

CONFIGURATION HANDBOOK

CNL35 SSI



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Device Presentation

Overview

The CNL35ssi is a converter for use with ssi absolute encoder. It allows to read and transform the data of an absolute encoder (mono or multi turn) in a analog output signal. The CNL35ssi can works in master or slave mode.

Master mode: The device drives the clock signal and reads the position data every 10ms. After treatment, the information is displayed and sent to the analog output and to the relays.

Slave mode: The device is in "listening mode" on ssi link. It synchronizes with the clock signal generated by the remote master to intercept data of encoder. The device can treated only one ssi telegram every 10ms, even if the remote master transmits more in this time.

Devices have several options:

CNL35ssi: base version. Display with one analog output.

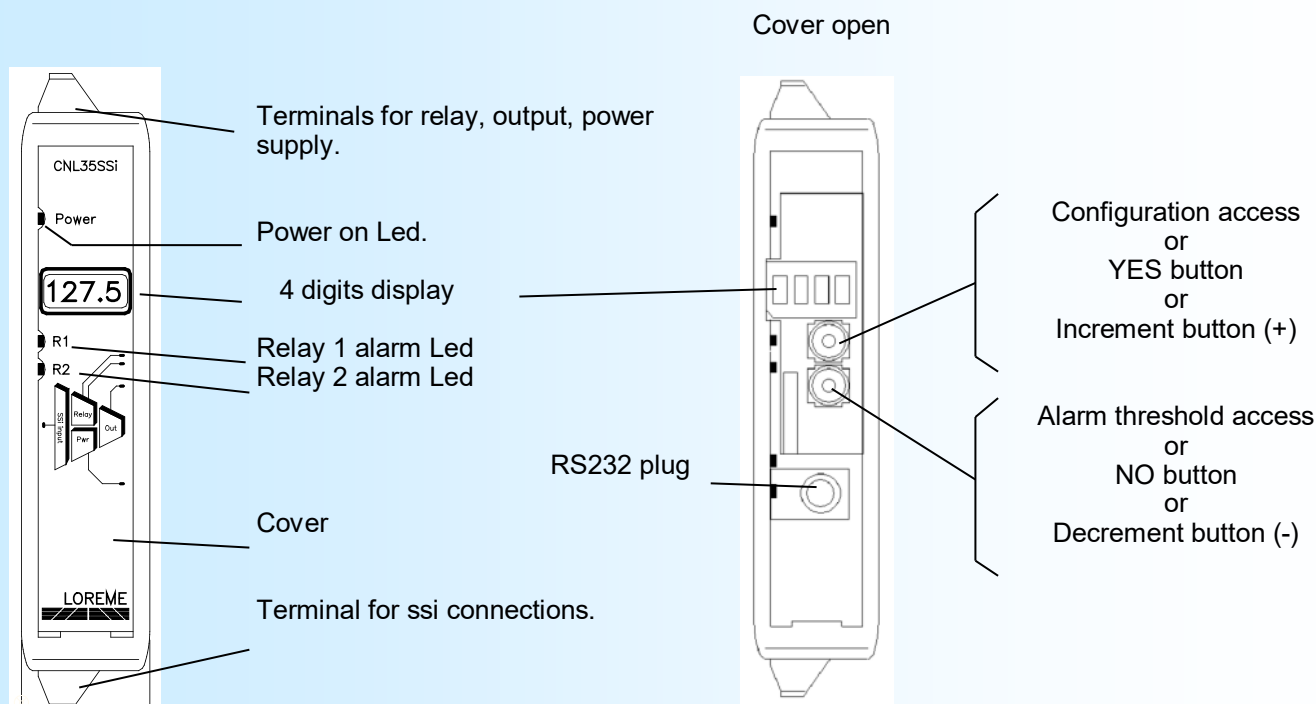
CNL35ssi/R1: base version + 1 relay.

CNL35ssi/R2: base version + 2 relays.

CNL35ssi/S2: base version + second analog output.

