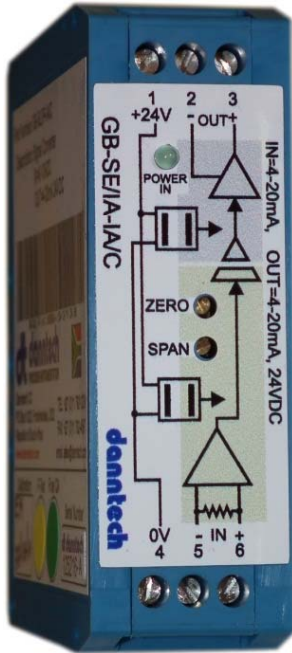# Eco-Line Signal Converters User Manual

The Eco-Line range of signal converters has been designed using a low-cost, powerful microprocessor which enables us to offer flexibility, reliability and accuracy at a really good price in a small package.

Using miniature DIP switches, a variety of standard inputs and outputs can be selected and with the 'one button' calibration, accurate operation in any configuration is assured. Having selected the required input and output ranges, these can be adjusted to be anything within the selected range using the 'one button' calibration.

For example, with a 0 to 100 mV input and ±10V output selected, one can calibrate the device to have say 0 to 60 mV input where 30 mV input gives an output of 0 V, 60 mV an output of +6 V and for 0 mV input and output of – 6 V. Output inversion is also easily accommodated.
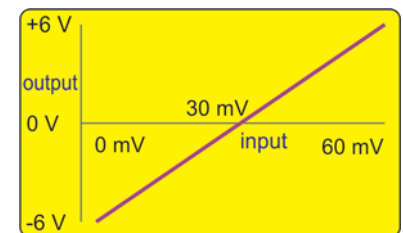
The Zero and Span trimpots can be disabled or switched to a wider adjustment range using the DIP switches. Filtering is also DIP switch selectable in four ranges up to 60 seconds.

We can also make firmware changes if you have a special application that we have not catered for.

If you have any comments or suggestions which could improve this User Manual please e-mail them to me at mailto:miked@danntech.com?subject=Eco-Line User Manual - Comment.

Configuration

As a customer you can do one of the following:

A: Order the standard stock part you require from this list below:

1. GB-SE/IA-IA/C   Input: 4-20 mA; Output: 4-20 mA; Auxiliary Supply: 24 VDC

2. GB-SE/VA-IA/C Input: 0-10 V; Output: 4-20 mA; Auxiliary Supply: 24 VDC

3. GB-SE/IA-VA/C Input: 4-20 mA; Output: 0-10 V; Auxiliary Supply: 24 VDC

(we may add others here depending upon demand)

and then accept our standard configuration –

Zero and Span Trimpots enabled,
Zero and Span Normal Range Adjustment Select, and
Moving Average Filter Step Response Time = 1 second.

No further configuration is required from you and you can ignore the remainder of this User Manual.

Or

B: Order the exact part you require using our Eco-Line Part Signal Converter Part Numbering guide and fill in the Eco-Line Ordering Form, sign and send to us and we will configure them for you.

No further configuration is required from you and you can ignore the remainder of this User Manual.

Or

C: Order the User Configurable Version (UCV) and then you can configure it yourself using the Eco-Line Signal Converter User Manual (this manual).

You will **not** be able to configure certain versions as some hardware changes are required for some types.

User configuration can be done for the following ranges:

Inputs: 0-100 mV, 0-1 V, 0-10 V, 0-100 V, ±100 mV, ±1 V, ±10 V, ±100 V, 0 to 22 mA

Outputs: 0-100mV, 0-1V, 0-10V, ±10 V, 0 to 22 mA

The User Configurable Version provides a way to configure the device for non-standard inputs and outputs within any of the configuration ranges listed above.
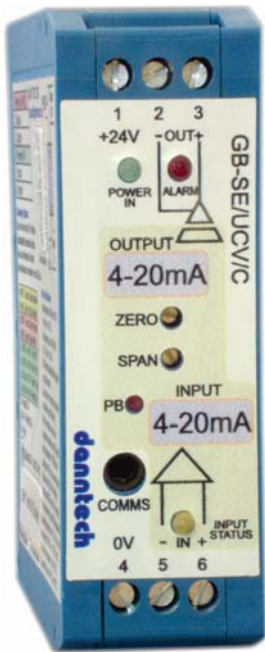
For example, you can set up the input to be say 200 mV to 800 mV with the output 20 to 4 mA (inversion).

For 200 mV input you want 20 mA output, and 800 mV input you need 4 mA output.

Input (mV)	Output (mA)
200	20.0
500	12.0
800	4.00

The Eco-Line Signal Converter provides a way of doing this without the need for you to have an expensive Process Calibrator to simulate the required input voltage.

All you will need is a basic, accurate, multi-meter and you can use the Eco-Line Signal Converter itself to generate the required input signal range (or you can use a process signal calibrator if you have one).

Please note that the product version you receive may not exactly match this picture as we plan to add a few more features early in 2013. These are: Alarm and Input Status LED operation and serial communications.

When you change the input or output ranges you must recalibrate the input and output as exact analogue values are slightly different internally for each range.

The DIP switches, Push Button Link and setup LEDs are accessed by removing the covering stickers.
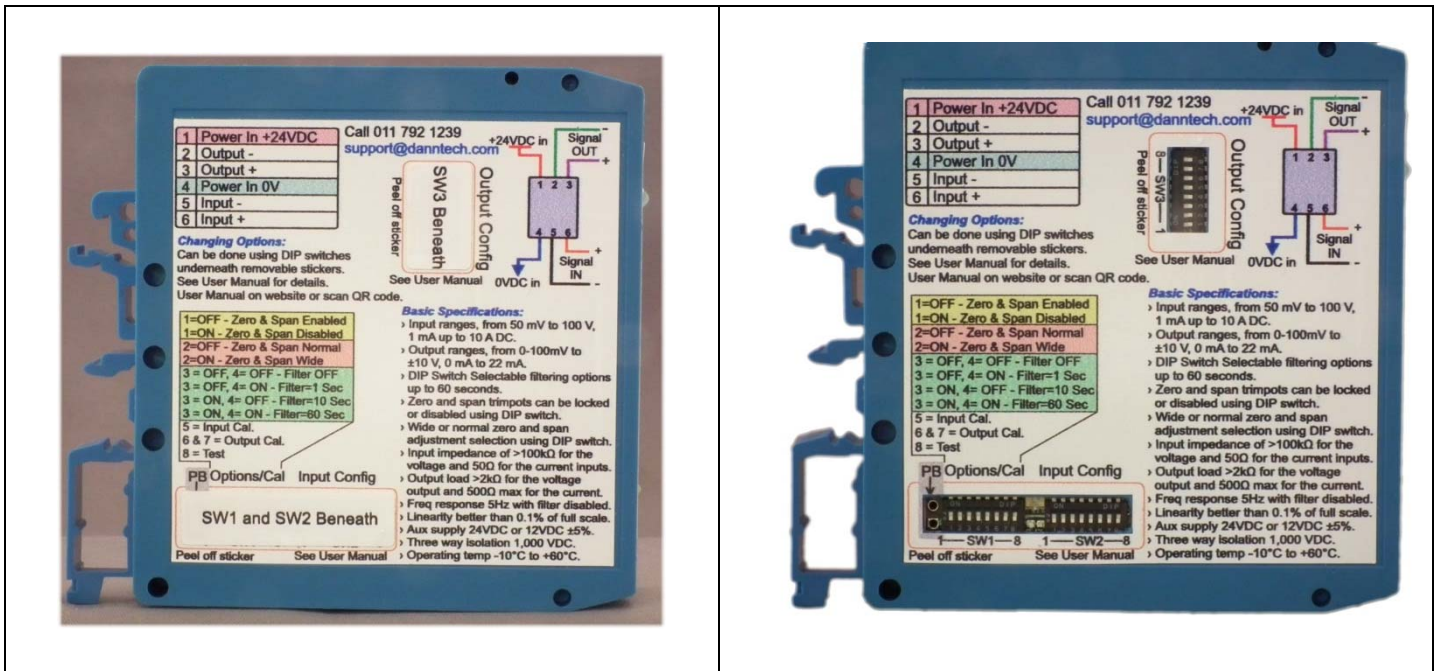
How it Works

A microcontroller forms the central part of the signal converter and after some basic signal conditioning the analogue signal is digitized. The Input Signal Conditioning is done in four stages and the various gain and offsets are applied to the input signal.

