USB Series

Model: UPS-GP

USB Pressure Sensor

Description:

The UPS-GP is based on our popular TPTd i2c pressure transmitter which we have integrated directly with a USB interface to provide a direct and simple interconnection to the USB port of your PC, Raspberry Pi, Arduino or any device with a USB input. The supplied PC Graphical User Interface allows a clear display of pressure with a real time graph, logging capability and a simple to use command set to communicate to the UPS-GP for bespoke applications.

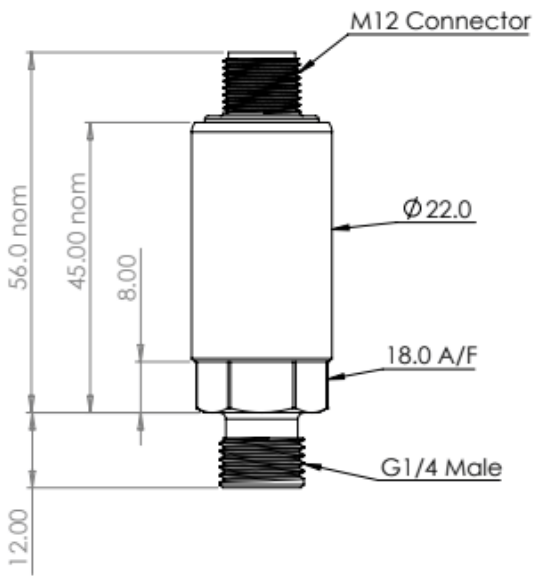
The onboard 16-bit microprocessor enables a high level of linearisation, temperature compensation and calibration to be performed on the sensor in the factory ensuring great accuracy, stability and repeatability are met.

Product Highlights:	**Applications include, but not limited to:**
• Pressure ranges from 0.5 up to 600 bar • Accuracy <±0.25% / <±0.10% • Digital USB interface • Choice of mechanical connections • Cost effective for Industrial and OEM Solutions • Graphical User interface • API for system integration	• OEM installations • Automation Systems • Hydraulic pressure measurement • Pneumatic pressure measurement • Education and laboratory testing

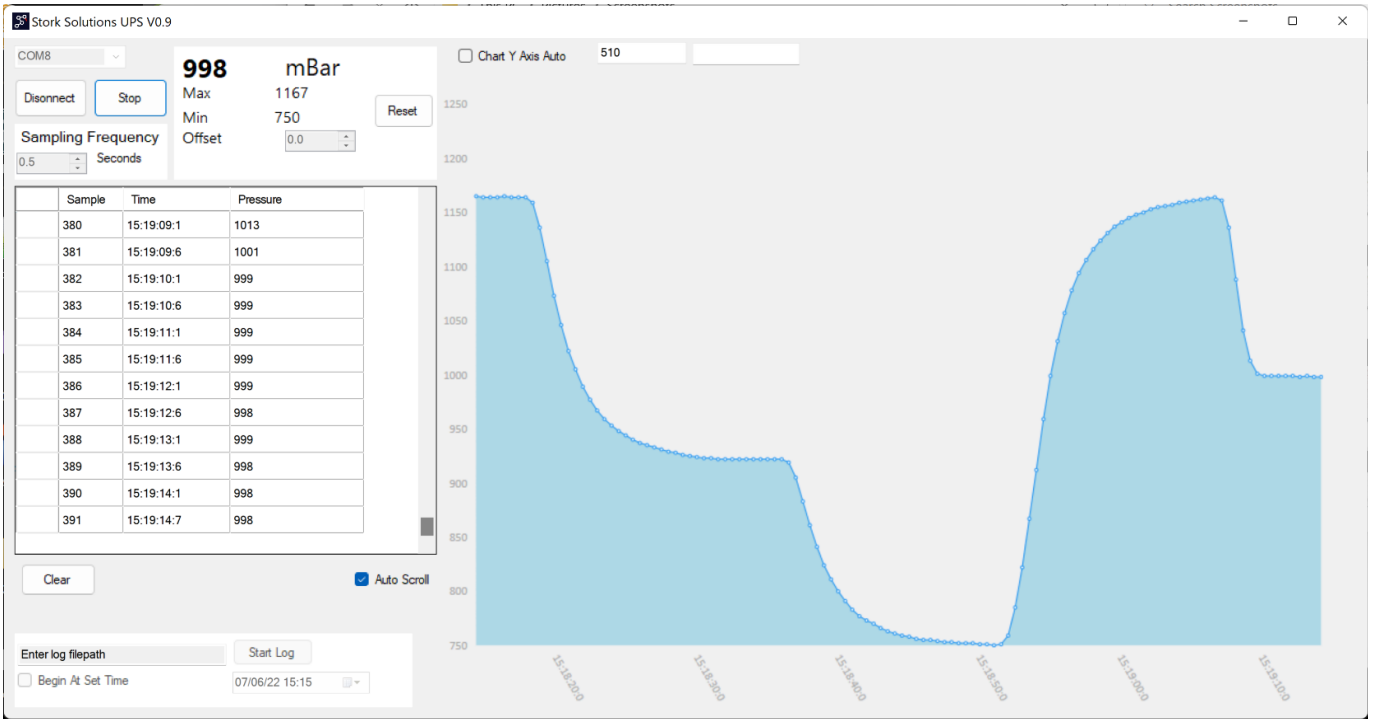
Specification:

UPS-GP - USB pressure sensor	
Sensor technology	Piezo-resistive
Output Versions	USB (Universal Serial Bus)
Supply voltage	USB supplied 5V
Pressure reference	Gauge (standard), Sealed Gauge, Absolute
Pressure ranges	0.5, 1, 2, 5, 10, 20, 50, 100, 200, 400, 600 Bar
Safe over range	1.5 times rated level
Burst rating	3 times rated level
Accuracy (NL&H)	≤ ±0.5 % / ≤ ±0.25 % (dependant on range)
Long Term Stability:	≤ ±0.10 % FS
Response time	<100ms
Ambient temperature	-20 °C to +75 °C
Media temperature	-40 °C to +125 °C
Storage temperature	-20 °C to +80 °C
Media wetted parts	316 Stainless Steel, Al_2O_3, Viton or EPDM or NBR
Permissible media	All fluids compatible with media wetted parts
Cable sheath material	PVC, PUR
Pressure connection	G¼" DIN 3852 male or ¼" NPT male, Others available
Environmental Protection	IP67

Dimensional Drawings



Graphical User Interface



UPS-GP Command Set:

Command Ascii	*Start*	*Data*	*# Data Bytes*	*Description*
RX101	U	0xXX	1	Unit of pressure, U = Unit
RX102	ZC	0xXX 0xXX 0xXX	3	Value at Zero Pressure
RX103	ZF	0xXX 0xXX 0xXX	3	Value at Full Range Pressure
RX104	ZP	0xXX 0xXX	2	Zero Pressure Range
RX105	FP	0xXX 0xXX	2	Full Pressure Range
RX201	0xAA 0x55	0xXX 0xXX 0xXX	3	Poll Pressure Output Value Turn Stream OFF
RX202	0xAA 0x55	0xXX 0xXX 0xXX	3	Stream Pressure Output Value
RX301	FW	ASCII string	20	FW and HW Version of UPS Device
RX501		OK		NO Averaging
RX502		OK		Average 4 Values
RX503		OK		Average 8 Values
RX601		OK		Stream Delay ON
RX602		OK		Stream Delay OFF

Command Summary + Pressure Calculation

Communication specification
115200 Baud
8 Data bits
1 Stop Bytes
Parity None

RX101 -U
Returns the numeric value corresponding to the pressure units

Number	Pressure Units
0x01	mBar
0x02	Bar
0x03	PSI

Command: RX101
Return: 0x55 0x01

RX102-ZC
Returns calibrated output at the zero pressure point.
If zero pressure is 0 Bar this is the calibrated output at 0 Bar
Command : RX102
Return : 0x5A 0x43 0x19 0x89 0x96
0x198996 = 1673622

RX103 - FC
Returns calibrated output value at the full pressure point.
If full pressure is 1250 this is the calibrated output at 1250
Command : RX103
Return : 0x46 0x43 0xE6 0xAA 0x27
0xE6AA27 = 15116839

RX104-ZP
Returns pressure value at the zero pressure point.
If zero pressure is 750 the value will be 750
Command : RX104
Return : 0x5A 0x50 0x02 0xEE
0x02EE = 750

RX105-FP
Returns pressure value at the full pressure point.
If full pressure is 1250 the value will be 1250
Command : RX105
Return : 0x5A 0x50 0x04 0xE2
0x04E2 = 1250

RX201-RTP
Turns pressure value stream OFF , use this command to request the Pressure.
Command : RX201
Return : 0xAA 0x55 0x62 0x3C 0x52
0x623C52 =6437970

RX202-RTP
Turns pressure value stream ON, use this command for the realtime pressure value to stream automatically.
Command : RX202
Return : 0xAA 0x55 0x62 0x3C 0x52
0x623C52 = 6437970

RX301
Request Firmware and Hardware version
Command: RX301
Return : FW-PSvX.X\r\nHW-vX.XXX\r\n

RX501
No Averaging of the raw output of the realtime pressure value.
Command : RX501
Return OK

RX502
Average the raw output of the realtime pressure value by 4
Command : RX502
Return OK

RX503
Average the raw output of the realtime pressure value by 8
Command : RX503
Return OK

RX601
When stream Turned on , turn ON delay.
Command :RX601
Return OK

RX601
When stream Turned on , turn OFF delay.
Command :RX601
Return OK

How To calculate pressure
Using the values used in the examples above , the pressure is calculates as follows

$((((FP - ZP)/(FC - ZC)) * RTP) + ZP)$
Using values in command example above
$(1250 - 750)$/(15116839-1673622)

$(500/13443217)$*6437970 = 239.45 to 5 S.F.
$239.45 + 750 = 989.450$
The pressure is 989.450
The units are 1 = mBAr therefore,
989.450mBar