The datasheet can be downloaded at : http://www.loreme.fr/fichtech/CNL35ssi_eng.pdf

USER INTERFACE



Front face configuration

1) Visualization

At the power on, the version of the CNL35ssi is display during 1 second. It's a message type "**r- x.y**". Where "x" represent the hardware version and "y" the software version.

Display of default:

- message "**Co !**" : the device don't receive data from encoder.
- message "**Ma !**" : the device don't receive the clock signal from the remote master.

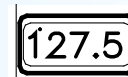
2) Tare function

The tare function may be activated with the front face buttons.

After pressing on the 2 buttons at the same time during 2 seconds, a message is displayed "**Tare Y/N?**"

- Press the UP button to take the tare. The device take the actual value of encoder and save it as tare. This value still activated even after a power supply loss.
- press the DOWN button for deactivate the tare function.

When the tare function is activated, a point is lit on the display (first digit)



3) Alarms thresholds setting

The access to the setup/display of threshold with the buttons is function of alarms configuration. Threshold detection must be enabled and front face setting allowed (use the RS232 link to allowed or not).

Setting method:

- The choice of the relay to be setting is made with the DOWN button. The message "ADJUST THRESHOLD?" is display and the Rx led is lit. Access to the setting with the UP button. Skip with the DOWN button. After pressing the UP button, the threshold value is display and le Rx led blinking.
- If the setting is allowed, the threshold can be modify with buttons. If not, the value is display only.
- If no action are made within 5 seconds, the device save the actual value of threshold and return to measure mode.

4) Front face configuration

Press the UP button to access to the configuration.

The UP button is for access to the menu, validate the proposal.

The DOWN button is for skip the menu, don't validate the proposal.

For a numerical value, increase with UP button and decrease with DOWN button. The display value is validate automatically after 5 seconds without buttons actions.

4-1) Language of messages

LANGUAGE CONFIGURATION ?
ENGLISH or FRENCH

This message scrolls on the display. Pressing the UP button to access the menu. DOWN button to skip this menu.
UP button to set the language. DOWN button to display another.

4-2) ssi parameters

SSI CONFIGURATION ?

MODE

MASTER or SLAVE

define the operating mode for the device.

CLOCK

100KHz, 250KHz,
500KHz or 1MHz

define the baud rate of ssi link.

FORMAT

GRAY or BIN

define the data format of ssi telegram.

SSI FRAME LENGHT

25bit

define the length of ssi telegram (8 up to 32bits)

LOW BIT

1

format the ssi frame by keeping the useful bits.
(keep only bits between LOW BIT and HIGH BIT)

HIGH BIT
19

DIRECTION ?
NORMAL or REVERSE

define the direction of counting.
with the "REVERSE", the encoder value is complemented so the counting direction is reversed.

For the slave mode only:

TIMEOUT
10.0 s

define the delay before the device detect a break in the ssi link
(the device wait this period before detecting a default/breaking in ssi link)

Low bit, High bit and ssi length parameters

The parameters Low and High bit used to not consider all bit of the ssi frame. The Low bit parameter specified the first bit that will be taken in account (LSB). The High bit parameter set the last bit (MSB).

Example:

On a ssi frame of 25 bits length, we want to use the first 15 bits. So :

ssi length frame = 25bits, Low bit = 1 (LSB) and High bit = 15 (MSB). (All bits above the bit 15 will be ignored)

If we need to keep only the last 19 bits: Low bit = 7, High bit = 25. (All bits below bit 7, will be ignored).

4-3) Display parameters

DISPLAY CONFIGURATION ?

NUMBER OF DECIMAL
LOW DISPLAY
HIGH DISPLAY
DISPLAY FILTER?

define the number of decimals displaying.
set the value display when the encoder value = 0.
set the value display when the encoder value is maximum.
allows to average the display value.

Example:

Set the parameters Low bit = 1 and High bit = 14, and the display range: low=0, high=300 with 2 decimals.

So, the encoder value evolves between 0 and 16384 ($=2^{14}$) and the display will evolve to "0.00 " and "300.00".

