AC Measurement

TEXMATE

Measurement & Control for the AC Power Industry

AC Measurement & Control

The Texmate family of digital displays, digital meter relays, intelligent controllers and transducers is designed to cover all your AC Measurement needs.
With an array of innovative features and display options you need look no further than Texmate.

DU-Series Meters

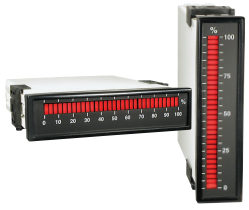
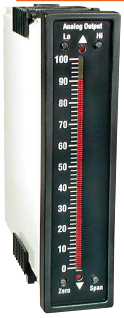
Digital Display only.

AC Volts	Model	Input Ranges Available	Digits	Case Size
	**DU-35AC**	AC volts, Scaled RMS. 199.9 / 700 V AC	3.5 digit.	96x48 mm
	DU-35ACRMS	AC volts, True RMS. 199.9 / 700 V AC	3.5 digit.	96x48 mm
	DU-40AC	AC volts, Scaled RMS. 700.0 V AC	4 digit.	96x48 mm
AC Amps	**DU-35ACI5**	AC amps, Scaled RMS. 1 Amp.	3.5 digit.	96x48 mm
	**DU-35ACI1**	AC amps, Scaled RMS. 5 Amp.	3.5 digit.	96x48 mm
	DU-35ACIRMS1	AC amps, True RMS. 1 Amp.	3.5 digit.	96x48 mm
	DU-35ACIRMS5	AC amps, True RMS. 5 Amp.	3.5 digit.	96x48 mm
	DU-40ACI1	AC amps, Scaled RMS. 1 Amp.	4 digit.	96x48 mm
	DU-40ACI5	AC amps, Scaled RMS. 5 Amp.	4 digit.	96x48 mm
AC Line Frequency	**DU-35Hz**	Line Frequency. 199.9 or 500 Hz. up to 700 V AC input.	3.5 digit.	96x48 mm
			3.5 digit.	96x48 mm

For low cost Non-DIN Case, see the UM Range on our website at: www.texmate.co.nz

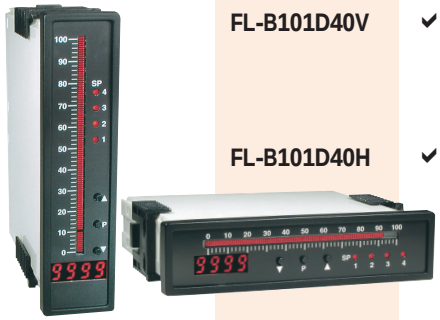
Lynx-Series Meters

Digital or Bargraph Display.
Analog Output and Relay Option with Specific Bargraph.

	Model	Input Ranges Available	Relays	Analog Output	Digits	Case Size
	**BX-35**	**AC Volts** **Description**			3.5 digit. 0.56"	96x24 mm
	**BX-45**	**IAO1** AC-Volts Scaled RMS, 200 / 600 V			4.5 digit. 0.56"	96x24 mm
	**DX-35**	**IAO2** AC-Volts Scaled RMS, 200 mV/2 V/20 V **IAO6** AC-Volts True RMS, 200 / 600 V **IAO7** AC-Volts True RMS, 200 mV/2 V/20 V			3.5 digit. 0.8"	96x48 mm
	**DX-40**	**IA10** AC-Millivolt Scaled RMS, 100 mV **IA12** AC-Millivolt True RMS, 100 mV			LG 4 digit. 0.8"	96x48 mm
	**DX-45**	**AC Amps** **IAO3** AC-mA Scaled RMS, 2/20/200 mA **IAO4** AC-Amps Scaled RMS, 0-1 A			4.5 digit. 0.56"	96x48 mm
	**BX-B31H** **BX-B31V**	**IAO5** AC-Amps Scaled RMS, 0-5 A **IAO8** AC-mA True RMS, 2/20/200 mA **IAO9** AC-Amps True RMS, 0-1 A	2		31 Segment Bargraph	96x48 mm
	**FX-B101Q**	**IA11** AC-Amps True RMS, 0-5 A **AC Line Frequency** **IFO2** Line Frequency, 50-500 VAC, 199.9 Hz or optional 400 Hz. All input modules suitable for meter range.		4-20 mA or 0-10 V	101 Segment Bargraph	144X36 mm

Leopard-Series Meters

Digital or Bargraph Display.
Analog Output and Relay Option with Specific Bargraph.

	Model	AC Volts	AC Amps	Freq	Relays	Analog Output	Digits	Case Size
	**BL-40**	✔	✔		3 Max	✔	4 digit.	96x24mm
	BL-40PSF				3 Max	✔	4 digit.	96x24mm
	BL-40F			✔	3 Max	✔	4 digit. 0.56"	96x24mm
	**DL-40**	✔	✔		4 Max	✔	4 digit.	96x48mm
	DL-40PSF		✔		4 Max	✔	4 digit.	96x48mm
	DL-40F			✔	4 Max	✔	4 digit. 0.56"	96x48mm
	**DL-40LR**	✔	✔		4 Max	✔	4 digit.	96x48mm
	DL-40FLR	✔	✔	✔	4 Max	✔	4 digit.	96x48mm
	DL-40PSFLR	✔	✔		4 Max	✔	4 digit. 0.8"	96x48mm
	**FL-B101D40V**	✔	✔		4 Max	✔	4 digit. 101 Segment Bargraph	144x36mm
	FL-B101D40H	✔	✔		4 Max	✔	4 digit. 101 Segment Bargraph 0.31"	144x36mm
	**FL-B101QV**	✔	✔		4 Max	✔	101 Segment Bargraph	144x36mm
	FL-B101QH	✔	✔		4 Max	✔	101 Segment Bargraph	144x36mm
	**FL-B202QV**	✔	✔		4 Max	✔	DUAL 101 Segment Bargraph	144x36mm
	FL-B202QH	✔	✔				DUAL 101 Segment Bargraph	144x36mm
	**BL-B51D40**	✔	✔		3 Max	✔	4 digit 51 Segment Bargraph 0.31"	96x24mm
	**PL-B101D40Q**	✔	✔		4 Max	✔	4 digit 101 Segment Bargraph 0.31"	144x24mm

AC Volts

IAO1 AC-Volts Scaled RMS, 200 / 600 V

IAO2 AC-Volts Scaled RMS, 200mV/2V/20V

IAO6 AC-Volts True RMS, 200 / 600 V

IAO7 AC-Volts True RMS, 200mV/2V/20V

IA10 AC-Millivolt Scaled RMS, 100mV

IA12 AC-Millivolt True RMS, 100mV

AC Amps

IAO3 AC-mA Scaled RMS, 2/20/200mA

IAO4 AC-Amps Scaled RMS, 0-1Amp

IAO5 AC-Amps Scaled RMS, 0-5Amp

IAO8 AC-mA True RMS, 2/20/200mA

IAO9 AC-Amps True RMS, 0-1Amp

IA11 AC-Amps True RMS, 0-5Amp

AC Line Frequency

IFO2 Line Frequency, 50-500VAC, 199.9Hz or optional 400Hz. Only suitable for:
BL-40F
DL-40F
DL-40FLR

Bargraph & 4-Digit Display Meter Relays

This versatile family of meters is designed to cover your AC application needs.
With an array of innovative features and display options, you need look no further than a Leopard for your next signal conditioner meter relay applications.

An Economical Smart Meter Relay

- *The **Quickest Setup** you will find in a **Panel Meter**.*
- ***Built-in Excitation** to power your sensors.*
- *Accepts **Process, AC, Volts, Amps, & Frequency Inputs**.*
- ***Step-by-step Prompts** makes configuration a breeze.*
- ***Field Scalable Analog Output** without recalibration.*
- ***Cost Competitive Bargraph Options**.*
- *Ideal for **Alarm**, **Genset Control**, **Signal Conditioning** and **Transducer Applications**.*

Relay

Up to 4 relay outputs available on DL, PL and FL models.
(2 x 5 amp form A and 2 x 10 amp form C)
Up to 3 relay outputs on BL and BL-B51
(3 x 5 amp form A or 1 x 10 amp form C).
Programmable delay-on-make and delay-on-break time on setpoints 1 and 2.

5 A
10 A
5 A
10 A
DOM DOB

Hysteresis

Analog Output

Isolated 0/4-20 mA or 0-10 V output scaleable to any desired span within the full scale range of the controller.

