



Bitronics®

Electric Power Measurement and Recording Products



## The Engineer's Choice



In applications ranging from traditional SCADA monitoring to distributed event recording and advanced, high-speed control, Bitronics Electric Power Measurement and Recording Products have set the gold standard for quality and dependability in the electric utility substation for decades. Designed, built, and tested in Bethlehem, Pennsylvania, Bitronics products are recognized worldwide for their reliability, advanced features, and outstanding support.

### Utility-Grade Design

Bitronics Electric Power Measurement and Recording Products are found in more high voltage substations than any other manufacturer because they are designed to withstand harsh electrical conditions.

- ◆ Heavy duty CT circuits withstand surges and high continuous over range operation
- ◆ Built-in secondary transformers for superior isolation and low burden at all input levels
- ◆ Wide range power supplies
- ◆ 2x continuous over range protection
- ◆ High-intensity, long-life displays with wide viewing angle
- ◆ No periodic maintenance or calibration required
- ◆ Non-volatile memory
- ◆ Built-in diagnostics

### Features by Product Family

	70 Series	50 Series	MultiComm	PowerPlex	TriPlex	Watt/VAR	Triple II	DC Meters
<b>Channels</b>	11-14	3-6	6	6	1-3	2-6	1-4	1-2
<b>Electrical</b>								
Single Phase					•	•	•	
Three Phase	•	•	•	•	•	•	•	
DC	•							•
<b>Measurement</b>								
Volts (v)	•	•	•	•	•	•	•	•
Amps (A)	•	•	•	•	•	•	•	•
Frequency (F)	•	•	•	•				
Power (P)	•	•	•	•		•		
Energy (E)	•	•	•	•				
Harmonics (H)	•	•	•	•				
Min/Max (M)	•	•	•	•	•		•	
Synchronizing (S)	•			•				
Advanced (+)	•							
<b>Accuracy</b>	Best	Best	Better	Better	Better	Better	Good	Good
<b>Mount</b>	Surface	Flush	Flush	Surface	Flush	Flush	Flush	Flush
<b>Display</b>	LED*	LED**	LED		LED	LED	LCD	LED
<b>Communications</b>								
Current Loop	•	•	•	•	•	•	•	
Serial/Master RTU	•	•	•	•				
Modbus Plus	•		•	•				
Ethernet	•	•						
<b>Recording Files</b>	•							
<b>Monitor Status</b>	•							
<b>Relay Output</b>	•							

\* Detached displays  
 \*\* No display for M651

## 70 Series Substation Measurement and Recording System

The Bitronics® 70 Series Measurement and Recording System is a substation monitoring and control solution designed to support multiple applications with a distributed network of Intelligent Electronic Devices (IEDs). One or more 70 Series IEDs can be configured to perform a number of electrical measurement, communication, and control functions, including:

### SCADA and Local Indication

70 Series IEDs provide real-time data to multiple SCADA masters using different protocols simultaneously, including IEC 61850. Detached displays present data locally on mimic panels and other substation equipment.

### Automation and Control

70 Series IEDs can be used to automate a substation while preserving existing investments in electromechanical relays. They perform supervisory control, distance to fault, sequence of events, oscillography recording, and other advanced measurement functions. 70 Series' high-speed measurements and communications may also be employed to perform synch-check and auto-synch applications for generators and bus ties.

### Distributed Disturbance Recording

Engineers can make better and faster diagnoses using up to seven highly configurable, time-synchronized recorders with advanced triggers settings (including cross-triggering via GOOSE messaging). 70 Series IEDs meet all of the Disturbance Monitoring and Reporting Requirements for NERC PRC-002-1 and draft standard PRC-002-2.

### Other Features

- ◆ Copper and Fiber Ethernet communications
- ◆ Quarter-cycle (4ms) measurement update
- ◆ IRIG-B timestamping to 1ms
- ◆ IEC 61850-compliant measurement server
- ◆ Common firmware and configuration toolset
- ◆ 0.1% accuracy (voltage and currents), .2% energy accuracy, and .001Hz frequency accuracy (M87x only)
- ◆ Multiple recording modes: trend, oscillography, and disturbance (Comtrade)
- ◆ Sequence of events recorder (csv text)
- ◆ 0-5A, 20X over range
- ◆ Status inputs/ transducer inputs
- ◆ Relay outputs/ transducer outputs
- ◆ Simultaneous support of multiple protocols
- ◆ Over 2000 measurements:
  - V, A, F, P, E, H, M
  - Harmonics to 63rd
  - Flicker
  - Phasors
  - Sequence components
  - Impedance
  - Distance to fault