The design includes a programmable current source and voltage reference. These are not available for the user to access but will be used in our resistance input devices. An optional thermocouple amplifier and cold junction temperature sensor are also included for later use.

Galvanic isolation between input, output and power supply is provided using to high quality DC to DC converters with the requisite noise filtering.

DIP switch 1 (SW1) provides selection inputs to the microcontroller, DIP switch 2 (SW2) switches the various analogue circuit parts to provide the signal conditioning necessary for the various input options. DIP switch 3 (SW3) selects the various output circuit options.

We have also included an optional, isolated RS232/TTL interface which will be used in later versions for configuration purposes, data logging and is able to be used for CANBUS.
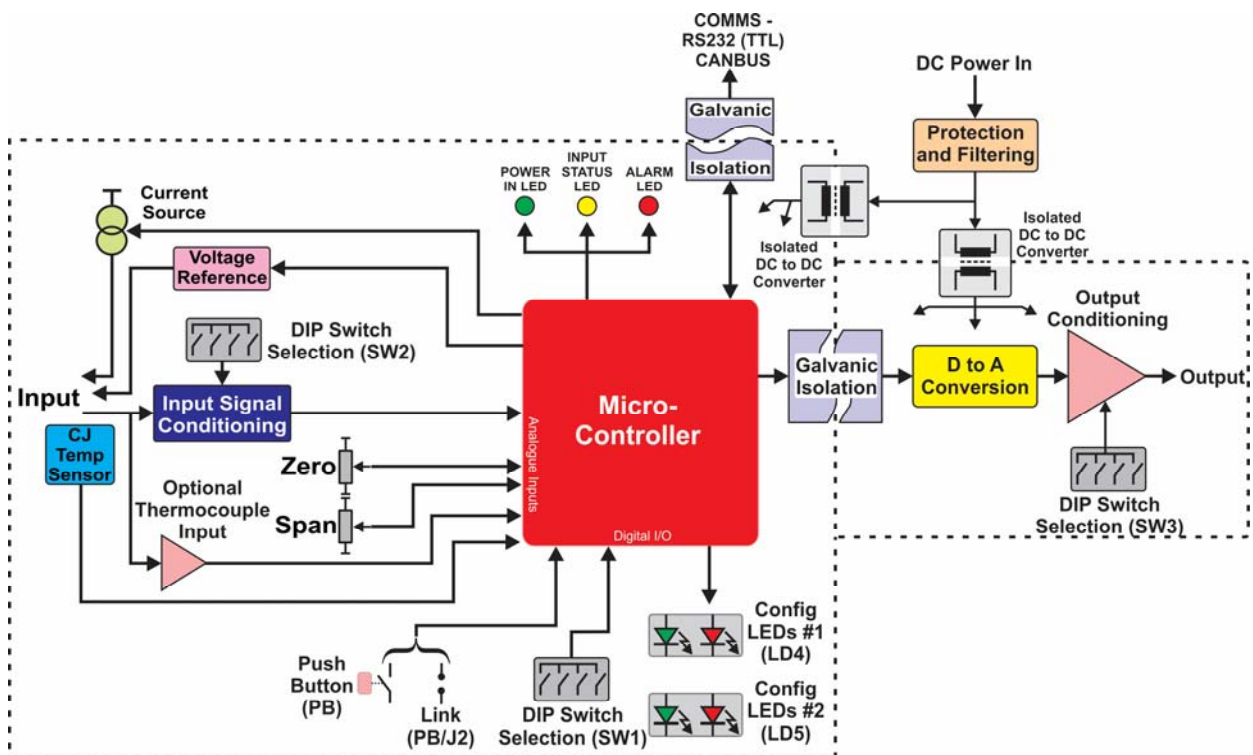
Quick Configuration Guide

If you change the input or output ranges from the settings as delivered (input: 4-20 mA, output: 4-20 mA) you must redo the setup for the changes made. So if you change the input, then only the input needs to be redone, not the output, likewise for the output. The exact internal analogue values are slightly different for each range.

Input (mA)	Output (V)
2.0	1.0
10.0	3.0
18.0	5.0

This step by step procedure will use, as an example, the setup for an Eco-Line Signal Converter with an input of 2.0 mA to 18.0 mA and output of 1.0 V to 5.0 V.

We will assume that you have a Process Calibrator to inject the desired input range although you could use the Eco-Line to generate the mA signal for you.

(In the case where you wish to use the Eco-Line to generate the input signal you will need to first of all set up the output to be 2.0 to 18 mA – follow the Output Setup procedure. Then you connect the output to the input and then set up the input using a multi-meter to check and adjust the input. Having done that you, then redo the setup for output to be what you require)

Normally the Eco-Line UCV version will be delivered with input and output set to be 4 to 20 mA.

Remove the DIP switch covering stickers (we do supply spare covering stickers with the unit).

Using the table in the *"Input Range Selection"* section use DIP Switch SW2 select the input range of 4-20 mA (this is how it is normally delivered) so switches 2, 3 and 8 must be ON all others OFF.

Use DIP Switch SW3 to select an output of 0 to 10 V. From the table in the *"Output Range Selection"* you will see that SW3 must have switches 2 and 6 ON and all others OFF. (The device is normally delivered set up for 4-20 mA output, which is SW3 only 1 and 6 are ON).

At this point you can decide if you wish to have:

- the Zero and Span trimpots enabled (use SW1 switch 1 to do this OFF=disabled, ON=enabled).

- the Zero and Span set for Normal or Wide range adjustment (use SW1 switch 2 to do this OFF=normal ±10%, ON=wide ±50%).

- The filtering you desire (using SW1 switches 3 and 4 – switch 4 ON and 3 OFF = 1 second, for other selections see the table).
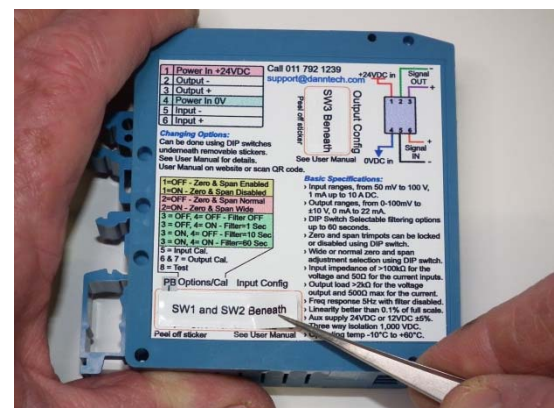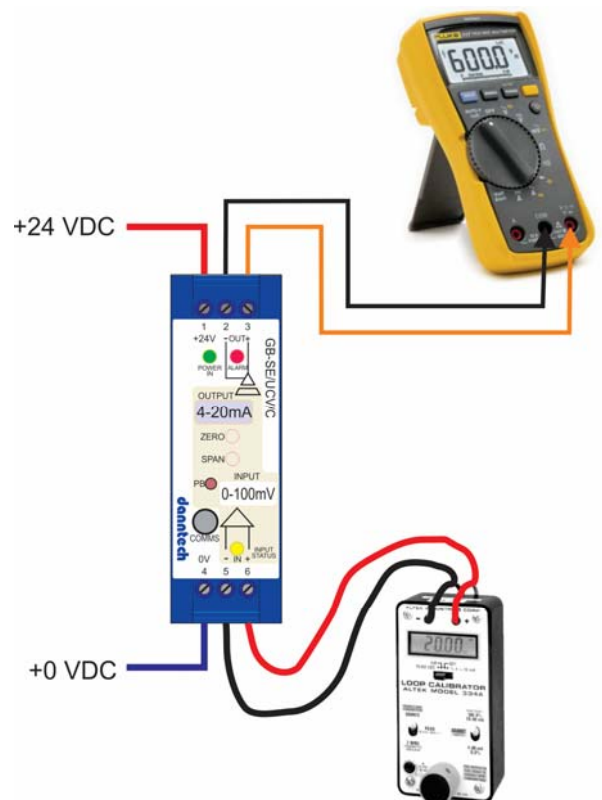
Now you can set up the input:

1. Now refer to the table in the section *"DIP SW1 Operational Settings on page 14"* to set up the input – switch SW1 switch 5 ON to select the Input Calibration mode (switches 6, 7 and 8 must be OFF).

2. Now using your Process Calibrator, inject the minimum input value (2 mA in this case). The state of SW3 does not matter at this point.

3. Now you need to press and hold in the Push Button (you can do this from the front panel or by closing the PB link next to DIP switch SW1). Hold in until the Push Button until the Red Configuration LED comes on.

4. The Green Configuration LED (as well as the Status LED) will come on for about 1 second to indicate that the minimum input value has been captured. Release the button as soon as the RED Configuration LED comes on.

   (During the minimum input calibration stage the unit will output a value set by the Zero trimpot which can be used for input calibration if required)

5. Now inject the maximum input value and again press and hold the Push Button as before to capture the maximum input value.

The internal processor has now recorded and saved these values to use forever.

Switch SW1 switch 5 off to complete the input calibration.

Now you can set up the output:

Here you have two choices of how to drive the output – you can use the input, with your Process Signal Calibrator (DIP SW1 switch 6=OFF) or the ZERO and SPAN trimpots (DIP SW1 switch 6=ON).

1. Now refer to the table in the section *"DIP SW1 Operational Settings on page 14"* to set up the output – switch SW1 switch 7 ON to select the Output Calibration mode (switch 5 and 8 must be OFF).

2. Set DIP SW1 switch 6 to choose your output control -

   OFF=uses the input;

   ON=uses the ZERO and SPAN trimpots, (ZERO for minimum output value, SPAN for maximum output value) – **this is recommended.**

3. Now using your Process Calibrator (or the ZERO trimpot) set the output to produce the minimum output value (1 V in this case).

4. Now you need to press and hold in the Push Button (you can do this from the front panel or by closing the PB link next to DIP switch SW1). Hold in the Push Button until the Red Configuration LED comes on.

5. The Green Configuration LED (as well as the Status LED) will come on for about 1 second

to indicate that the minimum output value has been captured. Release the button as soon as the RED Configuration LED comes on.

6. Now using your Process Calibrator (or the SPAN trimpot) set the output to produce the maximum output value (5 V in this case).

7. Again press and hold the Push Button as before to capture the maximum output value.

The internal processor has now recorded and saved these values to use forever.

Switch SW1 switch 7 (and switch 6 if used) off to complete the output calibration.

It is not necessary to setup both the Input and Output, you only need to setup those which have been changed, they operate independently from each other.

If you are using the Zero and Span trimpots (SW1 switch 1 is ON), you will need to inject the minimum and maximum inputs and adjust the Zero and Span trimpots to give the exact outputs you require. Do this once to set and a second time to check – for best accuracy.