4-4) Analog output parameters

OUTPUT CONFIGURATION?

BIPOLAR OUTPUT?

This item is display only for device with two analogs outputs (/S2 option)

In this case, the bipolar output is automatically a voltage output! (see "wiring" page)

OUTPUT low
OUTPUT high
DISPLAY for low output
DISPLAY for high output

enter the low voltage value for output
enter the high voltage value for output
enter the display value according to the output scale.
(ex: scale output: -10V / +10V for a display range of 0 / 500)

SECURITY VALUE?
RESPONSE TIME?
LIMITED OUTPUT?

Note: The display value are the value after linearization, scaling)
define the output value when the device is in default/breaking condition.
allows to apply a filter on the output to smooth the signal.
allows to clamp the output signal to the output scale. Except in breaking condition

OUTPUT 1?
CURRENT
VOLTAGE
OUTPUT low
OUTPUT high
DISPLAY for low output
DISPLAY for high output

Configuration of a single analog output
choose the type of output signal.
enter the output scale (ex: 4-20mA or 0-10V or 0-5V)
enter the corresponding display values.

SECURITY VALUE?
RESPONSE TIME?
LIMITED OUTPUT?

define the output value when the device is in default/breaking condition.
allows to apply a filter on the output to smooth the signal.
allows to clamp the output signal to the output scale. Except in breaking condition

4-5) Relays parameters

This menu is visible only for device with the relay option (/R1 or /R2)

Choose if the relay works in sense of rotation or works in threshold/breaking detection.

RELAY CONFIGURATION?

RELAY 1?

ALARME ON ROTATION

COUNTING?

COUNTDOWN?

RELAY CLOSED OUT OF ALARM

RELAY CLOSED IN ALARM

ACTIVATION DELAY?

DEACTIVATION DELAY?

End of relay configuration

Activate or not the sense of rotation detection.

define the sense of rotation (counting or down counting).

define the security of relay.

define the delay between the alarm detection and the relay action.
(value in seconds. pitch of 0.01 s)

or

BREAK DETECTION?

THRESHOLD DETECTION?

low THRESHOLD?

high THRESHOLD?

THRESHOLD?

HYSTERESIS ?

RELAY CLOSED OUT OF ALARM

RELAY CLOSED IN ALARM

ACTIVATION DELAY?

DEACTIVATION DELAY?

End of relay configuration

Activate or not the breaking detection.

activate or not the threshold detection.

choose the threshold detection (Low or High).

enter the threshold value (in same range as display)

enter the hysteresis value (in same range as display).

define the security for relay.

enter the delay between the alarm detection and the relay action.
(value in seconds. pitch of 0.01 s)

The **activation delay** define the time between the alarm detection and the action on relay.

The **deactivation delay** define the time between the alarm disappearance and the action on relay.

4-6) Special function

SPECIAL FUNCTIONS ?

SPECIAL LINEARIZATION ?

ACTIVATED LINEARIZATION ?

Allows to activate the linearization.

OK!

End of configuration. The changes have been saved.

Important: The configuration of linearization points is possible only via the RS232 link.

Note:

If no action are made during a delay of 90 seconds, the device leave the configuration mode and comes back to measure mode (the changes are ignore). For the changes to be saved, you must go through the configuration menus until the message "OK!".

RS232 link configuration

The device can be configured or updated in terminal mode via an RS232 link.

Step 1: Driver installation for USB / RS232 adapter



- download driver at www.loreme.fr/download/ rubric accessories

- Click on executable file to install the driver,
- Plug the cable on a USB port, Windows install a new serial communication port **COMx** (x >= 4).

Note :

The use of the cable on another USB port don't generates a new communication port. Use of another adapter generates another communication port number (COMx) and requires the reconfiguration of the HyperTerminal.

Step 2: Setting of terminal emulation software (PC with windows).