Power Supply

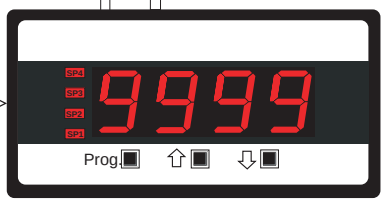
AC/DC
Power supply for voltages between 85-265 VAC/95-370 VDC or optional low voltage 18-48 VAC/10-72 VDC

Inputs

Will accept almost any AC input signal including:

Volts
Amps
Hz

24 V excitation for process applications.
5 V or 10 V excitation for load cell and pressure transducer applications.



Input to Chart Recorder

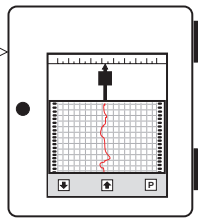


Chart Recorder

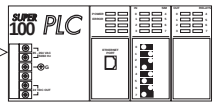
OR

Input to Remote Display

Remote Displays

OR

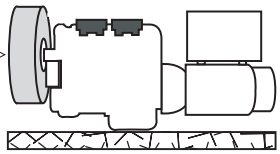
Input to PLC or Process Controller



PLC

OR

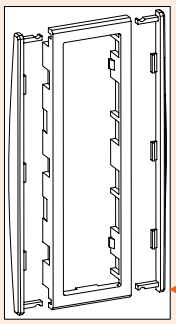
Analog Output to Speed Control Device



Speed Control Device

Mechanical Analog Meter Replacement

Panel Adapter fits 6" Edgewise Pointer Meter Cutouts.

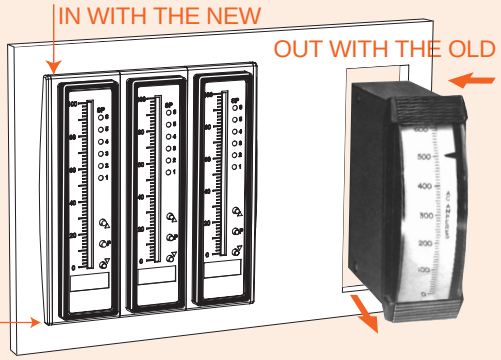


Fits existing cutouts for:
- Crompton
- G.E.
- Westinghouse
- Yokogawa
- and most others.

6" (150 mm) Edgewise Switchboard Pointer Meters.
Width: 43.7 mm to 48 mm (1.72") to (1.89")
Height: 143.4 mm to 149 mm (5.62") to (5.88")

PANEL ADAPTER
The adapter snaps on the 36 x 144 mm (1.42" x 5.69") case and enables single unit or stack mounting in an existing 6" edgewise pointer meter cut-out.

Two bezel trim strips are provided with each adapter to finish off the edge of each individually mounter meter or the edge of each stack mounted array.
These trim strips match the appearance of the trim strips used with most 6" mechanical meters.



Texmate's panel adapter enables modern DIN meters to fit in existing cutouts individually or stacked when replacing old 6" edgewise mechanical pointer meters.
Choose bargraphs from Lynx, Leopard, and Tiger families.

Use the Texmate Tiger 320 Series

- Motor Generator-Sets
- Load Control
- Current Control
- Voltage Control
- Frequency Control
- Power Factor Control
- Watts
- VAR
- Watt / Hrs
- VAR / Hrs
- Amp / Hrs
- Load Control
- Peak Display
- Average & Measurement
- RMS Measurement
- Null Offset Measurement
- Deviation Alarms
- Product Test Control

DI-50E

Single Phase - 2 or 3 Wire.

- Volts RMS.
- Amps RMS, (1A and 5A CT Input.)
- Frequency.
- Power factor.
- Watt and VAR Measurement.

Dual Totalizers for Amp/Hr, Watt/Hr, and VAR/Hr.

Power Factor Measurement and Control.

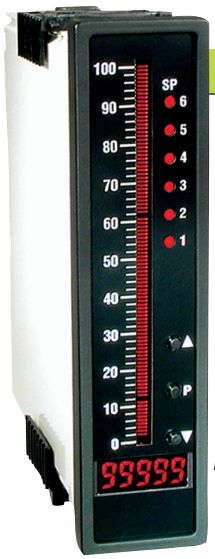
Peak Demand.

- Fixed Time or Block Internal Demand.
- Sliding Demand.
- Thermal Demand.

DI-503

Motor Generator-Set Control.

- Control Generator RPM.
- Max Load.
- Power Factor Alarm.
- kWh Measurement.
- kVAR Measurement.



FI-B101D50

6 Super-smart setpoints.

7 Programmable timer modes.

6 Relay outputs.

16-bit isolated analog output.

DI-60A5C

Dual totalizers.

Data logging.

Real-time clock.

Code blanking.

Display editing.

Scrolling text messaging.

Serial communications & direct printer output.

Custom macro programming with optional 22 opto-isolated I/Os.

for AC Measurement & Control

Tiger-Series Meters

Digital or Bargraph Display. Analog Output and Relay Option with Specific Bargraph.

Model	AC Volt	AC Amps	Freq	Relays	22I/O	Analog Output	Serial	Macro	Digits	Case Size
DI-50	✔	✔	✔	6 Max	✔	✔	✔	T/Ver.	5 digit.	96x48mm
DI-60A	✔	✔	✔	6 Max	✔	✔	✔	T/Ver.	6 digit Alphanumeric	96x48mm
DI-50AN6	✔	✔	✔	6 Max	✔	✔	✔	T/Ver.	5 digit. 6 Annunciators	96x48mm
DI-503	✔	✔	✔	6 Max	✔	✔	✔	T/Ver.	5 digit. 3 Displays	96x48mm
DI-50B51	✔	✔	✔	6 Max	✔	✔	✔	T/Ver.	5 digit. 51 Segment Bar	96x48mm
DI-802X	✔	✔	✔	6 Max	✔	✔	✔	T/Ver.	8 digit. 8 Digit x 2 Display Alphanumeric	96x48mm
FI-B101D50	✔	✔	✔	4 +		✔	✔	T/Ver.	5 digit. 101 Segment Bargraph	144x36mm
GI-50	✔	✔	✔	4 +		✔	✔	T/Ver.	5 digit Large.	144x72mm
GI-50B101	✔	✔	✔	4 +		✔	✔	T/Ver.	5 digit Large. 101 Segment	144x72mm

Input Ranges Available

AC Volts

	Description
IAO1	AC-Volts Scaled RMS, 200 / 600 V
IAO2	AC-Volts Scaled RMS, 200 mV/2 V/20 V
IAO6	AC-Volts True RMS, 200 / 600 V
IAO7	AC-Volts True RMS, 200mV/2 V/20 V
IA10	AC-Millivolt Scaled RMS, 100mV
IA12	AC-Millivolt True RMS, 100 mV

AC Amps

	Description
IAO3	AC-mA Scaled RMS, 2/20/200 mA
IAO4	AC-Amps Scaled RMS, 0-1 A
IAO5	AC-Amps Scaled RMS, 0-5A
IAO8	AC-mA True RMS, 2/20/200 mA
IAO9	AC-Amps True RMS, 0-1 A
IA11	AC-Amps True RMS, 0-5 A

AC Line Frequency

IFO2	Line Frequency, 50-500VAC, 199.9 Hz or optional 400 Hz.

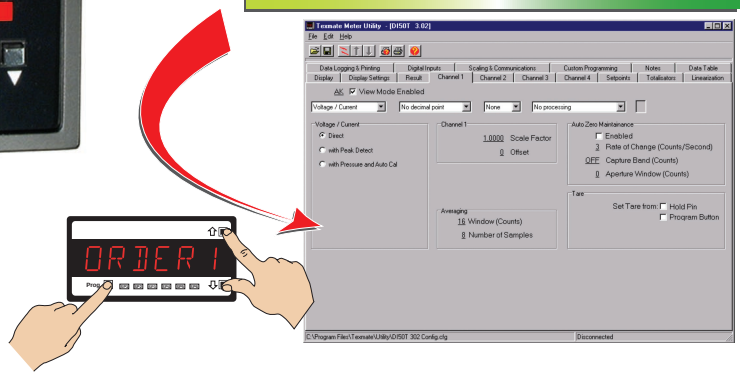
AC Watts Single Phase Power

IWO1	(Watts, V, A, Hz, PF, Whr) 300V/1A, 600V/1A
IWO2	(Watts, V, A, Hz, PF, Whr) 300 V/5 A, 600 V/5 A

DI-50B51 *DI-50AN6* *DI-802*

Configuration & Programming

from front buttons or from a PC.



