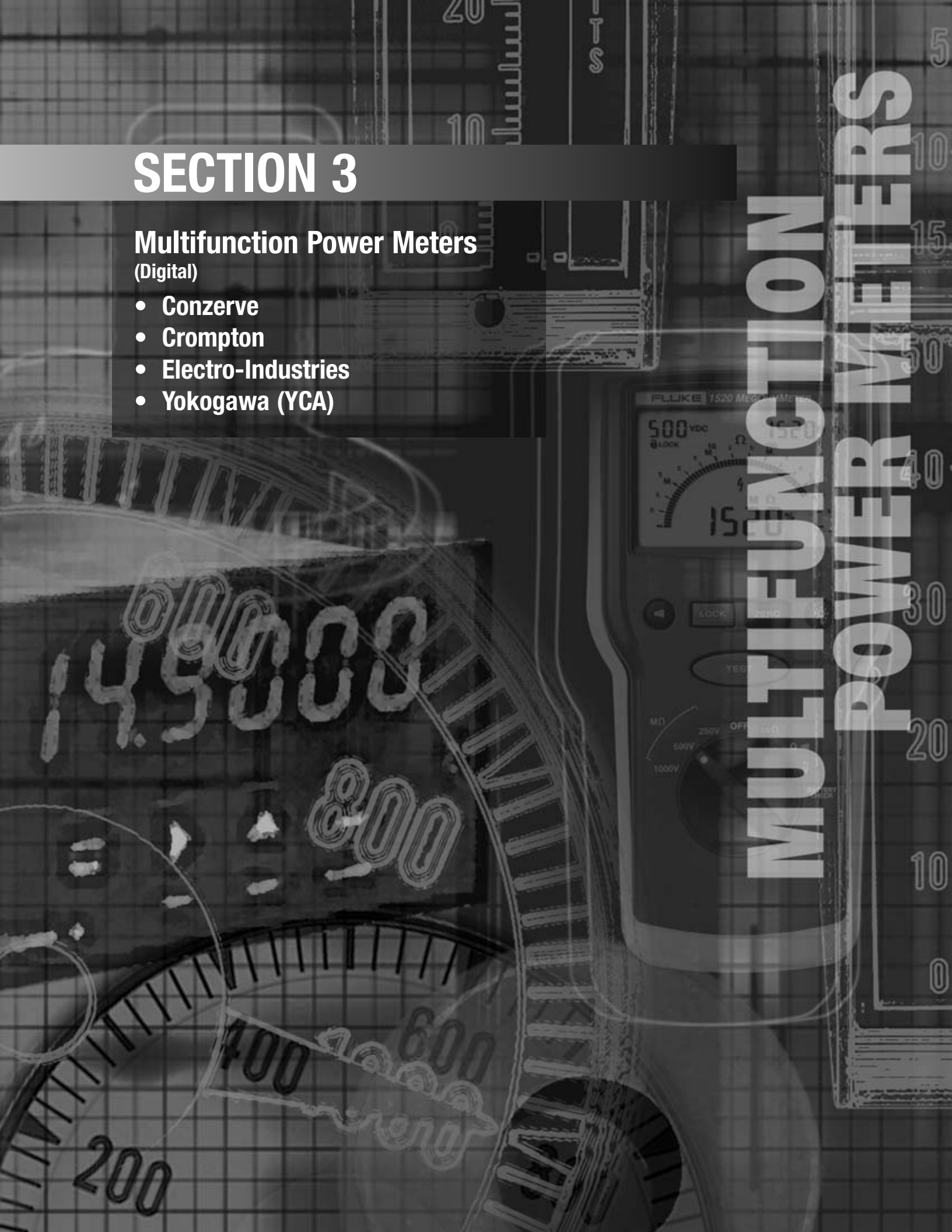
SECTION 3

Multifunction Power Meters
(Digital)

- **Conzerve**
- **Crompton**
- **Electro-Industries**
- **Yokogawa (YCA)**



POWER & ENERGY METER - PR300 SERIES

PR300 Series Features:

- Three rows of large LED displays
- Input: Up to 600V AC, 5A AC
- 1P 2W ~ 3P 4W
- Optional inputs/outputs (1DI, 1DO, 1AO)
- Analog output (W, var, VA, volt, current, freq. & PF)
- Pulse outputs (kWH, kvarh, kVAh)
- Demand current & power (average per specified period)
- RS485 & Ethernet communications
- UL/CE safety certifications
- Easily combines with DAQSTATION and DAQWORX for networking

Ordering Information:

Phase & Wire:	P3W / Universal
	3P4W / Universal
	3P4W / 2.5 Element
Rated Input:	120V, 240V, 480V, 1ACA
	120V, 240V, 480V, 5ACA
Inputs & Outputs:	1 Digital input
	1 Digital input, 1 analog output
	1 Digital input, 1 pulse output
	1 Digital input, 1 analog output, 1 pulse output
Communications:	RS-485
	RS-485, Ethernet communications
Measuring:	Demand measurement, I demand alarm output
Power Supply:	100-240 AC/DC+/- 10%
Phase Indication:	A, B, and C Indicators
	R, S, and T Indicators

Multifunction Power Meter

DIN Integra 1530 Series

Multi function Integra 1530 digital metering systems provide high accuracy <0.2% measurement, display and communication of all major electrical and power quality parameters, including true RMS system values, power quality data and total harmonic distortion (THD) measurement up to the 31st harmonic. To suit requirements the range offers single phase, single phase 3 wire, 3 phase 3 or 4 wire, and 3 phase 4 wire with neutral CT configurations.

This DIN 96 panel mounted enclosure offers simple programming and display of up to 34 power measurement parameters via a simple menu driven user interface on the front panel. Integra 1530 benefits from optional pulsed, analog and digital communication outputs, allowing enhanced status information of up to 50 measured parameters to be communicated into building management systems. Additionally, a simple Windows based software package is available to remotely configure, monitor and communicate all 50 major electrical and power quality parameters.

Features

Measurement and display of up to 34 electrical and power parameters

Measurement and communication of up to 50 electrical and power parameters

High contrast red LED display

LED annunciators for each measured parameter

THD measurement and power quality data to 31st harmonic

True RMS measurement

Pulsed, analog and digital outputs

Modbus, Johnson Controls, Lonworks and Profibus interface options

Fully programmable PT and CT ratios

Benefits

Replaces multiple single function instruments

Pre-calibrated plug-in options

High accuracy <0.2%

Configurable via software package or menu driven interface

Import and export monitoring

Neutral CT input option

True 3 and 4 wire measurement

Applications

Switchgear

Distribution systems

Control panels

Embedded generation

Energy management

Building management

Utility power monitoring

Process control

Motor monitoring

Compliant With

UL File No: E20300

UL 61010B-1

IEC 1010-1/BSEN 61010-1 CAT III

Operation

The multi function Integra 1530 offers uncomplicated operation and high accuracy <0.2% measurement of three phase voltage, current, frequency, Watts, VAr, VA, energy, power factor, and total harmonic distortion measurement of both phase and system, current and voltage.

3 phase 4 wire system line to line voltage measurements are usually derived from a calculation of the vector of the line to neutral voltage measurements. However, Integra 1530 includes true measurement of both line to neutral, and line to line measurements, ensuring accurate readings even under phase fault conditions.

To suit the requirements of individual power monitoring applications the Integra 1530 offers simple programming and display, via the menu driven interface. Alternatively, an optional Windows based software configuration package can be used for remote configuration and monitoring. Once configured by either method, simultaneous monitoring of up to 50 electrical and power quality variables can be communicated into building management systems via pulsed, analog or digital communication options.

If customer requirements extend beyond the original capabilities of their metering, the functionality of this innovative product is easily enhanced to meet new client expectations. Integra pre-calibrated plug-in option cards allow cost effective upgrades with any combination of pulsed, analog and digital communication outputs. Cards slot simply into the back of the unit, products do not need to be removed from the installation or recalibrated.

Accuracy

Integra 1530 digital metering systems utilize true RMS measurement techniques up to the 31st harmonic, providing <0.2% accuracy. An exceptional tolerance to high harmonic frequencies is achieved from a robust frequency detection method, which is able to lock the fundamental frequency onto any phase. High integrity measurements are possible where the system approximates CT current in the absence of voltage signals.

System Input

Designed for all low, medium and high voltage switchgear and distribution systems, the Integra 1530 offers programmable PT and CT ratio capability. Direct connected up to 480V AC with 5A CT inputs as standard, and 1A CT inputs available as an option.

Neutral CT Input Option

High harmonic environments can produce unexpected and dangerous neutral currents. Traditional 3 phase systems are only able to calculate the vector of line to neutral current measurements, which may not register the true reading. Integra 1530 offers a 3 phase 4 wire version with a neutral 4th CT allowing true neutral current measurement and protection in high harmonic environments.

Crompton INSTRUMENTS

Multifunction Power Meter

DIN Integra 1530 Series

Measurement and Display

Up to 34 electrical and power quality parameters can be configured and displayed on the Integra 1530 unit.

