METTLER TOLEDO

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®, 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 monochrome or optional 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, monochrome, backlit LCD (optional active TFT color)
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: Approvals Pending
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 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 / °C maximum

Span Temperature Coefficient: 6 ppm / °C 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, *PROFIBUS® L2 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

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.

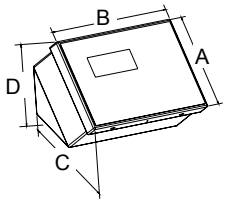
Axle-780: Application software for vehicle weighing on a single-platform axle scale. Weighs up to 12 axles, with traffic light control.

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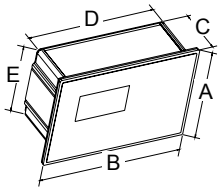
METTLER TOLEDO TECHNICAL BRIEF

Dimensions – in. (mm)

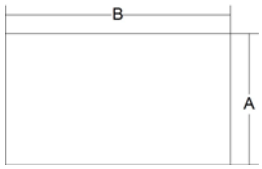
	Harsh	Panel Mount	Panel Cutout
A	7.88 (200)	8.66 (220)	7.64 (194)
B	11.77 (299)	12.60 (320)	11.58 (294)
C	9.27 (235)	4.13 (105)	N/A
D	5.57 (141)	11.41 (290)	N/A
E	N/A	7.48 (190)	N/A



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, L, R, S	0, 1, 3, 4	0, 1, 4, A	0, A, B, C	0, B, C, D, E, P, R	0, V, H	0, 1, 2, 3	0, A-H	00

78 L – 1 100 A0 – E V 0 – A 00

Order #	Description
Enclosure and Displays	
78J	Harsh Environment, Color Display
78L	Harsh Environment, Monochrome Display
78R	Panel Mount, Color Display
78S	Panel Mount, Monochrome Display
Slot 1	
0	None
1	Single Analog Load Cell Channel
3	POWERCELL® Channel
4	IDNet, DigiNet Channel
Slot 2, 3 or 4	
0	None
1	Single Analog Load Cell Channel
4	IDNet, DigiNet Channel
A	RS232 or 422/485 Serial Port (Max 2 per terminal)
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)

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

64057418	Analog Load Cell Channel	**72193580**	DeviceNet Interface
64057417	POWERCELL Channel	**71209353**	Fixed Wall mounting bracket, Harsh Environment model
64057421	IDNet / digiNet Channel	**71207884**	Adjustable Desk mounting bracket, Harsh Environment model
64057420	Single Channel Serial Port	**207294**	Column mounting bracket, Harsh Environment model
64057419	Discrete I/O (Relay) 4 Inputs / 4 Outputs	**64056538**	Sealing Kit
64057422	Discrete I/O (Solid State) 4 Inputs / 4 Outputs	**22009172**	Drive-780 – Vehicle Weighing Application
71209098	Allen-Bradley RIO Interface	**64061173**	Axle-780 – Vehicle Axle Weighing Application
71209096	PROFIBUS L2 DP Interface, Panel (vert. header)	**22009173**	Task Expert
71209097	PROFIBUS L2 DP Interface, Harsh (horiz. Header)	**64057889**	Task Expert with Drive-780
64057423	ControlNet Interface	**22009174**	Com-780 – Legacy Communications Module
64058677	EtherNet/IP & ModbusTCP Interface	**22009175**	TaskExpert with Com-780

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