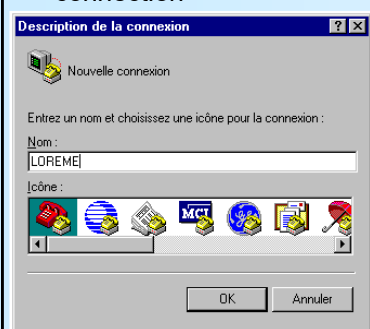
1 The terminal emulation software for PC « HyperTerminal » is resident in windows up to XP version. For later versions, it is downloadable on : **www.loreme.fr in download part** (www.loreme.fr/download/)

=> Run the downloaded software to install it.

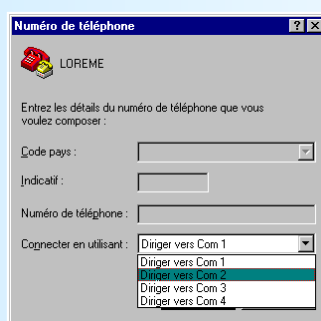
2 Start a "hyper Terminal" connection :

- Click on **"START"** button
- Go to **"All programs \ HyperTerminal Private Edition"**
- Click on **"HyperTerminal Private Edition"**

3 Enter name for the new connection

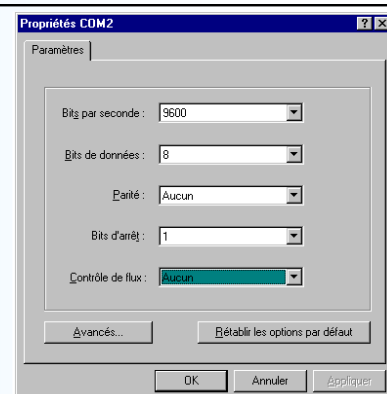


4 Choose the communication port related to the adapter.



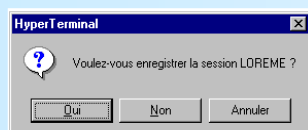
5

- Choose:
- 9600 bauds
 - 8 DATA bits
 - no parity
 - 1 stop bit
 - **XON/XOFF**



6 The PC is now in terminal mode, connect it to the device by plugging the RS232 cable. The measure is now displayed on the terminal. To access configuration, press 'C' key.

7 When leaving Hyper terminal, the following window will appear. By saving, the terminal session will start with the same configuration.



Thus, the shortcut **LOREME.ht** will permit to communicate with all LOREME devices.

Note: to modify the parameters of terminal mode whereas this one is already started, it is necessary, after having carried out the modifications, to close the terminal and to open it again so that the modifications are effective.

Terminal mode

1) Visualization

The CNL35ssi can be configured using the RS232 link on the front of the device.

This requires a USB/Jack or DB9/jack adapter cable, depending on connectors available on the PC, and have a ASCII emulation program like 'Hyperterminal ' or else.

Note: For RS232 cable installation, see the **"RS232 Configuration" page**.

Once the CNL35ssi is connected to PC, it send following informations:

B:13319	display of the encoder value reading (all bits),
C:13319	encoder value after bit formatting (with bit Low, bit High) and tare,
G:327.2 mm	corresponding value in display range (after linearization)
S1:7.25 mA	value of output 1.
S2:8.33 mA	value of output 2 (if exist).

To access to the configuration, press the "C" key on PC keyboard.

The device display:	
CONFIGURATION	temporary display of device version.
REV x.y	

Many message can be display:

- Message of menu: RELAY CONFIGURATION (Y-N)	Press the "Y" (Yes) to enter in this menu. Press the "N" (Non) to skip and go to next menu.
- Message for choosing: MASTER (Y-N)YES	The actual choice is display. Press "N" to change. The device will display another choice.
- Numerical enter: RESPONSE TIME 1.0 s	The current value is display. Enter the new value and validate it with ENTER For no change, just press the ENTER key. In case of error when entering new value, press the "←" (backspace) to cancel the modification.

