MULTI-FUNCTION POWER TRANSDUCER

The **TD2418** is a microprocess-based power meter with a 16-bit CPU (central processing unit) and is equipped with fully-digitized measurement, calibration, and output functions.

TD2418 not only can take the place of several static converters and measuring instruments (V, A, W, PF, VAR, WH, VARH, and Hz) with a single unit, but it also has special functions, such as maximum measuring, minimum measuring, and comparator output. In communications, we use the most convenient and easiest RS232 or RS485 as our standard output port. We also adopt the Modbus® Protocol, one of the most popular protocols in the world, as our standard protocol.

FEATURES

- Precision: True-RMS measurement even for distorted waves
- High immunity to external noise
- RS485 standard communication interface output
- Auto calibration from computer
- Maximum and Minimum function
- Power supply is AC 90V~264V, 50/60Hz

SPECIFICATION

Accuracy: (at 23±5° sinwave)

Voltage:	±0.1% of reading, ±0.15% of range
Current:	±0.1% of reading, ±0.15% of range
Watt:	±0.2% of reading, ±0.3% of range
Var:	±0.2% of reading, ±0.3% of range
Power factor:	±0.2% of reading, ±0.3% of range
PF polarity:	"+" lagging", —" leading
Watt-hour:	±0.25% of reading, ±0.05% of range
Var-hour:	±0.25% of reading, ±0.05% of range
Hz:	±0.2% of reading

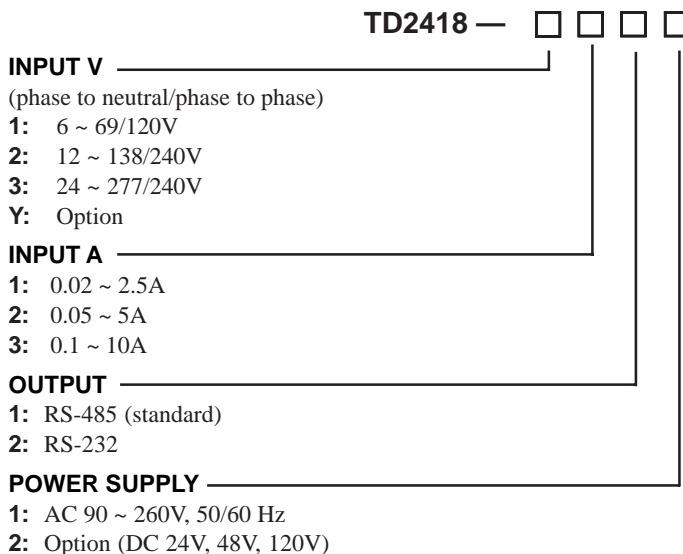|	
Frequency:	40~100Hz
Current measuring range:	0.05A~5A (standard)
Voltage measuring range:	6~69/120V 12~138/240V 24~277/480V
CT.PT scaling factors:	1~9999
Setting for REF:	0.5~9.999
Humidity range:	Up to 95% RH
Isolation:	Input/output/power/case
Dielectric test:	DIN-IEC 688. 2K Vrms 50/60 Hz, 1 min. Between terminal to terminal. 2.8K Vrms/1min. Between terminal to case.
Insulation resistance:	100MΩ or more, DC 500V
Housing material:	Steel sheet
Mounting:	Wall mounting

Temperature:	-10 ~ +50°C
Power supply:	AC 90 ~ 260V Option (DC 24V, 48V, 120V)

ORDERING INFORMATION

TD2418 — ☐ ☐ ☐ ☐

INPUT V
(phase to neutral/phase to phase)
- **1:** 6 ~ 69/120V
- **2:** 12 ~ 138/240V
- **3:** 24 ~ 277/240V
- **Y:** Option

INPUT A
- **1:** 0.02 ~ 2.5A
- **2:** 0.05 ~ 5A
- **3:** 0.1 ~ 10A

OUTPUT
- **1:** RS-485 (standard)
- **2:** RS-232

POWER SUPPLY
- **1:** AC 90 ~ 260V, 50/60 Hz
- **2:** Option (DC 24V, 48V, 120V)

