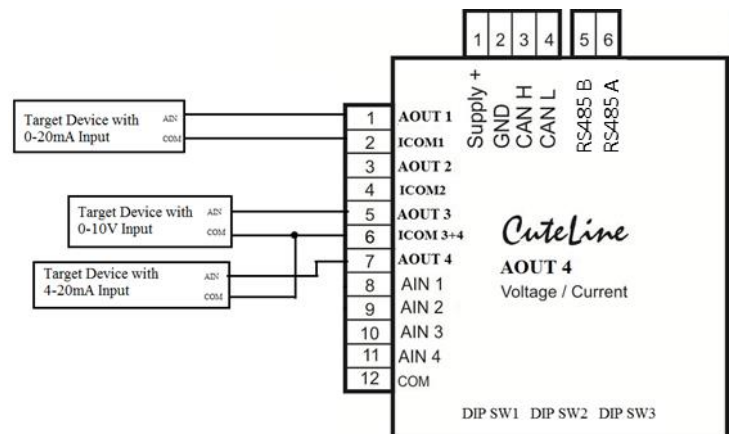
Switch Position	Communication Configuration
SW3: 1 2 OFF <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> ON <input type="checkbox"/> <input type="checkbox"/>	CAN bus for IS-NT/IG-NT controllers
	MODBUS(19200 baud) Read-only registers accessible
SW3: 1 2 OFF <input checked="" type="checkbox"/> <input type="checkbox"/> ON <input type="checkbox"/> <input checked="" type="checkbox"/>	CAN bus for HT controllers
	MODBUS(19200 baud) Read-only registers accessible
SW3: 1 2 OFF <input type="checkbox"/> <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> <input type="checkbox"/>	MODBUS All Registers(9600 baud)
	MODBUS All Registers(19200 baud)
SW3: 1 2 OFF <input type="checkbox"/> <input type="checkbox"/> ON <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Sensor type setting with cuteline configuration software.

3.3 Wiring Input/ Output Signals

Wiring Analog Outputs

For each of the 4 analogue outputs, Signal of 0-10 V or 0/4-20 mA can be provided to the target device.

The AOUTx (example: AOUT1) must be connected to the AIN/ (+) input of the target device. The respective ICOMx must be connected to the target device's COM/ (-) input.



With DIP SW1(DIP SW1:1 to SW1:4), the type of output(OFF→Current, ON→Voltage) is selected. Each of the 4 poles of DIP SW1 is assigned to the corresponding input. If the sensors are connected according to the picture shown on the right, DIP SW1 must be configured as:

DIP SW1:1 OFF
 DIP SW1:3 ON
 DIP SW1:4 OFF

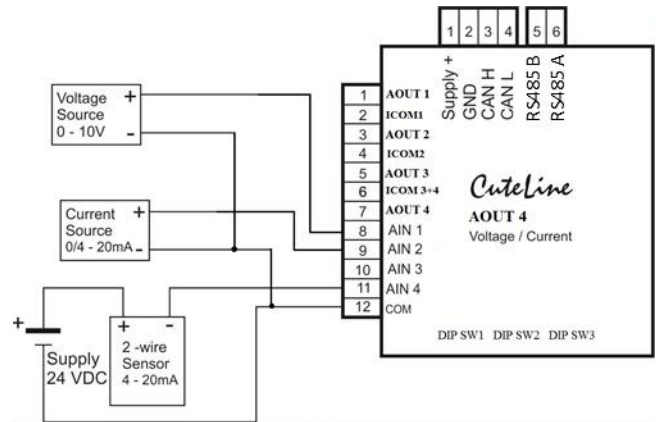
Wiring Analog Inputs

For each of the 4 analogue inputs, signal of 0-10 V or 0/4-20 mA can be connected. The + signal must be connected to AINx (Example: AIN1) and the – signal must be connected to COM.

With DIP Switch 1(DIP SW1:5 to SW1:8), the type of input is selected. Each of the 4 poles of DP SW1 is assigned to the corresponding input.