1 System Volts
System Current
System kW

2 System Volts THD %
System Current THD %

3 Volts L1 – N (4 wire only)
Volts L2 – N (4 wire only)
Volts L3 – N (4 wire only)

4 Volts L1 – L2
Volts L2 – L3
Volts L3 – L1

5 Volts Line 1 THD %
Volts Line 2 THD %
Volts Line 3 THD %

6 Current L1
Current L2
Current L3

7 Current Line 1 THD %
Current Line 2 THD %
Current Line 3 THD %

8 Neutral Current (4 wire only)
Frequency
Power Factor

9 kVAr
kVA
kW

10 kW Hr Import (7 digit resolution)

11 kVAr Hr Import (7 digit resolution)

12 kW Hr Export (7 digit resolution)

13 kVAr Hr Export (7 digit resolution)

14 kW Demand
Current Demand

15 kW Maximum Demand
Current Maximum Demand

Enhanced status information of up to 50 measured parameters can be communicated into building management systems via optional pulsed, analog and digital outputs.

Programmable Display

A two button interface on the front panel of Integra 1530 units provides simple programming of PT and CT ratio settings, configuration of selected communication options, and adjustment of operating parameters. To prevent unauthorized access to the product configuration settings, all set up screens offer password protection. Once configured, status information can be viewed by scrolling through 15 screens featuring a high contrast 3 line, 4 digit LED display, with separate annunicators for each of the 34 measured parameters. Optional pulsed, analog or digital outputs allow enhanced status information of up to 50 measured parameters to be communicated into building management systems.

Programmable Parameters

Parameter	Range
Password:	4 digit 0000 - 9999
Primary Current:	Max 9999:5A (360MW max**)
PT Primary:	400kV (360MW max**)
Secondary Voltage:	Nominal system voltage
	** maximum PT or CT ratios are limited so that the combination of primary voltage and current do not exceed 360MW at 120% of relevant input
Demand Integration Time:	8, 15, 20, 30 and 60 minutes
Reset:	Max demand & active energy registers
Pulse Output Duration:	60, 100, 200 ms
Pulse Rate Divisors:	1, 10, 100, 1000
RS485 Interface Baud Rate:	2.4, 4.8, 9.6, 19.2 kB
RS485 Parity:	Odd / Even / No, 1 or 2 stop bits
Modbus Address:	1 - 247
Analog Outputs:	User definable upper and lower levels and limits

Specification

Input	
Nominal Input Voltage:	57.7 to 277V L-N, 100 to 480V L-L
Max Continuous Input Voltage:	120% nominal
Max Short Duration Input Voltage:	2 x for 1 second, repeated 10 times at 10 second intervals
System PT Ratios (primary):	Any value up to 400kV **
Nominal Input Voltage Burden:	< 0.2 VA
Nominal Input Current:	5A (1A option)
System CT Primary Values:	9999:5A or 9999:1A max 360MW **
Max Continuous Input Current:	120% nominal
Max Short Duration Current Input:	20 x for 1 second, repeated 5 times at 5 second intervals
Nominal Input Current Burden:	< 0.6 VA
	** maximum PT or CT ratios are limited so that the combination of primary voltage and current do not exceed 360MW at 120% of relevant input
Outputs (Optional)	
RS485 Communications:	Two wire half duplex
Baud Rates:	2400, 4800, 9600, 19200
Pulsed:	Clean contact SPNO
Pulse Duration:	60, 100 or 200 milliseconds
Pulsed Outputs:	1 or 2
Analog Outputs:	1 or 2
Auxiliary	
Standard Nominal Supply Voltage:	100 V – 250 V AC or DC (85 V – 287 V AC Absolute) (85 V – 312 V DC Absolute)
AC Supply Frequency Range:	45 – 66 Hz
AC Supply Burden:	6VA
Optional Auxiliary DC Supply:	12 V - 48 V DC (10.2 V – 60 V DC Absolute)
DC Supply Burden:	6VA

Crompton INSTRUMENTS

Multifunction Power Meter

DIN Integra 1530 Series

Order Code Example

INT-1534-M-5-M-110

Integra 1530 digital metering system, 3 phase 4 wire, nominal input voltage, 140-277V L-N and 241-480V L-L, 5A CT input, auxiliary supply 100 to 250V AC or DC, one relay pulsed output and one RS485 Modbus communication port.

