

Integra 1630 Digital Metering System



The Integra 1630 digital metering system (dms) provides high accuracy 0.2% measurement, display and communication of all major electrical and power quality parameters including total harmonic distortion (THD) up to the 31st harmonic. To suit user requirements, the range includes single-phase, three-phase three-wire and three-phase four-wire capability, all selectable at the point of installation.

This DIN 96 panel mounting enclosure offers simple programming and display of up to 35 electrical parameters via a simple menu-driven user interface on the front panel. Optional pulsed and digital communication outputs are available, to allow up to 60 parameters to be communicated to building management systems. A Windows-based software package is available to remotely configure the Integra dms and display all 60 major parameters.

Application

- Switchgear distribution systems
- Control panels
- Embedded generation
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor monitoring

Features

- Low profile
- High contrast LED display
- LED annunciators for each measured parameter
- User programmable system configuration (4-wire default)
- Fully programmable VT and CT ratios
- Current demand per phase
- Elapsed time counter for connected loads
- Removable bezel for very low profile applications

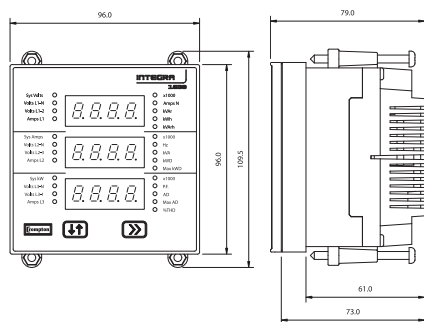
Benefits

- True rms measurement
- High accuracy <0.2% on some measurements
- Configurable via software package or menu-driven interface
- Import and export monitoring

Standards

- IEC1010-1 (BSEN 61010-1 – 2001)

Dimensions



Operation

Integra 1630 dms offers uncomplicated operation and high accuracy measurement of three-phase voltage, current, frequency, Watts, VAR, VA, energy, power factor, and total harmonic distortion of both phase and system, current and voltage. Integra 1630 dms includes true measurement of both line-to-neutral, and line-to-line voltages, ensuring accurate readings. The pre-calibrated plug-in option cards allow cost effective upgrades with any combination of pulsed, analogue and digital communication outputs. Cards slot simply into the back of the unit and products do not need to be removed from the installation or recalibrated.

Pulsed Outputs

Integra 1630 meters offer optional single or dual pulsed outputs, programmable to represent import or export kWh, import or export kVAh or kVAh. The output pulses have programmable pulse rate divisor and pulse width.

Modbus RTU RS485 Protocol

Integra 1630 dms offers an RS485 communication port using the Modbus RTU RS485 protocol or the Johnson Controls Metasys NII protocol. Integra 1630 meter establishes the format for the master's query automatically, and responds with the correct protocol using IEEE floating point values. The Modbus RTU RS485 protocol option also offers user programmable word order and support for function 8 subfunction 0, return query data diagnostic.

Modbus TCP (Ethernet)

Integra 1630 dms options include an Ethernet communication module for connection to SCADA systems using the Modbus TCP protocol. The Integra 1630 dms with Ethernet option module acts as a Modbus slave device and may be queried by a Modbus master device. All messages sent to the Integra Ethernet interface must conform to the Modbus TCP protocol. For details see:

http://www.modbus.org/docs/Modbus_Messaging_Implementation_Guide_V1_0b.pdf

BACnet IP Interface

Integra 1630 dms options include an Ethernet communication module for connection to SCADA systems using the BACnet IP protocol. The Integra 1630 dms acts as a server device and waits to receive commands from a BACnet/IP client. A BACnet/IP client (e.g. a SCADA system running on a PC), is used to instigate communication with the meter. All messages sent to the Integra Ethernet interface must conform to the BACnet IP protocol. For details on the protocol see the BACnet organisation website: <http://www.bacnet.org/>

BACnet MSTP Interface

Integra 1630 options include a BACnet MSTP module for connection via RS485 to SCADA or Building Automation and Management systems running BACnet MSTP clients. The Integra 1630 acts as a server device and waits to receive requests from a BACnet client that must conform to the BACnet MSTP Protocol. The module is fitted with a three-way screw terminal block to daisy-chain the BACnet communications cable. Standard RS485 communications cable should be used. Note that with this interface option fitted, there are no other external communication protocols available and pulsed relay outputs are not fitted.

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 16 screens featuring a high contrast three-line, four-digit LED display, with separate annunciators for each of the 35 measured parameters.

Product Codes

Description	Cat. no.
1-phase, 3-phase 3/4-wire, 100-240V L-L, 5A CT input, Aux. 100-250V AC/DC	INT-1630-L-5-M-option
1-phase, 3-phase 3/4-wire, 241-480V L-L, 5A CT input, Aux. 100-250V AC/DC	INT-1630-M-5-M-option
Options	
No options	000
1 pulsed output	100
2 pulsed outputs	200
Modbus RTU RS485 protocol	010
Modbus RTU RS485 protocol + 1kWhr pulsed output	110
Modbus RTU RS485 protocol + 2kWhr pulsed outputs	210
Modbus RTU RS485 protocol TCP	070
BACnet IP interface	080
BACnet MSTP interface	090
Extended collar	OPT-1630-collar

Programmable Parameters

Parameter	Range
Password:	4-digit 0000-9999
CT primary current:	Maximum 9999A ** CT Secondary Current: 5A (1A option)
VT primary voltage:	Maximum 400kV **
VT secondary voltage:	Nominal input voltage ** maximum VT 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, 60 minutes
3 independent resets:	Demands and maximum demands Energy registers Hours run
Pulse output duration:	60, 100, 200 milliseconds
Pulse rate divisors:	1, 10, 100, 1000
RS485 baud rate:	4.8, 9.6, 19.2, 38.4 kBd
RS485 parity and stop bits:	Odd or even with 1 stop bit or no parity with 1 or 2 stop bits

