Grid Solutions

iSTAT i5Mx

High Performance Multifunction Transducer

The i5Mx is a configurable, highly accurate, multifunction transducer family designed to meet the requirements of the high and medium voltage utility market and the low voltage industrial market.

High Performance Transducer Family

With a wide range of analog, digital and communications options, the i5Mx can be used for many applications - from a simple analog transducer through to an Ethernet transducer connected to a SCADA network.

The DIN rail mounting case is available with utility grade ring or pin terminals and when combined with the I/O options available, most requirements can be met from one transducer.

- The iSTAT i5Mx can be used as an analog transducer (up to four outputs) or as a communicating transducer, or both at the same time.
- The iSTAT i5Mx has fully programmable input scaling, which can be set to match any site application for single and 3-phase installations.
- The iSTAT i5Mx has fully programmable I/O and can produce any required output function and scaling.
- The iSTAT i5Mx has multiple communications port options: RS232, RS485, Ethernet and USB - allowing it to be engineered into most applications.
- The iSTAT i5Mx has multiple protocols allowing configuration to MODBUS RTU and MODBUS TCP based systems to interface with a wide range of RTUs and SCADA systems.
- The iSTAT i5Mx uses the QDSP setting software that is used across the entire range of programmable measurement products supplied by GE Vernova.

The i5Mx Family

- i5MT communicating transducer
- i5MR communicating network recorder
- i5MQ communicating network analyser

Key Benefits

- Multifunction transducer
- High accuracy
- Easily configured
- Multiple I/O options
- Multiple communications options
- Multiple protocols
- Connector options

GE VERNOVA

FEATURES	BENEFITS
Multifunction configurable transducer with over 120 measured and calculated values available	All site applications can be fulfilled using a small number of transducer types.
0.2% measurement accuracy and true RMS	High-accuracy measurements of any electrical network regardless of distortion
Class 0.55 energy measurement, combined with tariff inputs, tariff structure, real time clock and energy pulse outputs	Able to perform highly accurate energy measurement and manage functions.
Auto-range voltage and current inputs: up to 500 V and 5 A	Easy to specify the transducer for any application, including when full details are not available.
RS232, RS485, Ethernet and USB communications	Communications ports available increase system design options.
MODBUS RTU and TCP protocols	Multiple protocols allow connections to most remote energy management systems.
Up to four isolated analogue outputs can be fitted	Analogue outputs for up to four measurement quantities can be supplied from the same transducer, thus reducing the number of devices required.
Digital inputs and alarm outputs	Digital 1/0 increases the range of applications that the transducers can be used for.
Watchdog output option	The operational status of the transducer is always known via a hard-wired output.
Analogue inputs	Measure, record, alarm and transmit values from external sensors, i.e. pressure, temperature.
Two ranges of universal power supply	Power supply options to suit all site requirements.
Configuration using QDSP software	Easy to use software allowing fast configuration of transducers.
Wide operating temperature range: -30°C to 70°C	Suitable for installation in most environments.
Two versions available with Ring and Pin terminations	The customer's preferred terminations can be met within the same transducer range.
Optional remote LCD display - allowing programming/viewing without a PC of up to 31 transducers	A number of transducers can be accessed and configured from a single point without a PC being required.
Optional second RS485 communications port	Extends the communications systems options available to the customer.

ENERGY MANAGEMENT AND POWER QUALITY APPLICATIONS	i5MT	i5MR	i5MQ
Tariff clock	•	•	•
Cost management	•	•	•
Programmable alarms	•	•	•
PC software	•	•	•
Four energy counters	•	•	•
Real time clock	•	•	•
Alarm recorder		•	•
Measurement recorder		•	•
Power quality EN 50160			•
Harmonics	to 63rd	to 63rd	to 63rd