Display Options

5-digit, 7-segment, 13 mm LED display.
6-digit, 14-segment, 13 mm alphanumeric LED display.
3 x 5-digit, 7-segment, 8 mm LED display.
5-digit, 7-segment, 8 mm LED display + 50-segment LED bargraph.
5-digit, 7-segment, 8 mm LED display + 101-segment red, green or tri-colour bargraph.
3,4,5,or 6-digit, 7-segment, 100 mm remote LED display.
5-digit, 7-segment, 25 mm LED display with or without 101-segment red, green or tri-colour bargraph.

Power Supply

PS1.....85-265 VAC/ 95-370 VDC
PS2.....15-48 VAC/ 10-72 VDC

Signal Averaging

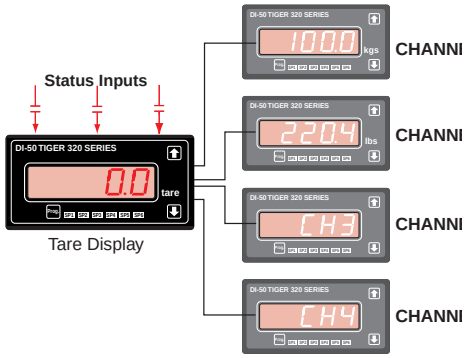
Programmable input signal 'windowed' averaging provides fast display response time.
The signal is then averaged within the window for ultra-low noise.

Multi-Display Options

From a 1, 2 or 3 display meter, 4 channels, total, total 2, peak and valley can be displayed using the UP and DOWN buttons or from a remote switched input.

The single phase power input module can be used to measure and display selected combinations of the following: Volts, Amps, Hertz, Power factor.

kW, kWh, kVAR, and kVARh.



Null Offset

The display can be zeroed from the front panel to set the position of the ideal input signal value. This is known as the null offset. From the null offset any positive or negative deviation to the ideal signal value is indicated on the display.

Linearization

The Tiger 320 Operating System has up to four user programmable linearization tables available. Standard 4 kilobit E meters have one linearization table that can be increased to four with a memory upgrade to 32 kilobits. Standard 32 kilobit T meters have four linearization tables available for CT linearization.

Peak and Valley Hold

Peak and valley readings are retained in the meter. They can be viewed on the normal display or by pressing the UP or DOWN buttons. Peak and valley can be reset from the front panel or from a remote switch.

Smart input modules can capture and display peak and valley at 50, or 800 Hz.

Peak Demand Meter

One of three different techniques can be selected to measure demand.

1. Fixed Time or Block Internal Demand.

In this mode, the demand is the average of the signal (normally AC current, power or apparent power) over a set time programmable from 1- 60 minutes.

2. Sliding Demand.

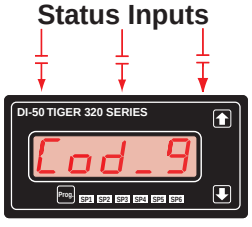
This is the average of the previous 15 minutes updated every 100 msec.

3. Thermal Demand.

An algorithm is used which simulates the thermal response of an analog demand meter. The demand setting can be programmed from 1- 60 minutes.

Status Inputs

With the standard Tiger 320 Series controller, three status inputs are available from remote switched inputs for null offset, reset peak and valley, channel viewing and register reset functions.



Six Setpoints for Advanced Control and Relay Output Options

All Tiger 320 Series meters have six LED setpoint status indicators on the front panel. Setpoints can be activated for advanced control functions from any channel or register for relay control and register reset.

Note: a 22 I/O option card is available for macro controlled applications

Relay Outputs

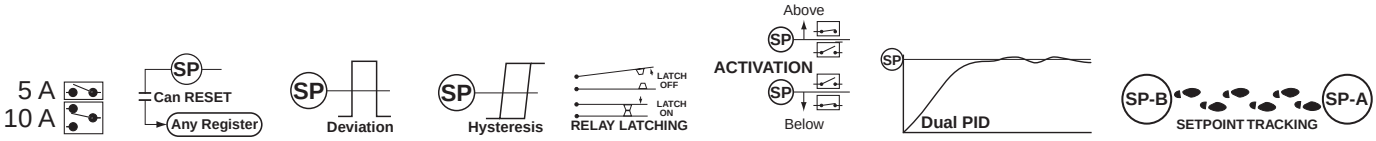
Six optional relay outputs are available. Order only the number of relays or 5 V SSR outputs you require for your application.

The relays can be individually programmed to operate from any channel or register, above or below a setpoint value, with or without start up inhibit, programmable hysteresis or deviation or as a timer. Dual PID control is available.

Programmable LATCH ON or LATCH OFF (for fail-safe applications) on all relays with latch reset from a setpoint or a remote switched input.

Setpoint tracking is available.

Relay outputs are activated within 10 milliseconds from setpoint activation.

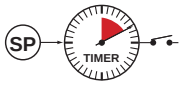


Timer Functions

The Tiger 320 series controller has super smart resident timers for process / time control applications.

The resident timers are programmable in 7 modes.

The timer functions are a standard feature on all six setpoints.



Single & Multiple Activation Timers

Normal .....Delay On Make / Delay On Break
1-Shot ON .....Delay On Make / Min ON-Time
1-Shot OFF .....Delay On Break / Min OFF-Time
Pulse ON .....Delay On Make / Max ON-Time
Pulse OFF .....Delay On Break / Max OFF-Time
Repeat ON.....ON-Time / OFF-Time
Repeat OFF .....OFF-Time / ON-Time

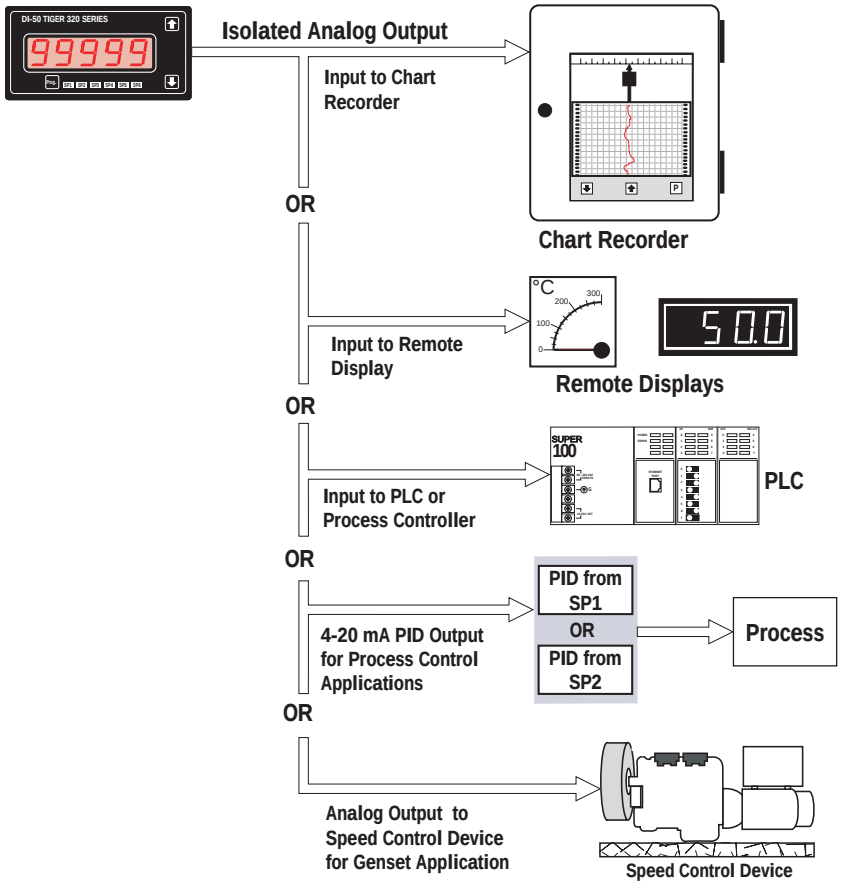
Dual Scalable Totalizers for Amp Hrs, VARh, Whr

The controller stores totals and sub totals in separate non-volatile registers.

The totals can be displayed and independently reset.