DIP Switches Push Button (PB) and Push Button Link
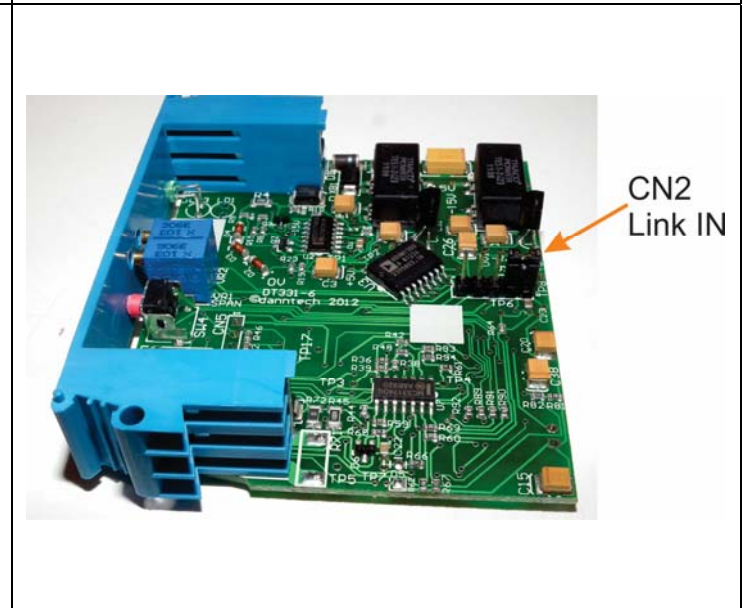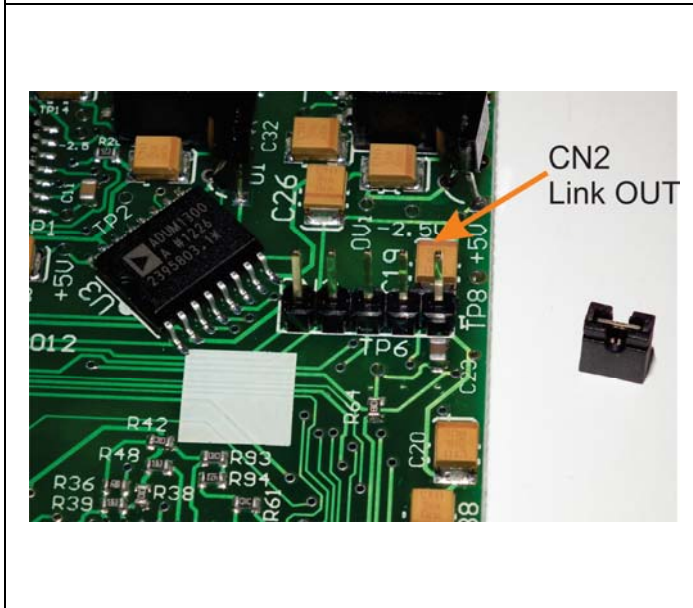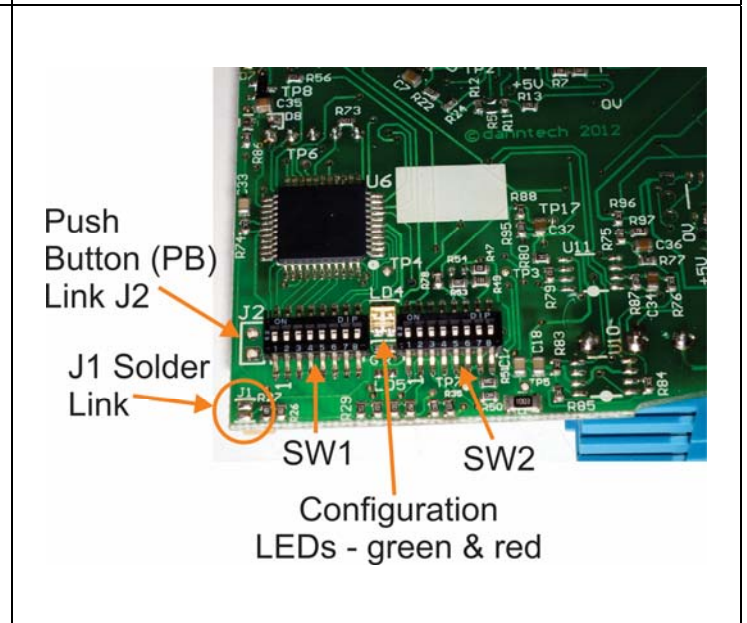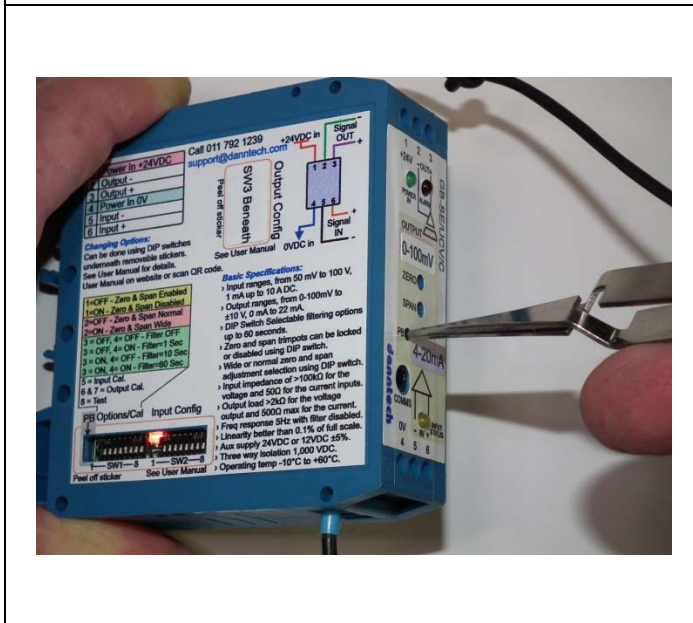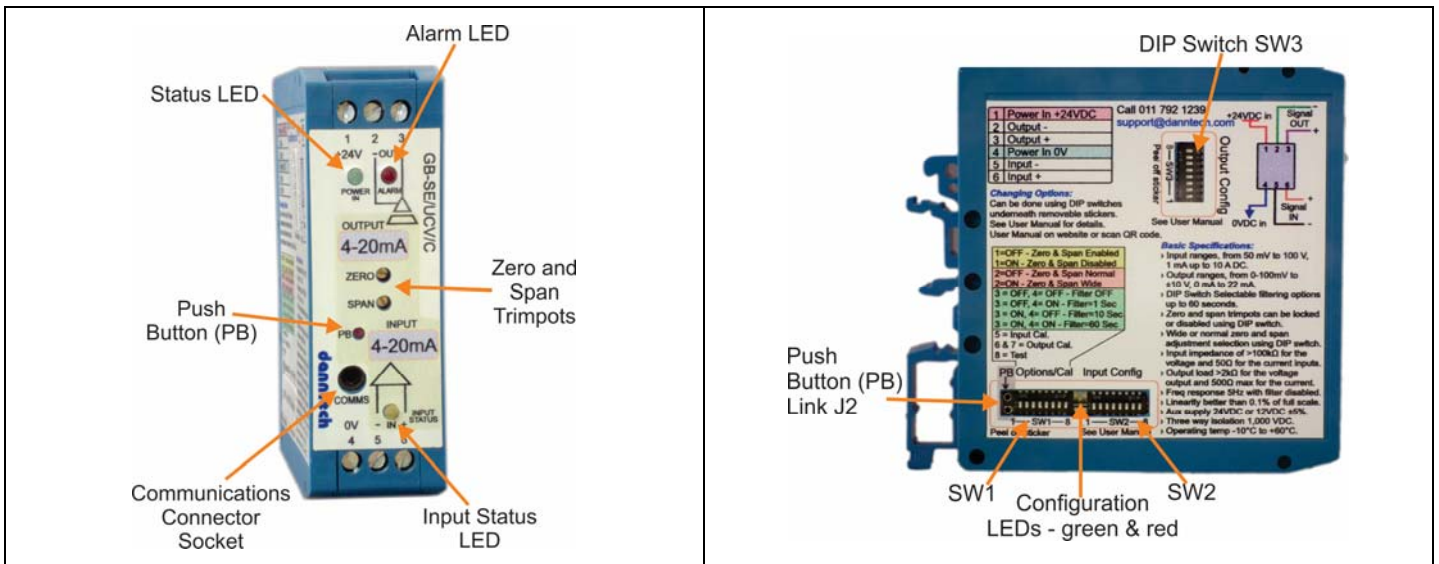
Input Range Selection

Setup using DIP Switch (SW2) and J1 –
(J1 is a solder link accessible only by opening the enclosure, you will need to open the enclosure, see on page 18 and solder a blob of solder on the pads to close this link):

DIP Switch SW2 #	1	2	3	4	5	6	7	8
Input								
4-20mA	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
0-20mA	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
0-100mV	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
0-1V	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
0-10V	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
0-30V (**J1 in**)	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
0-100V	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
±10V	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF

Input Setup:

This is done with the following steps – injecting minimum and maximum values:

1. SW1-5 is used to activate input calibration mode. SW1-6, 7 & 8 must all be off. The green LED will flash twice every 2 seconds.

2. Inject the minimum input you require.

3. Press and hold the Push Button (PB) for a few seconds until the red LED flashes and the green LED stays on for approximately two seconds. Release the Push Button as the red LED flashes, this latches the input value as the minimum input calibration value. The green LED will now flash as follows:

4. Inject the maximum value.

5. Press and hold the Push Button (PB) until the red LED flashes and the green LED stays on for approximately one second. Release the Push Button as the red LED flashes, this latches the input value as the maximum input calibration value. The green LED will now flash as follows:

6. Switch SW1-5 off to complete input calibration process.

While doing the input calibration information can be observed using the RS232 jack socket connection. This works at 9600, 8, N, 1 no flow control. Without the link installed between CN2 (programming header) pins 1 & 2 only the header line will be sent out (this is the way it is delivered). To see the internal values you must have this link installed.

Typically the info displayed will be:
Eco-line Signal Converter - (dt331) Copyright Danntech 2012 Firmware V200
Input Cal Mode. Use Button to capture Input Minimum and Input Maximum
Ain=2955 VR1=3727 VR2= 857 SW1= 24 Button=0 m=1.06 c=580.20 DACOut=3737

[Your unit may not have the COMMS jack socket fitted]

Output Range Selection

Setup using DIP Switch (SW3):

DIP Switch SW3 #	1	2	3	4	5	6	7	8
Output								
4-20mA	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
0-20mA	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
0-5V	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
0-10V	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
±10V	OFF	ON	ON	OFF	ON	OFF	ON	OFF

Output Setup

This is done by using either the Zero and Span trimpots, or by injecting a signal into the input to control the output and then latching the minimum and maximum output values desired. You can invert the output if you need this – making the maximum say =4mA and the minimum =20mA.

Use the following steps:

1. SW1-7 is used to activate output calibration mode. SW1-8 must be off. The green LED will flash twice every 2 seconds in the following way:

```
  ___       ___              ___     ___
 |   |     |   |            |   |   |   |
_|   |_____|   |_____|   |___|   |____
```

2. If SW1-6 is off then the input is used to activate the output. If SW1-6 is on then the Zero and Span trimpots are used to control the desired output **(this is the recommended option)**.

