TECHNICAL BRIEF

IND780

IND780 Panel

IND780 Harsh

Industrial Weighing Terminal

The **IND780** is a highly flexible terminal capable of supporting simple to complex, standalone to integrated weighing and control applications. A wide range of communications interfaces are available, including serial, Ethernet, USB and a variety of fieldbuses.

Applications

- General weighing
- Process weighing
- Vehicle weighing
- Advanced configuration and customization

Standard Features

- Panel-mount and Harsh Environment enclosures
- Interface up to four concurrent Analog, IDNet, POWERCELL®, POWERCELL® PDX® or MT-SICS (4 max.) channels with a metrologically approved sum
- Menu-driven navigation setup consistent with other METTLER TOLEDO IND terminals
- Backlit, LCD graphical display; 320 x 240 pixels; 5.7" (145 mm) QVGA in active TFT color
- Local setup through front panel; online or offline setup with InSite™ Configuration Tool
- TraxDSP™ digital filtering and TraxEMT™ maintenance features
- Optional discrete I/O; coincident or latching outputs for material transfers
- Optional PLC fieldbus support
- Optional additional serial connectivity

Specifications

Display

Type: Graphical, active TFT color LCD
Size: 320 x 240 pixel; QVGA, 5.7" (145 mm)
Display Update Rate: 10 Hz

Keypad

Type: Flat switch membrane with tactile-feel keys; polyester overlay
Primary function keys: Zero, Tare, Clear, Print, Switch Scale
Navigation keys: Up, Down, Left, Right, Enter, Clear
Numeric keys: 0..9, decimal point
Soft keys: 3 sets of 5 programmable with access to alpha characters
Application keys: 4 programmable keys

Power

Termination:
Panel: two position removal terminal strip for 16 to 12 AWG wire
Harsh: integral power cord
Supply Criteria:
AC: Universal AC: 100 - 240 VAC at 49 - 61 Hz
Consumption: 400 mA

Temperature Characteristics

Operating Temperature: 14° F to 104° F (-10°C to 40°C) at 10% to 95% relative humidity, non-condensing
Storage Temperature: -40° F to 140° F (-40°C to 60°C) at 10% to 95% relative humidity, non-condensing

Specifications (continued)

Enclosure

Panel Mount:
Material: 304L stainless steel front plate
Protection: Certified TYPE 4x/12 (ref. IP65) protection in appropriate enclosure
Dimensions (h x w x d): 220 x 320 x 105 mm (8.7 x 12.6 x 4.1 in)
TYPE / IP protection:
Harsh Environment - Desk, Wall and Column Mount:
Enclosure: designed to comply with EHEDG and NSF standards
Material: 304L stainless steel
Material: 304L stainless steel
Protection: IP69K certified protection, appropriate for heavy washdown with hot water under pressure
Dimensions (h x w x d): 200 x 299 x 235 mm (7.8 x 11.8 x 9.3 in)
Wall / Column Mounting Bracket Option: adjustable viewing angles

Compliance and Approvals

Weights and Measures:
U.S.A.: NTEP; CoC #06-017
- IDNet: Class II, 100,000d
- Analog: Class III / IIIL, 10,000d

Canada: AM-5592
- Class II, 100,000d
- Class III / IIIHD, 10,000d/ 20,000d

Europe: NMI; TC6944
- IDNet: Class II, Approved divisions determined by platform
- Analog: Class III, IIII, 10,000e

Product Safety:
UL/cUL: Tested and complies with UL60950-1, UL508 and CSA 22.2-60950-1
CE:
- *90/384/EEC*: Non-automatic Balances and Scales
- *EN45501:*1992, Adopted European Standard
- *89/336/EEC*: EMC Directive
- *EN55022:*1989, 2005, Class A

Hazardous Area Use: DELETED PENDING NOTICE
Zone 2/22 Division 2: Class I and II, Groups A-D, F and G when installed per METTLER TOLEDO drawing 174020R

Conducted and Radiated Emissions (RFI): Meets or exceeds FCC part 15 for conducted and radiated emissions requirements as a Class A digital device

Radio Frequency Interference Susceptibility: Meets U.S., Canadian, and European requirements with a maximum of one display increment of change when calibrated for the recommended scale builds
Radio Interference Frequency: 26-1,000 MHz
Field Strength: 10 volts / meter

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Specifications (continued)

Scale Interface

Scale Types:

Analog:

- Eight (8) 350 ohm load cells (2 or 3 mV/V) per channel
- Maximum of sixteen (16) 350 ohm load cells per terminal
- Factory calibrated A/D output

IDNet: Pik-Brick and T-Brick types

POWERCELL: Maximum of fourteen (14) POWERCELL, POWERCELL PDX or MTX DigiTOL® load cells; Twenty-four (24) with optional external power supply

MT-SICS (Standard Interface Command Set): X-Base, Excellence balances, 4 Series, WM/WMH, only with full level 0 and limited level 1 and 2 support

Update Rates:

Internal A/D:

- Analog > 366 Hz
- IDNET > 16 Hz, dependent on base

Target: 50 Hz

PLC Interface: 20 Hz

Serial Interface: 20 Hz

Load Cell Excitation Voltage:
10 VDC

Maximum Sensitivity: 0.1 microvolts

Zero Temperature Coefficient: 0.15 µV / ºC maximum

Span Temperature Coefficient: 6 ppm / ºC maximum

Display Resolution: 1,000,000 divisions

Units:

Primary: lb, kg, g, ton, metric tonnes

Secondary: lb, kg, g, ton, metric tonnes, oz, ozt, dwt, custom

Communications

Interfaces:

Standard:

Serial: One (1) RS-232, One (1) RS-232/422/485 ports configurable from 300 to 115,200 baud.