Isolated Analog Output

Optional isolated 16-bit, single 0-10 V or 0/4-20 mA, or dual 0-10 V is available. The output is scalable to any desired span within the full scale range of the controller in repeat or inverted mode for retransmission. 4-20 mA analog output is available from the proportional band of the PID register from setpoint 1 and 2.



Serial Communication

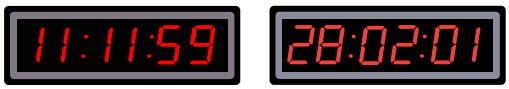
Isolated RS-232, RS-485 in ASCII code format, Modbus (slave) external Ethernet available, or DeviceNet with an optional card. Meter to meter communication is available using an RS-485 serial connection.

Direct Serial Printer or Large Display Driver Output

The Tiger 320 Series controller can be connected directly to most serial printers. Activated from a setpoint, the program, button or from an external switch the meter can print directly from selected registers, the date / time, number, weight, peak, valley, average, total, differential, or result of a calculation, etc.

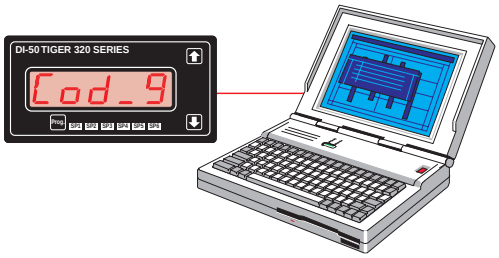
Real-time Clock Option

An optional resident real-time clock is available for time stamping in data logging and printing applications.



Data Logging

4000 samples can be logged within the meter. The data can be downloaded with date / time records to a computer using Windows Hyper-terminal program.



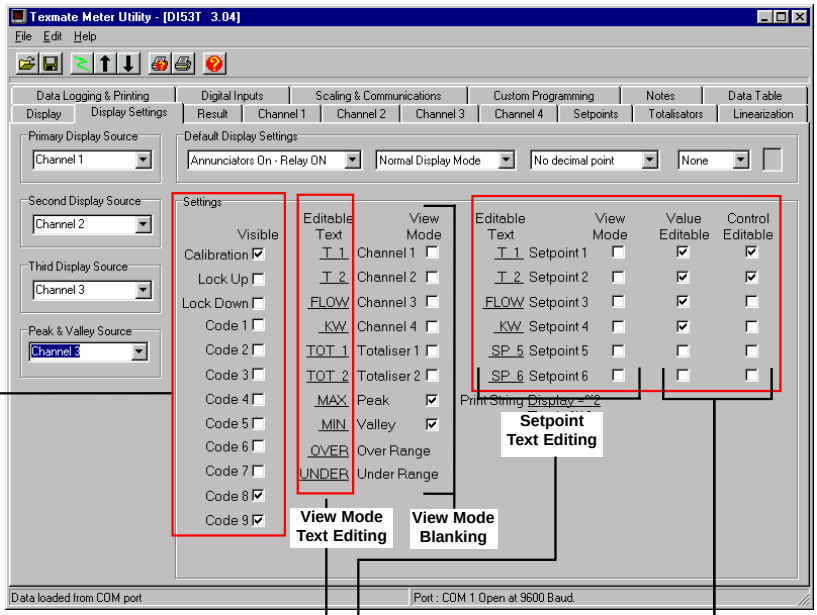
Texmate Configuration

The Tiger 320 Series controller is programmable from the front panel buttons or using the Texmate developed meter configuration utility software. The configuration utility program provides access to added features such as code blanking and display editing.

Code Blanking & Display Editing

Through the serial port, the controller can be programmed to blank out all or selected or non-required codes, as well as providing descriptive text messaging to suit a specific application. These features enable the controller to be easily configured and safely operated.

Code Blanking
Select only the codes you want to see.
In the example screen, Calibration, Code 8, and Code 9 are checked, meaning they are not blanked and still open for reconfiguration.



View Mode Text Editing
Edit display text to suit your application. Double-click underlined text to edit.
In the example screen, the text in the Editable Text column has been modified to suit a particular application. Only the peak (MAX) and valley (MIN) readings are viewable in the View Mode.

Setpoint Text Editing
Setpoints 1-4 have been edited to read T1, T2, flow, and KW.

Setpoint Blanking
Select only the setpoints you want to see.
In the example screen, with setpoints 5 and 6 in the Value Editable column clear, the setpoint value of setpoints 1 to 4 are still able to be adjusted.
With setpoints 3 to 6 in the Control Editable column clear, the control settings of setpoints 1 and 2 can still be fully configured for timer modes.

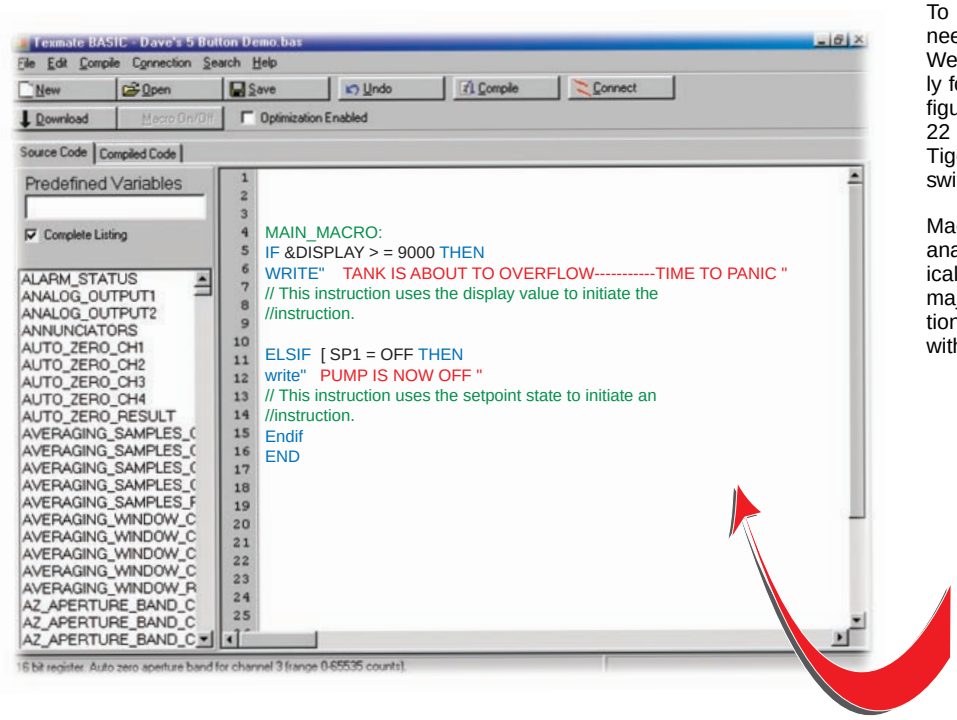
Texmate Development Software

Tiger 320 Macro Overview

The Tiger 320 Series of programmable meter controllers have been designed to incorporate the analog and digital functionality of an intelligent controller with the logic of a PLC.

Traditionally, the PLC approach is to build a working application entirely in some form of programming language. The approach used in the Tiger 320 Series of meters is to build an application by selecting the pre-programmed functions of the controller and then adding small amounts of programmability and logic where needed.

The operating system of the Tiger 320 controller controls all the pre-programmed functions, handling the input, averaging, scaling, linearization, totalization and much more, as well as driving the display, timers, relays, analog and serial outputs. Once configured, these functions are executed by the operating system and form the basis of a control system.



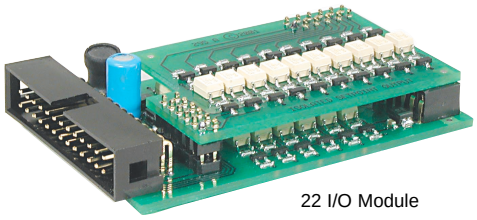
To form an advanced automation and control system you only need to write a small program that adds the extra logic required. We call this program a macro. A macro can be written specifically for your application and is used to initiate a sequence, reconfigure or disable some of the controller functions. With Texmate's 22 I/O plug-in module installed, a macro further expands the Tiger 320 operating system with additional status inputs and switched outputs.

Macro control is ideal for many OEM applications that require analog, digital, and timer functions with sophisticated mathematical and enhanced logic operations. The macro concept has major cost advantages for large or small sophisticated applications that require some degree of programmable logic control with display and front panel control.

BASIC Compiler

Example showing text messaging macro from a display value and setpoint state.