Simple to fit, set and connect
Advanced functionality Economical

Communicationg Transducer – I5MT

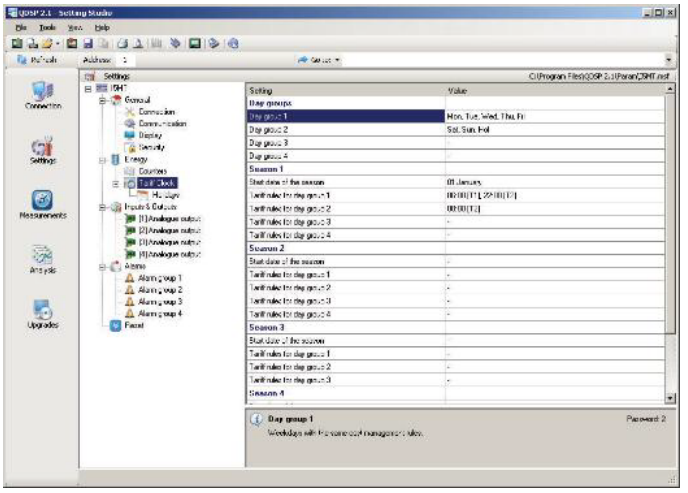
The i5MT is a Class 0.2 transducer which measures multiple parameters of an electrical system. The measured and calculated values can be viewed on a remote display, output as an analog signal, used to generate a relay alarm output or made available to a SCADA system. The i5MT can also input analog process signals from ancillary plant which can be converted to real values and made available in the same way.

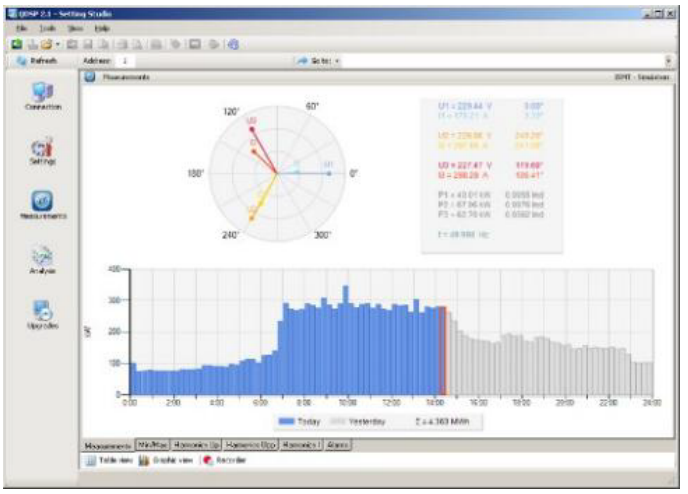
The i5MT also provides class 0.5S accurate energy measurement and has 4 energy counters that can be selected from all four quadrants. The provision of pulse energy outputs and tariff inputs means the i5MT can be used in most secondary metering applications. The i5MT also includes comprehensive energy cost measurement functionality, using the tariff structure and the real time clock it is able to calculate energy costs. The tariff structure allows the definition of up to 4 tariffs, 4 seasons and 4 day groups within each season as well as 20 additional holidays. For each tariff an energy cost can be defined.

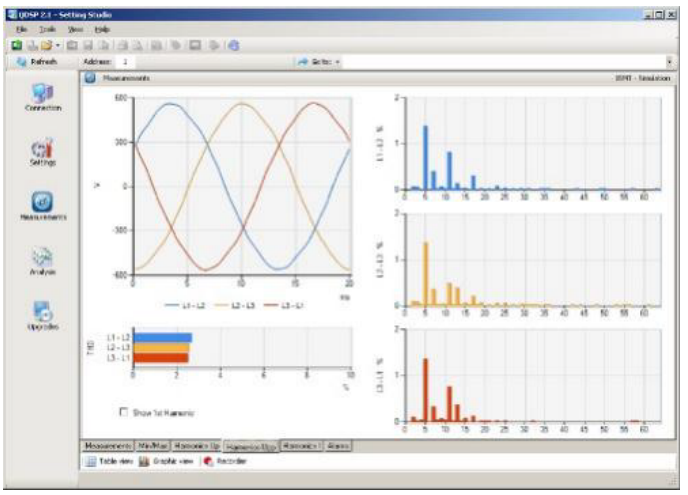
The i5MT has multiple communication port options, RS232/RS485, Ethernet or USB using MODBUS RTU or TCP, with the possibility of having a secondary RS485 port.