Product Codes

Product Code	Product Configuration				
INT-1531-*-**-***-option-****	Integra 1530 single phase				
INT-1532-*-**-***-option-****	Integra 1530 single phase 3 wire				
INT-1533-*-**-***-option-****	Integra 1530 3 phase 3 wire				
INT-1534-*-**-***-option-****	Integra 1530 3 phase 4 wire				
INT-1535-*-**-***-option-****	Integra 1530 3 phase 4 wire with neutral CT				
Input Voltage Suffix *					
L	100 - 240V L-L (57.7 - 139V L-N)				
M	241 - 480V L-L (140 - 277V L-N)				
Input Range Suffix **					
1	1A CT Input				
5	5A CT Input				
Auxiliary Supply Suffix ***					
L	12 – 48V DC				
M	100 - 250V AC/DC				
Communications Options	KWhr Pulsed Output	RS485 Modbus or Johnson Controls Metasys NII	Lonworks Interface	Profibus Interface	Analog Output
000 - Display Only					
001					1
002					2
010		1			
011		1			1
012		1			2
030			1		
050				1	
100	1				
101	1				1
102	1				2
110	1	1			
111	1	1			1
112	1	1			2
200	2				
210	2	1			
Analog Output Range ****					
1	0-20 mA, 10V compliance (user configurable as 4-20mA, 0-10mA and 0-5mA)				
3	-1/0/+1 mA, 10V compliance (user configurable as 0-1mA)				

Pre-calibrated plug-in options

The functionality of existing Integra 1530 units can be easily enhanced with the use of Crompton pre-calibrated plug-in cards.

	KWhr Pulsed Output	RS485 Modbus or Johnson Controls Metasys NII	Lonworks Interface	Profibus Interface	Analog Output
OPT-1530-002-1 (0-20mA)					2
OPT-1530-002-3 (-1/0/+1mA)					2
OPT-1530-010		1			
OPT-1530-012-1 (0-20mA)		1			2
OPT-1530-012-3 (-1/0/+1mA)		1			2
OPT-1530-030			1		
OPT-1530-050				1	
OPT-1530-200	2				
OPT-1530-210	2	1			

Multifunction Power Meter

ANSI Integra 1540 Series

Integra 1540 provides programmable measurement, display and communication of up to 31 major electrical and power quality parameters, including true RMS system values, total harmonic distortion (THD) measurement and power quality data. The meter offers simple user-friendly programming of voltage, current, and power measurement parameters using a menu driven interface. Status of all parameters can be viewed through 13 screens on the 3 line, 4 digit LED display. The Integra 1540 has pulsed and digital communication outputs and is ideal for all power and quality monitoring applications.

Features

Measurement, display and communication of up to 31 power parameters

THD measurement and power quality data

True RMS measurement

Pulsed energy outputs

Digital communications

Fully programmable PT and CT ratios

Simple menu driven interface

ANSI case style

High quality LED display

Benefits

Replaces multiple single function instruments

Simple menu driven interface

Remote monitoring

Monitoring, control and protection of power assests

Applications

Switchgear

Distribution systems

Generator sets

Control panels

Energy management

Building management

Utility power monitoring

Process control

Motor monitoring

Approvals

UL File No: 140758

IEC 1010 / BSEN 61010-1

Operation

A two button interface on the front panel of Integra 1540 units provides simple programming of PT and CT ratio settings, configuration of selected communication options, and adjustment of operating parameters. To prevent unauthorized access to the product configuration settings, all set up screens offer password protection. Once configured, status information can be viewed by scrolling through 13 screens featuring a high contrast 3 line, 4 digit LED display, with separate annunicators for each of the 31 measured parameters. Optional pulsed or digital outputs allow status information to be communicated into building management systems.

System Input

Designed for all low, medium and high voltage switchgear and distribution systems, the Integra 1540 has customer programmable PT and CT ratio capability. Direct connected up to 600V AC with 5A CT inputs as standard, and 1A CT inputs available as an option.

Pulsed Outputs

Integra 1540 offers an optional pulse output module enabling the retransmission of time based demand parameters. Outputs are pulsed at a rate proportional to the measured kWh active energy, with pulse width and rate easily programmable via the set-up screens. The output relay has a fully isolated volt free contact, with connection via screw clamp terminals.

Digital Communications

RS485 Modbus RTU

Integra 1540 digital metering systems offer an RS485 communication port for direct connection to SCADA systems using the Modbus RTU protocol, or the Johnson Controls Metasys NII protocol. Remote monitoring enables the user to record the systems parameters in real time, using high resolution numbers. The Modbus protocol establishes the format for the master's query by placing it into the device address. The slave's response is also constructed using the Modbus protocol; it contains the fields confirming the action taken, the data to be returned, and an error-checking field. The Modbus option includes the ability to change Modbus word order to suit the requirements of the user.

Crompton INSTRUMENTS

Multifunction Power Meter

ANSI Integra 1540 Series

Measurement, Display and Communication

Integra 1540 offers configuration, display and communication of up to 31 electrical and power quality parameters.

