

INTEGRA 1540 DIGITAL METERING SYSTEM



Application

- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor monitoring

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 VT 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 assets

Standards

- UL file no: 140758
- IEC 1010/BSEN 61010-1

The Integra 1540 dms series 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) and power quality data. The menu-driven interface allows the programming of voltage, current, and power measurement parameters. Status of all parameters can be viewed through 13 screens on the three-line, four-digit LED display. The Integra 1540 meter has pulsed and digital communication outputs.

System Input

Designed for all low, medium and high-voltage switchgear and distribution systems, the Integra 1540 digital metering system (dms) has customer programmable VT and CT ratio capability. Direct connection of up to 600V AC with 5A CT inputs is available as standard, and 1A CT input is available as an option.

Pulsed Outputs

Integra 1540 dms offers an optional pulse output module. Outputs are pulsed proportionally to the rate of measured kWh active energy, with pulse width and rate programmable via the set-up screens.

Modbus RTU RS485

Integra 1540 dms offers an RS485 communication port for direct connection to SCADA systems using the Modbus RTU protocol, or the Johnson Controls Metasys NII protocol. The Modbus protocol establishes the format for the master's query and the slave's response; it contains the fields confirming the action taken, the data to be returned, and an error-checking field. The Modbus RTU option includes the ability to change Modbus word order to suit the requirements of the user.

Programmable Display

A two-button interface on the front panel provides configuration programming of system (e.g. three-phase four-wire), VT and CT ratio settings, selected communication options and adjustment of operating parameters. All set-up screens offer password protection. Status information can be viewed by scrolling through 13 screens featuring a high contrast 3-line, 4-digit LED display, with separate annunciators for each of the 31 measured parameters.

Auxiliary Supply

The Integra dms family should ideally be powered from a dedicated supply, either 100-250V AC or DC (85-280V AC Absolute or 85-312V DC Absolute) or 12-48V DC (10.2-60V DC absolute). However the device may be powered from the signal source, provided the source remains within the working range of the chosen auxiliary supply.

Fusing

It is recommended that all voltage lines be fitted with 1 amp fuses.

Safety/Ground Connections

For safety reasons, all CT secondary connections should be grounded in accordance with local regulations.

Product Codes

Product code	Product configuration
INT-1544-***-5-*-*option	Integra 1540 dms 3-phase 4-wire 5A CT input
INT-1543-***-5-*-*option	Integra 1540 dms 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)

Measurement and Display

Integra 1540 dms 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. kVAh (7-digit resolution)
12. kW demand
Current demand
13. kW maximum demand
Current maximum demand

Product Codes continued

Product code	Product configuration
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 dms 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.	

Programmable Parameters

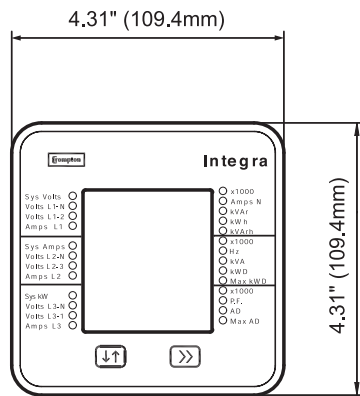
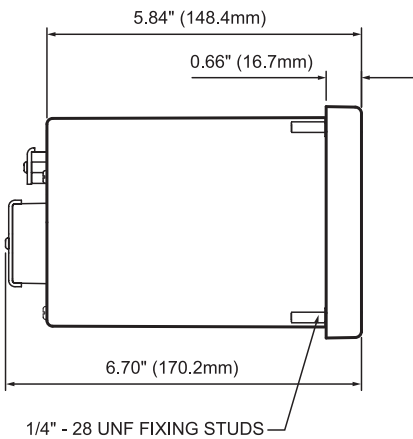
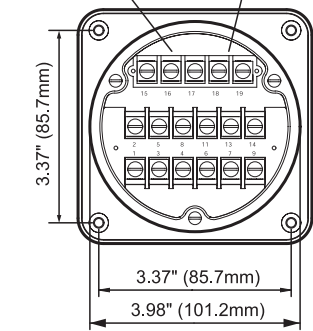
Parameter	Range
Password:	4-digit 0000-9999
Primary current:	Max 9999:5A (360MW max**)
VT primary:	400kV (360MW max**)
Secondary voltage:	Nominal system voltage ** maximum VT and CT ratios are limited so that the combination of primary voltage and current does not exceed 360MW at 120% of relevant input
Demand integration time:	8, 15, 20, 30 and 60 minutes
Reset:	Max demand and 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, 19.2kB
RS485 parity:	Odd/even/no, 1 or 2 stop bits
Modbus RTU RS485 protocol address:	1-247
Analogue outputs:	User definable

Specifications

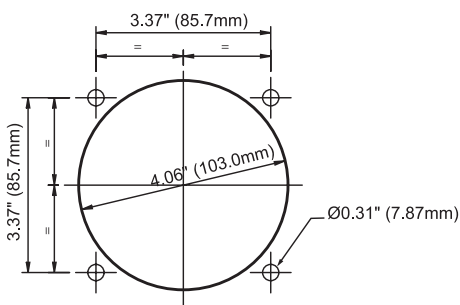
Nominal input voltage:	57.7 to 346V L-N, 100 to 600V L-L
Max continuous input voltage:	120% nominal
Max. short duration input voltage:	2 x for 1 second, repeated 10 times at 10 second intervals
System VT ratios (primary):	400kV or 360MW **
Nominal input voltage burden:	< 0.2VA
Nominal input current:	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:	< 0.6VA
Outputs	
RS485 communications:	2-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:	100-250V AC or DC (85-287V AC absolute) (85-312V DC absolute)
AC supply frequency range:	45-66Hz
AC supply burden:	6VA
Optional auxiliary DC supply:	12-48V DC (10.2-60V DC absolute)
DC supply burden:	6VA

Dimensions

RS485 OUTPUT			PULSED OUTPUT	
B	A	Gnd	COM	N/O



Panel cut-out



Specifications continued

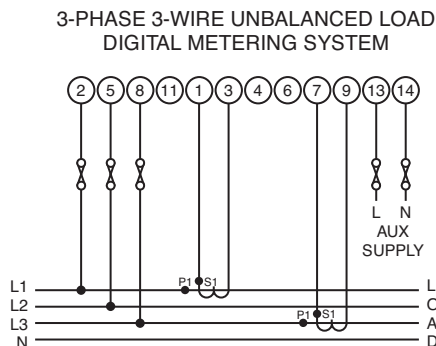
Measuring ranges	
Voltage:	50-120% of nominal (functional 5-120%)
Current:	5-120% of nominal (50%-120% for THD)
Frequency:	45-66Hz
Power factor:	0.5 inductive - 1 - 0.8 capacitive
THD:	To 15th Harmonic V & A
Energy:	7-digit resolution
Accuracy	
Voltage:	±0.1% of range ±0.4% of reading
Current:	±0.1% 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

Wiring

Input connections are made to screw-clamp terminals. Terminals for both current and voltage connections are sized to accept two #12 AWG (3mm²) solid or stranded wires, or ring lugs suitable for 6-32 screws. Connections for communications and pulse outputs use identical style terminals.

Wiring

3-Phase 3-Wire



3-Phase 4-Wire

