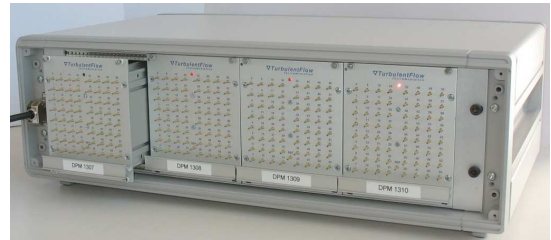


DPMS

The Dynamic Pressure Measurement System (DPMS) is a multi-channel pressure measurement system capable of accurately measuring both mean and fluctuating pressures and displaying the results in real time.

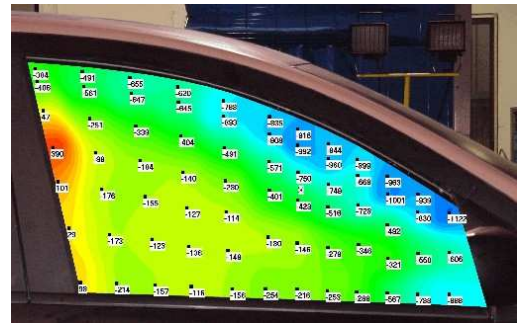
What does it provide?

- Measurement of up to 1024 channels (pressure taps) simultaneously
- Frequency response: 0 Hz (mean pressure) to several kHz
- Real-time correction of tube response
- Real-time data processing and display
- Real-time pressure contour display, overlaid on an image of the measurement situation



What is it used for?

- Time-averaged pressure measurement
- Time-varying pressure measurement
- Determination of mean, RMS and peak pressure distributions
- Visualisation of pressure distributions
- Wind tunnel and field measurements on model- or full-scale objects
- Vehicle, aircraft, industrial/environmental aerodynamics



What are the advantages over traditional systems?

The DPMS can be used as a general-purpose multi-channel pressure measurement system but also provides additional features. Sampling rates of 3 kHz per channel and correction for tube response allow accurate measurement of fluctuating pressures. Real-time mapping of pressure contours, without waiting for post-processing and visualisation, saves considerable time during testing and analysis. Creation of video files from the real-time pressure contour display can be used for later analysis and presentations. Easy to use hardware and software that can be integrated with existing equipment simplifies the measurement process.

What is supplied with a DPMS?

All items other than a Windows-based computer are provided:

- DP modules
- Cabling
- Data acquisition
- Software
- Technical support

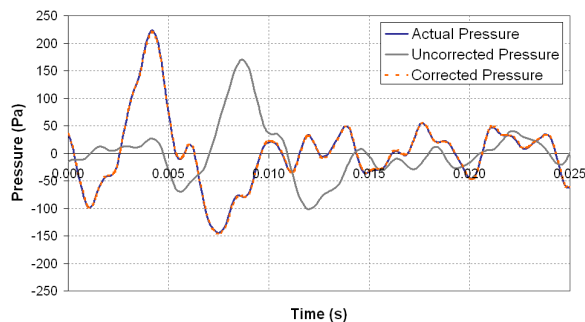
For further information

- Visit the TFI website at www.turbulentflow.com.au
- Contact Peter Mousley on (61 2) 6020 9250 or mousley@turbulentflow.com.au

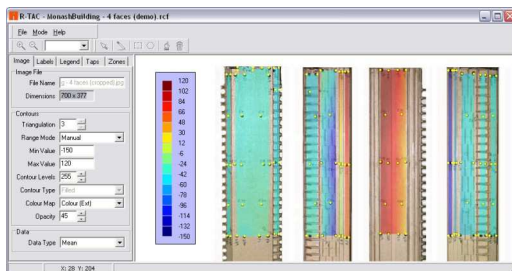
DPMS DETAILS

How it works ...

- Pressure taps (measurement points) are connected via tubing to pressure transducers in the Dynamic Pressure (DP) modules
- Fluctuating pressures are measured and linearised to correct for amplitude and phase distortions caused by the tubing
- Linearisation is performed automatically by the software as data are acquired
- Results are displayed in real-time, as time traces of the pressure signals or as pressure contours overlaid on an image of the measurement situation



Sample data showing the importance of linearisation (the corrected pressure is within 2% of the actual pressure, compared to 30% amplitude error for the uncorrected pressure).



