

Dynamometer Display Module

The Dynamometer Display Module is a rack-mounting unit which contains an accurate load cell amplifier and tachometer pick-up amplifier which feeds a micro-processor based digital display system. In conjunction with Dynamometer Services specified load cell it offers a very accurate and stable readout of torque, rpm and power.

Although each display is based on a common design, aspects such as imperial / metric units, analogue meter scales and load cell amplifier gain are custom-built for every display in order to offer the best possible resolution, accuracy and stability.




Key Design Features:

- Large clear analogue panel meters for fast estimated readings.
- 4-digit high-brightness LED displays for torque, speed and power.
- Digital auto-zero button to compensate for cooling hose torque.
- 10-range selectable digital filter for smoothed torque display.
- Hold button freezes digital display, continuous data/analogue output.
- 0-5V analogue outputs for torque and speed fitted as standard.
- 4-20mA output and RS232 data output available as low-cost options.
- Crystal controlled tachometer, display accuracy ± 2 rpm.
- Load cell voltage measurement accuracy $\pm 0.03\%$ of span.
- Straightforward automated torque calibration routine.
- Rugged 19 inch (3U high) rack-mounting case.
- A complete display solution for all dynamometers.
- Customised versions available for special requirements.

Notes on Instrument Functions:

- Filter button toggles between filter 'OFF' (actually filter level 2, the normal measurement period of 1 second), and 'ON', the user's selected filter number. This button illuminates in amber when 'ON'. When first switched on, the filter level is displayed for one measurement period.

If, when switched on, the button is held for more than 2 seconds, the filtering level shown in the display will cycle round '1' (two readings per second) to '10' (one reading every 5 seconds). When the desired level is reached, the button is released and that level is stored in memory as the 'user's filter level'. This can therefore be recalled and/or adjusted at any time.



- Hold button by-passes the micro-processor's display update routine to that although readings continue to be made and sent up the RS232 link, the displayed values do not change. Display freezing is clearly shown by the button illuminating in red. Pressing again resumes updates. The analogue functions (0-5V, 4-20mA, analogue meters) are independent of the micro-processor and so continue unaffected.

- Zero (tare) makes the present reading becomes zero. This is useful for zeroing the display in case of a small torque offset induced by pressure in the cooling water hoses etc. The activation of a temporary zero is shown by the button illuminated in green. Pressing again re-loads the factory-calibrated zero.

- Digital Displays are 0.56" high brightness types with circular polarised red filters and are therefore clearly readable in daylight. The power display (kW or BHP according to requirements) is calculated exactly by the micro-processor and needs no calibration.

- Analogue Meters are 96mm square DIN panel meters with 90° movements. To make the best of their resolution, custom scales (e.g. 0-3600 rpm) are fitted to each meter. They offer fast and intuitive but, of course, approximate ($\pm 1.5\%$ accuracy) readings.

- Back Panel Connectors are standard square multi-pin types. Three connectors are used, one for mains (9-pin), one for the load cell (12-pin) and one for the tachometer (6-pin); all are keyed and non-reversible. A 9-pin 'D' connector is included for the retro-fittable RS232 option.

- Calibration is activated by means of a keyswitch for security. Calibration coefficients are held in non-volatile memory with a retention time of 200 years and cannot drift. If the load cell zero drifts due to mechanical pre-load, the digital zero button restores exact calibration.



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