2) Configuration menus

2-1) Language of messages

LANGUAGE
(Y-N)
FRENCH or ENGLISH

2-2) ssi parameters

MODE
(Y-N)
MASTER or SLAVE

CLOCK
(Y-N)
100K, 250K, 500K or 1M

FORMAT
(Y-N)
GRAY or BIN

SSI FRAME LENGTH

LOW BIT
HIGH BIT

DIRECTION

(Y-N)

NORMAL or REVERSE

TIMEOUT *(only for slave mode)*

2-3) Display parameters

DISPLAY CONFIGURATION

(Y-N)

UNIT Display of current unit. Type directly the character for new unit and validate it with ENTER. Or press ENTER only for no change. (the unit is display only in terminal mode.)

NUMBER OF DECIMAL

ENTRY DISPLAY SCALES

(Y-N)

Yes : enter the Low and High scale for display range

No : enter coefficients M, D, P for scaling like that:

$$\text{Display} = [\text{encoder value} - \text{tare value}] \times M / D + P$$

The '**encoder value**' is the value after the bit formatting (with Low and High bit)

DISPLAY FILTER

(Y-N)

allows to average the display

2-4) Analog output parameters

OUTPUT CONFIGURATION

(Y-N)

BIPOLAR OUTPUT

(Y-N)

(voltage output only. Use the two outputs)

OUTPUT low

define the physical output range.

OUTPUT high

DISPLAY for low output

define the value in display range corresponding to physical output

DISPLAY for high output

SECURITY VALUE

output value in default/breaking detection

RESPONSE TIME

to smooth the output signal

OUTPUT LIMITED

clamp the output signal to the physical scale (except for default detection)

(Y-N)

OUTPUT 1

(Y-N)

configuration for single output

OUTPUT low

OUTPUT high

DISPLAY for low output

DISPLAY for high output

SECURITY VALUE

REPOSE TIME

OUTPUT LIMITED

(Y-N)

2-5) Relay parameters

RELAY CONFIGURATION

(Y-N)

ALARM ON ROTATION

Activate the sense of rotation detection

(Y-N)

COUNTING or COUNTDOWN

define the type of rotation

Or

BREAKING DETECTION

activate the Default/Breaking detection.

(Y-N) YES

THRESHOLD DETECTION

activate the threshold detection

(Y-N) YES

LOW or HIGH THRESHOLD	type of threshold detection
THRESHOLD	threshold value
HYSTERESIS	
FRONT FACE THRESHOLD ADJUST	Allows to modify the threshold value by front face buttons.
(Y-N)YES	
RELAY CLOSED IN ALARM or OUT OF ALARM	define the security
ACTIVATION or DEACTIVATION DELAY	setting the delay between detection and action on relay.

2-6) Special function

SPECIAL FUNCTION

(Y-N)

FRONT FACE LOCKED	allows or not the configuration by front face buttons.
(Y-N)NO	The relays threshold value still be possible.

SPECIAL LINEARIZATION

(Y-N)

ACTIVATED LINEARIZATION	activate the special linearization
(Y-N)YES	
CONFIGURATION	setting the number of point and the linearization points.
(Y-N)	

2-7) Linearization configuration

In some case, it may be useful to have a specific display according to the encoder value.

After specifying the number of linearization points, the device request the value of the entry point (this value corresponds to the display without linearization) and the linearized point (this value correspond what should display the device). When calculating, the device considers a line segment between two linearization points.

CONFIGURATION

(Y-N)

NUMBER OF POINTS	define the number of points (3 to 26 points)
9 pts	
INPUT POINT 01	enter the value normally displaying
0 mm	
LINEARIZED POINT 01	enter the new value display.
0 mm	
... ..	

OK! Indication for the good saving of configuration parameters.
End of configuration

Note:

If no action is made during two minutes, the device leave the configuration (discard change) and go back to measure mode.

FIRMWARE update

To access to the firmware update function, you must first open an HyperTerminal session on a PC, connect the device to the PC with the RS232 link cable and then power on the device.

The following character is send to the terminal:

> <————— The device sends this character then it waits the « F » key during 0.5 s.