The i5MT is not only a comprehensive measurement device it also has hardware interfaces that can be used to monitor and control ancillary equipment. The hardware options include tariff and digital inputs, alarm and pulse outputs, analog inputs and outputs, and watchdog outputs.

The i5MT is programmed using the QDSP software which can also be used to remotely read and display most of the measurements available from the unit.







Communicating Network Recorder – i5MR

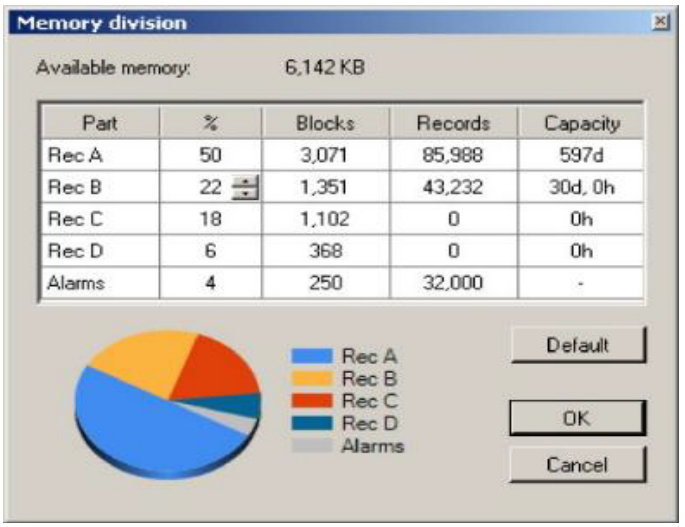
The i5MR can be used to monitor the status of plant or an electrical power system and record the required data. The measurements from an electrical system provide data for system analysis, load planning and maximum demand analysis.

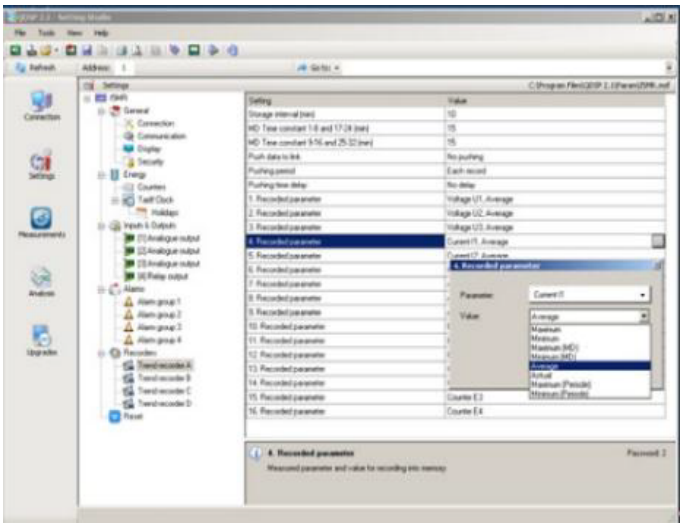
The i5MR is a class 0.2 communicating network recorder with all the same capabilities as the i5MT. In addition, the i5MR includes an 8MB trend data recorder which allows up to five data recorders to be programmed: four for measurements and one for alarms. The recorders allow up to 64 (4 × 16) different electrical parameters and the status of the 32 alarms to be recorded. The data from analog inputs and the status of the digital inputs (as alarms) can also be stored in the recorder. All of the data is stored in non-volatile memory which ensures the data is retained if power is lost.