1. System Volts
   System Current
   System kW
2. System Volts THD %
   System Current THD %
3. Volts L1 – N
   Volts L2 – N
   Volts L3 – N
4. Volts L1 – L2
   Volts L2 – L3
   Volts L3 – L1
5. Volts Line 1 THD %
   Volts Line 2 THD %
   Volts Line 3 THD %
6. Current L1
   Current L2
   Current L3
7. Current Line 1 THD %
   Current Line 2 THD %
   Current Line 3 THD %
8. Neutral Current
   Frequency
   Power Factor
9. kVAr
   kVA
   kW
10. kWh (7 digit resolution)
11. kVAr Hr (7 digit resolution)
12. kW Demand
    Current Demand
13. kW Maximum Demand
    Current Maximum Demand

Programmable Parameters

Parameter	Range
Password	4 digit 0000 - 9999
Primary Current	Max 9999:5 (360MW max**)
PT Primary	400kV (360MW max**)
	** maximum PT or CT ratios are limited so that the combination of primary voltage and current do not exceed 360MW at 120% of relevant inputs
Demand Integration Time	8, 15, 20, 30 minutes
Reset	Max demand & active energy registers
Pulse Output Duration	60, 100, 200 ms
Pulse Rate Divisors	1, 10, 100, 1000
RS 485 Interface Baud Rate	2.4, 4.8, 9.6, 19.2 kB
RS 485 Parity	Odd / Even / No, 1 or 2 stop bits
Modbus Address	1 - 247

Product Codes

Product Code	Product Configuration
INT-1544-***-5-*-option	Integra 1540 3 phase 4 wire 5A CT input
INT-1543-***-5-*-option	Integra 1540 3 phase 3 wire 5A CT input
Input Voltage Suffix * **	
100	100V L-L (57.7V L-N)
110	110V L-L (63.5V L-N)
115	115V L-L (66.4V L-N)
120	120V L-L (69.3V L-N)
139	139V L-L (80.2V L-N)
208	208V L-L (120V L-N)
240	240V L-L (139V L-N)
277	277V L-L (160V L-N)
380	380V L-L (220V L-N)
400	400V L-L (230V L-N)
415	415V L-L (240V L-N)
480	480V L-L (277V L-N)
600	600V L-L (346V L-N)
Auxiliary Voltage Suffix*	
L	12 – 48V DC
M	100 - 250V AC/DC
Communications Options	
M	RS485 Modbus RTU or Johnson Controls Metasys NII
W	kWh Pulsed output

Order Code Example:

INT-1544-120-5-L-W

Integra 1540 3 phase 4 wire, 120V L-L (69.3 L-N) nominal voltage, 5A CT input, 12-48V DC auxiliary supply, with pulsed output option.

Crompton INSTRUMENTS

Multifunction Power Meter

ANSI Integra 1540 Series

** maximum PT or CT ratios are limited so that the combination of primary voltage and current do not exceed 360MW at 120% of relevant input

Specification

Input	
Nominal Input Voltage:	57.7 to 346V L-N, 100 to 600V L-L
Max Continuous Input Voltage:	120% nominal
Max Short Duration Input Voltage:	2 x for 1 second, repeated 10 times at 10 second intervals
System PT Ratios (primary):	400kV or 360MW **
Nominal Input Voltage Burden:	< 0.2 VA
Nominal Input Current:	5A (1A option)
System CT Primary Values:	9999:5A or 9999:1A max 360MW **
Max Continuous Input Current:	120% nominal
Max Short Duration Current Input:	20 x for 1 second, repeated 5 times at 5 second intervals
Nominal Input Current Burden:	< 0.6 VA
Outputs	
RS485 Communications:	Two wire half duplex
Baud Rates:	2400, 4800, 9600, 19200
Pulsed:	Clean contact SPNO, 100V DC 0.5A max
Pulse Duration:	60, 100 or 200 milliseconds
Auxiliary	
Standard Nominal Supply Voltage:	100 V – 250 V AC or DC (85 V – 287 V AC Absolute) (85 V – 312 V DC Absolute)
AC Supply Frequency Range:	45 – 66 Hz
AC Supply Burden:	6VA
Optional Auxiliary DC Supply:	12 V - 48 V DC (10.2 V – 60 V DC Absolute)
DC Supply Burden:	6VA
Measuring Ranges	
Voltage:	50 .. 120% of nominal (functional 5..120%)
Current:	5 .. 120% of nominal (50%..120% for THD)
Frequency:	45 .. 66Hz
Power Factor:	0.5 inductive – 1 – 0.8 capacitive
THD:	To 15th Harmonic V & A
Energy:	7 digit resolution
Accuracy	
Voltage:	±0.1% of range ±0.4% of reading
Current:	±0.1% of range ±0.4% of reading
Power:	±0.1% of range ±0.9% of reading
THD:	±1%
Neutral Current:	±4% of range
Energy:	kWh 1% IEC1036 (PF 0.8-1-0.8)
KVArh:	2% IEC1036 (PF 0.8-1-0.8)
Temperature Coefficient:	0.013%/°C typical
Update Time:	500ms display 250ms optional digital port
Enclosure	
Enclosure Style:	ANSI C39.1
Compliant With:	UL 140758 and IEC 1010 / BSEN 61010-1
Material:	Polycarbonate front and base, steel case
Terminals:	Barrier terminal strip 6-32 binding head screw
Dielectric Voltage:	Withstand test 3.25kV RMS 50Hz for 1 minute between all electrical circuits
Operating Temperature:	-20 to +70°C
Storage Temperature:	-30 to +80°C
Relative Humidity:	0 .. 95% non condensing
Warm-up Time:	1 minute
Shock:	30g in 3 planes
Vibration:	10 .. 15Hz, 1.5mm peak to peak / 15 .. 150Hz @1g
Enclosure Integrity :	IP54 (front face)
Dimensions:	4.31" high x 4.31" wide x 6.7" deep 109.4mm high x 109.4mm wide x 170.2mm deep
Panel Cut Out:	4.06" (103mm) diameter, 4 stud positions