3. If SW1-6 is on (using the ZERO trimpot to set the output) adjust VR2 (Zero) until you get the output desired for the minimum output value.

   If SW1-6 is OFF (you have selected to use the input to control the output) vary the input to adjust the output you require for the minimum output value.

7. Press and hold the Push Button (PB) for a few seconds until the red LED flashes and the green LED stays on for approximately two seconds. Release the Push Button as the red LED flashes, this latches the output value as the minimum output calibration value. The green LED will now flash as follows:

```
  __    __    __    __    __    __
 |  |  |  |  |  |  |  |  |  |  |  |
_|  |__|  |__|  |__|  |__|  |__|  |__
```

4. If SW1-6 in on (you have selected to use the SPAN trimpot to control the output) adjust VR1 (Span) until you get the output desired for the maximum output value.

   If SW1-6 is off (you have selected to use the input to control the output) vary the input to adjust the output you require for the maximum output value.

5. Press and hold the Push Button (PB) for a few seconds until the red LED flashes and the green LED stays on for two seconds. Release the Push Button as the red LED flashes, this latches the output value as the maximum output calibration value. The green LED will now flash as follows:

```
  __                    __
 |  |                  |  |
_|  |_____|  |_____
```

6. Switch SW1-7 (and 6) off to complete the process.

While doing the input calibration information can be observed using the RS232 jack socket connection. This works at 9600, 8, N, 1 no flow control. Without the link installed between CN2 (programming header) pins 1 & 2 only the header line will be sent out. To see the internal values you must have this link installed.

Typically the info displayed will be:
Eco-line Signal Converter - (dt331) Copyright Danntech 2012 Firmware V200
Output Cal Mode. Use Button to capture Output Min and Max. <SW1-6 OFF=Ain, ON=POTs top=zero, bot=span>
Ain= 535 VR1=3727 VR2= 857 SW1=104 Button=0 m=1.07 c=285.11 DACOut= 857

[Your unit may not have the COMMS jack socket fitted]

Test Mode

There is a test function built in which is activated by switching ON SW1-8 with switches SW1-5, 6 & 7 OFF.

In Test mode the output can be switched with each press as follows:

> No press yet - following the input

1. the minimum possible output value
   (which would can be 0 mA for an output setup of 4–20 mA or -0.3 V for an output setup of 0–10 V)

2. the minimum setup output value – 0 %
   (which would be 4 mA for an output setup of 4–20 mA or 0 V for an output setup of 0–10 V)

3. the midrange setup output value - 50%
   (which would be 12 mA for an output setup of 4–20 mA or 5 V for an output setup of 0–10 V)

4. the maximum setup output value – 100%
   (which would be 20 mA for an output setup of 4–20 mA or 10 V for an output setup of 0–10 V)

5. maximum possible output value
   (which would be about 21.5 mA for an output setup of 4–20 mA or 10.4 V for an output setup of 0–10 V)

> Using the Push Button (PB) you can cycle through these outputs. The cycle is repeated as the button is pressed.

The LED will flash once every 2 seconds and the output will be as per normal, determined by the input without the Zero and Span adjustments. The green LED will flash as follows:

First press – output = zero

Second press – output = calibrated minimum

Third press – output = (calibrated maximum – calibrated minimum)/2 + calibrated minimum

Fourth press – output = calibrated maximum

Fifth press – output = maximum

Sixth press – output = normal and follows input without Zero and Span adjustments

While doing the input calibration information can be observed using the RS232 jack socket connection. This works at 9600, 8, N, 1 no flow control. Without the link installed between CN2 (programming header) pins 1 & 2 only the header line will be sent out. To see the internal values you must have this link installed (the unit is shipped with this link out).

Typically the info displayed will be:
Eco-line Signal Converter - (dt331) Copyright Danntech 2012 Firmware V200
Use Button to Cycle through outputs => 0, min, (max-min)/2, max 4095
Ain= 536 VR1=3727 VR2= 858 SW1=136 Button=0 m=1.07 c=285.11 DACOut= 859 Tm=1.00 Tc=0.00 Runtime= 122

[Your unit may not have the COMMS jack socket fitted]

DIP SW1 Operational Settings

SW1	Description	Default Setting
1	*Zero and Span Trimpot Enable* Enables the operation of the Zero and Span trimpots on the front panel. You can enable the trimpots, make your adjustments and then when you disable the trimpots, the values that you last adjusted are saved and used until the trimpots are enabled again. OFF = trimpots disabled ON = trimpots enabled	ON
2	*Zero and Span Normal/Wide Range Adjustment Select* Provides "normal" and "wide" trimpot adjustments for Zero and Span. OFF = Zero and Span adjustment are normal i.e. approx ±10% over full trimpot range. ON = Zero and Span adjustment are "wide" i.e. approx ±50% over trimpot range. Note that you may need to adjust zero and span several times to get the best accuracy.	OFF

SW1	Description			Default Setting
3	*Filtering Select* Selects the moving average filter step response time:			OFF
	SW1-3	**SW1-4**	**Filter Step Response Time (seconds)**	
	OFF	OFF	No filtering – step response approximately 0.1 sec	
4	OFF	ON	1 sec	ON
	ON	OFF	10 sec	
	ON	ON	60 sec	

SW1	Description	Default Setting
5	*Input Calibration* Calibrates the input circuit to take into account any component tolerances for the input range selected. Using calibrate button to indicate the required input is present at the input. You must follow the sequence and carry out all three steps in order. Uses three values to fit polynomial to input calibration for highest accuracy operation. Inject Minimum Input Value – press and hold button until green LED stops flashing and stays on, then release button. Inject Maximum Input Value – press and hold button until green LED stops flashing and stays on, then release button.	OFF
6	*Output Calibration Activation Source Select* OFF = Input is selected as the output activation source.	OFF

	ON = Zero and Span trimpots selected as the output activation source for minimum and maximum output values.	
7	*Output Calibration* Calibrates the output circuit to take into account any component tolerances for the input range selected and the output range required. Uses the calibrate button to indicate the required output is present at the output. You must follow the sequence and carry out both steps in order. The output can be set using the input (SW1-6 = OFF) or the values are set using the Zero and Span trimpots (SW1-6 = ON). Select output activation source Ain or trimpots. Set input or Zero trimpot for the minimum output required - press and hold button until green LED stops flashing and stays on, then release button. Set input or Span trimpot for the maximum output required - press and hold button until green LED stops flashing and stays on, then release button.	OFF

8	*Test*
	Built-in test function which is activated by switching on SW1-8 with switches SW1-5, SW1-6 & SW1-7 off.
	
	In Test mode the output can be switched in sequence from
	  1. following the input, to
	  2. minimum possible output value, to
	  3. a value for approximately 4mA output (if the output is set for current, otherwise approximately 2 volts),
	  4. then 12 mA (50% output),
	  5. then 20mA (100% output) and
	  6. then 22mA (maximum output value)
	  7. then back to following the input – step 1.
	
	Using the calibrate button you can cycle through these outputs. The cycle is repeated as the button is pressed.
		OFF

Power Up

All the LEDs flash twice on power up or when the unit resets for any reason.

On power up the following is sent to the RS232 port irrespective of the CN2 link.
Eco-line Signal Converter - (dt331) Copyright Danntech 2012 Firmware V200
Normal power up!

If the device has restarted due to a watchdog reset then instead of Normal power up! The following will be displayed instead:
Eco-line Signal Converter - (dt331) Copyright Danntech 2012 Firmware V200
Restarted processor because of watchdog timeout!