If the sensors are connected according to the picture shown on the right, DIP SW1 must be configured as follow:

DIP SW1:5 OFF
DIP SW1:6 ON
DIP SW1:8 ON

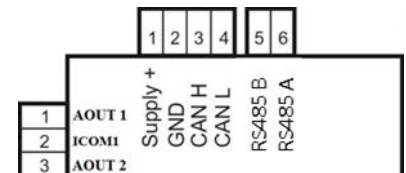


Note: Unused inputs must be connected to COM and the corresponding DIP switch must be OFF.

4 Serial Connection

The CuteLine AOUT Module provides two kinds of serial connection:

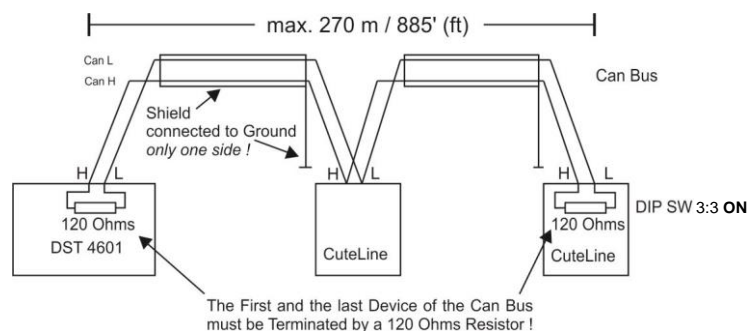
CAN Bus *Various Protocols*
RS485 *Mod Bus RTU*



4.1 CAN Bus Connection

Using the CAN Bus connection, the bus cable must be connected to the terminals Can H(igh) and Can L(ow). If the module is the first or the last device in the bus, a termination resistor is required. There is a built-in resistor (120 Ohms) which can be activated by switching DIP SW3:3 to ON position. Shielded cable (for example, HELUKABEL CAN BUS 2x0.22) must be used for the CAN Bus connection.