CONZERV™
Smart Energy Management

Multifunction Power Meter

EM 6000 DigitAN™ Series

● Compact ● Smart ● Global; CE, UL marks ● Universal

80mm Depth | **96 x 96 mm Flush Mount** | **ISO 9001-2000 Certified**

- Accuracy Class 1.0 (0.5 Option)
- True RMS, Accurate on Distorted waveforms
- Simultaneous sampling of Volts & Amps
- Low PT, CT burden
- Patented Alpha numeric bright display
- View 3 Parameters together
- Auto Scaling from Kilo to Mega to Giga
- Programable CT, PT ratios
- Built-in phase analyser
- Quick and easy installation

EM 6459

Monitors
- Voltage: Line to Neutral per Phase and Average
- Voltage: Line to Line per phase and Average
- Current: Phase Wise & Average
- PF per phase and 3 phase
- Percentage load phase wise
- Load unbalance in percentage, RPM
- Phase Angles of A_1, A_2, A_3
- Frequency

EM 6434

- Power Parameters Per Phase and Total (kVA, kW, kVAR)
- PF per phase and 3 phase
- Energy Parameters (kVAh, kWh, kVARh inductive and kVARh capacitive)
- Old energy parameters: (kVAh, kWh, kVARh inductive and kVARh capacitive)
- Built-in RS 485 port

EM 6400

- EM 6434 & EM 6459 +
- Run Hrs, ON Hrs and No. of Interruptions
- THD V and I
- RS 485 port option
- Demand option
- IE option (Import / Export)

- UL & CE certified
- Auto Scrolling
- Communication with PCs, PLCs, DCS through optional RS 485 Serial Port
- 10 year back-up of integrated data
- Touch safe terminals
- Sealed dust-proof construction
- Easy Turbo Key for 'One Touch' operation and setup
- Measures 4 Quadrant Power & 2 Quadrant Energy. (IE option measures 4 Quadrant Energy)
- Monitors Demand (Option)

User Programmable

- Delta or Star (Wye)
- PT, CT Ratios Primary & Secondary

Applications

- Control Panels
- Motor Control Centers
- Power Distribution Panels
- Connection to Plant Monitoring & Control Systems
- Genset Panels
- Original Equipment Manufacturers (OEMs)

Display Features

- Brilliant 3 line, 4 digit per line, (digit height 14mm) LED display with auto-scaling capability for Kilo, Mega, Giga
- Meter can display Volts, Amps and Frequency simultaneously
- Colour Coded Analog Load Bar
- Easy set up through Front Panel keys
- Password protection for setup parameters

Rugged Construction

Conforms to:
- Emission : CISPR 22
- Fast Transient : 4kV IEC 61000 - 4 - 4
- Burst : IEEE 62.41:1991
- Surge withstand : IEEE C37.90.1:2002
- ESD : EC 61000 - 4 - 2
- Impulse voltage : 6kV, IEC 60060, 1.2/50
- Safety Construction: Self extinguishable V 0 plastic

