DIGITAL PANEL INDICATORS

Innovation In Motion
Universal input Indicators - DMP200 series

The DMP200 series of universal input indicators offer unparalleled price and performance and are ideal for industrial test and process applications. Surface mount and microprocessor technology has enabled powerful features to be packed into a 1/8 DIN case. The measurement performance is significantly better than that normally associated with indicators in this price range. Applications range from simple measurement only to more demanding situations requiring digital communications, alarms, maths functions and complex signal conditioning. The powerful menu-driven software enables fast flexible set-up from the front panel or via the serial communications interface. No adjustment of internal potentiometers, internal links or plug-in cards is necessary.

The units are primarily suited for use with the Penny & Giles range of rotary or linear position sensors, but can also be configured to accept any one of over 20 different input types, including thermocouple, RTD, mA, mV and 10V signals.

User linearisation

Linearisation curves can be defined using up to 24 calibration points entered manually or directly from the sensor output. The indicator will use the stored values to define the linearisation curve.

Rugged enclosure

The enclosure uses flame retardant (VO) materials and the front panel conforms to IP65 (NEMA 4). The instrument can be removed from the panel without disturbing the connections.

Connectivity

Digital status inputs, serial communications, analogue output, transmitter supply, alarm relays, transducer supply, are all available.

Selection Guide

Penny+Giles offers the widest choice of options to suit your application.

Model DML220 and DML340 are available from stock.

Features

- Universal input
- Isolated analogue output
- Digital status inputs
- Transmitter & transducer supplies
- Four alarm set points
- Front panel function buttons
- Universal mains power supply
- Math functions
- Serial communications
- Dual alarm relays
- Compatible with Penny & Giles rotary or linear position sensors

DMP210 page 4
4 digit indicator
Universal input

DMP220 page 4
4 digit indicator
Dual alarm relays
Universal input

EMC
The products detailed in this document have been tested to the requirements of EN 50081-1 (Emissions) and EN 50082-2 (Immunity).

Quality Assurance
Penny + Giles are accredited to BS EN ISO 9001:2000
Quality is at the heart of all our systems ensuring the reliability of our products from initial design to final despatch.
LVDT input Indicators - DML300 series

The DML300 series of digital panel indicators are designed for use with LVDT transducers. They are ideal for industrial and test applications and feature a five digit variable brightness LED display, a fast (125Hz) unscaled analog output for monitoring fast changes, a separate electrically isolated 0-10 Vdc/4-20mA scalable output, serial 2 or 4 wire RS 422/485 communications interface, two logic control inputs to allow remote control of user selectable functions and two front panel push buttons that can be user defined to allow fast access to pre-programmed functions. The ‘Fast-Cal’ feature provides a fast, simple method of calibrating an indicator to the transducer at any two stroke positions. As LVDT transducers can only be calibrated in situ, the sensor is set to the mechanical low (zero) and then the high (span) positions when prompted by the DML300. The measured LVDT signal values are then stored, with their relevant display values, as the calibration parameters. The DML300 also automatically sets the correct input gain to suit the transducer output. Displayed values can be in any measurement units.

Clear display
The flat, slightly recessed high brightness LED display, ensures maximum visibility even in difficult ambient conditions.

Front panel control
Set-up is facilitated by the front panel buttons and a password protected menu. Two of the buttons can be user programed to provide one or more special functions.

Total reliability
Surface mount and microprocessor technology has enabled powerful features to be packed into a 1/8 DIN case. No maintenance is necessary.
**DMP 200 SERIES**

**DISPLAY**
- Type: 14.7mm high, high brightness red LED
- Range: -19999 to +99999 (DMP230, DMP240) -1999 to +9999 (DMP210, DMP220)
- Update Rate: 2 per second

**A/D CONVERTER**
- Dual slope integrating with auto zero
- Conversion rate: 10 per second
- Resolution: 16 bit + sign (1µV)
- Common mode rejection: >150dB
- Series mode rejection: >70dB (50 or 60Hz)

**VOLTAGE INPUTS**
- Ranges: ±100mV ±10V
- Accuracy: 0.05% of reading ±20µV (typically 0.02%)
- Resolution: 1µV (100mV range), 100µV (10V range)
- Input impedance: >100MΩ (mV i/p) >1MΩ (V i/p)

**CURRENT INPUT**
- Range: ±20mA
- Accuracy: 0.05% of reading ±4µV (typically 0.02%)
- Resolution: 2.0µA
- Input impedance: 5Ω typical
- Maximum burden: 100mV

**REFERENCE JUNCTION COMPENSATION (CJC)**
- Accuracy: Better than ±0.5°C after 30 minutes

**RESISTANCE/RTD INPUTS**
- Configuration: 2, 3 or 4 wire programable
- Excitation current: 0.25mA typical
- Range: 0-400Ω
- Accuracy: 0.4Ω (typically 0.2Ω)
- Resolution: 0.01Ω

