



FlightDaq2

Flight Pressure Acquisition System

- **Intelligent heated pressure scanner module with engineering unit output.**
- **Selectable absolute or differential output**
- **With IEEE 1588 PTP V2 as standard.**
- **Up to 2KHz per channel measurement frequency.**
- **Output over Ethernet (100Mbit TCP / UDP), CAN and IENA.**
- **Heated enclosure for applications down to -55° C**
- **Fully configurable over Ethernet with embedded web server.**
- **Purge / rezero control fully incorporated.**
- **Tested to D0160F.**



The Chell FlightDaq 2 is a development of our previous FlightDaq model. The FlightDaq2 is smaller than its predecessor and has more features including absolute/differential measurement, IENA protocol, smart power supply and low power consumption heaters.

Internally, the MicroDaq build on the proven MicroDAQ / MicroCAT architecture to provide up to 2KHz per channel data acquisition. This is combined with the pneumatics necessary to shift the shuttle valve within the scanner to give full control of the scanner functions including re-zero and purge. There is also an optional internal purge valve to control the flow of purge gas if necessary.

The enclosure features an inner machined case which is heated and insulated from the external case. This, combined with a micro-processor controlled heater array gives a highly stable operating temperature and low overall power consumption..

The FlightDaq uses the TE DTC scanner which provides full thermal compensation from 0 to 80°C combined with an accuracy of 0.05% of full scale (after re-zero). The output of the scanner is differential which, combined with the internal shuttle valve control, enables any zero offset to be removed.

This differential measurement is combined with a precision barometric sensor to enable the user to select between differential or absolute outputs.

The FlightDaq features a smart sensing power supply that will shut down the unit if the supply rails moves outside its operating band. When the power rail returns to normal, the FlightDaq will restart and resume operation.

External connectors are the TE QDCM range (other options are available) which feature high reliability coupled with an extremely small space envelope. The supply gas and purge connectors are via Swagelok or Chell AS series quick disconnects.

The flightDaq is designed for on-engine as well as airframe applications and as such is tested to the D0160G vibration and shock standards.

The FlightDaq will output high speed engineering unit data over Ethernet (TCP/IP or UDP), CAN or IENA.

For ease of setup, the FlightDaq is fully configurable using an embedded web-server .

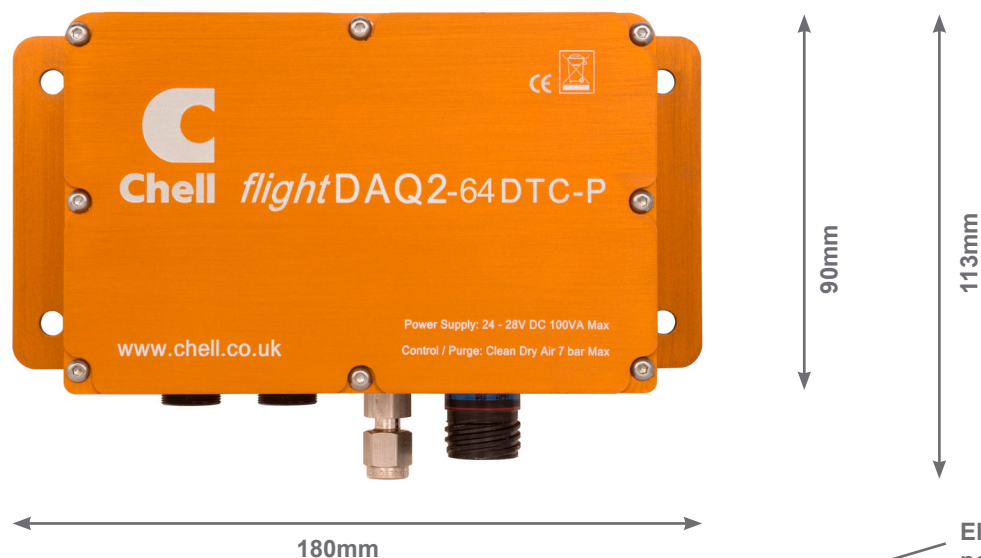
FlightDaq2 Specifications		
	FlightDaq2-32	FlightDaq2- 64
High speed data output.	Serial, CAN and Ethernet (TCP/IP and UDP) and IENA	
Range (differential)	±1Kpa to ±1Mpa (± 4"water to ±150 psi)	
Range (absolute)	105Kpa to 1.1Mpa	
Barometric Range (Pressure)	14Kpa to 137Kpa Absolute	
Barometric Range (Altitude)	Nominally 0 to 45,000 feet	
System accuracy - differential (range ≥ 35Kpa)	±0.05% FS	See table below for combined absolute measurement accuracy
System accuracy - differential (range :2.5Kpa ≤ range ≤ 35Kpa)	±0.1% FS	
System accuracy - differential (range < 2.5Kpa)	±0.15% FS	
System resolution - differential	16 bit	
System resolution - barometric	18 bit	
Dimensions (width x depth x height in mm excluding connectors)	180 x 90 x 60	
Weight (with DTC scanner)	1.13Kg	1.23Kg
Maximum acquisition Speed (measurements / channel / second)	2000	1000
Input supply	18 to 32 VDC with smart sensing power supply max current = 1.25A at 28VDC	
Pressure connection (measurement lines)*	1 x QDCM 36 way	2 x QDCM 36 way
Pressure connection (purge and supply lines)*	1 or 2 x Swagelok 1/4 fitting or Chell AS fitting	
Supply pressure for scanner valve (for re-zero and purge)	6 to 7 bar	
Mating electrical connector	Amphenol 2M805-001-16-C-10-13-P-A	
System timing	Hardware trigger (5v TTL) or IEEE1588 PTP V2	
Operating temperature range.	-55 to+90°C	
Maximum relative humidity	95% at 50°C (non-condensing)	
Ethernet specification	Auto-negotiating 100Mbit TCP/IP or UDP	
CAN specification	2.0 B	
* Other pneumatic connection options are available.		

