



nanoDAQ-LTR

Digital Pressure Scanner

- **16 and 32 channel Intelligent pressure scanner module with engineering unit output.**
- **User selectable absolute or differential measurement**
- **Up to 0.02% FS accuracy output.**
- **Complete with IEEE 1588 PTPv2 time stamping**
- **Thermally compensated from -20 to 90°C**
- **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-LTR is a new development by Chell Instruments utilizing the latest technology in digital transducers.

The nanoDAQ-LTR is now available in 16 and 32 channel forms in a ultra-miniature slim-line package. It features a Souriau 8STA0-06-9PN connector making it very suitable for motor sport and other on-vehicle applications.

The nanoDAQ-LTR 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-LTR's sister products; the nanoDAQ and the MicroDAQ3.

The nanoDAQ-LTR makes use of 17 or 35 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-LTR 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-LTR also features a hardware trigger allowing the pressure acquisition to be synchronised to an external TTL pulse.

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

General

| | |
|---|---|
| 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 | |
| 15 to 115 kPa (2.2 to 16.8 psia) for differential ranges \leq 35 kPa (5psi) | 0.04% FS |
| 13 to 160 kPa (1.885 to 23.2 psia) for differential ranges = 55 kPa (8psi) | 0.04% FS |
| 15 to 206 kPa (2.2 to 29.9 psia) for differential ranges = 103 kPa (15psi) | 0.02% FS |
| 0 to 400 kPa (2.2 to 58.01 psia) for differential ranges \geq 207 kPa (30psi) | 0.02% FS |
| Reference pressure range (differential range \leq 8 psid) | 13 kPa to 160 kPa (1.89 psia to 23.2 psia) |
| Reference pressure range (differential range $>$ 8 psid) | 13 kPa to 400 kPa (1.89 psia to 58 psia) |
| Line pressure effect | Negligible |
| Proof Pressure (all ranges) | Ranges \leq 8 psid :50 psig (64.5 psia), Ranges $>$ 8 psid:90 psig (105 psia) |
| Output Resolution | 16 bit or \pm range / 65536 |
| System Resolution | 24 bit |

Mechanical

| | |
|----------------------------------|--|
| 16 Channel | 74 x 27 x 15.2mm excluding tubulations |
| 32 Channel | 74 x 33.5 x 16.3mm excluding tubulations |
| Weight (16 Channel / 32 Channel) | 36g / 42g |
| 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 | Souriau 8STA0-06-9PN |

Environment

| | |
|-------------------------------|---|
| Operating Temperature Range | -20 to +90°C |
| Compensated Temperature Range | 20 to +90°C (optional -20 to +90°C) |
| Storage Temperature Range | -20 to +90°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 | 1 μ s |
| Hardware Trigger | 5 V TTL pulse, maximum 400 Hz, minimum 2 Hz |

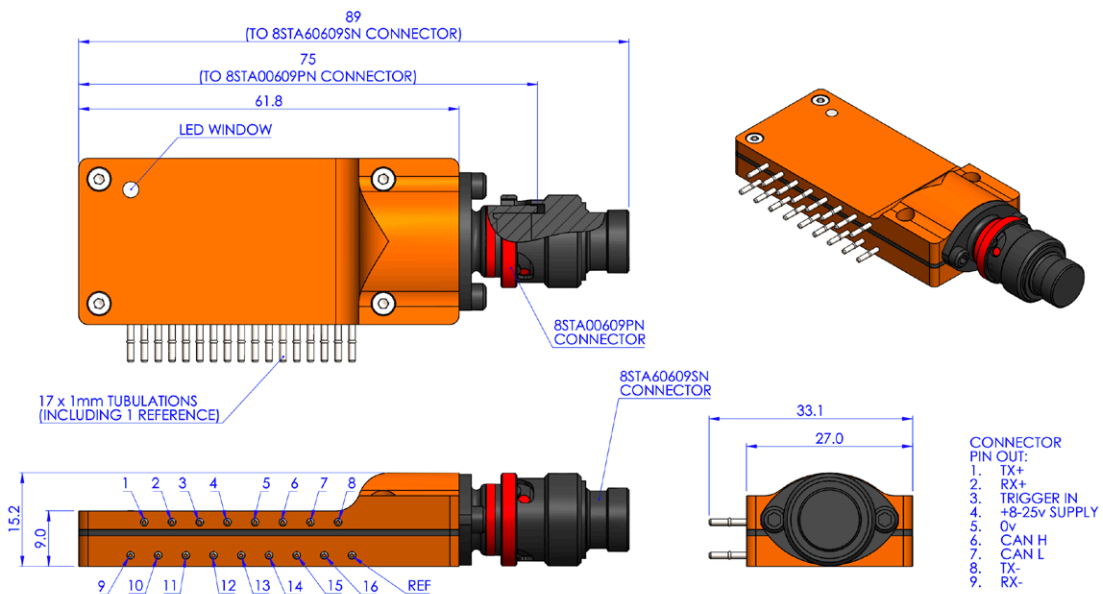
nanoDAQ-LTR Performance

* 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% |

Dimensions

16-Channel



32-Channel

