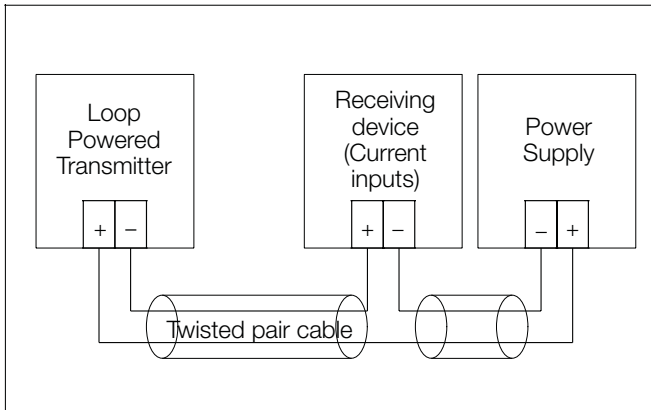


eLINE LPI

Operating Instructions



Connection diagram for loop powered transmitter outputs.

Operation

General

The eLINE LPI is a DIN rail device that converts signals from commonly used industrial signal sources and provides a fully isolated 4-20mA signal that varies in proportion to the input signal.

Loop powered operation

Loop powered transmitters use the drop in voltage across the outputs to generate power for the electronics. The eLINE LPI requires a 10-40V drop to operate correctly. Using a power supply that provides this voltage drop will comply with the instrument's UL/CSA listing.

Receiving devices are placed in series with the eLINE LPI and introduce additional load resistances into the loop. The total loop load for a

4-20mA loop powered by supply voltage V_s is $R_{loop} = 50 \times (V_s - 10)$.

So, for example, an eLINE LPI powered from a 24Vdc supply can drive a 700Ω loop load.

Installation

General

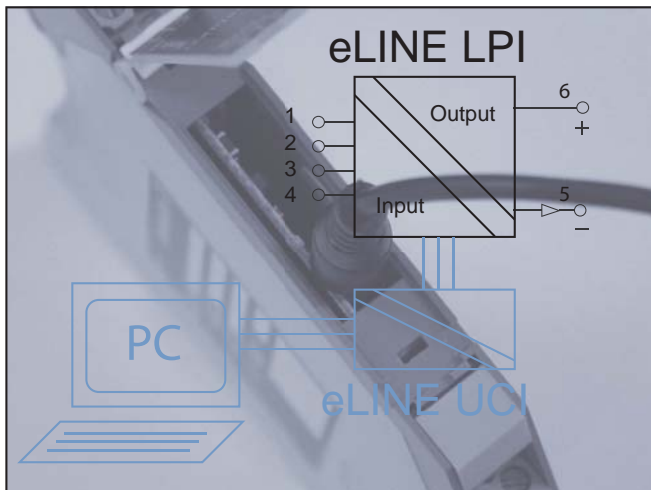
These units must only be installed by qualified staff in accordance with the information given in this manual and all relevant national electrical wiring and safety rules must be followed.

Do not cover the case ventilation holes.

Case front should be closed in normal operation.

Location

Locate the instrument in an area that is free from dust, moisture and corrosive gases.



eLINE LPI block diagram showing eLINE UCI connection for Setup

Cleaning

The case can be wiped with a damp cloth. De-energise the unit before cleaning.

Connections

Strip wires to 7mm from the ends. Use a suitable ferrule for multistranded wires (do not solder).

Use 12-28AWG Cu Wire rated for temperatures above 70°C Only, tighten to 4.5lb-In.

For effective protection from electromagnetic noise, all signal cables must be shielded, or located on conductive trays or in conduits.

Terminal	Signal	
5	Loop -	Output (4-20mA)
6	Loop +	
1	Signal +	Thermocouple
2	Signal -	
1	Asense	4-wire RTD (or Resistance)
3	A	
2	B	
4	Bsense	
1	Asense	3-wire RTD (or Resistance)
3	A	
2	B	
3	A	2-wire RTD (or Resistance)
2	B	
1	Signal +	Voltage (mV or V)
2	Signal -	
1	Signal +	Current (mA)
2	Signal -	
3	A	Potentiometer
1	Wiper	
2	B	

Setup

Getting started

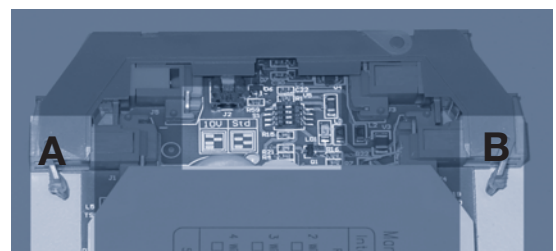
1. Connect the eLINE LPI to a spare RS232 serial port on your PC using the eLINE UCI interface kit (See diagram above).
2. Switch on the eLINE UCI.
3. Start the Setup/Calibration software on your PC. [The latest setup/calibration software is available for free download from our website.]
4. Apply power to the eLINE LPI.

Warning: Take care to avoid touching the internal components when the front panel is open.

Attenuator switch

For input voltages above 1V.