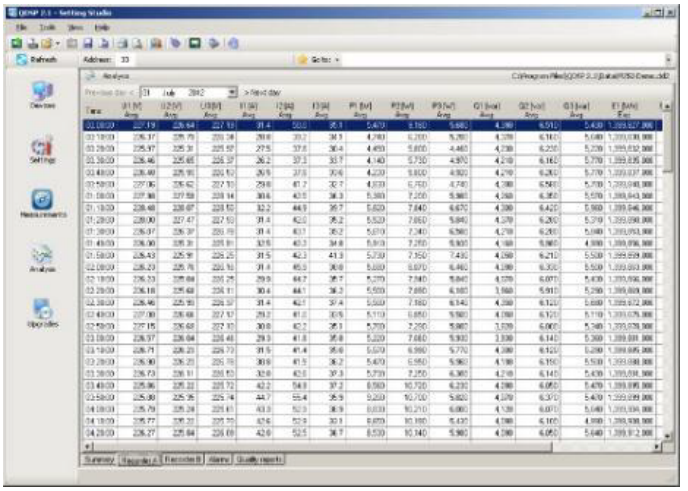
Each of the 4 measurement recorders has a configurable recording time period so that recording at different time periods can be performed at the same time. The type of value can be defined for each parameter, i.e. minimum, maximum, or average. Maximum demand and maximum and minimum instantaneous (every cycle) values can also be recorded. The proportion of the memory assigned to each recorder can be adjusted to optimise how long the data can be recorded before needing to be downloaded. When any of the data recorders is full the oldest data will be overwritten by the newest data.

The i5MT is programmed using the QDSP software which is also used to download the trend files for archive and analysis.

The data can be displayed and analysed within QDSP and can be exported to an Excel file for further analysis.







Power Quality Monitoring – I5MQ

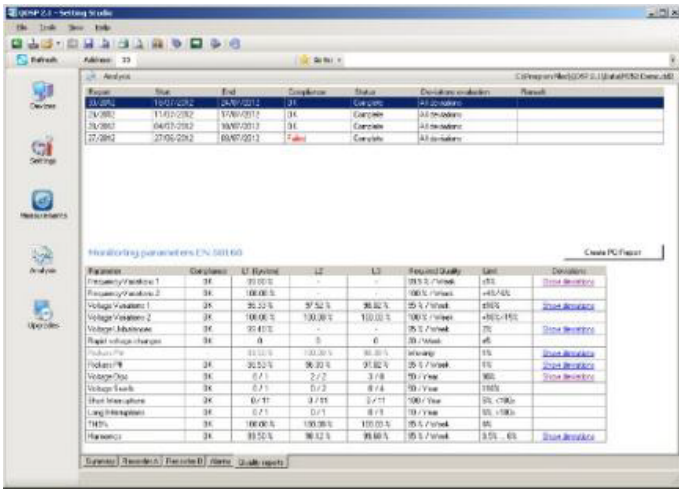
The i5MQ is a class 0.2 communicating network analyser with the same features and recorder capabilities as the i5MR. In addition the i5MQ includes Power Quality measurements and compliance monitoring to EN50160.

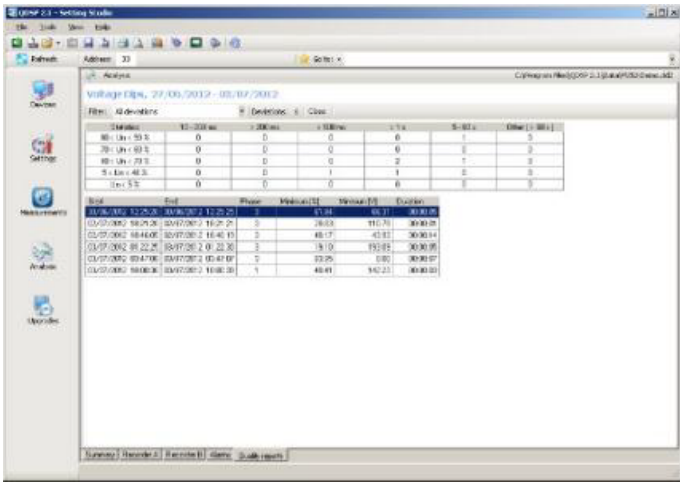
The i5MQ measures or monitors for frequency deviations, voltage deviations, voltage dips, voltage interruptions, voltage unbalance, overvoltage, fast voltage changes, flicker intensity, THD and harmonics.