Note: The SP1 value is adjustable by the operator. The IF & DISPLAY value is not adjustable by the operator.



22 I/O Module

Scrolling Text Messaging

Scrolling text messaging is another bonus from running a macro. Any number of messages for detailed operator instructions, of up to 100 characters each, can be written into the macro during compilation for detailed operator instructions, alarm and control applications.

Alphanumeric Displays

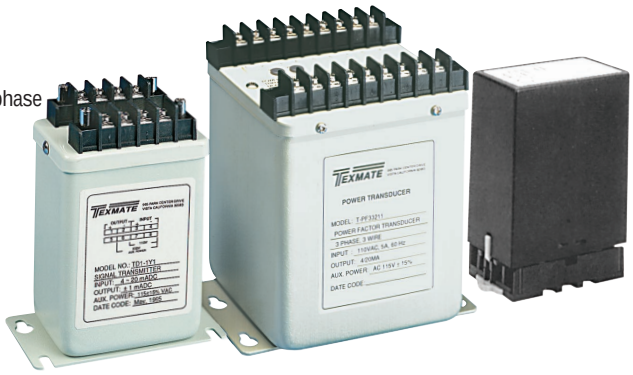
14-segment alphanumeric displays are Texmate's display choice for easy to read display text and scrolling text messaging.

	7-SEGMENT		14-SEGMENT
For "tank low" as:	tnk_L	or	TNK_LO
or for "slow" as:	SLOWJ	or	SLOW

Power Transducers & Signal Transmitters

High Accuracy, High Immunity to external noise.
Wide selection of Input and Output Range.

Type includes:
DC Voltage / Current
AC Voltage
AC Current, single or 3-phase
Watt / VAR, single or 3-phase
Watt hour, single or 3-phase
Watt (active power), single or 3-phase
VAR (reactive power), single or 3-phase
Phase angle single or 3-phase
Frequency
VAR hour, single or 3-phase
Power factor, single or 3-phase
RTD or Thermocouple
Frequency to DC/DC frequency



Power Transducers

Part No.	Description

AC Current Transducer
High accuracy ± 0.2% rated output. Input 0-1 A / 0-5 A / 0-10 A AC.
Output 4-20 mA / 0-20 mA / 0-10 mA / 0-5 mA / 0-1 mA
or 0-1 V / 0-5 V / 1-5 V / 0-1 V. Option: 0-20 mA, 0-12 V max.
Power supply: AC115/230 ± 15% standard.

TA-1	1 ϕ, Average
TA-1T	1 ϕ, True RMS
TA-3	3 ϕ, Average
TA-3T	3 ϕ, True RMS
TAN-1	1 ϕ, Average, self-powered, output: 0-1mA DC only
TAN-3	3 ϕ, Average, self-powered, output: 0-1mA DC only

AC Voltage Transducer
High accuracy ± 0.2% rated output. Input 0-150 V / 0-300 / 0-600 V AC.
Output 4-20 mA / 0-20 mA / 0-10 mA / 0-5 mA / 0-1 mA
or 0-10 V / 0-5 V / 1-5 V / 0-1 V. Option: 0-20 mA, 0-12 V max.
Power supply: AC115/230 ± 15% standard. Self-powered: output 0-1 mA DC only.

TV-1	1 ϕ, Average
TV-1T	1 ϕ, True RMS
TV-3	3 ϕ, Average
TV-3T	3 ϕ, True RMS

Watt and VAR Transducers
High accuracy ± 0.2% Reading, ±0.1% rated output. Input 120 V / 240 V AC / 5 A / 600 V AC, 10 A. Input frequency: 50/60 Hz ±3 Hz. DC output: 4-20 mA / 0-20 mA / 0-10 mA / 0-5 mA / 0-1 mA / -10~0~+10 mA / -1~0~+1 mA or0-10 V / 0-5 V / 1-5 V / 0-1 V / -10~0~+10 V / -1~0~+1 V / Option; ±20 mA, ±12 V max.

TW-12	1 ϕ, 2 Wires, Watt
TW-13	1 ϕ, 3 Wires, Watt
TW-33	3 ϕ, 3 Wires, Watt
TW-34	3 ϕ, 4 Wires, Watt
TQ-12	1 ϕ, 2 Wires, VAR
TQ-13	1 ϕ, 3 Wires, VAR
TQ-33	3 ϕ, 3 Wires, VAR
TQ-34	3 ϕ, 4 Wires, VAR
TWQ-12	1 ϕ, 2 Wires, Watt plus VAR
TWQ-13	1 ϕ, 3 Wires, Watt plus VAR
TWQ-33	3 ϕ, 3 Wires, Watt plus VAR
TWQ-34	3 ϕ, 4 Wires, Watt plus VAR

Power Transducers

Part No.	Description

Watt Hour and VAR Hour Transducers
High accuracy ± 0.2% Reading, ±0.1% rated output (WH); ±0.25% reading, +0.1% rated output (VARH). Input: 120 V / 240 V AC, 5 A / 600 V AC, 10 A. Input frequency: 50/60 Hz ±3 Hz. Frequency Output: 1/10 Pulse. Frequency Output Mode: Open collector/Reed relay. Two frequency output: Forward+Reverse/ Forward only. DC output: 4-20 mA / 0-20 mA / 0-10 mA / 0-5 mA / 0-1 mA / -10~0~=10 mA / -1~0~+1 mA or 0-10 V / 0-5 V / 0-1 V / -10~0~+10 V / -1~0~+1 V. Option: ±20 mA, ±12 V max. Power supply: AC 115/230 ±15%, 50/60 Hz standard.

TWH-12	1 ϕ, 2 Wires, Watt-Hour
TWH-13	1 ϕ, 3 Wires, Watt-Hour
TWH-33	3 ϕ, 3 Wires, Watt-Hour
TWH-34	3 ϕ, 4 Wires, Watt-Hour
TQH-12	1 ϕ, 2 Wires, VAR-Hour
TQH-13	1 ϕ, 3 Wires, VAR-Hour
TQH-33	3 ϕ, 3 Wires, VAR-Hour
TQH-34	3 ϕ, 4 Wires, VAR-Hour
TWWH-12	1 ϕ, 2 Wires, Watt-Hour + Watt
TWWH-13	1 ϕ, 3 Wires, Watt-Hour + Watt
TWWH-33	3 ϕ, 3 Wires, Watt-Hour + Watt
TWWH-34	3 ϕ, 4 Wires, Watt-Hour + Watt
TQQH-12	1 ϕ, 2 Wires, VAR-Hour + VAR
TQQH-13	1 ϕ, 3 Wires, VAR-Hour + VAR
TQQH-33	3 ϕ, 3 Wires, VAR-Hour + VAR
TQQH-34	3 ϕ, 4 Wires, VAR-Hour + VAR

Power Factor and Phase Angle Transducer
High accuracy 0.5% FS ± 0.3° rated output. Input 30-600 VAC, 5 A / option. Input Frequency: 50/60 Hz ± 3 Hz. DC Output: 4~12~20 mA / 1-10~0~+10 mA / -1~0~+1 mA or 0~5~10 V / -5~0~+5 V / 1~3~5 V / Option: ± 20 mA, ± 12 V max. Power supply: AC115/230 ± 15% 50/60 Hz standard. Self-powered or Options.

