Penny+Giles

A Curtiss-Wright Company

DIGITAL
PANEL INDICATORS

Innovation In Motion

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.

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

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

DMP210 *page 4*

4 digit indicator
Universal input

DMP220 *page 4*

4 digit indicator
Dual alarm relays
Universal input

CE

EMC
The products detailed in this document have been tested to the requirements of EN50081-1 (Emissions) and EN50082-2 (Immunity).

Quality Assurance
Penny + Giles are accredited to BS EN ISO9001:2000 Quality is at the heart of all our systems ensuring the reliability of our products from initial design to final despatch.

Registered No. 924881

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DIGITAL PANEL INDICATORS

Features

- 'Fast-Cal' calibration
- Adjustable display resolution
- Maximum / minimum memory
- Isolated analogue output
- Two logic inputs
- Front panel function buttons
- Transducer excitation supply
- High speed analogue output
- Universal mains power supply
- Serial communications
- Dual alarm relays
- Quad TTL alarm outputs
- Compatible with Penny & Giles LVDTs

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 scaleable 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.
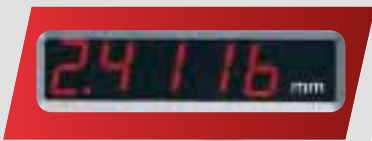
Front panel control

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.

DMP230 *page 4*

5 digit indicator
Analogue output
Serial output
Logic status
Universal input

DMP240 *page 4*

5 digit indicator
Dual alarm relays
Analogue output
Serial output
Logic status
Universal input

DML330 *page 6*

5 digit indicator
LVDT input

DML340 *page 6*

5 digit indicator
Dual alarm relays
LVDT input

DML 350 *page 6*

5 digit indicator
Quad TTL outputs
LVDT input

DMP200 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

THERMOSENSOR BREAK DETECTION

Programable	Up or down scale

TRANSMITTER/TRANSDUCER 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
Resolution	0.01V
Accuracy	±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.

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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 / $^{\circ}$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	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 @ 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 despatch

DML300 SERIES

DISPLAY

Type 14.7mm high, high brightness red LED
Range -19999 to +99999
Decimal point position User selectable
Update rate User selectable 2, 4 or 10 per second
Filter User adjustable, 0 (off) to 999 seconds

LVDT INPUT

Input voltage range 0.05V to 5Vrms
Gain ranges 1, 5, 10 & 100
Automatic or manual gain setting facilities
Non linearity < ±0.02%
Temperature drift < ±0.005% FSO / °C
Stability < ±0.01% FSO after 15 minutes
Transducer supply Selectable 3.0 or 5Vrms @ 25mA
Supply frequency User selectable 2.5 or 5.0kHz
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.
Alarm 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:

Tare, auto (offset) zero, display hold, analogue output hold, display max, display min, display average, display test, reset (latched) alarms, reset max/min & average (to the current measured value), 'Enter' button lock (disables entry to configuration menus), alarm inhibit and *Fast-Cal* calibration enable

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:
Tare, zero, display hold, display max, display min, display average, display test, reset (latched) alarms, Reset max/min & average (to the current measured value), *Fast-Cal* calibration enable

HIGH SPEED ANALOGUE OUTPUT

This is a buffered output giving a fast response from the LVDT demodulator output. The signal amplitude is dependant on the transducer excitation and the amount of sensor travel.

Output filter -3dB @ 125Hz

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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	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
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			

model number

* preferred model held in stock for rapid despatch