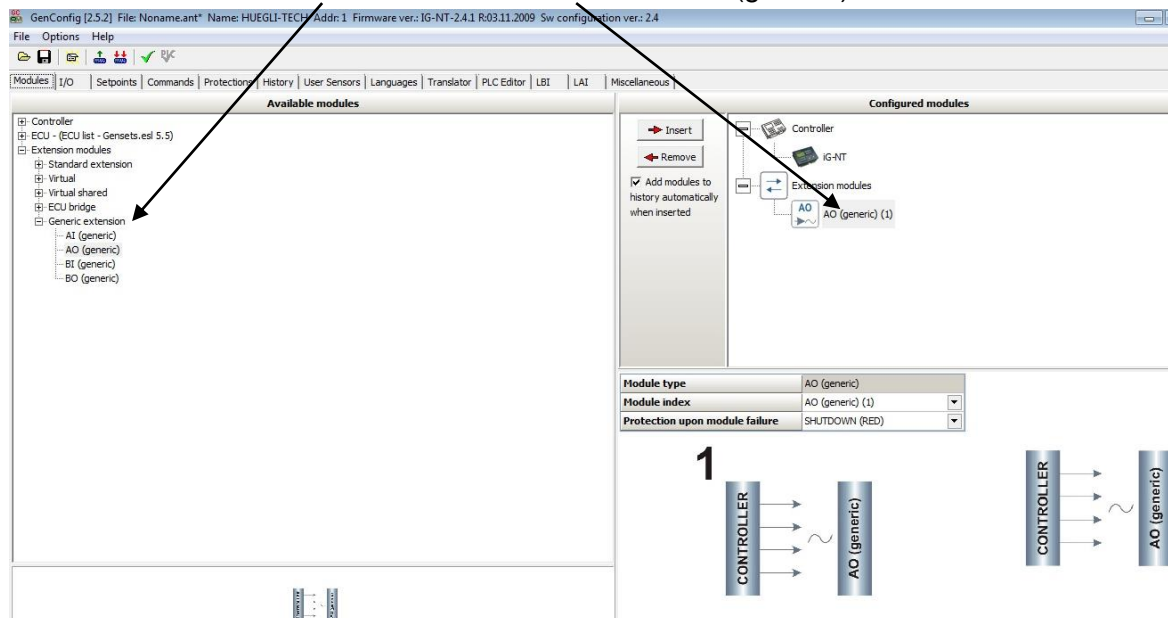
Recommended Wiring



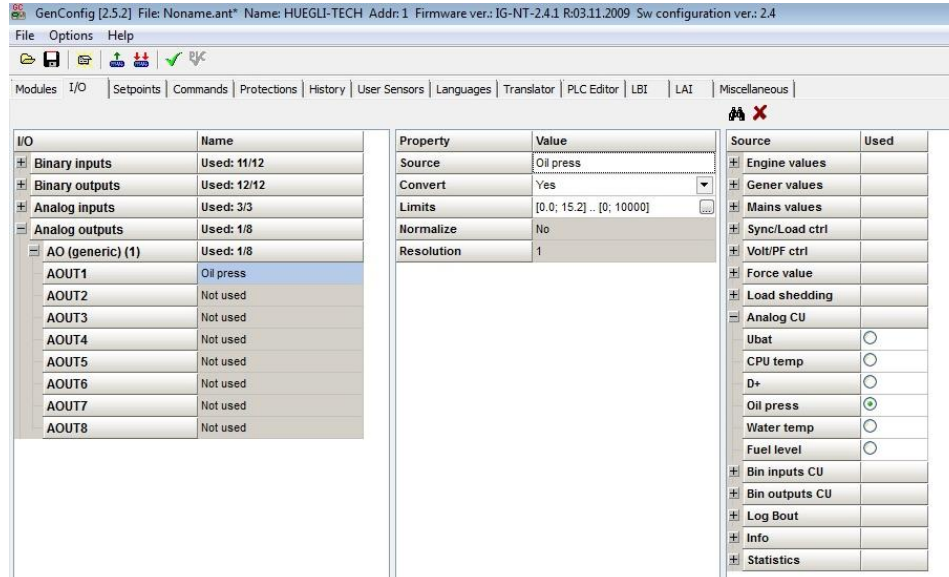
4.2 Can Bus Connection to IG-NT / IS-NT

Configuring Analog Outputs

If the device is connected to IG-NT / IS-NT, the address setting (DIP SW2:1 to SW2:4) in the CuteLine module must be similar to the setting in the Controller. In the GenConfig, the CuteLine devices should be selected as a Generic Extension -> AO (generic).



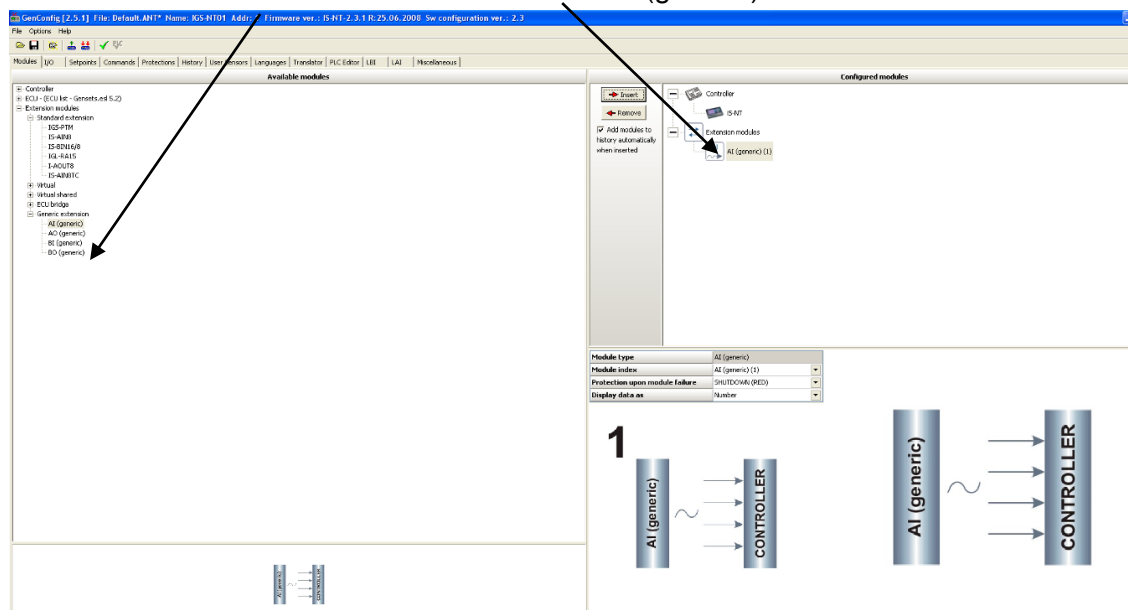
Some of the sources that can be configured to be the output are shown below:



