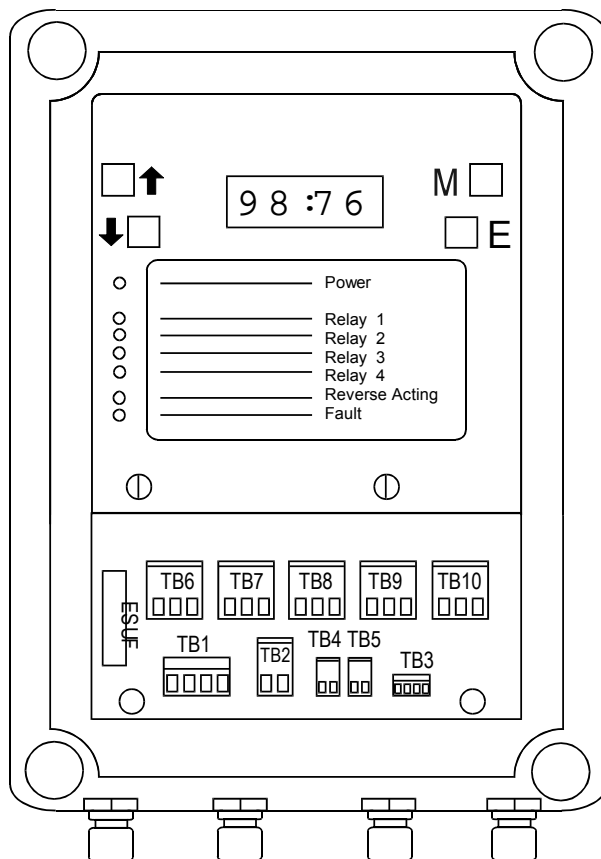


# FLEXILEVEL 2

## Level Indication & Control System

### Installation & Setting up Instruction



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- P1 Specifications
- P2 Installation
- P3 Setting-up - General
- P4 Setting Upper/Lower  
Setting up the Display
- P5 Setting Relays

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## **SPECIFICATIONS**

Display:	4 Digit 9mm LCD. Configuration between 0.1 and 9999. The decimal point can be positioned to suit.
Input:	Within the range 0-25mA (Min span 2mA) Input circuit fully isolated.
Input Impedance:	12-54ohms depending on range.
Zero Suppression:	A live zero can be anywhere within the range.
Accuracy:	Better than 1% for 4-20mA input.
Resolution:	0.1%
Input Supply:	110/230V 50Hz or nominal 24V DC.

## **OUTPUTS**

Sensor Supply:	24V Dc for loop powered transducer, fully isolated from the input and supply. Current limiting at 30mA.
Four Control Relays:	Each having fully adjustable hysteresis with programmable fail safe action.
One Failure Relay:	De-energises on loss of, or excess current in a loop powered system. De-energises on lost echo for the Hawker Sondaloop. All relays provide volt free changeover contacts rated at 240V AC 5 amps resistive.
L.E.D's:	4 Off for relay Energised. 1 Off for Supply On. 1 Off for Reverse Acting Signal. 1 Off Fault (Flashes on failure condition).
Re-transmission:	Programmable within 0-21mA. Max loop resistance 1000 ohms Voltage output 1-5V when set for 4-20mA. Min load 10K ohms. Output fully isolated from input & supply.
Enclosure:	Weather resistant to IP54. With a clear polycarbonate fascia 214mm H x 162mm W x 92mm D

**INSTALLATION**

The Hawker Flexilevel 2 is a wall mounted Process Indicator and Controller, which accepts a signal input between 0 to 25mA, it incorporates a 24V DC power supply to operate loop-powered transmitters such as Hawker Sondaloop. Five voltage free relays are provided, four of which are programmable with fully adjustable hysteresis for use as pump control or alarm. The fifth relay is a multi-purpose fault relay designed to de-energise with power failure and excess current (21mA). Power Supply for the Flexilevel is either 230/110VHz or 24V DC. Please check that you have the correct power before connecting.