**THERMOMETER**
- Break Detection: Programable
- Configuration: Up or down scale

**TRANSFOMER/TRANSODUCER SUPPLIES**
- Isolation: 500Vdc/peak ac
- 24V transmitter supply: All models nominally 24V@ 32mA maximum
- 10V regulated transducer supply: DMP210, DMP220 10V ±0.1V @ 30mA maximum
- 0-12V regulated transducer supply: DMP230, DMP240 0.01V ±0.05V (typically 0.02V)
- Temperature drift: <100ppm / °C
- Output Ripple: <5mV
- Output Current: 35mA maximum

**ALARMS**
- Each type of the DMP200 series has four software alarms. These can be configured by the user for alarm type, setpoint, on/off delay and on/off hysteresis value. Alarms can be individually set to be latching or non-latching and to flash a message on the front panel display when active. Any of the four software alarms can operate a relay (models DMP220 and DMP240 only). In addition a special AND function allows a relay to switch only if two or more alarm conditions are active.

**ALARM RELAYS**
- (DMP220 and DMP240 only)
- 2 off single change over (form C) contacts. Rated 1A @ 250Vac 5A @ 30Vdc
- Relays can be configured to be energised or de-energised in the alarm condition.

**DIGITAL STATUS INPUTS**
- (DMP230 and DMP240 only)
- One or more of the stated functions can be user assigned to either of the two digital inputs which can be activated by external volt-free contacts:
- Tare, auto zero, display hold, display maximum, display minimum, display average, display test, Reset max/min & average (to the current measured value), alarm disable, alarm acknowledge, analogue output hold, keyboard lock.
FUNCTION KEYS

One or more of the stated functions can be user assigned to either of the two front panel function buttons:
Tare, auto zero, display hold, display maximum, display minimum, display average, display test, reset max/min & average (to the current measured value)

ANALOGUE OUTPUT

DMP230, DMP240

- Isolation: 500Vdc/peak ac
- Ranges: User selectable 0-10V, 0-20mA or 4-20mA
- Accuracy: 0.2% of span (typically 0.1%)
- Temperature drift: <100ppm / °C
- Output ripple: <10mV
- Response: 63% within 32mS, 99% within 100mS
- Resolution: 0.05% of span (5mV or 0.01mA)
- Maximum voltage output: 11V @ 22mA
- Maximum current output: 22mA @ 18V
- Maximum load: 900Ω
- Output damping filter: Programmable

SERIAL COMMUNICATIONS

DMP230, DMP240

- Type: RS422/485, 2 or 4 wire multidrop
- Isolation: 500Vdc/peak ac
- Speed: 1200, 2400, 4600, 9600 Baud
- Parity: Odd, even or none
- Stop bits: 1 or 2
- Protocols: User selectable for MODBUS™ (RTU or ASCII) J-BUS and DTPI

MATHS

- Max / Min
- Averaging

POWER REQUIREMENTS

Universal

- 90 to 265Vac 50 or 60Hz @ 10VA nominal or 10 to 32Vac or dc

ENVIRONMENTAL

- Temperature: 10° to 50°C (operating) -10° to 70°C (storage)
- Humidity: 0-95% RH non condensing
- Protection: Front panel to IP65 (NEMA 4)

PHYSICAL

- Panel mount: 1/8 DIN panel mount
- Dimensions: 48mm (H) x 96mm (W) x 173mm (D)
- Panel cut-out: 44mm (H) x 92mm (W)
- Depth behind panel: 166mm including terminals
- Weight: 0.4kg (0.55kg packed weight)

SAFETY AND EMC

- Safety: EN61010, IEC1010
- Susceptibility: ESD to IEC801-2, EN50082-1. Fast Transient burst to IEC801-4, Radiated to IEC801-3.
- Emissions: To EN50081-1; EN50022 Class A for radiated and conducted
- CE certified: 1995

ORDERING CODE

DMP210 - 4 digit indicator only - no alarm outputs
DMP220* - 4 digit indicator with dual alarm relays
DMP230 - 5 digit indicator with analogue output, serial output, logic status
DMP240 - 5 digit indicator with dual alarm relays, analogue output, serial output, logic status

Power 1 = 90 to 265Vac 50 or 60Hz  2 = 10 to 32Vac or dc

Please state model number, power requirements and quantity.

D M P  [ ] [ ] model number  power

* preferred model held in stock for rapid dispatch
DISPLAY
Type
14.7mm high, high brightness red LED
-19999 to +99999
User selectable
Update rate
User selectable 2, 4 or 10 per second
User adjustable, 0 (off) to 999 seconds

LVDT INPUT
Input voltage range
0.05V to 5Vrms
Gain ranges
1, 5, 10 & 100
Temperature drift
< ±0.005% FSO / °C
Non linearity
< ±0.02%
Transducer supply
 selectable 3.0 or 5Vrms @ 25mA
Supply frequency
User selectable 2.5 or 5.0kHz
Stability
< ±0.01% FSO after 15 minutes
Measurement resolution
Better than 1 part in 120,000
Measurement rate
10 readings per second
Measurement modes
User selectable 4 wire differential or 5 wire ratiometric