1. Push in the lugs marked A & B below.
2. Pull the electronics forward gently to reveal the attenuator switches.
3. Set the switches to the position required.
4. Recalibrate the inputs (see over).



Attenuator switch location and front panel locating lugs A & B.

Setup (Continued)

Changing the instrument setup

1. Open the Setup/Calibration software.
2. Enter your initials using the 'Enter Initials' command from the 'Device' menu (shortcut is F7).
3. Press the 'Get from instrument' button at the bottom of the screen (shortcut is F9).
4. The screen will now show the instruments current configuration.
5. Save the current configuration to disk using the 'Save as' command from the 'File' menu.
6. Setup the instrument to suit your application via the input screen (press F5) and output screen (press F6).
7. Return to the main screen, check the details are correct and press the 'Send to Instrument' button (shortcut F8).

Note: You are required to enter a password to change the instruments setup. The default password is 100. Make a note of the instrument password if you change it - otherwise you will have to send the instrument back to us.

8. Save the changes to disk as a record of changes you have made.

Main screen

Fields	Description
ID Tag	User defined field (e.g., PT1015-2)
User reference	User defined field (e.g., Pump 1015 bearing)

Input screen

Set the input type by pressing the appropriate button - relevant fields (as shown below) will appear.

Fields	Description
Engineering unit	Sets the units used for the input low and high settings
Input Low	The input value corresponding to 'zero' (4mA) output
Input High	The input value corresponding to 'full scale' (20mA) output
Damping factor	Sets the damping factor for the inbuilt digital filter. Accepts values from 1-99.
# of samples	The number of samples averaged for each measurement. The effect of this setting depends on the input type. Normally set around 50.
10V Attenuator	This check box allows you to set 'Input High' and 'Input Low' values in the software in volts up to 10V. Note: The eLINE LPI will only accept values up to 10V if the attenuator switch on the main board is set to the 10V setting. If you change the switches you must recalibrate the voltage input.
Burnout	Sets the action in case of sensor burn-out or disconnection. Upscale sends the output to 22mA, downscale sends the output to 3.7mA.
Type	Allows you to choose between thermocouple or RTD types. Not shown for other input types. Note: you can set up your own linearisation tables here by choosing 'user defined'.
Input connection	Is the input connected in two, three or four wire mode. For RTD and resistance inputs only. Sets up the lead length compensation.

Output screen

Fields	Description
Range	Sets the output range, normally 4.00mA to 20.00mA.
Transfer function	X1 gives the usual proportional output.
Output action	Set to direct or reversed. Direct gives the usual proportional output. For reversed action, the input low value gives a 20mA output and the high value a 4mA output.

Calibration

General

All instruments are fully calibrated before leaving the factory and should not need adjustment until the next scheduled calibration. However, if you change the voltage attenuator switches, you must recalibrate the voltage input.

Equipment requirements

- Suitable accurate signal source for the inputs (see calibration points table below)
- An accurate digital multimeter (accurate to 0.05mV and $\pm 0.1\mu A$)
- A suitable regulated power supply.
- eLINE UCI USB Cable Interface connected to a PC with the Setup/Calibration software.

Digital multimeters are frequently better at measuring voltages than currents, so you may wish measure the voltage across an accurate standard resistor (say $10\Omega \pm 0.05\%$) when monitoring the output current.

Connections

Connect the output circuit as shown on page one with the multimeter in place of the receiving device.

Connect the eLINE LPI up to a PC running the setup/Calibration software (as if you were going to change the setup).

Input Calibration points

Range	Values	Notes
Volts/Thermocouple	10mV, 20mV, 50mV, 80mV, 200mV, 1V	If the internal switches are set to 10V, you must supply a signal ten times the displayed value, e.g. 10V for the 1V point.
mA	20mA	
RTD/Resistance	100 Ω , 200 Ω , 500 Ω , 800 Ω , 2k Ω , 10k Ω	Use four wire mode
Individual calibration	As selected	Allows you to recalibrate any of the points above
Fine adjust	Current input	Fine tune the adjustment for the range you have selected.
All	All ranges	Complete calibration of all points. Internal switches must be in the 1V position.

Input calibration

1. Save the current calibration to disk (select 'Save Calibration data' from the 'Device' menu).
2. Select 'Calibrate Input' from the 'Device' menu.
3. Enter the calibration password (Default is 101).
4. Choose the calibration required (see Input calibration points table for guidance).
5. Supply the signals requested by the software and follow the instructions on screen. Press the 'Done' button when finished.

Output Calibration

1. Measure the output current.
2. Select 'Calibrate output' from the 'Device' menu.
3. Enter the calibration password.
4. The 4mA adjustment window will open. Adjust the output to 4.00mA using the buttons shown.
Note: you can use PgUp and PgDn controls on the keyboard for fine adjustment and <CNTRL> + PgUp and <CNTRL> + PgDn for coarse adjustment.
5. Press Next when the output has settled at 4.00mA.
6. Repeat the procedure for the 20.00mA adjustment.
7. Press OK to save the changes to the instrument.
This completes the output calibration.