To connect cables to the unit, remove only the lower fascia. **Do Not** remove the upper fascia

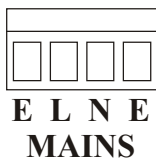
**CONNECTION DETAILS**

Connect the wires to the plug of the plug & socket connectors

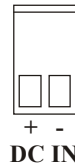
**1. Power Supply**

Either AC mains to TB1 or DC to TB2

**TB1 (Mains) Connection details**



**TB2 (DC) Connection details**

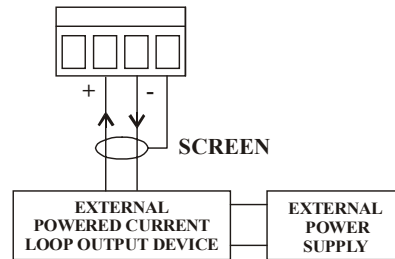
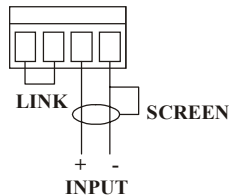
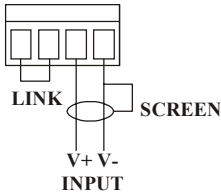


**2. Input Connection Details to TB3**

**FLEXICAP**

**LOOP POWERED DEVICE  
E.g. SONDALOOP**

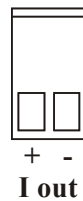
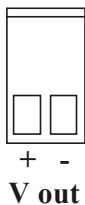
**EXTERNALLY POWERED  
DEVICE WITH CURRENT LOOP**



**3. Output Connections**

**VOLTAGE OUTPUT TB4**

**CURRENT OUTPUT TB5**



**4. Relay Connections to TB6 to TB9 Respectively**

The PCB indicates the common (C) normally open (N/O) and normally closed (N/C). The Fault Relay is connected to TB10. (This is normally energised so that the (C) terminal is connected to the (N/O) terminal).

## SETTING UP THE FLEXILEVEL 2

1. Switch on the unit and allow 10 minutes for it to stabilise.
2. The unit is normally set up at works according to the parameters given.
3. If however you want to change these, this is done by the keys and display in the upper part of the fascia.
4. You need to get into the menu system (see page 4) and there are five steps to complete the setting up.

They are:- set the upper and lower levels  
set the display in either % full scale or the desired units.  
set the relay points.  
set the re-transmission current or voltage  
set the forward or reverse acting function

**See Pages 4 & 5 for Menu System Programmable Flow Chart (PFC).**

### **1. The Upper and Lower Limits.**

These must mirror the settings of the input device e.g. Sondaloop, Pressure Transmitter, or Flexicap Capacitance probe. So for example, in the depth mode, the 4mA output has to correspond to the empty vessel, and the 20mA output to the full vessel. (And visa versa for the distance off mode). If it is impossible to attain a full vessel, measure the amount present with say a dip stick and enter this amount. This is the 'Degree of fullness' and under the perc position it can be extrapolated to full (see later under perc). Having set up these press ↑ to move the next display.

### **2. Setting the Display.**

This can be programmed to show any full-scale value from 0.100 to 9999 or between 0 & 100 % of full-scale value. This is set in two stages; firstly the position of the decimal point, then the actual number in chosen units, or the percentage of full scale (see the PFC page) note that the empty condition is always 0.

(a) Using the menu system select 'disp' and press E key. The display will show 'decP' (decimal point). Use the ↑ & ↓ keys to set the decimal point to the desired position and Press E to store it.

(b) The display will now show the current full-scale value. Set this to the required number, using the ↑ & ↓. Press E to save it.

Note that the unit operates on an internal resolution of 0.1% so for example a full scale of 2000 will result in the least significant figure changing in steps of 2.

### **3. Setting the Relay Set Points**

These are displayed as a % of full vessel. This is done to ensure they are independent of the displayed full-scale value. Relay on % off points may be set anywhere in the range of 0% to 100% but they must be more than 1% apart. Setting the **On** point **above** the **Off** point will result in the relay energising on a **rising** input. This is Fail to safe Low (**FSL**). Setting the **On** point **below** the **Off** point will result in the relay energising on a falling input. This is Fail to Safe High (**FSH**)

**The Fault Relay** (No5) is not user adjustable. It is normally energised, but will de-energise if the input current exceeds 103% of normal maximum or falls to half of the normal minimum. This will thus detect open or short circuit conditions, and drive to 21mA.

### **4. Setting the Re-transmission**

The voltage output is set for 1-5V to correspond to a 4-20mA output. This is not user adjustable. This output is not guaranteed linear below 0.5V. The current output may be set within the range 0-21mA e.g. 4-20mA, 0-10mA etc.