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MEASURING AND INDICATING

Indicating Items	Phase 1	Phase 2	Phase 3	Phase to phase	Total
V_{TRMS}	V_1	V_2	V_3	V_{12}, V_{23}, V_{13}	$V (\Sigma)$
A_{TRMS}	A_1	A_2	A_3		$A (\Sigma)$
W	W (CH1)	W (CH2)	W (CH3)		$W (\Sigma)$
VAR	VAR (CH1)	VAR (CH2)	VAR (CH3)		$VAR (\Sigma)$
PF	PF (CH1)	PF (CH2)	PF (CH3)		$PF (\Sigma)$
WH	WH (CH1)	WH (CH2)	WH (CH3)		$WH (\Sigma)$
VARH	VARH (CH1)	VARH (CH2)	VARH (CH3)		$VARH (\Sigma)$
Hz	Hz (CH1)	Hz (CH2)	Hz (CH3)		$Hz (\Sigma)$

V_1, V_2, V_3 : Phase to neutral voltage
V_{12}, V_{23}, V_{13} : Phase to phase voltage

Equation:

$V(\Sigma)=(V_{12} + V_{23} + V_{13})/3$

$A(\Sigma)=(A_1 + A_2 + A_3)/3$

$W(\Sigma)=W(CH1) + W(CH2) + W(CH3)$

$PF(\Sigma)=W(\Sigma)/[V_1A_1 + V_2A_2 + V_3A_3]$

$VAR(\Sigma)=\sqrt{(V_1A_1) - W(CH1)^2} + \sqrt{(V_2A_2) - W(CH2)^2}$
$\quad + \sqrt{(V_3A_3) - W(CH3)^2}$

DESCRIPTION OF FRONT PANEL
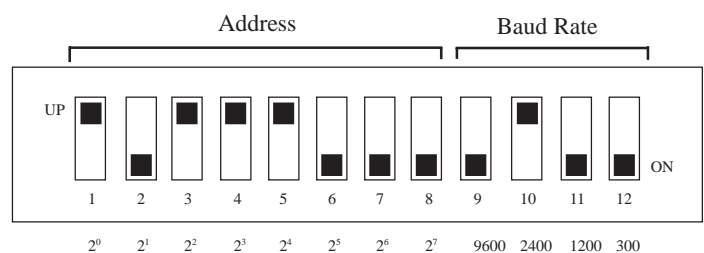
Terminal Board

DIP Switch

RX, TX, and Power Lights
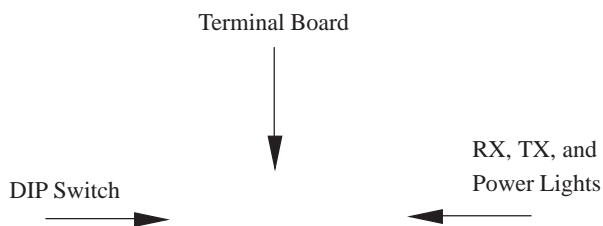
Terminal board: Input and output terminals
RX, TX, and power lights: Communication and power on indication
DIP switch: Address and band rate setting
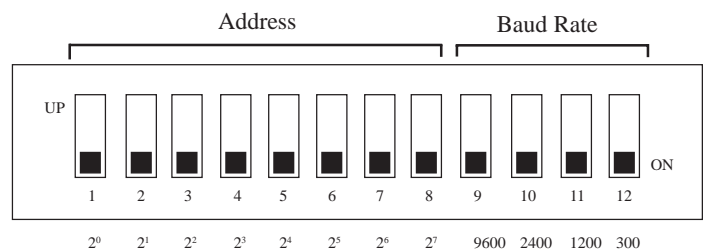
Example:

(a) Set Address 29:
Please push the handles of Switch No. 1, 3, 4, 5, up, and all others down.

(b) Set Baud Rate to 2400:
Please push the handle of Switch No. 10 up, and all others down.