Display of pressure contours on an image of a model building using TFI's Real-Time Animated Contouring software.

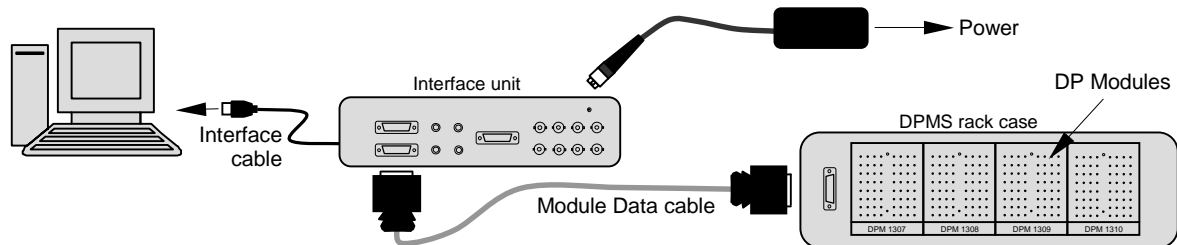
Tube response linearisation

Accurate time-varying (dynamic) measurements require linearisation using an appropriate tubing frequency response function. The figure at left shows how effectively a fluctuating pressure signal can be recreated by applying the appropriate tube response function. If linearisation is not performed, the resulting time-varying pressure signal will be incorrect. The corrected data are a more accurate representation of the actual pressure at any instant of time, and have more accurate statistical measures such as peak pressure and standard deviation. This allows correlations with other events and calculations, such as wind loadings, to be performed accurately.

The DPMS performs linearisation as the data are collected. This provides time-accurate data that can be saved to file and displayed as a time series, frequency spectra and animated pressure contours.

Configuration

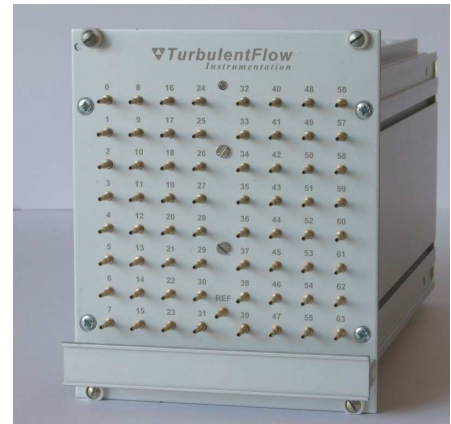
There are several DPMS configurations available to suit requirements. A typical configuration consists of a number of 64-channel modules connected to an interface unit that also houses the data acquisition system. The interface unit connects to a PC via USB. Modules can be produced with different channel counts if required. The typical maximum channel count is 1024, although higher channel counts are possible. Other custom configurations are available and every system is designed with future expansion potential.



Typical DPMS configuration

System integration

All TFI systems are designed to integrate with other instrumentation, including products from TFI and 3rd parties. This streamlines your running procedures, allows for synchronised measurements, gives consistent data storage formats and simplifies post-processing.



Calibration

- DP Modules are supplied fully calibrated and ready for use
- Static (transducer) re-calibration requires occasional checking (easily performed by the user)

Specifications

Pressure range	±1 kPa, ±2.5 kPa, ±7 kPa (±4" H ₂ O, ±10" H ₂ O, ±1 psi)
Static accuracy	±0.3% FS (0° - 50°C)
Frequency response	Amplitude ±2% (depending on tube dimensions)
Sample rates	3 kHz/channel (higher rates available for special purposes)* Aggregate rates in excess of 2.7 MHz
Number of channels	64 to > 1024 channels (larger systems available)*
Module sizes	Typical channel counts are 16, 32 or 64*
Port sizes	Custom made to suit application*
Dimensions	Dependent on configuration selected Most common system based on a standard 19" portable rack
Power	12 VDC (can use a mains adaptor, or battery for portable use)

* Many custom configurations are available