nanoDAQ-LTS

Digital Pressure Scanner

- **16 and 32 channel Intelligent pressure scanner module with engineering unit output.**
- **User selectable absolute or differential measurement**
- **Up to 0.03% FS accuracy output.**
- **Complete with IEEE 1588 PTPv2 time stamping**
- **Thermally compensated from -20 to 100ºC**
- **Output over Ethernet (100Mbit TCP / UDP) and CAN.**
- **Rugged enclosure for on-vehicle applications. Sealed to IP67**
- **Fully configurable over Ethernet with embedded web server.**

The nanoDAQ-LTS is a new development by Chell Instruments utilizing the latest technology in digital transducers.

The nanoDAQ-LTS is now available in 16 and 32 channel forms in a ultra-miniature slim-line package.

The nanoDAQ-LTS is a fully configurable smart pressure scanner that will output pressure data in engineering units over Ethernet and CAN. The data output over all interfaces is identical to the nanoDaq-LTS's sister products; the nanoDaq and the MicroDAQ3.

The nanoDAQ-LTS makes use of 17 or 33 absolute transducers which are thermally compensated and conditioned to provide 16 or 32 either absolute or differential measurements relative to one reference port.

The user can select a number of operating parameters using the embedded web server. These include; absolute or differential, TCP and UDP setup, data averaging and units, CAN setup and time stamp configuration.

The nanoDAQ-LTS features a hardware implementation of the IEEE 1588 PTPv2 time stamping protocol which allows the pressure data to be time stamped to a resolution of 1µSecond.

The nanoDAQ-LTS also features a hardware trigger allowing the pressure acquisition to be synchronised to an external TTL pulse.

The nanoDAQ-LTS is contained within a miniature package which is sealed to IP67 enabling it to be used in harsh environments. It is also available with alternative packaging to suit particular applications - please contact Chell for more details.

The transducers within the nanoDAQ-LTS have a very high proof pressure (50 psig or 90 psig depending on range) which reduces the chances of in-field transducer damage.

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General	
Differential ranges available	1, 2.5, 5, 7, 10,17, 35, 55, 103, 207 and 310 kPa
Number of channels	16 / 32
Maximum Acquisition Speed (measurements / channel / second)	200
Data Output	
Output formats	CAN and Ethernet (TCP/IP & UDP), IENA
Ethernet Specification	100Mbit TCP/IP or UDP (user configurable)
CAN Specification (DC Powered version only)	2.0B
Performance	
System Accuracy	See table below
Absolute Ranges	160 kPa and 400 kPa
Calibrated absolute pressure range (differential range ≤ 8 psid)	14 kPa to 160 kPa (2.0 psia to 23.2 psia)
Calibrated absolute pressure range (differential range > 8 psid)	14 kPa to 400 kPa (2.0 psia to 58 psia)
Line pressure limitation	None - as long as all measured pressures are within absolute pressures above
Proof Pressure (all ranges)	Ranges ≤ 8 psid :50 psig (64.5 psia), Ranges >8 psid:90 psig (105 psia)
Ouput Resolution	16 bit or ±range / 65536
System Resolution	24 bit
Mechanical	
16 Channel	59.4 x 27 x 9 excluding tubulations
32 Channel	59.5 x 33.5 x 11.2 excluding tubulations
Weight (16 Channel / 32 Channel)	24g / 36g
Enclosure Sealing	IP67
Measurement ports	1.0 mm (0.04”) bulged tubulations
Power Supply	
Input supply	8-25 VDC
Power consumption	1VA Max)
Electrical Connector	Female 9-way micro-miniature ‘D’ type (suggested mate : Glenair MWDM2L-9PS - solder cup version)
Environment	
Operating Temperature Range	-40 to +100°C
Compensated Temperature Range	20 to +100°C (optional -20 to +100°C)
Storage Temperature Range	-40 to +100°C
Ambient Pressure	100 mbar abs (52,000 ft) to 2.5 bar abs
Vibration	Engine standard vibration test to DO160E category S, curve W with duration of 1 hr/axis. Fan blade (20 g 2 kHz)
Shock	Fan blade out to DO160F section 7 (40g 11 m/s)
Maximum relative humidity	95% at 50°C (non-condensing)
Timing / Data Synchronisation	
Time Stamping	IEEE 1588 PTPv2
Time Stamping Resolution	1µs
Hardware Trigger	5 V TTL pulse, maximum 400 Hz, minimum 2 Hz

nanoDAQ-LTS Performance

* Measurement uncertainty includes all non-linearity, repeatability and thermal gain errors over the compensated temperature range. Differential range assumes a reference pressure of 1 bar.

Differential Range (+/-)		Output Resolution (Pa)	Standard Deviation (Pa)	Measurement Uncertainty* Pa	%FS
1 kPa	4” water	0.03	5	20	2%
2.5 kPa	10” water	0.08	5	20	0.8%
5 kPa	20” water	0.15	5	20	0.4%
7 kPa	1 psi	0.21	5	20	0.3%
10 kPa	1.5 psi	0.31	5	20	0.2%
17 kPa	2.5 psi	0.52	5	20	0.1%
35 kPa	5 psi	1	7	20	0.06%
55 kPa	8 psi	1.7	7	20	0.04%
-83 kPa to 103 kPa	-12 to 15 psi	3.15	15	50	0.05%
-83 kPa to 207 kPa	-12 to 30 psi	6.3	18	70	0.03%
-83 kPa to 300 kPa	-12 to 43 psi	9.5	20	100	0.03%