TPF-12	1 ϕ, 2 Wires, Power Factor (COSθ)
TPF-33	3 ϕ, 3 Wires, Power Factor (COSθ)
TPF-34	3 ϕ, 4 Wires, Power Factor (COSθ)
TPA-12	1 ϕ, 2 Wires, Phase Angle
TPA-33	3 ϕ, 3 Wires, Phase Angle
TPA-34	3 ϕ, 4 Wires, Phase Angle

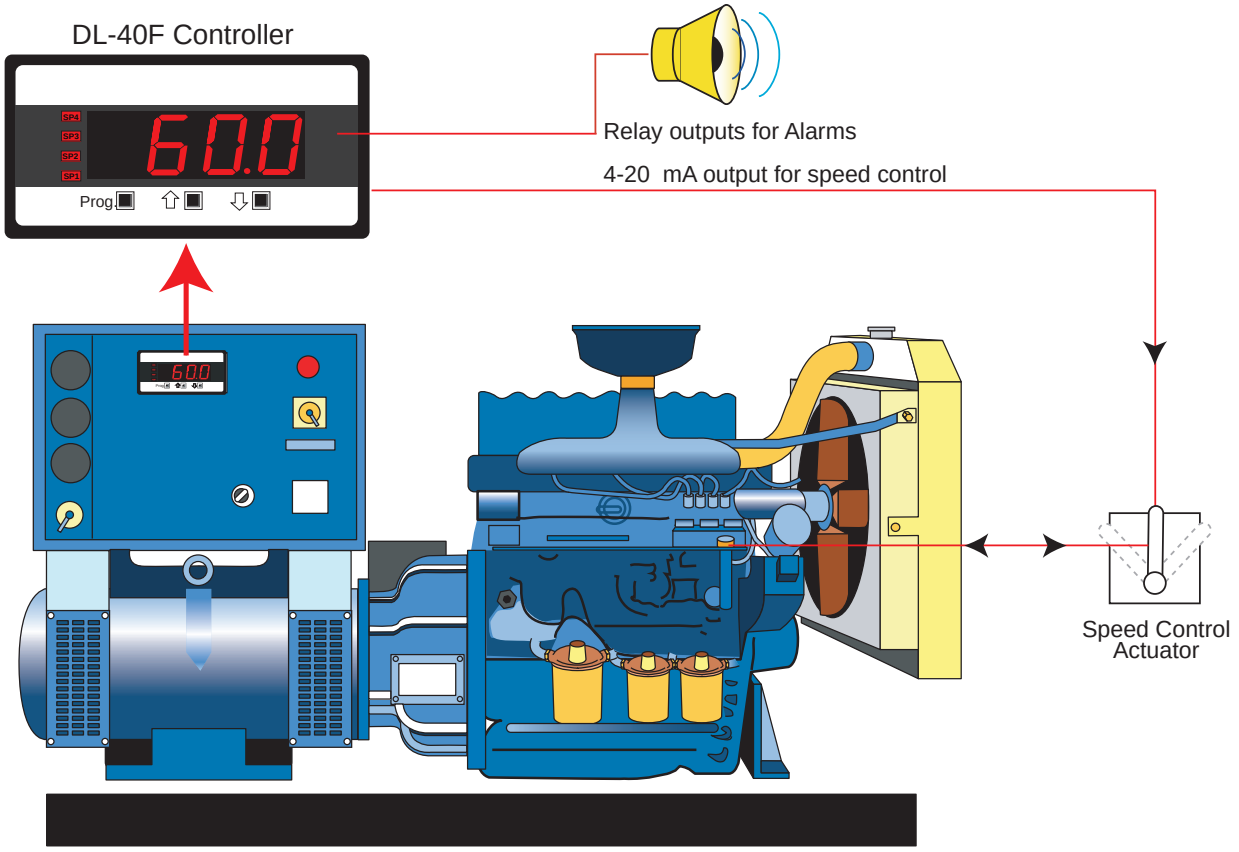
Frequency Transducer
High accuracy ± 0.05% rated output. Input Frequency: 45-55 Hz / 55-65 Hz / 45-65 Hz / 0-100 Hz / 0-1 KHz / Option. Input Volt: 30-600 V / 2-200 V AC DC output: 4-20 mA / 0-10 mA / 0-1 mA or 0-10 V / 0-5 V / 0-1 V / Option: 0-20 mA, 0-12 V max. power Supply: AC115/230 ±15%, 50/60 Hz std. or Options.

TF-1	Frequency Transducer

AC Measurement Applications

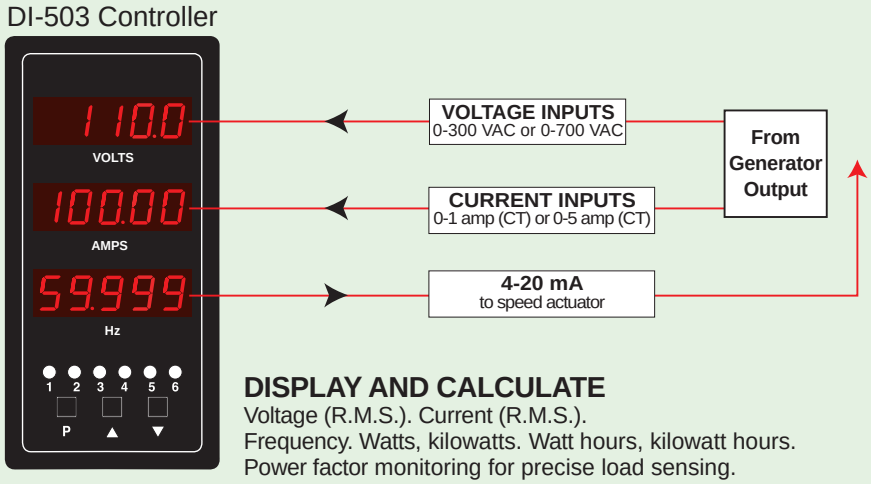
Motor Generator-Set Frequency Control.

Our customer has a motor generator set that requires to be controlled at 60 Hz output frequency.
Texmate installed a DL-40F controller to measure and display the frequency and to control the motor speed control actuator via the 4-20 mA analog output. The analog output is scaled at 55 Hz for 4 mA and 65 Hz for 20 mA. The speed control actuator is set to 12 mA to govern the speed at a generator output of 60.0 Hz.
If the frequency falls below 60.0 Hz, the motor speed increases.
If the frequency rises above 60.0 Hz, then the motor speed decreases.



OPTIONS & VARIATIONS

- Up to 6 super smart relay outputs, digitally programmable upper and lower limits.
- Programmable deviation mode, hysteresis mode, latch ON or latch OFF.
- Built-in super smart timers on each setpoint.
- Programmable DOM to eliminate nuisance tripping.
- Power ON inhibit to avoid tripping during power up.
- 4-20 mA or dual 0-10 V, 16-bit analog output.
- RS-232 or RS-485.
- DeviceNet / ModBus.
- Direct serial printer output.
- Data logging with real-time clock.



DISPLAY AND CALCULATE

Voltage (R.M.S.). Current (R.M.S.).
Frequency. Watts, kilowatts. Watt hours, kilowatt hours.
Power factor monitoring for precise load sensing.

AC Measurement Applications

Peak Demand

Demand and peak demand are important measurements for large consumers of electricity. This is because the price utilities charge for electricity is related to the peak usage of the consumer over the billing period.

The **Electronic Demand Meter** from Texmate is ideal as a submetering system that can measure and track demand and peak demand in different parts of the factory. This information can then be used to manage the overall peak demand strategy of the factory.

If the real-time clock option is installed in the **electronic demand meter**, the meter can log or print the time the peak demand occured.

The 6 setpoints can be used for load switching or alarms.

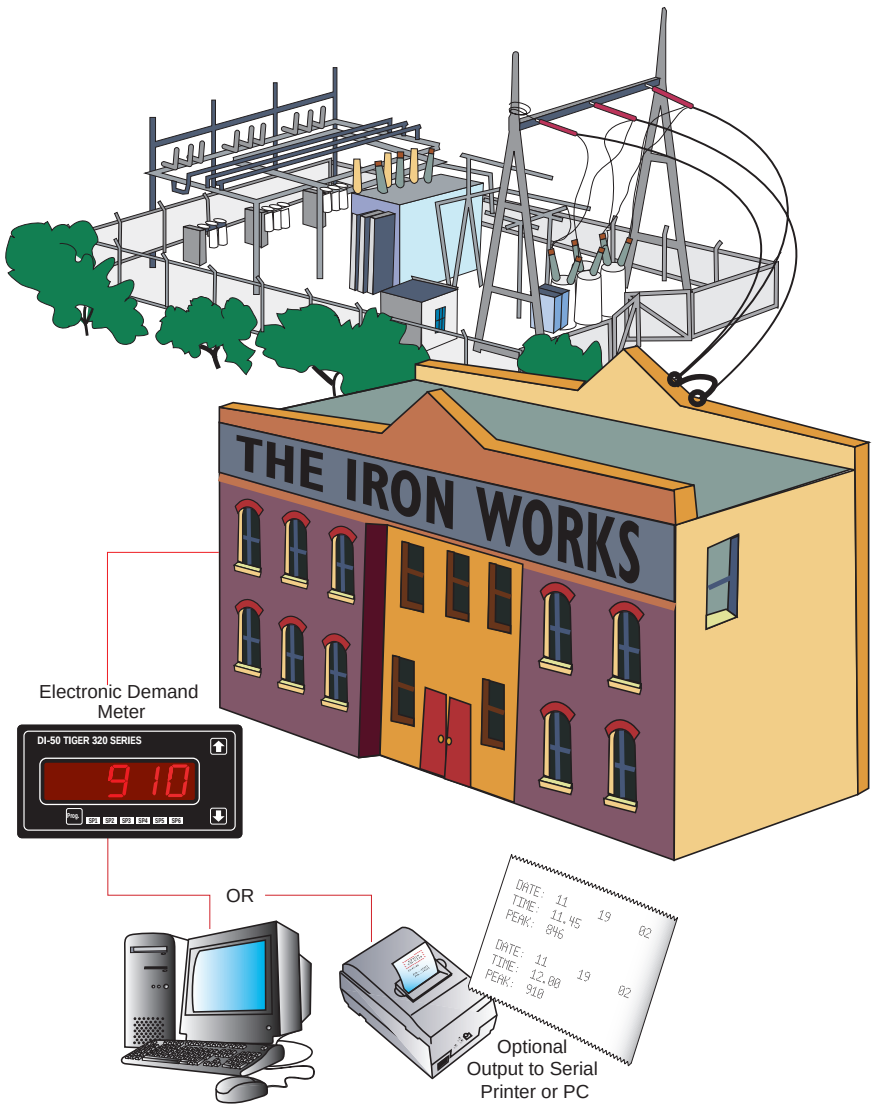
If an IWO2 watt input module is installed, the amps, volts, frequency kW, and kWh power factor readings can be viewed by using the UP and DOWN buttons.