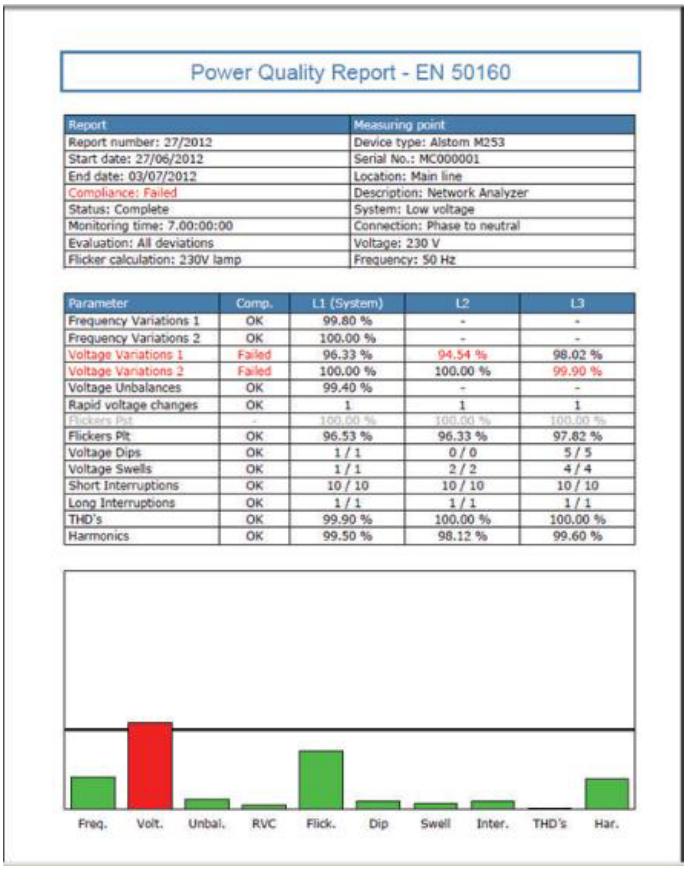
The i5MQ as standard compares the power quality values against the European compliance specification EN50160 and stores the compliance and deviation data required. The default compliance values used are for EN50160 but the values can be adjusted to suit the requirements of the utility.

The i5MQ assigns 2MB of the memory to recording power quality data for a period of up to 3 years. The measurement data recorder memory is therefore 6 MB.

The power quality compliance settings are configured using the QDSP software which also downloads and displays the compliance details for each reporting period along with the details of all deviations. The power quality status summary can be printed out. The QDSP software can also produce an EN50160 report for each reporting period.







i5Mx Features

Comprehensive Measurements

The iSTAT i5Mx includes the following:

- Measurements of instantaneous values of more than 140 quantities (V, I, P, Q, S, PF, PA, f, %THD, MD, energy, energy cost by tariffs, etc...)
- Power accuracy class 0.2 , Energy class 0.5 S
- Harmonic analysis of phase, phase-to-phase voltages and currents up to 63rd harmonic
- Measurements of 40 maximum and minimum values in different time periods
- 32 adjustable alarms
- Wide Frequency range from 16 Hz to 400 Hz, that allows use in many applications: 16 2/3 Hz (Railway), 50/60 Hz (Electrical Networks) or 400 Hz (Marine/Airport)

User Friendly Design

Connection is simplified by the use of auto-ranging on voltage and current input circuits and configuration using QDSP setting software. The CT and VT secondary values do not need to be specified at the time of order as these are configured within the i5Mx.

The auto-ranging allows connection to any nominal secondary values up to 500 V. The i5Mx is rated for connection to either 5 A or 1 A CT secondary's. To meet all of the ac or dc auxiliary voltage supplies that are found in substations, the i5Mx has the option of 2 universal power supplies with different ranges.