Absolute Range		Output Resolution (Pa)	Standard Deviation (Pa)	Measurement Uncertainty* ±Pa	%FS
15 to 115 kPa	2.2 psia to 16.8 psia	1.5	1.13	50	0.04%
Extended range (for scanners calibrated at 55 kPa)					
13.0 to 160 kPa	1.885 psia to 23.2 psia	2.24	1.6	60	0.04%
Absolute range for 15 psid scanners					
15 to 206 kPa	2.2 psia to 29.9 psia	2.9	3.5	50	0.02%
Absolute range for 30 and 45 psid scanners					
15 to 400 kPa	2.2 psia to 58.01 psia	6.1	6	90	0.02%

Absolute range can be user defined within the above limits.
Lowest absolute calibrated pressure is 14 kPa as standard (please contact us for lower pressures)
Lowest measurable absolute pressure for ranges up to 160kPa is 11kPa.
Lowest measurable absolute pressure for 206 and 400 kPa range ranges is 0.5kPa.
Data collected in accuracy mode with an average of 16
%FS values refer to the percentage of the maximum absolute values as listed.

Absolute Transducers - More information and better performance

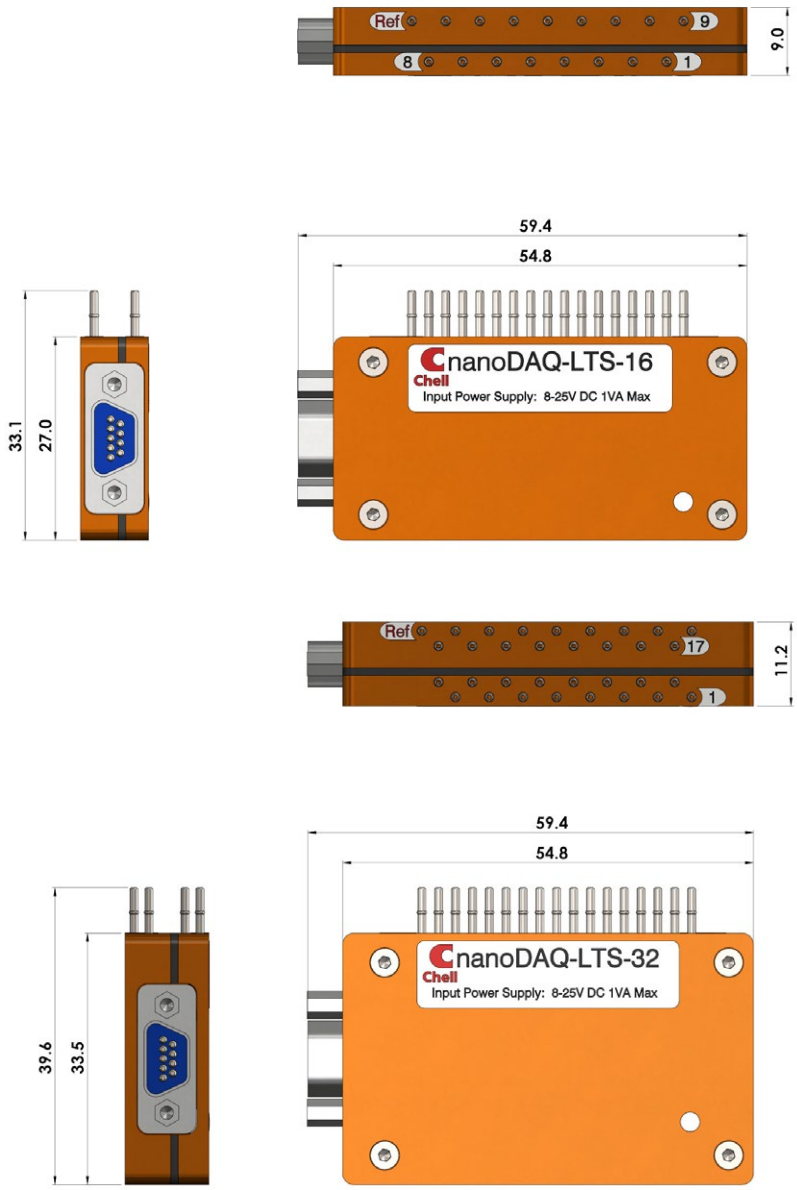
The nanoDAQ-LTS is available with two ranges of absolute sensors; 160kPa and 400 kPa absolute which are used for both the measurement and reference ports. The nanoDAQ-LTSs are calibrated over their full absolute range (see above) and the absolute output can be configured to suit the use case to optimise the resolution of the 16-bit output.

For differential outputs, the reference port is subtracted from the measurement ports to provide a differential output. The nanoDAQ-LTS’s are purchased pre-configured for a particular differential range to maximise the resolution of the 16-bit output. Line pressures can be accommodated as long as the range of pressures measured falls within the absolute range of the sensors.

The use of absolute transducers in the nanoDAQ-LTS leads to several advantages:

- The ability for the user to switch between differential and absolute measurements.
- The ability to output differential measurements ***and*** the absolute value of the reference removing the need for external barometric transducers.
- The option to output absolute values for all channels and thereby removing the need for a reference all together.
- The lack of an internal reference cavity (and therefore volume) means the scanner responds much faster to changes in reference pressure (for example, changes in altitude) improving data quality.

Dimensions



Part Number:

16LTS -AABB - 16 channel
32LTS -AABB - 32 channel

AA = Range
01 = 1 kPa (4” water)
02 = 2.5 kPa (10” water)
03 = 5 kPa (20” water)
04 = 7 kPa (1 psi)
05 = 10 kPa (1.5 psi)
06 = 17 kPa (2.5 psi)
07 = 35 kPa (5 psi)
08 = 55 kPa (8 psi)
09 = 103 kPa (15 psi)
10 = 207 kPa (30 psi)
11 = 310 kPa (45 psi)

BB = Calibrated Temperature Range
01 = 0 to 90°C
02 = -20 to 90°C