One of three different techniques can be selected to measure demand.

1. Fixed Time or Block Internal Demand.
In this mode, the demand is the average of the signal (normally AC current, power or apparent power) over a set time programmable from 1 - 60 minutes.

2. Sliding Demand.
This is the average of the previous 15 minutes updated every 100 msec.

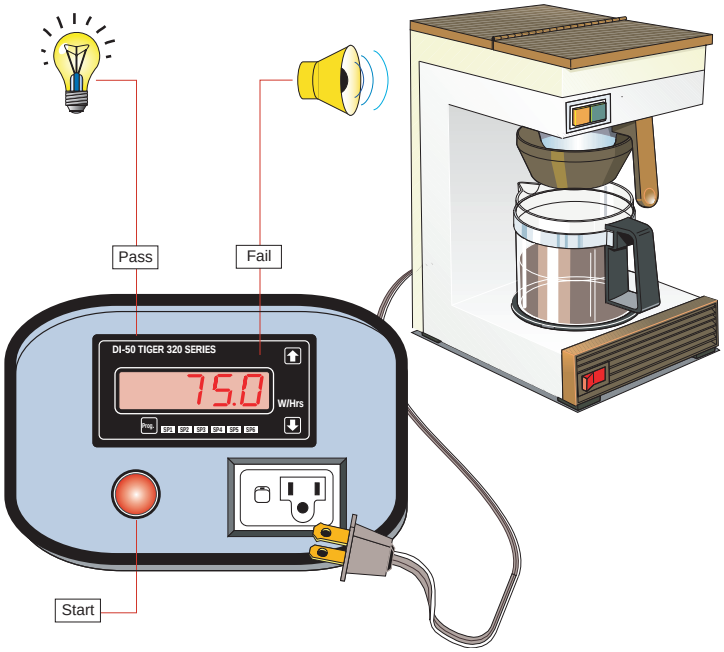
3. Thermal Demand.
An algorithm is used which simulates the thermal
response of an analog demand meter. The demand
setting can be programmed from 1 - 60 minutes.



Watt / Hour Appliance Test

Our customer requires a quality control test for watt/hour rating of electrical appliances. The test is carried out over 5 minutes. A Texmate DI-50E meter with a watt input module is installed. The meter is programmed to totalize the watt/hours when the start button is pressed. The meter totalizes the watts for 5 minutes and the watt/hour rating is held on the display.

When the next appliance is connected, the start button is pressed, the meter is reset to 0 and counts the watts for 5 minutes again. A setpoint is programmed in the deviation mode to indicate PASS/ FAIL. The appliance ON-time is programmable to suit your application.



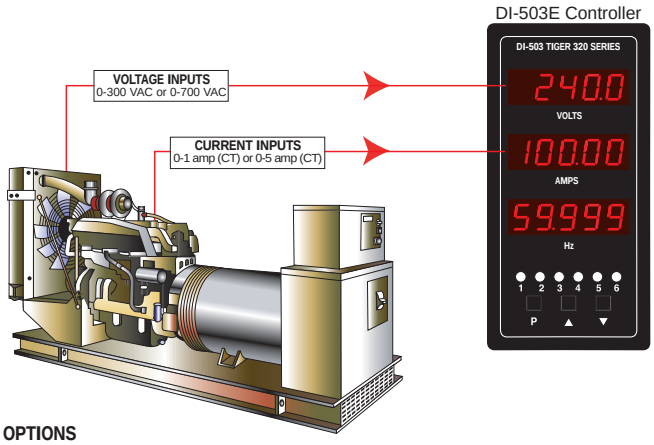
AC Measurement Applications

Single Phase Measurement and Control

It is no longer necessary to use combinations of transducers to achieve a power measurement and control system.

A Texmate Tiger 320 Series DI-503 meter, installed with a single-phase power input module, calculates and displays volts, amps, Hz, watts, watt hours, and power factor from a single-phase 2 or 3-wire voltage and current input.

The optional relay, analog and serial outputs can be configured from all the above parameters to interface with a control or alarm system.

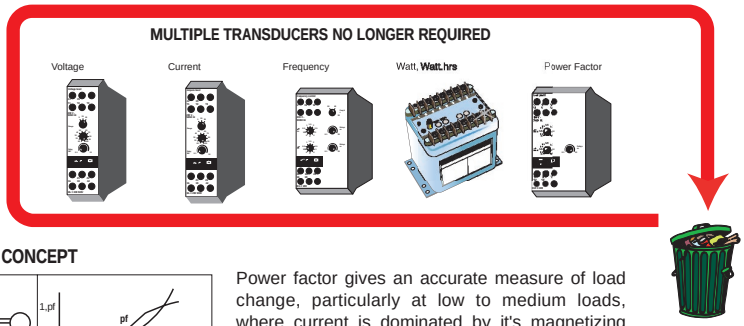


DISPLAY AND CALCULATE

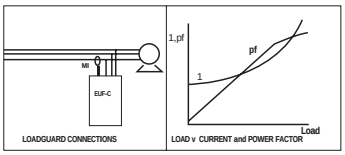
Voltage (R.M.S.).
Current (R.M.S.).
Frequency.
Watts, kilowatts.
Watt hours, kilowatt hours.
Power factor monitoring for precise load sensing.*

OPTIONS

- Up to 6 super smart relay outputs, digitally programmable upper and lower limits.
- Programmable deviation mode, hysteresis mode, latch ON or latch OFF.
- Built-in super smart timers on each setpoint.
- Programmable DOM to eliminate nuisance tripping.
- Power ON inhibit to avoid tripping during power up.
- Dual 4-20 mA or 0-10 V, 16-bit analog output.
- RS-232 or RS-485.
- DeviceNet / ModBus.
- Direct serial printer output.
- Data logging with real-time clock.