[Your unit may not have the COMMS jack socket fitted]

Application Examples

Typical Results

Product Test Report

Part Number:	GB-SE_UCV/VG-VG/9C	
Description:	Eco-Line Signal Converter	
Serial Number:	125914-A	

Supply: 24VDC   Isolation: yes
Tested By: MD   Date: 13-Nov-12

	Input		Output
Units:	V	Units:	V
Min:	-10.00	Min:	-10.00
Max:	10.00	Max:	10.00

Input V	Output V	Error % of Range
-10.500	-10.500	0.00%
-10.000	-10.005	-0.02%
-5.000	-5.009	-0.05%
0.000	0.010	0.05%
5.000	5.014	0.07%
10.000	10.002	0.01%
10.500	10.499	-0.01%

Load Resistance = 4.7kΩ

Other Eco-Line Versions

Resistance Inputs — 0-10V to Datalogger, +24 VDC, +0 VDC, Resistance Input
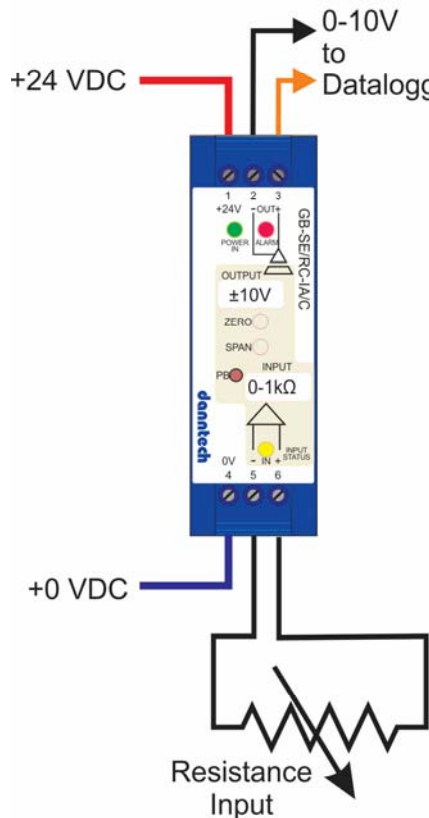
Thermocouple Inputs — 4-20 mA to PLC, +24 VDC, +0 VDC, Thermocouple Input

Pt100/Pt1000 Inputs — 4-20 mA to PLC, +24 VDC, +0 VDC, Platinum Resistance Temperature Sensor Pt100/Pt1000
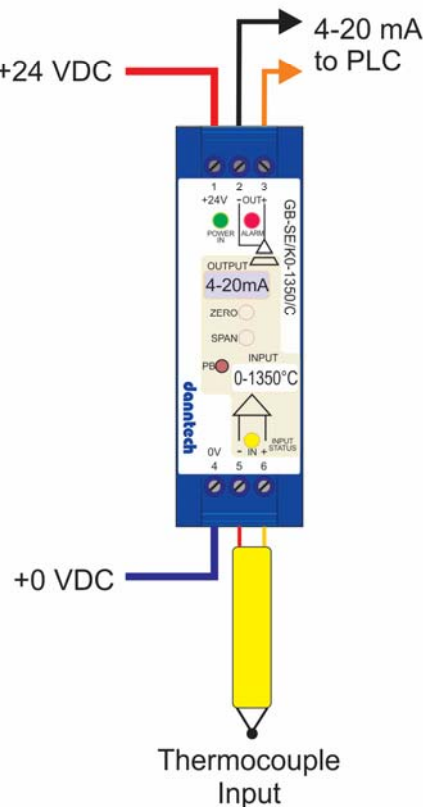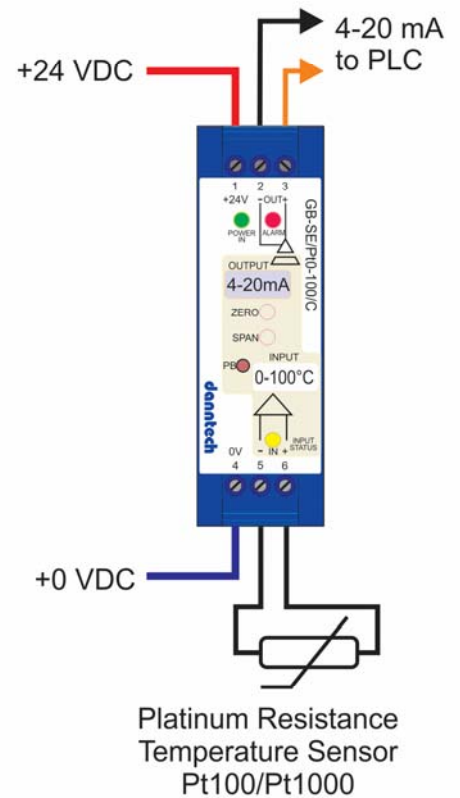
Using the Eco-Line Signal Converter as a Preset Signal Source

You can configure the desired output type and range for the signal that you require. Set the maximum and minimum as per setting the *Output Range Selection* section. Then you set the unit into *Test Mode* by switching ON SW1-8 with switches SW1-5, 6 & 7 OFF.

Now by pressing the Push Button repeatedly cycles through the five possible outputs:

At starting   0 (zero) output value
Press 1   Minimum Output Calibration value
Press 2   Halfway between Minimum and Maximum Output Calibration values
Press 3   Maximum Output Calibration value
Press 4   Full-scale possible output value
Press 5   back to starting

Serial Communications

As delivered the communications socket is left out and connection using RS232 TTL is available internally. This is not isolated from the input signal. We do have the facility to include an isolated RS232 TTL using the 4 way jack socket. This will be used in the future to provide a software configuration feature. We can also provide a configuration cable which provides connection from USB to our RS232 TTL.

Setting up without a Process Signal Calibrator

The unit is designed to be able to be setup without a Process Signal Calibrator for standard type inputs.
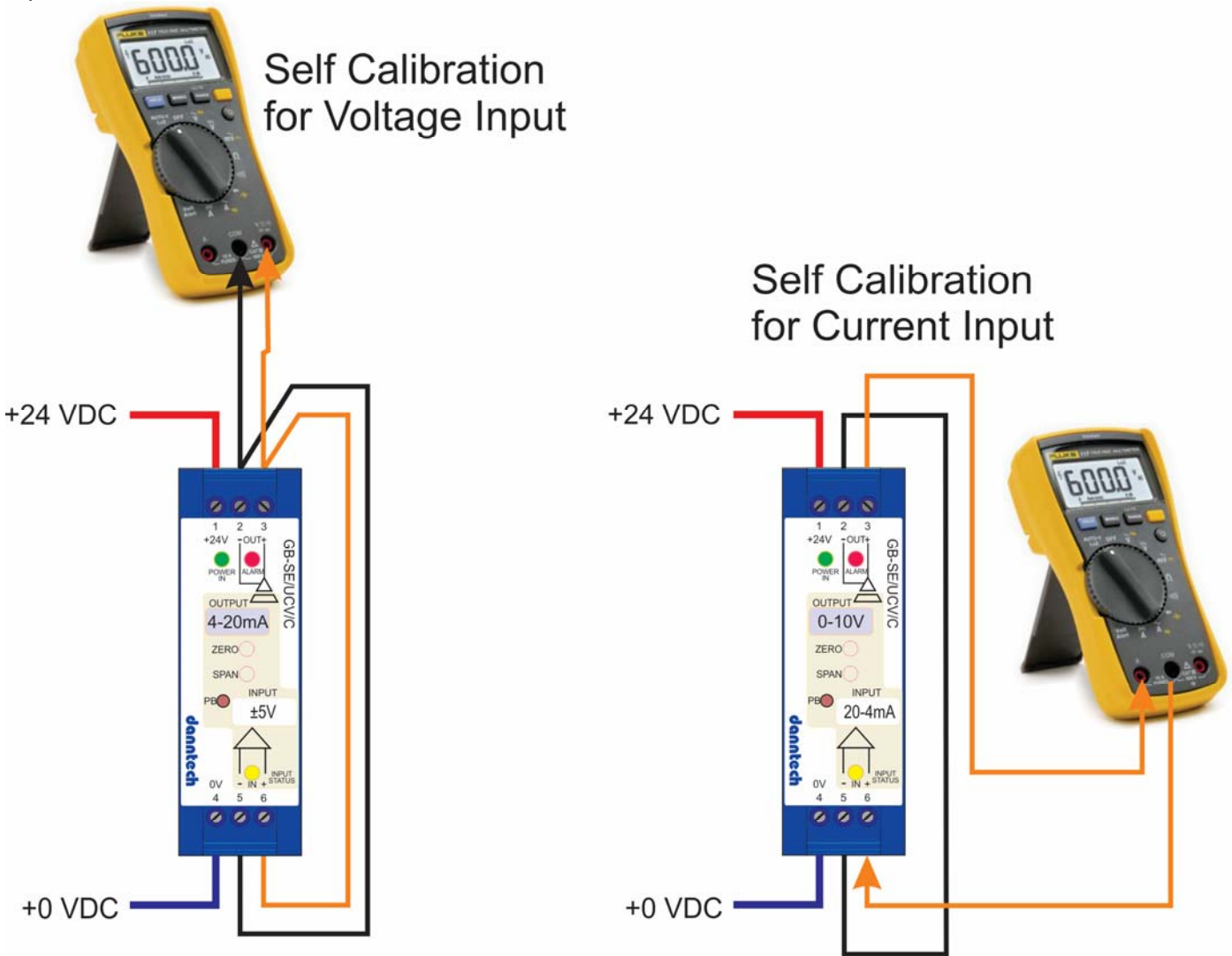
The basic process is as follows:

- Set up the output to be able to generate the type of input signal you require.
- Using a multi-meter adjust the trimpots to configure the output for the minimum and maximum values you require for your input.
- Now, connect up the output to the input including your multi-meter as shown in the diagram above for voltage or current input.
- Now calibrate the input and while calibrating the input the output will generate the values you setup previously for the input minimum and maximum values.
- When you have set up the input, you need to go back and configure the output to be what you required.
- This avoids the need for an expensive process signal calibrator for basic input types/ranges.

Opening the Enclosure

The only reasons to open the unit are to install the solder link J1 (if you need the 0-30 V input range) or to install the CN2 link to enable the COMMS output. Both of these are fairly unusual and most users will not need to open the unit.
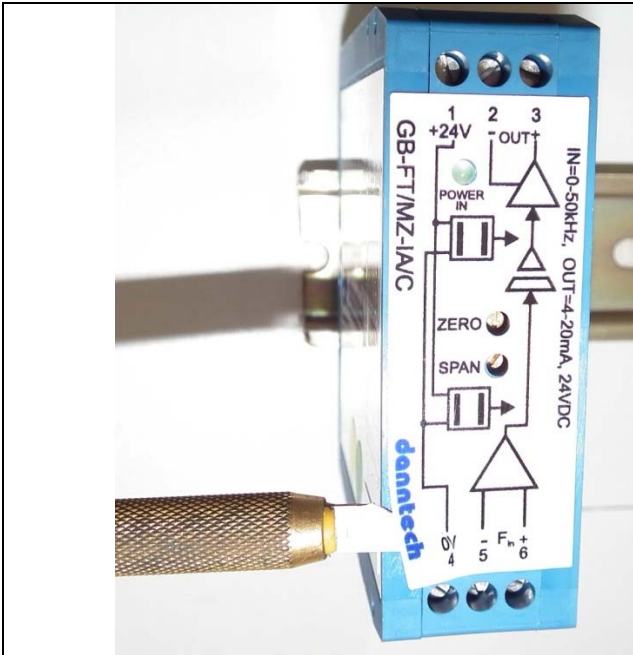
Use a moderately sharp blade (not too sharp) to gently lift up the left side of the front label. Be careful not to cut the label. Run the blade all along the left side to free up the left side of the front label.
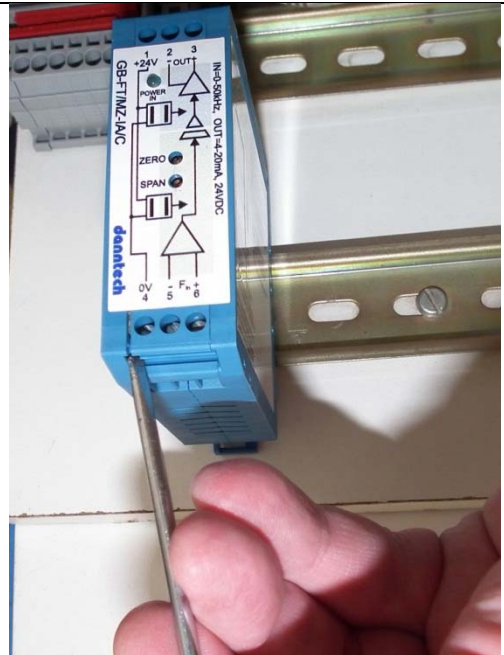
With a screwdriver you can get some leverage at the bottom of the enclosure between the parts as shown in the photo. Gently pry the left side cover apart from the front panel.
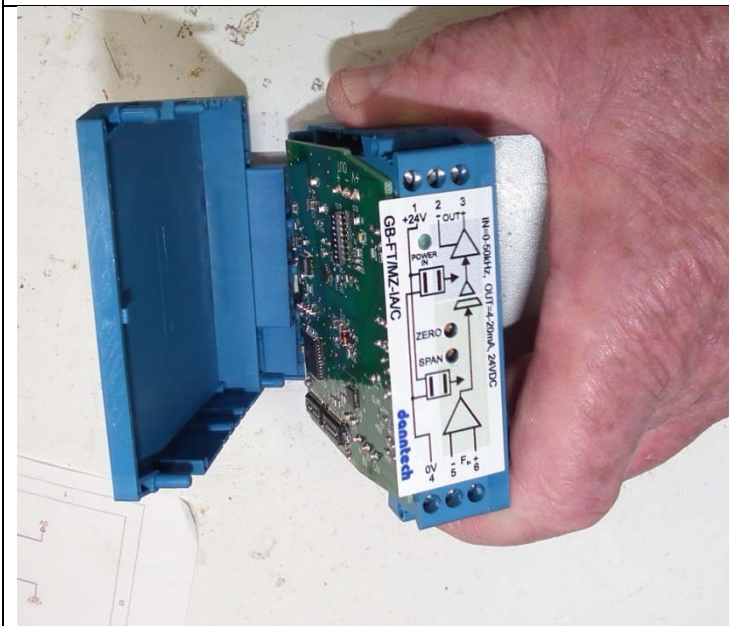
Using the screwdriver gently pry open the enclosure all around taking care not to damage the plastic parts

Some other interesting things about the Eco-Line Signal Converters

- This QR code is on the right side of the product and if you download a barcode reader app for your smartphone and scan in this code you will be taken to the latest version of this user manual on our website.

- If you squeeze the enclosure (front to back) you can press in the Push Button. So you can get away from using a sharp thin object to press in the switch.

- You can use the Eco-Line as a signal source to calibrate itself or use it to generate two output levels which you can switch between by pressing the push button (this by using the Input Calibration mode). You can also use the Test mode to generate five different outputs which can be switched in sequence using the push button. See the section *"Using the Eco-Line Signal Converter as a Preset Signal Source"*.

