

## FEATURES

- ! Ranges: 15 psia to 750 psia  
115 kPa to 5000 kPa
- ! Better than  $\pm 0.01\%$  FS Accuracy
- ! Long term stability better than 0.01% FS per year
- ! RS-232 or multidrop RS-485 interfaces
- ! Pressure output in choice of engineering units
- ! Up to -40 to +70 degrees C operating range

## APPLICATIONS

- ! Meteorological and barometric reference
- ! Low cost, high accuracy pressure standard
- ! Pressure calibration equipment
- ! Storage tank/liquid level determination



The Model 7885 Digital Pressure Module (DPM) is a completely self-contained high accuracy pressure transmitter suitable for measurement of air. The DPM incorporates the latest miniaturized version of the Weston Aerospace vibrating cylinder pressure transducer, proven in many demanding airborne and ground based applications. This sensor, being of a resonant element technology, is inherently digital in its primary signal output, and is also widely acknowledged as one of the most stable configurations, typically offering long term drift performance of around 0.005% FS per year, irrespective of its temperature exposure experience.

The DPM combines this sensor with an on-board microcontroller and timer/counter circuitry. This performs all of the necessary sensor frequency and temperature compensation signal acquisition and computes pressure, delivering measurements in a choice of four engineering units. A unique feature of the DPM is that calibration and characterization is carried out at the top level of integration. This procedure monitors the outputs over a matrix of 11 pressures at 7 different temperatures, fully characterizing the device over a temperature span of up to -40 to +70 degrees centigrade. Interface options include a standard RS-232 port or RS-485 addressable, multidrop interface, allowing up to 31 DPMs to be networked together.

Deliverable with every DPM is a power connector and Windows™ compatible start-up software. This software allows the user to exercise the functions of the DPM and also includes a datalogger and simulation of a pressure indicator.

Pressure Systems, Inc.  
34 Research Drive  
Hampton, VA 23666  
USA  
Phone: (757) 865-1243  
Fax: (757) 766-2644  
E-mail: sales@psih.com  
Website: www.psih.com

PSI Ltd.  
124, Victoria Road  
Farnborough, Hants  
GU14 7PW United Kingdom  
Phone: +44 1252 510000  
Fax: +44 1252 510099  
E-mail: dcopley@solartron.com

# 7885 Specifications

| Parameter                               | 7885  | Units          | Comments   |
|---|---|----------------|--|
| <b>PNEUMATICS</b>                       |   |                |  |
| Pressure Ranges                         | 0.5 to 15 / 3.5 to 115<br>0.5 to 19 / 3.5 to 130<br>0.5 to 38 / 3.5 to 262<br>0.5 to 50 / 3.5 to 345<br>0.5 to 150 / 3.5 to 1000<br>0.5 to 750 / 50 to 5000 | psia / kPa     | Absolute pressures only                                      |
| Media                                   | Air   |                |  |
| Non-Derangement Pressure                | 3.0X  | F.S. min       |  |
| Burst Pressure                          | 5.0X  | F.S. min       |  |
| <b>PERFORMANCE</b>                      |   |                |  |
| Resolution / Repeatability <sup>1</sup> | ±0.002%   | % F.S.         | Standard refresh rate of 200 ms                              |
| Accuracy (Linearity) <sup>2</sup>       | ±0.01% maximum<br>±0.005% typical   | % F.S.         |  |
| Temperature Hysteresis <sup>3</sup>     | ±0.01% maximum<br>±0.005% typical   | % F.S.         |  |
| Longterm Stability                      | ±0.01%<br>±0.005% typical   | % F.S.per year |  |
| <b>POWER REQUIREMENTS</b>               |   |                |  |
| Input Voltage                           | 11 to 18  | VDC            | Nominal power consumption 300 mW                             |
| <b>ENVIRONMENTAL / PHYSICAL</b>         |   |                |  |
| Temperature Range                       | -40 to 70<br>0 to 50  | Degrees C      | Ranges up to 50 psi/345 kPa<br>Ranges above 150 psi/1000 kPa |
| Size                                    | 114 x 95 x 52<br>4.49 x 3.74 x 2.05   | mm<br>inches   | Excluding pressure / electrical fittings                     |
| Weight                                  | 1.25 / 0.57   | lbs. / kg      |  |
| Electromagnetic Compatibility           | EN50081-1<br>EN50082-1  |                |  |

- 1 Maximum observed repeatability error at 25 degrees C ambient, 200 ms refresh.
- 2 Maximum error observed between applied and reported pressure during calibration process.
- 3 Maximum error at 35 degrees C after exercising DPM to either operating temperature extreme.

Specifications subject to change without notice.

# Operational Features 7885

The commands for the DPM are transmitted using ASCII characters. Each character group consists of 1 start bit, 8 data bits and 1 stop bit. For RS-232 interface DPMs, the commands are generally of a 4 character format, commencing with a \$ symbol. This indicates to the DPM that a command sequence has begun. Any commands that do not commence with a \$ are ignored. Similarly, a carriage return <CR> indicates that the command has terminated. RS-485 interface DPMs operate in exactly the same manner, with the difference that an additional 2 characters are included after the \$ command to indicated the unit address. Additional broadcast and set address commands are included within the firmware for these units.