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COMMUNICATION CONNECTIONS

■ RS-232C CONNECTION

The figure below illustrates the wiring requirements for connecting the 2418 using RS-232C communications. This can include a local direct connection to a computer or other device.
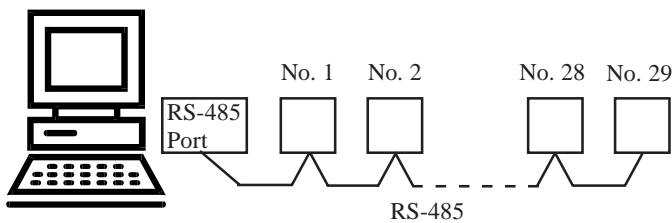
The RS-232C standard allows only as single point-to-point communications connection. Using this method, only one RS-232C-equipped device may be connected to the serial port of the computer or other device.

The cable connected to the computer is a standard RS-232C communications cable with a maximum length of 50 feet (15.2 m).
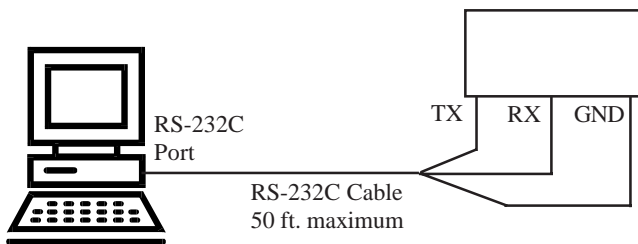
■ RS-485 CONNECTION

RS-485 communications allows multiple devices to be connected on the same bus. Up to 29 devices can be connected on a single RS-485 bus, which consists of a shielded, twisted pair cable. The overall length of the RS-485 cable connecting all devices cannot exceed 4000 ft (1219 m).
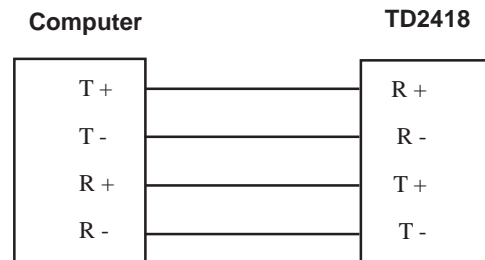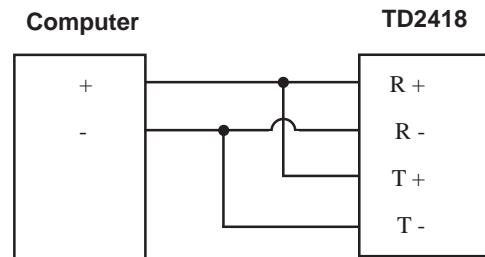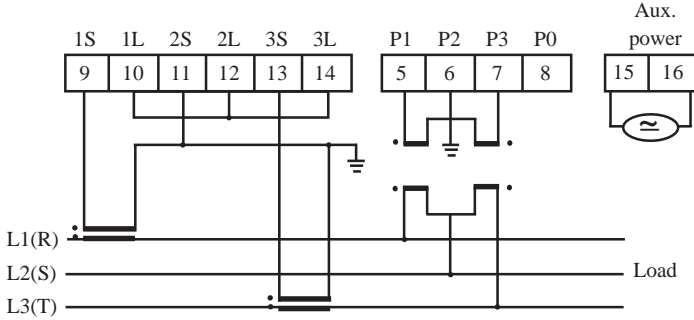
■ RS-232/RS-485 WIRING DIAGRAM

A: RS-232

Computer		TD2418
TX		RX
RX		TX
GND		GND

B: RS-485 (4 wires)

Computer		TD2418
T +		R +
T -		R -
R +		T +
R -		T -

C: RS-485 (2 wires)