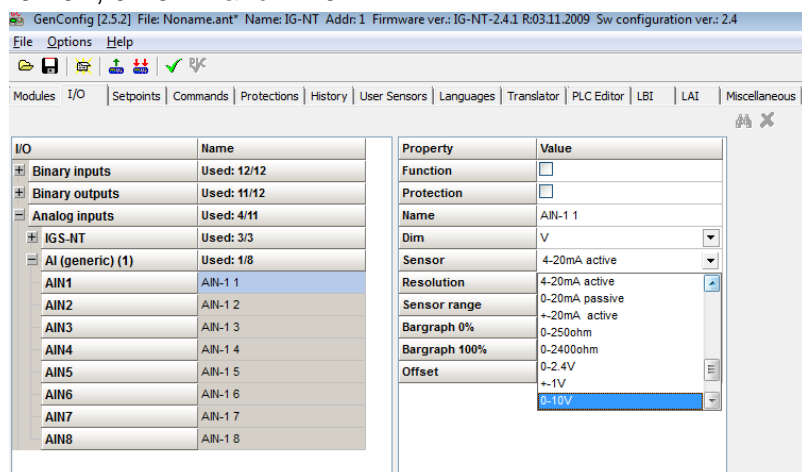
Note: CuteLine AOUT4 module supports only the first four outputs(AOUT1 to AOUT4) to each of the generic extension module added.

Configuring Analog Inputs

If the device is connected to IG-NT / IS-NT, the address setting (DIP SW2:5 to SW2:8) in the CuteLine module must be similar to the setting in the Controller. In the GenConfig, the CuteLine devices should be selected as a Generic Extension -> AI (generic).



Sensors that can be configured in GenConfig that supports this module include 0-10V, 0-20mA and 4-20mA.



Note: CuteLine AOUT4 module supports only the first four inputs(AIN1 to AIN4) to each of the generic extension module added.

Address Setting for IG-NT/IS-NT Mode

DIP Switch 2

Function	Analog Output Function				Analog Input Function			
Address	SW2:1	SW2:2	SW2:3	SW2:4	SW2:5	SW2:6	SW2:7	SW2:8
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
6	ON	OFF	ON	OFF	ON	OFF	ON	OFF
7	OFF	ON	ON	OFF	OFF	ON	ON	OFF
8	ON	ON	ON	OFF	ON	ON	ON	OFF
9	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
10	ON	OFF	OFF	ON	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON	OFF	ON	OFF	ON
12	ON	ON	OFF	ON	ON	ON	OFF	ON
13	OFF	OFF	ON	ON	OFF	OFF	ON	ON
14	ON	OFF	ON	ON	ON	OFF	ON	ON
15	OFF	ON	ON	ON	OFF	ON	ON	ON