HIGH RANGE	80-276 V ac, 70-300 V dc
LOW RANGE	45-77 V ac, 19-70 V dc

With the optional remote display fitted a Setup Wizard is available to assist in the basic configuration of the transducer.

Energy Management

The i5Mx can operate as an energy counter, with the included function of cost management by tariffs. A tariff structure and a real time clock allow the calculation of energy costs. This allows up to four seasons and four day groups within each season, with energy costs defined for each (16 different cost periods), as well as 20 additional holidays. The i5Mx has four energy counters that can be selected from all four quadrants.

Inputs and Outputs

The i5Mx can be fitted with four I/O modules, which are fully isolated from each other and all other circuits and can be fitted with various options.

The status of the digital inputs is assigned to one of the software alarms which can be read over the communications or stored in the alarm recorder.

The value of the analog input can be scaled to a real value and assigned units for display on the i5RD. The scaled value can be read over the communications, stored in the measurement recorder and can be used to set alarms.

It is also possible to use the i5Mx to convert analog process signals if an analog input and output are both fitted. The analog input value can be assigned as the source for the analog output, which can be programmed for any process signal output.

i5Mx multifunction transducer. Flexible I/O options: analog, alarm and pulse. Individually selectable and isolated

Various I/O Options

I/O OPTIONS	QUANTITY	POSITION	SPECIFICATION
Alarm output	4 outputs	any I/O	48 V ac/dc @ 1000 mA max.
Analog input	4 inputs	any I/O	[-10-0-10 V, -20-0-20 mA, PTI00]
Watchdog output	4 outputs	any I/O	48V ac/dc @ 1000 mA max
Analog output	4 outputs	any I/O	Fully programmable± 20 mA, ± 10 V
Pulse output	4 outputs	any I/O	40 V ac/dc 30 mA
Tariff input	2 inputs	I/O 1,2	110/230 V ac 45 ... 65 Hz
Digital input	4 inputs	any I/O	48 V ac/dc (+ 40% max.)
Additional RS485 comm. port (COM2)	1 I/O	I/O 4	

Communications

The i5Mx is a communicating transducer and is always supplied fitted with at least one communications port. The communications port is used for programming the transducer using QDSP software in addition to anyconnection required for the application. All measurements and calculated values are available for download.

The second RS485 port option (COM2) allows two independent serial communication connections to be used simultaneously. There are a number of communication configurations that can be defined to suit the application.

MODBUS RTU or TCP communications protocols have been implemented with the transducer automatically detecting which protocol is being used.

The optional remote display can be connected to COM1 or COM2 to allow connection to multiple transducers. Or it can be connected to a separate remote display port for connection to a single transducer. If the Remote display port option is included in the configuration of the transducer, COM2 cannot be specified.

i5RD Remote Display

The i5Mx can be connected to an optional i5RD remote display to allow measurements to be viewed and the transducer configured without a PC. A single i5RD remote display can be connected to a maximum of 31 i5Mx transducers, and can address each of them individually, allowing a complete network to be programmed from a single point.

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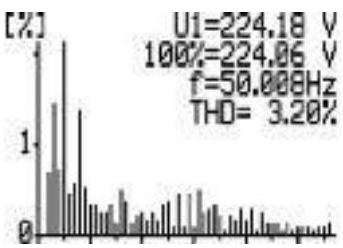
The Installation Wizard can be used to assist with installation and commissioning of the addressed i5Mx transducers. This utility leads the operator through the settings required to set up the basic operations.