The available features of the DPM are summarized in the following table.

| Command Description  | ASCII Code   | Code   |
|--|--|--|
| <b>USER CONFIGURATION</b>  |  |  |
| Set baud rate  | \$SB****<CR>   | Selectable from 75 to 9600 baud                            |
| Set pressure units   | \$SU*<CR>  | psi, hPa, kPa, inHg  |
| Save defaults  | \$SD<CR>   | Saves units, baud settings                                 |
| Clear defaults   | \$SC<CR>   | Clears units, baud settings                                |
| Recalibration, zero offset only  | \$CS<applied pressure><br><CR>   | Adjust for zero drift                                      |
| Recalibration, offset and span   | \$CL<low pressure><CR><br>\$CH<high pressure><CR>                      | Two point offset and span adjustment                       |
| Clear recalibration  | \$CC<CR>   | Restores factory set calibration                           |
| <b>IDENTITY</b>  |  |  |
| Ask for type and pressure range  | \$TT<CR>   | Returns part number and range                              |
| Ask for serial number  | \$TS<CR>   | Returns S/N, cylinder no. calibration number               |
| Status request   | \$ST<CR>   | Returns system status and details of any sub-system faults |
| <b>MEASUREMENT</b>   |  |  |
| Single pressure reading  | \$MR<CR>   | Returns a single pressure reading                          |
| Continuous pressure reading  | \$MC<CR>   | Returns a pressure reading stream                          |
| Stop cont. pressure reading  | \$MS<CR>   | Stops pressure reading stream                              |
| Request pressure units   | \$MU<CR>   | Returns the set pressure unit                              |
| Temperature measurement  | \$MT<CR>   | Returns internal temperature                               |
| Go into low power (LP) mode  | \$LP<CR>   | Shuts down sensor  |
| Restore normal operation   | Any above command  | Wakes up unit from LP mode                                 |
| <b>WARNING MESSAGES</b>  |  |  |
| The 7885 DPM will report a warning if it is being operated outside of its normal pressure or temperature range. This is transmitted as an additional string after a single or continuous pressure reading. |  |  |
| PRESS CAL  | Operation is outside calibrated pressure range and will be in error    |  |
| PRESS LIMIT  | Operation is close to, or exceeding derangement pressure limit         |  |
| TEMP LIMIT   | Operation is outside calibrated temperature range and will be in error |  |

# 7885 Ordering/Part Number Information

## Ordering Information:

PN: 7885-AAAAB00000

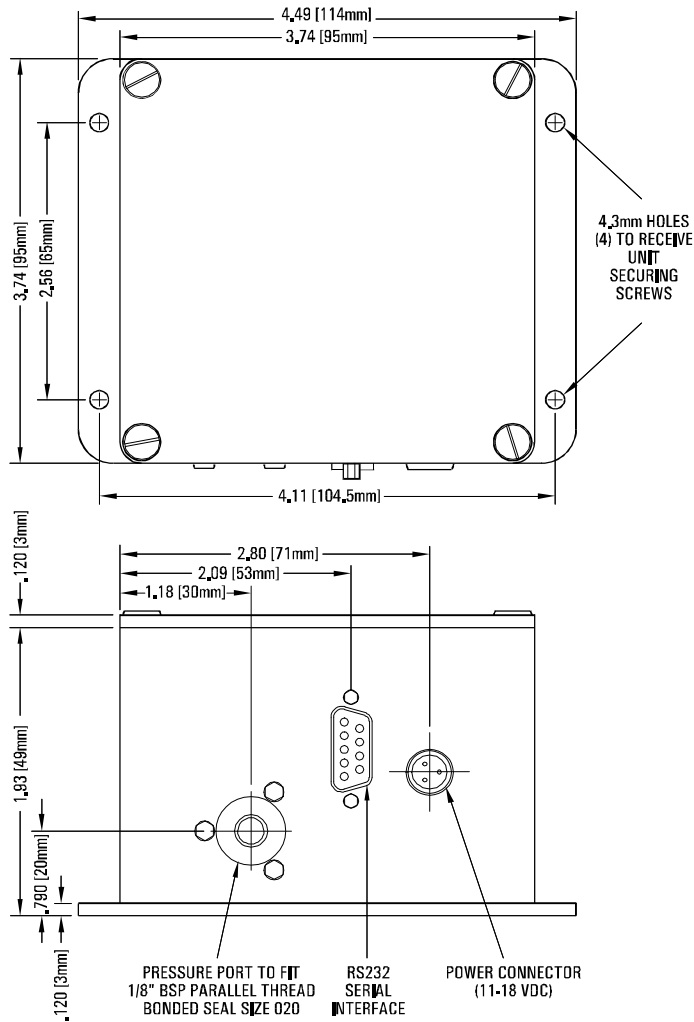
7885 Digital Pressure Module

### AAAA = Pressure Range

- 0015, 15 psia (115 kPa)
- 0019, 19 psia (130 kPa)
- 0038, 38 psia (262 kPa)
- 0050, 50 psia (345 kPa)
- 0150, 150 psia (1000 kPa)
- 0750, 750 psia (5000 kPa)

### B = Interface

- 0, RS-232
- 1, RS-485



No. 0897