CAN Bus Setting for IG-NT/IS-NT Mode

DIP Switch 3

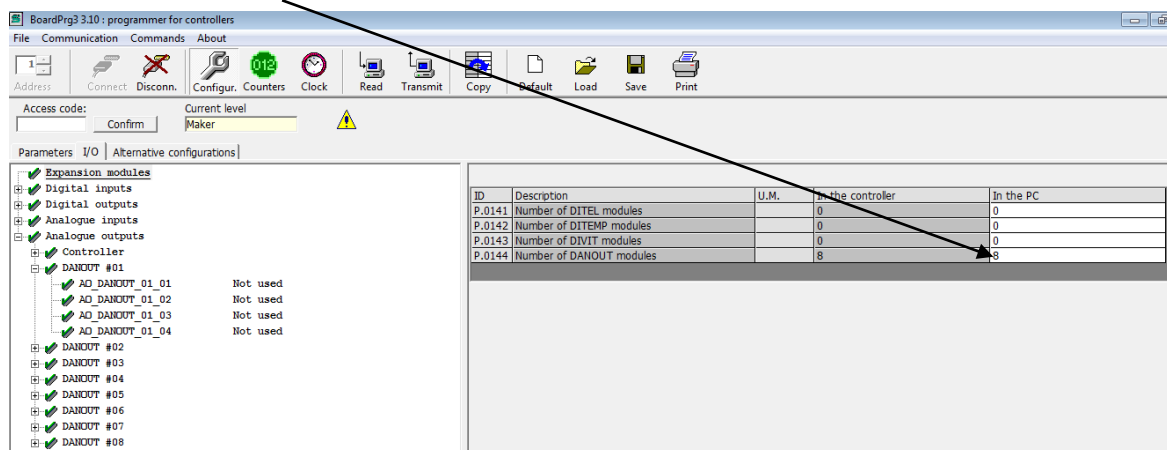
SW3:1	SW3:2
OFF	OFF

Note: Any changes on the address and mode settings (DIP SW2:1 to SW2:8, SW3:1 to SW3:2) are valid only after a Power Down Reset

4.3 Can Bus Connection to HT Controller (DST Mode)

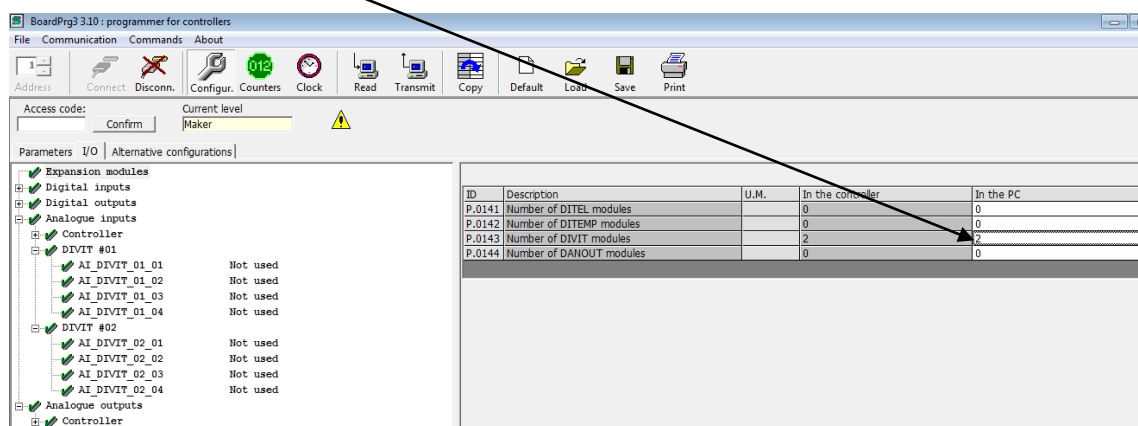
Configuring Analog Outputs

If the device is connected to HT Controller, the address setting(DIP SW2:1 to SW2:4) in the CuteLine module must be similar to the setting in the Controller. . In the BoardPrg, the CuteLine devices must be selected as DANOUT.



Configuring Analog Inputs

If the device is connected to HT Controller, the address setting(DIP SW2:5 to SW2:8) in the CuteLine module must be similar to the setting in the Controller. . In the BoardPrg, the CuteLine devices must be selected as DIVIT.



Note: In DST Model, Yellow LED on the front is blinking when data are sent out.