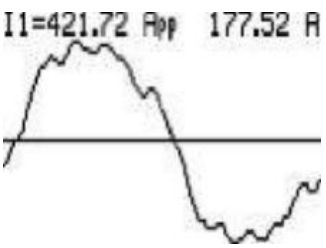
For different martkets around the world, the i5RD is offered in two case styles and two colours of LCD.

i5Mx transducer advanced communications options: Serial, Ethernet and USB MODBUS, RTU or TCP

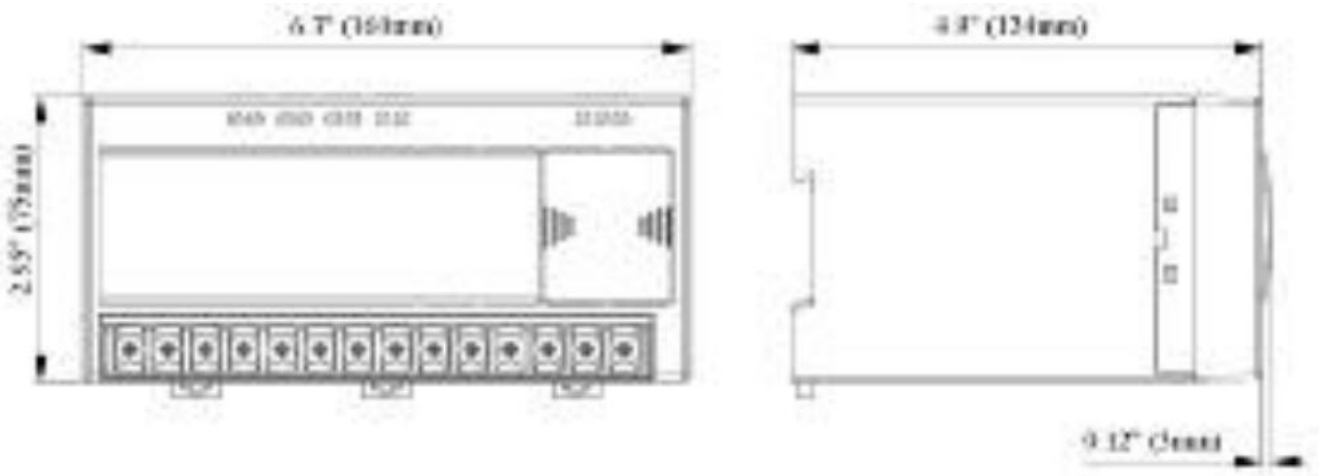
COM	PORT	A NUMBER OF COMMUNICATIONS PORTS ARE AVAILABLE
1	RS232/RS485	Both options on one D89 connector. In addition the RS485 connections are available via terminals. The two options cannot be connected at the same time.
1	Ethernet	RJ-45 connector
1	USB	USB-B connector
2	RS485	Terminals

CONFIGURATION	COM1A	COM1B	COM2
1	RS232/485	/	/
2	RS232/485	/	RS485
3	USB	/	/
4	USB	/	RS485
5	Ethernet	USB	/
6	Ethernet	USB	RS485



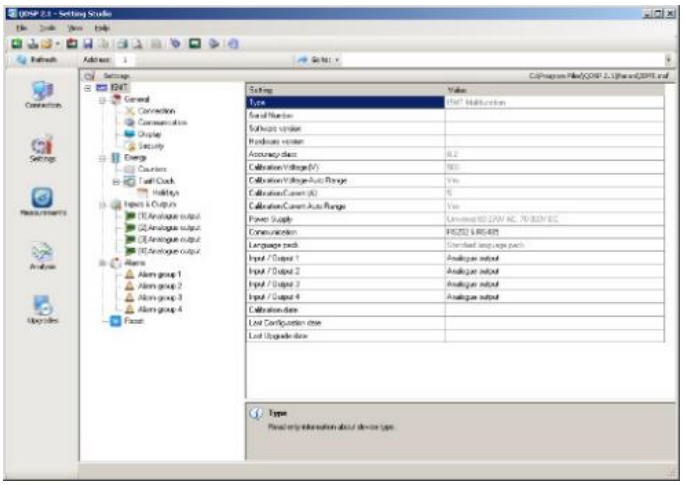


Dimensions



QDSP Setting Software

The iSTAT i5Mx uses the same QDSP setting software that is used across the range of programmable iSTAT measurement products supplied by GE Vernova.



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