

ESI- USB-PLUS USER MANUAL Issue 01, Oct 2023

#### 1. Summary

- 1.1. General Specification
- 1.2. Electrical connections
- 1.3. ESI-USB software

#### 2. General Specification

The ESI USB-PLUS interface adapter is designed to extend the functionality of the existing 'ESI-USB' Windows based data logging software, originally supporting ESI GS/GD4200-USB and RS485 pressure transmitters.

ESI-USB-Plus interface allows customer to use the software with a wide range of analogue transmitters - with current or voltage output, and to measure temperature with a separate PT100 temperature sensor.

USB-Plus specification:	
USB 2.0, 3.x compatible, connects	s to USB type A port on computer
Integrates with ESI-USB software	version 2.7.12.0 onwards
Compatible with Windows 8, Wind	dows 10, and Windows 11
Analogue input types	4-20mA or 0-10V differential
Sampling rate	Up to 1000 Hz
Accuracy (NLHR)	± 0.15% of span BFSL <sup>(1)</sup>
Temperature input type	PT100 class B, RTD 3-wire or 4-wire connection
Temperature sampling rate	Minimum interval 0.2 seconds
Temperature accuracy	Class B (IEC 60751): • -20.00°C ±0.45°C • 0.00°C ±0.35°C • 100.00°C ±0.85°C • 200.00°C ±1.35°C
Electrical protection	Reverse polarity and over-voltage protection
USB software	Allows using engineering units (V, mA) alongside with pressure and temperature

Note 1: Performance specifications, including accuracy, are applicable to the USB interface alone and not the external sensors or power supply.





3 x PG7 Cable Glands for cable diameters 3.5mm to 6mm





#### Dimensions in mm





#### Inputs:

1 general analogue input channel, single ended analogue input 4-20mA or single ended / differential 0-10Vdc.

1 temperature input channel, PT100 class B (IEC 60751) 3-wire or 4-wire.

Mating to USB mini-B socket on ESI-USB Plus. Supplied with 2m lead to connect to USB A port on computer.

USB adapter box is powered via the USB.

External power supply is used for powering the transmitter.

# Power supply voltage must not exceed maximum transmitter supply voltage or **32VDC**, whichever is lower!



### 3. Electrical connections

- 1. 4-20mA 2 wire configuration
  - a. Switch transmitter type selector J1 into "4-20mA" position,
  - b. Connect 24V external power supply to terminal J2,
  - c. Connect transmitter to terminal J3 "Supply+" and "Supply-".
  - d. Connect USB cable to a PC.



- 2. 0-10V 3-wire
  - a. Switch transmitter type selector J1 into "0-10V" position,
  - b. Connect 24V external power supply to terminal J2,
  - c. Connect transmitter to terminal J3:
    - i. Positive supply input to "Supply+",
    - ii. Negative supply input to "Supply-",
    - iii. Transmitter positive output to "Output+",
    - iv. Join terminals "Output-" and "Supply-".







#### 3. 0-10V 4-wire

- a. Switch transmitter type selector J1 into "0-10V" position,
- b. Connect 24V external power supply to terminal J2,
- c. Connect transmitter to terminal J3:
  - i. Positive supply input to "Supply+",
  - ii. Negative supply input to "Supply-",
  - iii. Transmitter positive output to "Output+",
  - iv. Transmitter negative output to "Output-",





#### 4. Platinum thermometer Pt100 3-wire

- a. Install a "3-wire" link on J4,
- b. Connect Pt100 to terminal J11:
  - i. Positive excitation wire to "IN+",
  - ii. Negative excitation wire to "IN-",
  - iii. Positive side of PT100 to "SENSE+",



- 5. Platinum thermometer Pt100 4-wire
  - a. Remove a "3-wire" link from J4,
  - b. Connect Pt100 to terminal J11:
    - i. Positive excitation wire to "IN+",
    - ii. Negative excitation wire to "IN-",
    - iii. Positive side of PT100 to "SENSE+",
    - iv. Negative side of PT100 to "SENSE-",





#### 4. ESU-USB Software

### 4.1. Starting the software

- Connect equipment according to Section 3, switch the power supply On.
- Start ESI-USB.exe
- The program starts with checking the available software updates and scanning PC USB and virtual USB ports looking for connected transmitters and USB boxes.
- When a connected USB box is found, temperature, main value and units may be displayed incorrectly, as the software has not been configured for this sensor yet.





4.2 USB Box configuration

ESI+USB										-
Find Scan Manag	ge Alarm	Filter	Export	Edit Marke	Generat	e Settings	Un	lock Module	s Check	Help
Sensor	Set	ttings	Excel		Reporting			Access	Update	He
Interface Roy										
										0
Serial Number									^	-
Manufacture Date										Mo
Calibration Date			0/2023 09:14							1.0
Temperature Offset			-246.4295							
Temperature Linear										1
Temperature Quadr	ratic									Gr
Two Wire Offset										
Two Wire Gain										
Two Wire Non-Line	arity		.940365E-16							
Three Wire Offset										Calib
Three Wire Gain										Com
Three Wire Non-Lin	nearity									
Four Wire Offset			0.004403727						~	
		Calibra	ation Folder				Configu	re		
Write Read		C:\Users\Public\Documents\ESI\ESI-USB			Tempera	ture Recalibr	ation	File M		
							Tempera	nure necalibri	auon	
Open	Save						Primary	Recalibration		
open	Save						Generat	e Certificate		

• Click Configure to open Configuration dialog.

Configure Device		
Sensor Type	Three Wire (0-10 V) 👻	
Primary Input Use input Pressure input		٦
Parameter Name	Flow	
Units	SCFM	
Format	#.###	
0 V =	0 🗘	SCFM
10 V =	100	SCFM
Temperature Inp ✓ Use input	ut	
Offset	0 🗘	] °C
Gain	1 🗘	
	ОК	Cancel

Filename: ESI-USB\_PLUS User Manual.docx



- Select Sensor type (4-20mA or 3/4wire 0-10V), check Use input to use Primary Input, enter Parameter Name and Units, select Format,
- Enter lower and upper parameter values, corresponding to 0 and full scale (10V in this case) input,
- Configure Temperature input if necessary. At this stage Offset = 0, Gain = 1.
- Click OK to save configuration.
- 4.3 Taking Measurements.

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Click
 Click
 to return

to return to the main screen,

- Enter required main parameter recording interval (Flow in this case, recorded every 100mS)
- Enter Temperature interval (here 0.5sec)
  - Click Start v to start recording.

€ ESI-USB				- 🗆 X
Find Scan Manage Sensor	Alarm Filter Export Settings Excel	Add Marker Generate Settings Reporting	Lock Modules Check Access Update	Relp About
High	<b>46.3</b> ℃	39	9.975 SCFM	Monitor Graph
All Sensors	Temperature Units C	v		Calibration
► Start 💌	Flow Interval 0.1	00 🗘 s 🕜 Details		1
∎ Pause ▼	Temperature Interval 0.5	00 0 s		File Manager
Stop -				
Zero Sensor				
Running 00:00:35				



- 68 1 Ð Ō Ê X e Add Ma Check () Help 0 9 2 1 2 1234567 0543566 √ MMM Show Temperature ⊳ 40.016 Show Alarm Levels 1234567 High II Pause Show Pauses C Low 52.1 °C Time Axis Format Aut Excel -Stop Running 00:01:17
- To view graph of the process being recorded, click

- Click Stop to stop recording.
- On closing the software will ask whether you want to save recorded files.