- If you order our USB configuration adaptor you can install the internal CN2 link and then get various information to a PC with a Terminal Emulation program (there are freeware versions around). At some point we will provide a way read from and write to multiple devices using RS232, RS485, USB or Ethernet.

- If you are setting several units it may be easiest to use our auxiliary Push Button switch which you can insert next to DIP switch SW1, this makes it a bit easier to work with the DIP switches while setting up. A small flat screw driver is also useful if you are using the zero and span trimpots.

Specifications

1. Standard inputs (DIP switch selectable): 4-20 mA, 0-20 mA, 0-100 mV, 0-1 V, 0-10 V, 0-100 V, ±1 V, ±10 V, (others possible).

2. Standard outputs (DIP switch selectable): 4-20 mA, 0-20 mA, 0-5 V, 0-10 V, ±10 V.

3. Isolation 1000 V AC RMS – three way isolation between input, output and auxiliary power supply.

4. Response time approximately 100 mS (with filter off).

5. Optional filtering, selection with DIP switches – 0.1, 1, 10 and 60 seconds step responses to eliminate noise if required.

6. Internal trimpot adjustment of output minimum and maximum which can be locked using DIP switch.

7. Power-On LED indication.

8. Microprocessor based – latest architecture.

9. Smart input and output calibration (re-ranging) using push button switch and LED.

10. Linearity better than 0.1% of full scale.

11. Auxiliary supplies 12 VDC or 24 VDC ±10% (must be specified with order).
    Auxiliary supply current: 12 VDC at 80mA + Iout, 24 VDC at 45mA + Iout.

12. Operating temperature -10°C to 70°C.

13. DIN rail mounting with flame proof high quality enclosure.

14. Screw terminal connections for wire diameter 2.5 mm^2.

15. Dimensions 25 x 80 x 85 mm (W x H x D).

Part Numbering

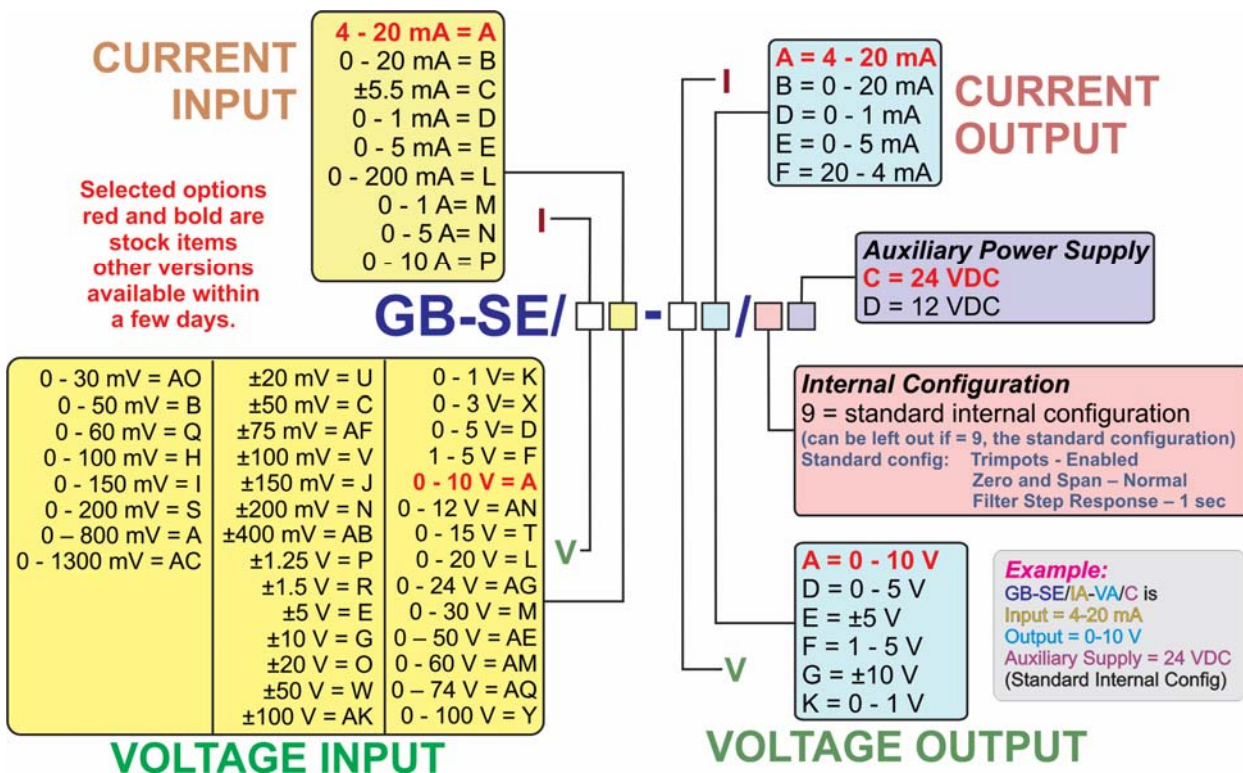***There are two main types (please call us if something is not clear !):***

GB-SE/kg-nt/ip   Eco-Line Signal Converter [input]/[output] [aux supply]

Basic preconfigured version. Has labels, etc. all preconfigured, **not** intended to be configured by the user (part number selected as indicated below).

AND

GB-SE/UCV/p   User Configurable Version, can specify 24 or 12 VDC auxiliary supply. Supplied at 4-20mA/4-20mA setup. Uses push button and DIP switches to select various options. User can change settings and has overstickers for various options and blanks for user to make up own ranges.

CURRENT INPUT

Selected options red and bold are stock items other versions available within a few days.

| 4 - 20 mA = A |
| 0 - 20 mA = B |
| ±5.5 mA = C |
| 0 - 1 mA = D |
| 0 - 5 mA = E |
| 0 - 200 mA = L |
| 0 - 1 A= M |
| 0 - 5 A= N |
| 0 - 10 A = P |

CURRENT OUTPUT

| A = 4 - 20 mA |
| B = 0 - 20 mA |
| D = 0 - 1 mA |
| E = 0 - 5 mA |
| F = 20 - 4 mA |

GB-SE/ □□ - □□ / □□

Auxiliary Power Supply
C = 24 VDC
D = 12 VDC

Internal Configuration
9 = standard internal configuration
(can be left out if = 9, the standard configuration)
Standard config: Trimpots - Enabled
Zero and Span – Normal
Filter Step Response – 1 sec

VOLTAGE INPUT

0 - 30 mV = AO	±20 mV = U	0 - 1 V= K
0 - 50 mV = B	±50 mV = C	0 - 3 V= X
0 - 60 mV = Q	±75 mV = AF	0 - 5 V= D
0 - 100 mV = H	±100 mV = V	1 - 5 V = F
0 - 150 mV = I	±150 mV = J	0 - 10 V = A
0 - 200 mV = S	±200 mV = AN	0 - 12 V = AN
0 - 800 mV = A	±400 mV = AB	0 - 15 V = T
0 - 1300 mV = AC	±1.25 V = P	0 - 20 V = L
	±1.5 V = R	0 - 24 V = AG
	±5 V = E	0 - 30 V = M
	±10 V = G	0 – 50 V = AE
	±20 V = O	0 - 60 V = AM
	±50 V = W	0 – 74 V = AQ
	±100 V = AK	0 - 100 V = Y

VOLTAGE OUTPUT

| A = 0 - 10 V |
| D = 0 - 5 V |
| E = ±5 V |
| F = 1 - 5 V |
| G = ±10 V |
| K = 0 - 1 V |

Example:
GB-SE/IA-VA/C is
Input = 4-20 mA
Output = 0-10 V
Auxiliary Supply = 24 VDC
(Standard Internal Config)

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