ALARMS
Setpoints
Alarms can be quickly adjusted during normal running via the front panel buttons or by
password protected menus (user selectable)
Alarms
Can be flashed on the display with the measured value.
Alarms menus
4, each individually user selectable for: high, low or deviation alarm action;
high and low band limits (deviation action only); on and off delay timers; on and off hysteresis;
and latching or non-latching

ALARM RELAYS
(DML340 ONLY)
2 off single change over (form C) contacts. Rated 1A @ 240Vac 5A @ 30Vdc
Relays can be configured to be energised or de-energised in the alarm condition

TTL ALARM OUTPUTS
(DML350 ONLY)
4 off TTL open collector.
Alarm outputs can be configured to be energised or de-energised in the alarm condition

STATUS (LOGIC) INPUTS
One or more of the stated functions can be user assigned to either of the two logic inputs:
Logic switching
The logic inputs can be switched by external volt free contacts or a TTL signal

FUNCTION KEYS
One or more of the stated functions can be user assigned to either of the two front panel function buttons:

HIGH SPEED ANALOGUE OUTPUT
Output filter
-3dB @ 125Hz
**ISOLATED ANALOGUE OUTPUT**

- **Isolation**: 500Vdc/peak ac
- **Output**: User selectable 0-10V, 0-20mA or 4-20mA
- **Scaling**: User selectable (e.g. 4 to 20mA = 3.0 to 5.0mm)
- **Accuracy**: Better than 0.2%
- **Temperature drift**: <100ppm / °C
- **Response**: 63% within 32mS, 99% within 100mS
- **Resolution**: 0.05% (5mV or 0.01mA)
- **Maximum voltage output**: 11V @ 22mA
- **Maximum current output**: 22mA @ 18V
- **Maximum load**: 900Ω
- **Output damping filter**: Programmable

**FAST-CAL CALIBRATION**

Automatically calibrates and matches the indicator to a connected LVDT transducer. The DML300 reads the transducer's output at any two sensor positions. The two measured values are stored as the calibration parameters. Calibration can be performed at any time.

**SERIAL COMMUNICATIONS**

- **Type**: RS422/485, 2 or 4 wire multidrop
- **Isolation**: 500Vdc/peak ac
- **Speed**: 1200, 2400, 4600, 9600 Baud
- **Parity**: Odd, even or none
- **Stop bits**: 1 or 2
- **Protocols**: User selectable for MODBUS™ (RTU or ASCII) J-BUS and DTPI

**MATHS**

- **Max / Min**: Stores maximum and minimum display values
- **Averaging**: Calculates average value over a user defined period between 1 and 9999 seconds

**POWER REQUIREMENTS**

- **Universal**: 90 to 265Vac 50 or 60Hz @ 12VA nominal

**ENVIRONMENTAL**

- **Temperature**: 10º to 50ºC (operating) -10º to 70ºC (storage)
- **Humidity**: 0-95% RH non condensing
- **Protection**: Front panel to IP65 (NEMA 4)

**PHYSICAL**

- **Panel mount**: 1/8 DIN panel mount
- **Dimensions**: 48mm (H) x 96mm (W) x 173mm (D)
- **Panel cut-out**: 44mm (H) x 92mm (W)
- **Depth behind panel**: 166mm including terminals
- **Weight**: 0.4kg (0.55kg packed weight)

**SAFETY AND EMC**

- **Safety**: EN61010
- **Susceptibility**: EN50082-1 & 2
- **Emissions**: To EN50081-1 & 2; EN50022 Class A for radiated and conducted
- **CE certified**: 1997

**ORDERING CODE**

- **DML330**: LVDT Indicator with no Alarm Outputs
- **DML340**: LVDT Indicator with Dual Alarm Relays
- **DML350**: LVDT Indicator with Quad TTL Outputs

Please state model number and quantity.

```
D | M | L |
```

* preferred model held in stock for rapid despatch
www.pennyandgiles.com

Penny & Giles
Position sensors and joysticks for commercial and industrial applications.

15 Airfield Road
Christchurch
Dorset BH23 3TG
United Kingdom
+44 (0) 1202 409409
+44 (0) 1202 409475 Fax
sales@pennyandgiles.com

36 Nine Mile Point Industrial Estate
Cwmfelinfach
Gwent NP11 7HZ
United Kingdom
+44 (0) 1495 202000
+44 (0) 1495 202006 Fax
sales@pennyandgiles.com

12701 Schabarum Avenue
Irwindale CA 91706
USA
+1 626 337 0400
+1 626 337 0469 Fax
us.sales@pennyandgiles.com

Straussenlettenstr. 7b
85053 Ingolstadt,
Germany
+49 (0) 841 61000
+49 (0) 841 61300 Fax
info@penny-giles.de

The information contained in this brochure on product applications should be used by customers for guidance only. Penny & Giles Controls Ltd makes no warranty or representation in respect of product fitness or suitability for any particular design application, environment, or otherwise, except as may subsequently be agreed in a contract for the sale and purchase of products. Customer’s should therefore satisfy themselves of the actual performance requirements and subsequently the products suitability for any particular design application and the environment in which the product is to be used.

Continual research and development may require change to products and specification without prior notification. All trademarks acknowledged.

© Penny+Giles Controls Ltd 2005

Innovation In Motion