If the user has pressed the « F » key in the allowed time, the following message is displayed in the Hyperterminal windows:

FIRMWARE LOADER Rev3 READY TO TRANSFER...

The device is now in the firmware load mode and is waiting for the firmware file. This file is provide by LOREME and contain the firmware code in Intel HEX format.

Select the « Transfer », « Send a text file ... » in the Hyperterminal menu.
Select the directory and open the file. The Hyperterminal program begins to send the file to the device.

FIRMWARE LOADER Rev3 READY TO TRANSFER

***** <————— The star characters appears to show the progress of the uploading.

At the end, the message « **PROGRAMMING OK !** » is display if no errors occurs. Otherwise, these following message could be displayed:

- | | |
|-------------------------------|---|
| - SERIAL COM ERROR ! | Error during receipt. |
| - SERIAL TIMEOUT ! | Waiting time of receipt elapsed (60 s). |
| - PROGRAMMING FAILED ! | Programming error in the internal flash memory. |

Attention

*If an error occurs during the programming process, it is necessary to start again the whole procedure.
A bad programming leads to an inoperative device.*

EMC Consideration

1) Introduction

To meet its policy concerning EMC, based on the Community directives **2014/30/EU** & **2014/35/EU**, the LOREME company takes into account the standards relative to this directives from the very start of the conception of each product.

The set of tests performed on the devices, designed to work in an industrial environment, are made in accordance with **IEC 61000-6-4** and **IEC 61000-6-2** standards in order to establish the EU declaration of conformity. The devices being in certain typical configurations during the tests, it is impossible to guarantee the results in every possible configurations. To ensure optimum operation of each device, it would be judicious to comply with several recommendations of use.

2) Recommendations of use

2.1) General remarks

- Comply with the recommendations of assembly indicated in the technical data sheet (direction of assembly, spacing between the devices, ...).
- Comply with the recommendations of use indicated in the technical data sheet (temperature range, protection index).
- Avoid dust and excessive humidity, corrosive gas, considerable sources of heat.
- Avoid disturbed environments and disruptive phenomena or elements.
- If possible, group together the instrumentation devices in a zone separated from the power and relay circuits.
- Avoid the direct proximity with considerable power distance switches, contactors, relays, thyristor power groups, ...
- Do not get closer within fifty centimeters of a device with a transmitter (walkie-talkie) of a power of 5 W, because the latter can create a field with an intensity higher than 10 V/M for a distance fewer than 50 cm.

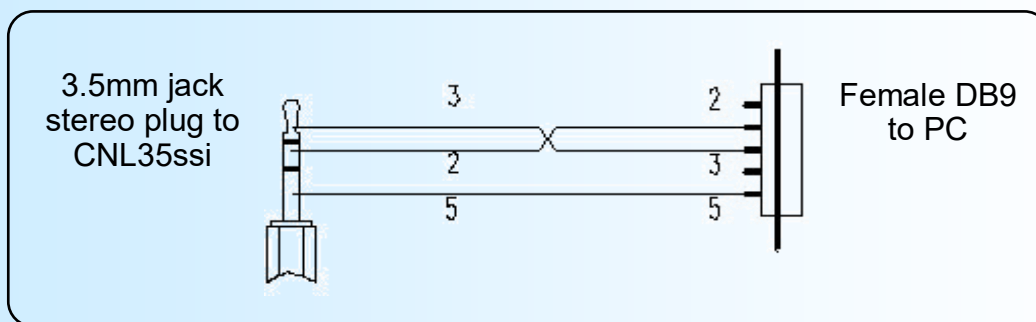
2.2) Power supply

- Comply with the features indicated in the technical sheet (power supply voltage, frequency, allowance of the values, stability, variations ...).
- It is better that the power supply should come from a system with section switches equipped with fuses for the instrumentation element and that the power supply line be the most direct possible from the section switch.
- Avoid using this power supply for the control of relays, of contactors, of electrogates, ...
- If the switching of thyristor statical groups, of engines, of speed variator, ... causes strong interferences on the power supply circuit, it would be necessary to put an insulation transformer especially intended for instrumentation linking the screen to earth.
- It is also important that the installation should have a good earth system and it is better that the voltage in relation to the neutral should not exceed 1V, and the resistance be inferior to 6 ohms.
- If the installation is near high frequency generators or installations of arc welding, it is better to put suitable section filters.