DST Mode Setting for HT Controller

DIP Switch 3

SW3:1	SW3:2
OFF	ON

Address Setting for DST Mode

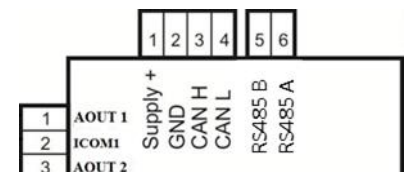
DIP Switch 2

Analog Output Function					Analog Input Function				
Function					Function				
Address	SW2:1	SW2:2	SW2:3	SW2:4	Address	SW2:5	SW2:6	SW2:7	SW2:8
DANOUT #01	OFF	OFF	OFF	OFF	DIVIT #01	OFF	OFF	OFF	OFF
DANOUT #02	ON	OFF	OFF	OFF	DIVIT #02	ON	OFF	OFF	OFF
DANOUT #03	OFF	ON	OFF	OFF	DIVIT #03	OFF	ON	OFF	OFF
DANOUT #04	ON	ON	OFF	OFF	DIVIT #04	ON	ON	OFF	OFF
DANOUT #05	OFF	OFF	ON	OFF	DIVIT #05	OFF	OFF	ON	OFF
DANOUT #06	ON	OFF	ON	OFF	DIVIT #06	ON	OFF	ON	OFF
DANOUT #07	OFF	ON	ON	OFF	DIVIT #07	OFF	ON	ON	OFF
DANOUT #08	ON	ON	ON	OFF	DIVIT #08	ON	ON	ON	OFF
DANOUT #09	OFF	OFF	OFF	ON	DIVIT #09	OFF	OFF	OFF	ON
DANOUT #10	ON	OFF	OFF	ON	DIVIT #10	ON	OFF	OFF	ON
DANOUT #11	OFF	ON	OFF	ON	DIVIT #11	OFF	ON	OFF	ON
DANOUT #12	ON	ON	OFF	ON	DIVIT #12	ON	ON	OFF	ON
DANOUT #13	OFF	OFF	ON	ON	DIVIT #13	OFF	OFF	ON	ON
DANOUT #14	ON	OFF	ON	ON	DIVIT #14	ON	OFF	ON	ON
DANOUT #15	OFF	ON	ON	ON	DIVIT #15	OFF	ON	ON	ON
DANOUT #16	ON	ON	ON	ON	DIVIT #16	ON	ON	ON	ON

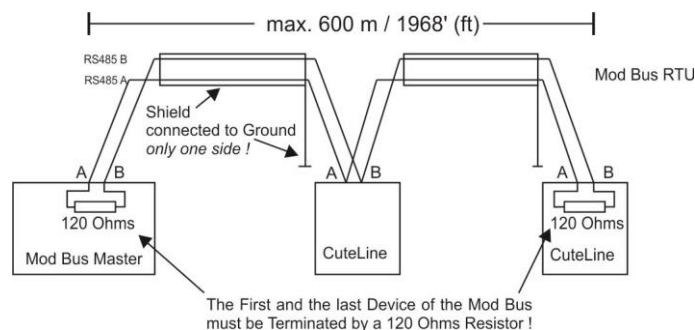
Note: Any changes on the address and mode settings (DIP SW2:1 to SW2:8, SW3:1 to SW3:2) are valid only after a Power Down Reset

4.4 Mod Bus RTU Connection

When working in this mode, the CuteLine AOUT4 Module works as a Mod Bus Slave so the Master has to request data from it. The connection must be on the terminals RS485A and RS485B. If the module is the last device in the bus, an external 120 Ohms termination resistor must be added.



Recommended Wiring



There are fixed object numbers for the 4 analogue inputs:

30001 AIN 1 30002 AIN 2 30003 AIN 3 30004 AIN 4

The Master can read a single or several objects by using the command 04.
The transmitted values are scaled 0-10000 for 0-10 V or 0/4-20 mA signal.

There are fixed object numbers for the 4 analogue outputs:

40001 AOUT 1 40002 AOUT 2 40003 AOUT 3 40004 AOUT 4

The Master can write a single or several objects by using the command 03.
The received values are scaled 0-10000 for 0-10 V or 0/4-20 mA signal.

The communication settings are 9600 / 19200 Baud (depending on DIP SW3:2), 8 Bit, 1 Stop Bit, No Parity.
The yellow LED on the front is blinking when data are sent out after a request from the Master.

Mod Bus RTU Mode Baud Rate Setting

DIP Switch 3

Mod Bus Setting	SW3:1	SW3:2
Baud Rate 9600	ON	OFF
Baud Rate 19200	ON	ON

Address Setting for Mod Bus RTU Mode

DIP Switch 2

Function	Analog Output Function				Function	Analog Input Function			
Address	SW2:1	SW2:2	SW2:3	SW2:4	Address	SW2:5	SW2:6	SW2:7	SW2:8
1	OFF	OFF	OFF	OFF	1	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	2	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF	3	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF	4	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF	5	OFF	OFF	ON	OFF
6	ON	OFF	ON	OFF	6	ON	OFF	ON	OFF
7	OFF	ON	ON	OFF	7	OFF	ON	ON	OFF
8	ON	ON	ON	OFF	8	ON	ON	ON	OFF
9	OFF	OFF	OFF	ON	9	OFF	OFF	OFF	ON
10	ON	OFF	OFF	ON	10	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON	11	OFF	ON	OFF	ON
12	ON	ON	OFF	ON	12	ON	ON	OFF	ON
13	OFF	OFF	ON	ON	13	OFF	OFF	ON	ON
14	ON	OFF	ON	ON	14	ON	OFF	ON	ON
15	OFF	ON	ON	ON	15	OFF	ON	ON	ON
16	ON	ON	ON	ON	16	ON	ON	ON	ON