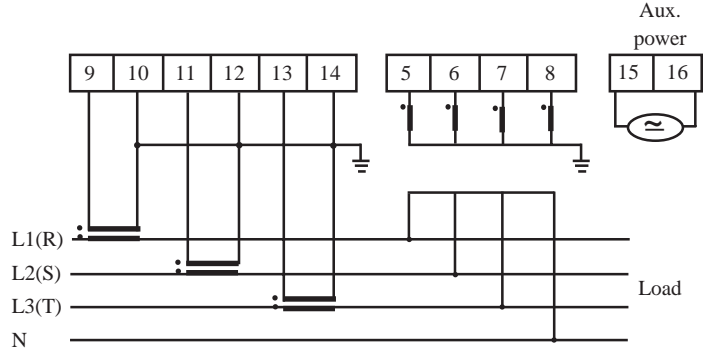| Computer		TD2418
+		R +
-		R -
		T +
		T -
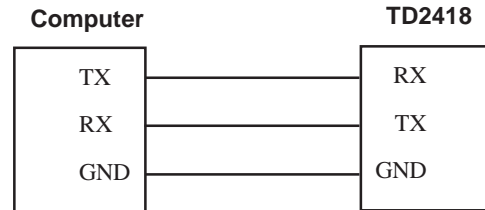
MULTI-FUNCTION POWER TRANSDUCER

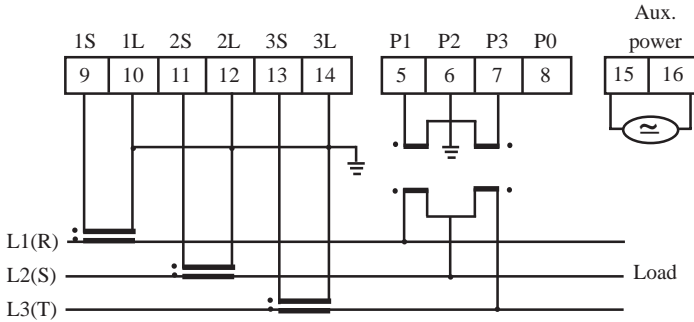## WIRING DIAGRAMS OF INPUT

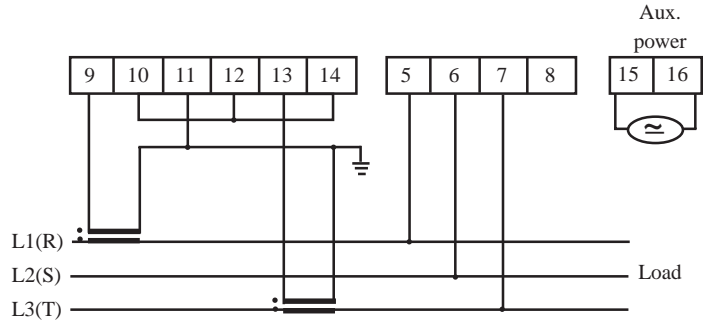### ■ 3 Phase 3 wires with 2CTs. 2PTs

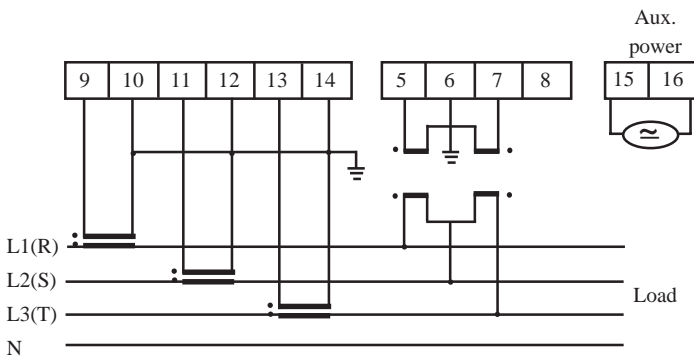### ■ 3 Phase 4 wires with 3CTs. 3PTs

■ 3 Phase 3 wires with 3CTs. 2PTs

■ 3 Phase 3 wires with 2CTs. no PT

■ 3 Phase 4 wires with 3CTs. 2PTs

■ 3 Phase 4 wires with 3CTs. no PT