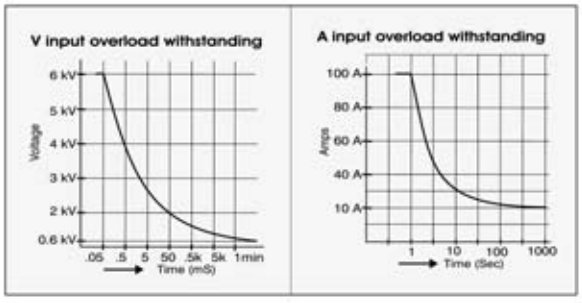
3

Multifunction Power Meter

Technical Specifications

■ Sensing / Measurement	True RMS, 1 sec update time 4 Quadrant Power & Energy
■ Accuracy (Wh)	Class 1.0 as per IEC 62052-11, 62053-23, class 0.5 (optional) as per IEC 62052-11, 62053-22 and ANSI C12.20
■ Input voltage	4 Voltage inputs (V_1, V_2, V_3, V_N) 110 or 415 V L-L nominal (Range 80 to 600V L-L)
■ Aux Supply (Control Power)	80 - 270V ac dc, 44 - 300V ac dc (wide range option)
■ Input current	Current inputs (A_1, A_2, A_3) 20mA - 6A (Field configurable 1A or 5A)
■ Overload	10A max continuous 50A max for 3 seconds
■ Burden	0.2VA max per Volts/Amps input 3VA max on Auxiliary Supply
■ Frequency	45 - 65Hz
■ Resolution	RMS 4 digit, Integ 8 digit
■ Digital Communications	RS 485 serial channel connection Industry standard Modbus RTU protocol.
■ Isolation	2000 volts AC isolation for 1 minute between communication and other circuits
■ Demand	Integration period multiple of 5 minutes from 5 to 30 minutes 15 Sec update time
■ Safety	Measurement category III, Pollution Degree 2, Protection against shock by double insulation at user accessible area
■ Environmental	Operating Temperature -10°C to +60°C (14°F to 140°F) Storage Temperature -25°C to +70°C (-13°F to 158°F) Humidity 5% to 95% non condensing.
■ Weight	400 gms approx. Unpacked 500 gms approx. Shipping
■ Warranty	1 Year from date of Invoice

Overload



Accuracy

Measurement	Accuracy % Reading CI 1.0	CI 0.5
■ Volts LN per phase	1.0	0.5
■ Volts LL per phase	1.0	0.5
■ Volts LN Avg	1.0	0.5
■ Volts LL Avg	1.0	0.5
■ Amps per phase	1.0	0.5
■ Amps Avg	1.0	0.5
■ Amps phase angle per phase	2°	1°
■ Frequency	0.1	0.1
■ Real Power per phase & total	1.0	0.5
■ Reactive Power per phase & total	2.0	1.0
■ Apparent Power per phase & total	1.0	0.5
■ Active Energy Import /Export	1.0	0.5
■ Reactive Energy (Inductive / Capacitive)	2.0	1.0
■ Apparent Energy	1.0	0.5

Note:
- Additional error of 0.05 % of full scale, for meter input current below 100 mA
- PF error limit is same as W error limit in %

Display Pages

		Pages	EM6459	EM6434	EM6400
RMS		VLL, A avg., PF	✓	–	✓
		VLN, A avg., F	✓	–	✓
		VA, W, VAR	–	✓	✓
		W, VAR, PF	–	✓	✓
		Per phase for the above parameters	✓	✓	✓
THD		V1 %, V2 %, V3 %	–	–	✓
		A1 %, A2 %, A3 %	–	–	✓
DM		VA demand	–	–	✓
		Rising demand	–	–	✓
		Time remaining	–	–	✓
		MD (Max Demand)	–	–	✓
		Hr (MD occurred)	–	–	✓
INTEG	Also for IE option	VAh	–	✓	✓
		Wh	–	✓	✓
		VARh Inductive	–	✓	✓
		VARh Capacitive	–	✓	✓
		Run hours	–	–	✓
		On hours	–	–	✓
		Interruptions (Outages)	–	–	✓
OLD		VAh	–	✓	✓
		Wh	–	✓	✓
		VARh Inductive	–	✓	✓
		VARh Capacitive	–	✓	✓

3 Phase Multifunction Power Monitor

DMMS350

Built-In Ethernet LAN Connectivity & Power Quality

The Low-Cost Solution to Get 3 Phase Electrical Parameters to Your Ethernet LAN

- True RMS Voltage, Current, and Power Measurements
- Bidirectional Energy and Min/Max on All Electrical Parameters
- On-Board Ethernet TCP/IP Protocol with Standard Modbus TCP
- Harmonics (%THD and K-Factor) to the 31st Order
- Standard ANSI Size for Easy Installation to New or Retrofit Panels
- Advanced Control Features
- KYZ Pulse for Energy

Electro Industries/GaugeTech offers the DMMS 350 Multifunction Power Meter, providing you with complete access to all voltage, current, and power values through an easy to use display and through your TCP/IP Ethernet LAN. The DMMS 350 is ideal for applications that require real time metering data streaming to data collection systems through LAN or through the Internet. This meter provides online connectivity easily, quickly, and economically.