Specifications

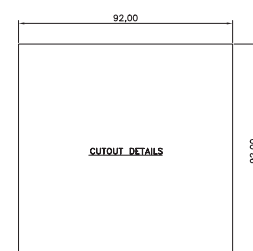
Nominal input voltage:	57.7 to 277V L-N, 100 to 480V L-L
Max. continuous input voltage:	120% nominal
Max. short duration input voltage:	2 x nominal for 1 second, repeated 10 times at 10 second intervals
System VT ratios (primary):	Any significant 4-digit integer value up to 400kV **
Nominal input voltage burden:	< 0.2 VA
Nominal input current:	5A (1A option)
System CT primary values:	Any integer value up to 9999A **
Max. continuous input current:	120% nominal
Max. short duration input current:	20 x nominal for 1 second, repeated 5 times at 5 minute intervals
Nominal input current burden:	< 0.6 VA ** maximum CT and VT ratios are limited so that the combination of primary voltage and current do not exceed 360MW at 120% of relevant input

Measurement and Display

Up to 35 electrical and power quality parameters can be configured and displayed.

- System (average) volts
System (average) current
System (total) kW
- System volts (average) THD%
System current (average) THD%
- Volts L1 - N
Volts L2 - N
Volts L3 - N
(4-wire only)
Volts L1 - L2
Volts L2 - L3
Volts L3 - L1
(3-wire only)
- Volts L1 - N THD%
Volts L2 - N THD%
Volts L3 - N THD%
(4-wire only)
Volts L1 - L2 THD%
Volts L2 - L3 THD%
Volts L3 - L1 THD%
(3-wire only)
- Volts L1 - L2
Volts L2 - L3
Volts L3 - L1
(4-wire only)
- Current L1
Current L2
Current L3
- Current line 1 THD %
Current line 2 THD %
Current line 3 THD %
- Neutral current
(4-wire only)
Frequency
Power factor (overall)
- kVAr kVA kW
- kW Hr import (7-digit resolution)
- kVArh import (7-digit resolution)
- kW Hr export (7-digit resolution)
- kVArh export (7-digit resolution)
- kW demand
Current demand
- Maximum kW demand Maximum current demand
- Hours run

Panel cut-out





Specifications continued

Output modules (optional)

RS485 communications:	2-wire half duplex
Baud rates:	4800, 9600, 19200, 38400
Pulsed:	Solid state relays
Pulse duration:	60, 100 or 200 milliseconds
Contact rating:	50mA max at 250V AC max
Pulsed outputs:	1 or 2

Auxiliary

Standard nominal supply:	100-250V AC or DC voltage: (85-287V AC absolute limits) (85-312V DC absolute limits)
AC supply frequency range:	45-66Hz
AC supply burden:	6VA
Optional auxiliary DC supply:	12-48V DC (10.2-60V DC absolute limits)
DC supply burden:	6VA

Measuring ranges

Voltage:	80-120% of nominal (functional 5-120%)
Current:	5-120% of nominal
Frequency:	45-66Hz
Power factor:	0.8 capacitive-1-0.8 inductive (functional 4 quadrant, 0-1 lag/lead)
THD:	Up to 31st harmonic 0-40% Measured voltage >5% of range Measured current >5% of nominal Full accuracy of voltage >25% of range Full accuracy of current >25% of nominal
Energy:	7-digit resolution

Reference conditions

Ambient temperature:	23 ±1°C
Input frequency:	50 or 60Hz ±2%
Input waveform:	Sinusoidal (distortion factor < 0.005)
Auxiliary supply voltage:	Nominal ±1%
Auxiliary supply frequency:	Nominal ±1%
AC auxiliary supply waveform:	Sinusoidal (distortion factor < 0.05)
Magnetic field of external origin:	Terrestrial flux

Accuracy

Voltage:	±0.17% of range maximum
Current:	±0.17% of nominal
Frequency:	0.15% of mid frequency
Active power:	±0.2% of range maximum
Power factor:	1% of unity
Reactive power (VAr):	±0.5% of range maximum
Apparent power (VA):	±0.2% of range maximum
THD:	±1%
Neutral current calculated:	±0.95% of nominal
Energy:	0.3% of range maximum (Better than class 1) IEC1036 Sect 4.6)
kVAh:	0.6% of range maximum
Temperature coefficient:	Voltage and current typical: 0.013%/°C Watts typical: 0.018%/°C

Specifications continued

Enclosure

Enclosure style:	DIN 96 panel mount
Compliant with:	IEC 1010-1/ BSEN 61010-1 : 2001 CAT III, CE EMC and LVD directives
Material:	Polycarbonate
Terminals:	Shrouded screw-clamp 0.05mm to 4mm wire
Dielectric voltage:	Withstand test 3.25kV rms 50Hz for 1 minute between all electrical circuits
Operating temperature:	-20 to +60°C
Storage temperature:	-30 to +80°C
Relative humidity:	0-90% (non condensing)
Warm-up time:	1 minute
Shock:	30g in 3 planes
Vibration:	10-18Hz, 1.5mm peak-to-peak 18-150Hz @1g
IP protection:	IP54
Dimensions:	96mm wide x 96mm high x 79mm deep (max). Typically <60mm depth behind panel 3.78" wide x 3.78" high x 3.11" deep (max)
Panel cut-out:	92mm x 92mm, 3.62" x 3.62"

Wiring