**Selecting a reverse acting** output i.e. greater the depth, the less the current output. (see page 5).

# THE MENU SYSTEM PROGRAMMABLE FLOW CHART

Note that in the following:     the key ↑ key moves the programme to the next item.  
                                           the key ↓ key returns the programme to the last item  
                                           the M ↑ ↓ key returns to current mode without change  
                                           the M key exits the menu and returns to normal mode

## 1. UPPER & LOWER LIMITS.

Operation	Display Reads	Notes
Press M		Colon in display stops flashing
Press ↑↓↑↓	---- ILo	Dashes appear after each arrow stroke
Press E	Input which is applied	
Press E	Done ILo	The input value is stored
Press ↑	Iho	Represents high level input
Press E	Input which is applied	
Press E	done IHi	This value is stored
Press ↑	Perc	Will automatically extrapolate stored Ihi value to give full value
Press E	Number between 1 & 100	This operation is to allow setting up when only a partially full vessel is available. Take the vessel's depth as a % using say a calibrated dip stick = X
Press ↑		To increase the number
Press ↓		To decrease the number
	X	Number reached corresponding to dip stick
Press E	Done Perc	The number is stored
Press E	Fsd	

## 2. Setting up the display for Depth or Distance in Engineering Units

This operation is in two parts. First the position of the decimal point; then scaling the display in either engineering units or % of full scale.

### The decimal point setting x.xx or xx.xx or xxx.x or xxxx

Operation	Display Reads	Notes
	Fsd	
Press E	deCP	
Press ↑		To move decimal point to left
Press ↓		To move decimal point right
Press E	Position of decimal point	Store it and move to next sub-menu

**Note:** When no point is displayed, it will appear at the opposite end of the display with the next press of the key. The display now shows a number between 100 & 9999 with the decimal point in the chosen position e.g. 0.100 to 9999. Now set the display in your chosen units e.g. Litres, by setting the upper or maximum limit.

### Setting up the Display Unit

Operation	Display Reads	Notes
	Number	
Press ↑		To increase this number
Press ↓		To decrease this number
	Units selected between 0.1 to 9999	
Press E		Stores number which = Full value of vessel's contents

To set the percentage of contents for 0 to 100, chose 0 to 100 in 4<sup>th</sup> item above  
 Press ↑ to go to Relay Set Points rL

## 3. Setting the Relay Points

The minimum hysteresis between On & Off points is 1%. If attempts are made to set up less than this the display will read **Err** and then return to On.

Operation	Display Reads	Notes
	RL1	Relay No 1
Press E	On	Indicating Relay No 1 point is to be set
Press E	Number between 0 & 100	The On point of the relay as % of full vessel
Press ↑		To increase the number
Press ↓		To decrease the number
Press E	Off	To store selected number
		The Off point is now to be set
Press E	Number between 0 & 100	Off point of relay as % of full vessel
Press ↑		To increase the number
Press ↓		To decrease the number
Press E	Done rL1	Stores chosen number

Press ↑ to go to Relay No 2 rL2

Set Up Relays 2,3, & 4 exactly as rL1.

After setting all these Relays Press ↑ to move to the next item.

### To set Re-transmission Output 4mA

Connect a multimeter to TB5 and set it to the milliamp range. The voltage is set to 1-5V at works corresponding to 4-20mA, is not user variable, and is not guaranteed linear below 0.5V. The current may be set within the range 0-21mA e.g. 4-20mA or 0-10mA etc. you can adjust the mA output to any point in the range, but you must select the lower value at the 4mA point and the higher value at 20mA point.

Operation	Display Reads	Notes
	4mA	
Press E	Number + current reading multimeter	
Press ↑ or ↓		To increase or decrease this value
Press E	Value of current	
Press E	Done 4mA	
Press ↑	20mA	To move to next item 20mA
Press E	Number + current reading on multimeter	
Press ↑ or ↓		To increase or decrease this number
Press E	Number selected	This is stored
Press E	Done 20mA	
Press ↑	rEv	To move to next Menu item rEv

### Transmission Output – Forward or Reversed

The unit can be made reverse acting –i.e. the greater the depth or contents, the less the current output.

Operation	Display Reads	Notes
	rEv	Reverse acting
Press E	For	Forward acting
Press ↑	rEv	Reverse acting LED will illuminate
Press ↓	For	Forward acting LED extinguishes
Press E	Done rEv or For	Mode selected is stored

**THIS COMPLETES THE SETTING UP PROCESS.  
PRESS M TO RETURN TO RUN.**