Specifications

Accuracy	
Volts (All Channels), Volt Max/Min Demand, Amperes, Amp Max/Min Demand	0.2%
KW, kVA, kVAR, KW Max/Min Demand, KW-Hour, KVA-Hour, KVAR-Hour	0.4%
PF	0.1%
Frequency	0.02 Hz
Harmonics	0.50%
Voltage Inputs	
3 Voltage Inputs: Va, Vb, Vc	
120 Option: 150 Volts Phase to Neutral; 300 Volts Phase to Phase, for 120/208 Connection	
G Option: 300 Volts Phase to Neutral; 600 Volts Phase to Phase, for 277/480 Connection	
75 Option: 75 Volts Phase to Neutral; 150 Volts Phase to Phase, for 69/120 Connection	
Current Inputs	
3 Current Inputs: Ia, Ib, Ic; 5 Amp Nominal Current Input	
Communication Format	
Ethernet 10BaseT	
Modbus TCP/IP Protocol	

Ordering Information

OPTION #	OPTION NAME
	Model
[DMMS350]	DMMS 350
	Connection
[3E]	3 Element Wye System
[2E]	2 Element Delta System
	Volts Label
[V]	Volts
[KV]	Kilovolts
	Current Label
[A]	Amps
[KA]	Kiloamps
	Power Label
[KW]	Kilowatts
[MW]	Megawatts
	Operating Voltage
[120]	120/208
[G]	277-480
[75]	69-120
	Control Power
[115A]	115V AC +20%
[D]	24-48V DC +20%
[D2]	125V AC or DC +20% Universal

Multifunction Power and Energy Meters

SHARK100

- 0.2% Class Multifunction Metering
- Multifunction Measurements including Voltage, Current, Power, Frequency, Energy, etc.
- Optional KYZ Pulse
- Power Quality Measurements (%THD and Alarm Limits)
- % of Load Bar for Analog Meter Perception
- RS-485 Modbus and DNP 3.0 Protocol – 57.6K Baud
- IrDA Port for Remote Read
- Ultra Compact, Easy to Install
- Fits both ANSI and DIN cutouts

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ELECTRICAL & ELECTRONIC MEASURING & TEST EQUIP.
22CZ

The Shark 100 meter provides high performance and accurate measurements. This low cost meter significantly outperforms other devices many times its price. It is perfect for both new metering applications and as a simple replacement to existing analog meters.

Specifications

Accuracy	
Voltage L-N, Voltage L-L, Current	0.1%
+/- Watts, +/- Wh, +/- VARs	0.2%
+/- VARh, VA, Vah, PF	0.2%
Frequency	0.01 Hz
Voltage Inputs	
0-416 Volts Line to Neutral, 0-721 Volts Line to Line	
Programmable Voltage Range to Any PT Ratio	
Supports: 3 Element WYE, 2.5 Element WYE, 2 Element Delta, 4 Wire Delta Systems	
Current Inputs	
Class 10: (0 to 11) A, 5 Amp Nominal	
Class 2: (0 to 2) A, 1A Nominal Secondary	
Programmable Current to Any CT Ratio	
Communication Format	
2 Com Ports	
RS485 Port	
IrDA	
Com Port Baud Rate 9600 to 57,600	
Modbus RTU, ASCII, or DNP 3.0 Protocols	

Ordering Information

OPTION #	OPTION NAME
	Model
[100]	Shark100 (Meter/Transducer)
[100T]	Shark100T (Transducer Only)
	Frequency
[50]	50 Hz System
[60]	60 Hz system
	Current Class
[10]	5 Amp Secondary
[2]	1 Amp Secondary
	V-Switch Pack
[V1]	-V1 – Default V-Switch Volts/Amps
[V2]	-V2 – Above with Power and Freq
[V3]	-V3 – Above with Energy Counters
[V4]	-V4 – Above with Harmonics and Limits
	Power Supply
[D2]	90-265V AC/DC
[D]	24-48V DC
	COM
[X]	No Com
[485P]	RS485+Pulse (Standard in Shark 100T)
	Mounting
[X]	ANSI Mounting
[DIN]	DIN Mounting Brackets