Note: Any changes on the address and mode settings (DIP SW2:1 to SW2:8, SW3:1 to SW3:2) are valid only after a Power Down Reset

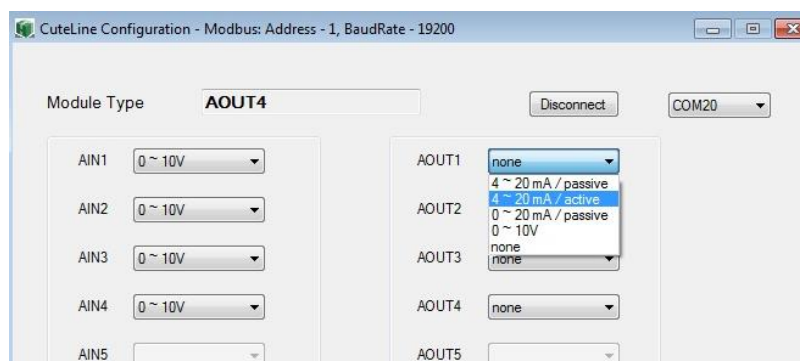
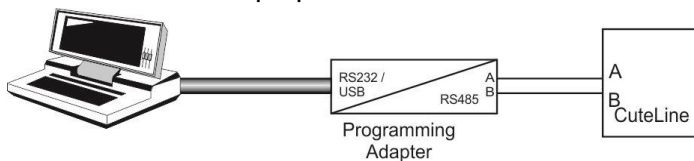
4.5 Sensor type setting when using HT Controller or Mod Bus RTU

When using a connection to HT Controller or Mod Bus RTU in standard setup, only 0-10V and 0-20mA input/output can be configured for use. With the software **CuteLine Configuration**, the module can be configured to have 4-20mA input/output Signal. Latest version of the software can be downloaded from <http://www.huegli-tech.com/>

To start the configuration, switch off the module and set the DIP SW2 & SW3 to these positions:

SW2:1	SW2:2	SW2:3	SW2:4	SW2:5	SW2:6	SW2:7	SW2:8	SW3:1	SW3:2	SW3:3	SW3:4
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF

Connect the PC/Laptop to the module:



Launch the software and click on "Connect". Select the input/output type which is required on the individual input/output and click on "Ok". If the configuration is successful, you will receive a pop up box message to notify you about it. After this is completed, click on "Disconnect" and turn off the power supply to the module. This completes the sensor type configuration process.

To resume the use of the module, put back DIP SW2 & SW3 to the position of the configuration as needed and follow the instruction to the relevant chapters.

4.6 Alert Status Configuration

This module features an Alert Status for its all output signals, whereby during data communication loss, the output can be defaulted either to 0% or 100% of the analogue output range through the setting DIP SW3:4

Alert Status Output Range	DIP SW3:4
0% of Analogue Output Range	OFF
100% of Analogue Output Range	ON

Note: Any changes on the Alert Status Configuration(DIP SW3:4) is valid only after a Power Down Reset.

Technical Data

Power Supply	9-30VDC, Reverse Polarity Protected	
Current Consumption	70 mA with 24VDC Input @ 25°C under no load condition	
Number of Inputs.....	4, Non-Isolated	
Number of Outputs	4, Galvanic Isolated	
Input/Output Type	Current..... 0-20mA/ 4-20mA	
	Voltage	0 – 10V
Accuracy	0.5% of Full Scale @ 25°C	
Calibration	Factory Calibrated	
Communication Supported Protocols.....	Can Bus IS/IG	
	Can Bus HT Controller	
	Mod Bus RTU	
Operational Temperature	-40 to +85 °C (-40 to +185°F)	
Storage Temperature	-40 to +85 °C (-40 to +185°F)	
Relative Humidity	5 to 95%, Non-condensing	
Dimension(Including Terminal blocks)	30 x 110 x 94 mm	
Weight(Including Terminal blocks).....	190g	
Wire Size.....	22 to 12 AWG	
Mounting	DIN Rail 35 mm	