2.3) Inputs / Outputs

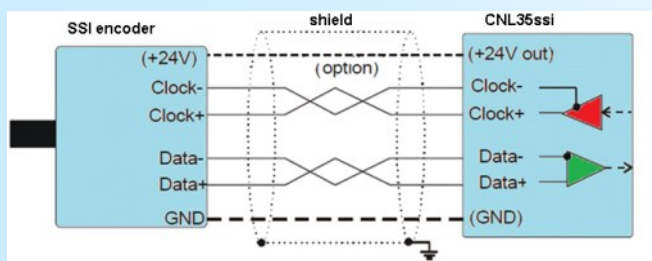
- In harsh conditions, it is advisable to use sheathed and twisted cables whose ground braid will be linked to the earth at a single point.
- It is advisable to separate the input / output lines from the power supply lines in order to avoid the coupling phenomena.
- It is also advisable to limit the lengths of data cables as much as possible.

terminal - device link

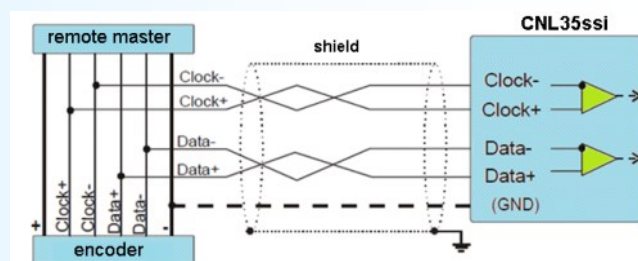


ssi link wiring

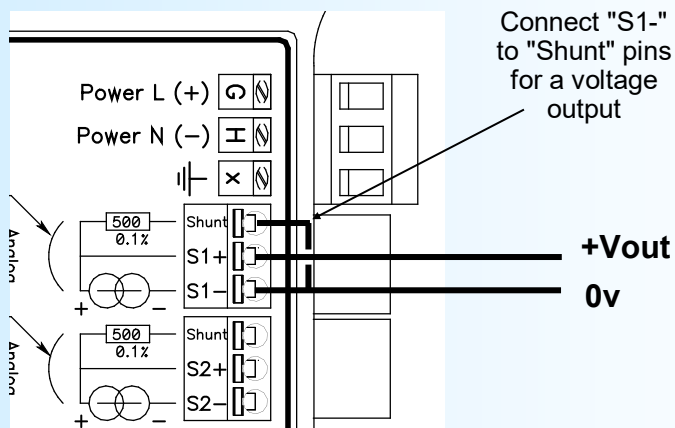
Master mode



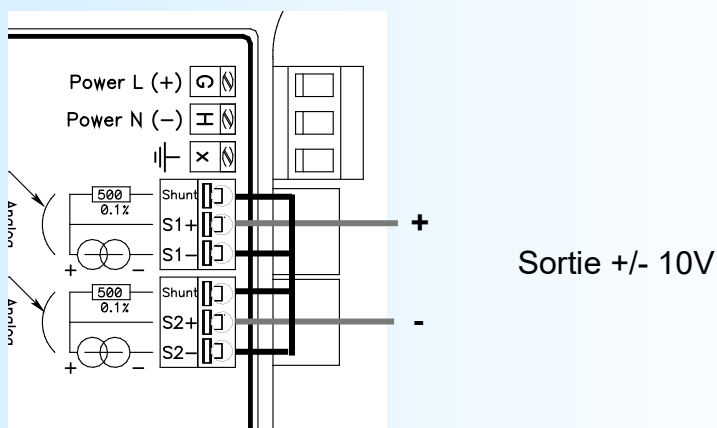
Slave mode



Voltage output wiring



Bipolar output wiring



Outlines