*** APPLICATION CONCEPT**



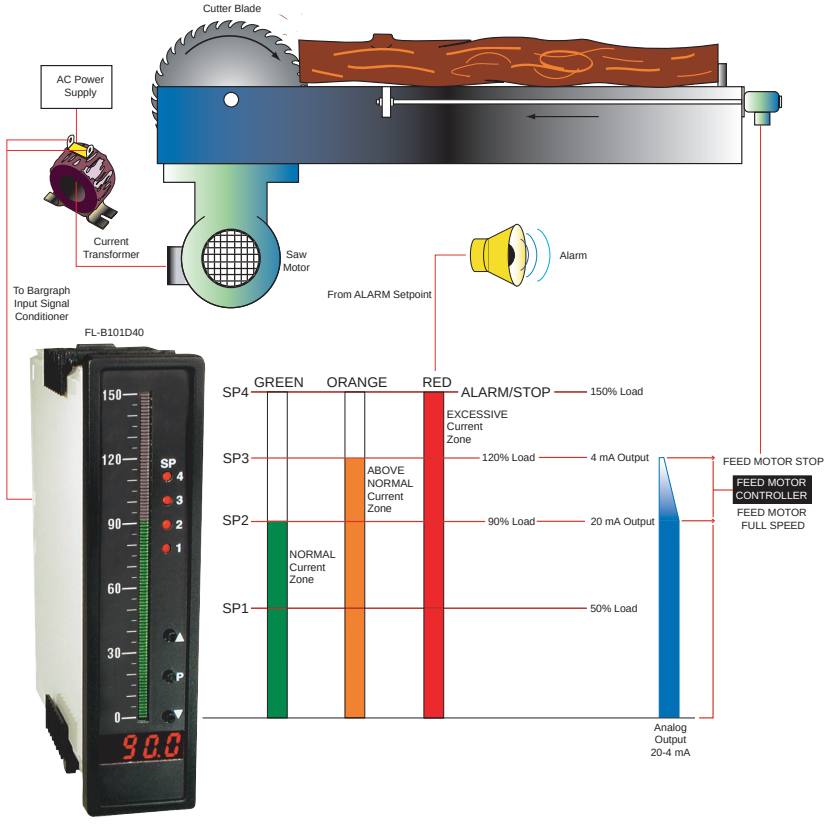
Power factor gives an accurate measure of load change, particularly at low to medium loads, where current is dominated by it's magnetizing element. Where prompt action is required the optional relays in the Tiger 320 Series meter can be used for protection against broken belts, pump cavitation, conveyor stalling and general overloads.

AC Current Measurement with Load Control

Our customer has a large log saw with a log feed motor and requires to optimize efficiency of the cutting operation.

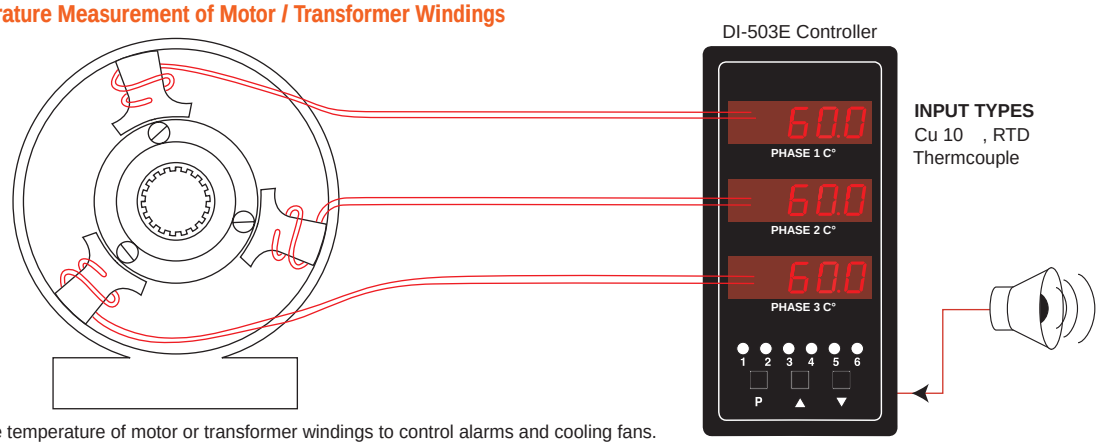
The log feed motor speed is controlled by the 4-20 mA output scaled from the saw blade motor current. As the saw motor load increases above 90% load, the log feed motor slows. If the load increases above 130%, the feed motor stops. If the load increases to 150%, the saw motor stops.

The motor load is represented on the tri-color bargraph. The bargraph scale indicates 1% steps in motor current, and changes from green to orange at 90% load and orange to red at 120% load. The digital display indicates saw motor amps.



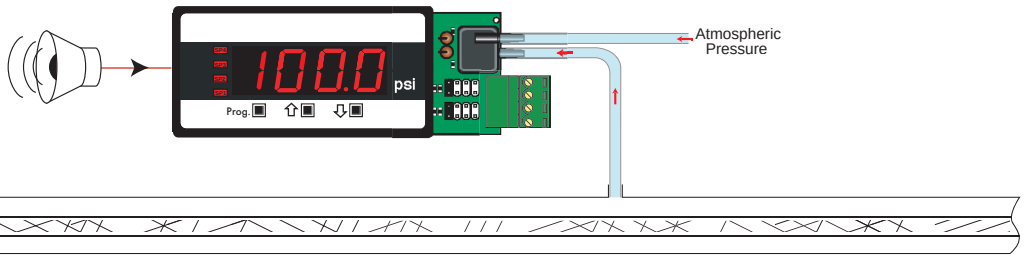
Related Applications

Temperature Measurement of Motor / Transformer Windings



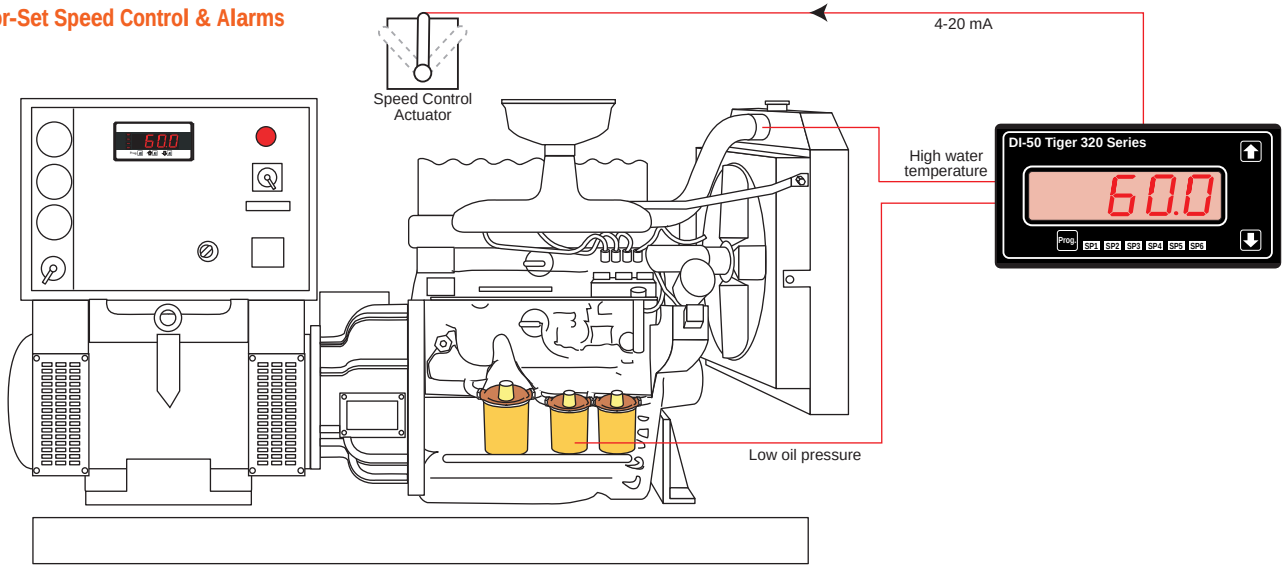
Measure temperature of motor or transformer windings to control alarms and cooling fans.

Direct pressure Transformer Cable



Measure pressure in transformers and underground cables using a direct pressure module for pressure alarms.

Generator-Set Speed Control & Alarms



Control genset RPM with low oil pressure, and high water temperature. Shut down from switched inputs.

WARRANTY

Texmate warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment. Texmate's obligations under this warranty are limited to replacement or repair, at its option, at its factory, of any of the products which shall, within the applicable period after shipment, be returned to Texmate's facility, transportation charges prepaid, and which are, after examination, disclosed to the satisfaction of Texmate to be thus defective. The warranty shall not apply to any equipment which shall have been repaired or altered, except by Texmate, or which shall have been subjected to misuse, negligence, or accident. In no case shall Texmate's liability exceed the original purchase price. The aforementioned provisions do not extend the original warranty period of any product which has been either repaired or replaced by Texmate.

USER'S RESPONSIBILITY

We are pleased to offer suggestions on the use of our various products either by way of printed matter or through direct contact with our sales/application engineering staff. However, since we have no control over the use of our products once they are shipped, NO WARRANTY WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE is made beyond the repair, replacement, or refund of purchase price at the sole discretion of Texmate. Users shall determine the suitability of the product for the intended application before using, and the users assume all risk and liability whatsoever in connection therewith, regardless of any of our suggestions or statements as to application or construction. In no event shall Texmate's liability, in law or otherwise, be in excess of the purchase price of the product.

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