Ethernet: 10 / 100 Base-T with standard RJ-45

USB: Master supports external keyboard

Optional: Two (2) single channel RS-232 or 422/485 ports

Protocols:

Serial Outputs: METTLER TOLEDO Continuous or Demand supporting ten (10) configurable print templates, report printing; For use with printers, data collection devices, remote displays, ARM100™ remote digital I/O module and DeviceNet™ Bridge

Serial Inputs: ASCII Clear, Tare, Print, Zero; barcode; keyboard; SICS level 0, partial level 1

Ethernet: Demand and continuous template, METTLER TOLEDO Continuous, Remote terminal clustering

Interface Options

PLC Interfaces:

Allen-Bradley® Remote IO (supports discrete and block transfer), *Analog output, PROFIBUS® DP, EtherNet/IP™, ControlNet™, DeviceNet™, ModbusTCP*

Discrete Input/Outputs: Maximum 40 inputs, 56 outputs

Local Discrete I/O –Dry Contact Relay and Solid State Relay (MOSFET):

- 4 inputs: optically isolated; external sink source 5 to 30VDC; 5 VDC internal source for passive external push buttons
- 4 outputs: normally open, isolated relay or solid state type; Maximum 30 VAC/VDC, up to 1 amp current each output

Remote Discrete I/O: 4 in / 6 out, isolated high level relay, maximum 60 VDC/250 VAC at up to 1 amp current each output, with total not exceeding 2 amps; maximum 8 per terminal

Internal Software Features and Functions

Bar Code and Keyboard Input: Via serial input and USB

Calibration Support: Separate single-point Zero and Span, Multi-point Calibration (Linearized), CalFREE™ (electronic calibration without using test weights), Step Calibration (managed build-up test process)

Calibration Maintenance: Programmable test calibration sequence using CalTest (up to 25 steps), calibration expiration choices to disable scale and/or alert

Comparators: 20 simple targets with programmable outputs. 2 modes of operation: coincidence or range. Rate, displayed weight or gross weight available as sources.

Diagnostic Testing: Standard functional terminal testing plus scale, discrete I/O, serial port, network, and PLC testing

Alibi Memory: Access up to 256,000 transactional records; search by date or transaction number

Event Logging: Exportable internal log file contains changes to calibration, configuration, communication and overload conditions

Expand by 10 (x10): Temporarily increase resolution by 10

Geo Codes: Gravity Adjustment Factor

ID (Prompting): Two ID sequences, each with 20 fields of prompt and response. Entered data can be used in print templates.

Filtering: TraxDSP® multi-stage digital filtering

Material Transfer Mode: Latched or coincidence target comparison outputs for single or dual speed (concurrent or independent) material delivery control

Over / Under Mode: Uses stored target (setpoint) table and utilizes SmartTrac to visualize weighing operation

Printer Templates: 10 configurable

Message Table: Storage for 99 frequently used text strings

Security Levels: 4 classes, with multiple users within a class

Softkey Configuration: Selectable appearance of 3 sets of 5 softkeys tailored to user requirements

Application Key Configuration: Selectable assignment of 4 commonly used functions (e.g. Contrast adjustment or time and date setting

Tare Table: Stores tares with IDs and descriptions; includes totalization by record ID

Target (Setpoint) Table: Stores targets with IDs and tolerances

SmartTrac: Graphical representation of weight as it approaches a target; Bar graph, Crosshair and Zone designs

Time and Date: With battery backup option; multiple formats and separators

Totalization: Subtotal and Grand Total weights (8 digit); Transaction weights, stored in primary units (10 digit)

Transaction Counter: Terminal specific (8 digit)

Sequential Counter: Measurement channel specific (8 digit)

TraxEMT™: Embedded Maintenance Technician permits creation and recall of electronic asset tag, logs errors; monitors cell symmetry, zero and overload conditions, calibration validity checking, and communication failures; web-based service diagnostic tools

MinWeigh: Ensures weighing accuracy at the minimum weight value

Configuration Software

InSite™: Standard PC configuration tool to upgrade firmware, configure scale parameters, store Target and Tare Tables, and configure print templates

Optional Software

TaskExpert™: Development tool software to create or customize IND780 applications. Graphical flowchart-based design reduces reliance on complex programming languages

Drive-780: Application specific solution for vehicle weighing; includes such features as tare storage and retrieval, tare expiration, commodity conversion, traffic light and gate control

Com-780: Specialized software module focused on the needs of users utilizing legacy communication protocols such as 8142, 8530, PT6S3 and SMA.