FlightDaq2 Measurement Error - Differential					
Range		Measurement Range*		Maximum Error	
Kpa	psi	Kpa	to	Kpa	%FS
1	4" Water	-1	1	1.5	±0.15
2.5	10" Water	-2.5	2.5	2.5	±0.1
5	20" Water	-5	5	5	±0.1
7	1	-7	7	7	±0.1
17	2.5	-17	17	17	±0.1
34	5	-34	34	17	±0.05
70	10	-70	70	35	±0.05
105	15	-105	105	53	±0.05
207	30	-207	207	104	±0.05
310	45	-310	310	155	±0.05
345	50	-345	345	173	±0.05
689	100	-689	689	345	±0.05
1000	150	-1000	1000	500	±0.05

FlightDaq2 Measurement Error - Absolute					
Range		Measurement Range*		Maximum Error	
Kpa	psi	Kpa	to	Kpa	%FS
1	4" Water	99	101	21.5	±2.15
2.5	10" Water	97.5	102.5	22.5	±0.9
5	20" Water	95	105	25	±0.5
7	1	93	107	27	±0.4
17	2.5	83	117	37	±0.2
34	5	66	134	37	±0.1
70	10	30	170	55	±0.05
105	15	0	205	73	±0.05
207	30	0	307	124	±0.05
310	45	0	410	175	±0.05
345	50	0	445	193	±0.05
689	100	0	789	365	±0.05
1000	150	0	1100	520	±0.05

* Assumes barometric = 100Kpa

FlightDaq2 Dimensions (32 and 64 channel versions)



FlightDaq2 64



Electrical connection for power, Ethernet, CAN and trigger connections

Supply and purge input. 1 (for high pressure ranges) or 2 inputs for supply (7bar) and purge inputs. Swagelok 1/4" or Chell AS quick disconnects

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Pneumatic connectors for measurement and reference ports. TE QDCM's as standard (other types available)

FlightDaq2 Environmental Tests

Ambient altitude	100 mbar abs or nominally 52000 ft
Vibration	Engine standard vibration test to DO160E category S, curve W with duration of 1 hr/axis. Fan blade out case to DO160E category S, curve P.
	Fan blade out to DO160F section 7 (40g 11m/s)
	Engine load to +/- 40g per axis
Temperature	Engine temperature to DO160F section 4 cat D2 and section 5 cat A requirements
	General temperature -55 to+90°C
	-55 to+90°C at altitude
	Thermal transient : $\pm 10^{\circ}\text{C}/\text{min}$
Radiated emissions	MIL standard 461-E: RE102
Conducted emissions	MIL standard 461-E/MIL standard 461-C



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