Axle-780: Application software for vehicle weighing on a single-platform axle scale. Weighs up to 12 axles, with traffic light control.

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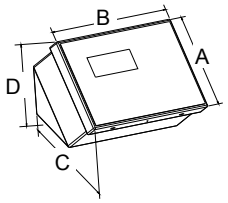
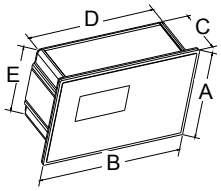
Dimensions – in. (mm)

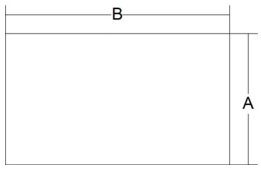
	Harsh	Panel Mount	Panel Cutout
A	7.88 (200)	8.66 (220)	7.64 (194)
B	11.77 (299)	12.60 (320)	11.58 (294)
C	9.27 (235)	4.13 (105)	N/A
D	5.57 (141)	11.41 (290)	N/A
E	N/A	7.48 (190)	N/A



IND780 Harsh Environment



IND780 Panel



IND780 Panel Cutout

IND780 Model Configuration

Term. Type	Enclosure Type	Slot 1	Slot 2, 3, 4	Slot 5, 6	PLC Interface	Application Software	Module	Line Cord/ Plug	Region/ Lang.
78	J, R	0, 1, 3, 4, 6	0, 1, 4, 6, A, D	0, A, B, C, D	0, B, C, D, E, P, R	0, V, H	0, 1, 2, 3	0, A-H	00

78 J – 1 100 A0 – E V 0 – A 00

Order #	Description
Enclosure and Displays	
78J	Harsh Environment, Color Display
78R	Panel Mount, Color Display
Slot 1	
0	None
1	Single Analog Load Cell Channel
3	POWERCELL® MTX® Channel
4	IDNet, DigiNet Channel
6	POWERCELL® PDX® Channel (max. 1 per terminal)
Slot 2, 3 or 4	
0	None
1	Single Analog Load Cell Channel
4	IDNet, DigiNet Channel
6	POWERCELL® PDX® Channel (max. 1 per terminal)
A	RS232 or 422/485 Serial Port (Max 2 per terminal)
D	Analog Output
Slot 5 or 6	
0	None
A	RS232 or 422/485 Serial Port (Max 2 per terminal)
B	Local Discrete I/O (Relay); 4 In / 4 Out (Max 2 per terminal)
C	Local Discrete I/O (Solid State); 4 In / 4 Out (Max 2 per terminal)
D	Analog Output

Order #	Description
PLC Interface	
0	No output option
B	ALLEN-BRADLEY® RIO Interface
C	ControlNet™ Interface
D	DeviceNet™ Interface
E	EtherNet/IP™ & ModbusTCP Interface
P	PROFIBUS® DP Interface, Panel Mount (vert. header)
R	PROFIBUS® DP Interface, Harsh (horiz. header)
Application Software	
0	Basic Functionality
V	Drive-780: Vehicle Application
H	Axle-780: Vehicle Axle Application
Software Modules	
0	No Module
1	TaskExpert™ (not available with Axle-780)
2	Com-780 (not available with Drive-780 or Axle-780)
3	TaskExpert™ & Com-780 (not available with Drive-780 or Axle-780)
Line Cord and Plugs	
0	No power cord (Panel Mount only)
A	120 VAC, U.S. Plug
B	230 VAC, Schuko Plug
C	240 VAC, U.K. Plug
D	240 VAC, Australian Plug
E	230 VAC, Swiss Plug
G	220 VAC, U.S. Plug
H	220 VAC, India Plug
Region/Language	
00	English, French, German, Italian, Spanish

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Options

64063330	Analog Load Cell Channel
64057417	POWERCELL MTX Channel
64067252	POWERCELL PDX Channel
64057421	IDNet / digiNet Channel
64057420	Single Channel Serial Port
64057419	Discrete I/O (Relay) 4 Inputs / 4 Outputs
64057422	Discrete I/O (Solid State) 4 Inputs / 4 Outputs
71209098	Allen-Bradley RIO Interface
71209096	PROFIBUS L2 DP Interface, Panel (vert. header)
71209097	PROFIBUS L2 DP Interface, Harsh (horiz. Header)
64057423	ControlNet Interface
64058677	EtherNet/IP & ModbusTCP Interface
72193580	DeviceNet Interface
71209353	Fixed Wall mounting bracket, Harsh Environment model
71207884	Adjustable Desk mounting bracket, Harsh Environment model
207294	Column mounting bracket, Harsh Environment model
64056538	Sealing Kit
22009172	Drive-780 – Vehicle Weighing Application
64061173	Axle-780 – Vehicle Axle Weighing Application
22009173	Task Expert
64057889	Task Expert with Drive-780
22009174	Com-780 – Legacy Communications Module
22009175	TaskExpert with Com-780

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