### 70 Series by Model

	M571	M572	M871	M872
<b>Modular Chassis</b>			.	.
<b>Option Slots</b>	Fixed	Fixed	3, 5, or 6	5 or 6
<b>Line 1</b>				
Voltage Input	A, B, C, N	A, B, C, N	A, B, C, N	A, B, C, N
Current Input	A, B, C	A, B, C	A, B, C, N	A, B, C
<b>Line 2</b>				
Voltage Input	A, B, C, N	A, B, C, N	A, B, C, N	A, B, C, N
Current Input		A, B, C		A, B, C
<b>Auxiliary</b>				
Voltage Input			Aux 1, Aux 2	
<b>Frequency Range</b>	40-70Hz	40-70Hz	15-70Hz	15-70Hz
<b>Comm Ports</b>	(2) RS-232/485 (1) RS-232	(2) RS-232/485 (1) RS-232	(3) RS-232/485 (1) RS-232	(3) RS-232/485 (1) RS-232



**“ The Bitronics M571 is an ideal measurement and control node for integrating distributed intermittent renewables like wind. Its 4ms measurement response time, integrated I/O, and simultaneous communications to multiple masters are uniquely suited to the high-speed control of wind turbines, feeders, and other smart microgrid components.”** - Oliver Pacific, CTO of Spirae

Both the Bitronics 70 Series IEDs and the NovaTech Orion Automation Platform are designed to enable today's most ambitious automation and control strategies while creating a flexible, upgradeable, and continuously supported measurement, communication and control infrastructure for future applications.

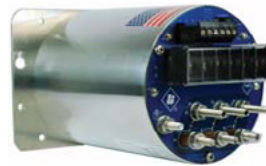
## 50 Series SCADA Meters, Digital Transducers and Indicators

The 50 Series of SCADA meters and digital transducers consists of single function and multifunction devices with optional transducer, serial, or Ethernet communications ports to interface to SCADA/EMS systems and substation automation.

### Features

- ◆ Easy to communicate with, read from, and install
- ◆ Meters have outstanding 3-line, 5-digit display with automatic indication of engineering units
- ◆ Option to have the power supply voltage input value monitored (model M3)
- ◆ Meets frequency accuracy specification of .001Hz to comply with NERC BAL-005-0.1b standard
- ◆ Fiber optic Ethernet option using MT-RJ connector
- ◆ Communications flexibility with optional RS-232/RS-485 serial port, transducer output, or Ethernet port
- ◆ Standard Ethernet service port for access to on-board web server – port can also provide Modbus/DNP3 TCP communications
- ◆ Digital transducer version (no display) M651 model available
- ◆ Three display-at-once M653 provides three simultaneous displays in a 19" 3U panel from a single input.

	M350	M650 / M651 / M653
Measurements	V, A, M	V, A, F, P, E, H, M



## MultiComm Digital Power Meters

The MultiComm family consists of multifunction power meters with serial ports for communications of multiple parameters to SCADA/EMS systems and substation automation systems.

### Features

- ◆ Simultaneous display of all phases
- ◆ Push-button, in-the-field scaling from library of ANSI CT and PT ratios
- ◆ Non-volatile memory requires no batteries for settings retention
- ◆ Modular construction simplifies maintenance
- ◆ One RS-232, RS-485, or Modbus Plus Port
- ◆ Transducer Outputs: 0-1mA or 4-20mA
- ◆ DNP3, Modbus, or Modbus Plus protocol

	RT	RTH
Measurements	V, A, F, P, E	V, A, F, P, E, H, M



## PowerPlex Digital Transducer

The PowerPlex family consists of multifunction power transducers with serial ports for serial communications of multiple parameters to SCADA/EMS systems and substation automation systems.

The family includes an RTS model with a separate reference voltage to calculate the phase angle to system voltage for synchronizing. The RTS' high-speed measurements and communications are ideally suited for gen-set applications.

### Features

- ◆ Selectable element switch
- ◆ Transducer Outputs: 0-1mA or 4-20mA
- ◆ DNP3, Modbus, or Modbus Plus protocol

	RT	RTH	RTS
<b>Measurements</b>	V,A,F,P,E	V,A,F,P,E,H,M	V,A,F,P,E,S



## Triplex Amp and Volt Meters

### Features

- ◆ Simultaneous display of all phases
- ◆ Non-volatile memory requires no batteries for settings retention
- ◆ Modular construction simplifies maintenance
- ◆ Optional transducer outputs: 0-1mA or 4-20mA
- ◆ Push-button, in-field scaling

Measurements	Ammeter	Voltmeter	Amp/Volt Meter	Dual Channel Voltmeter	Amp Demand
Amps	•		•		•
Volts		•	•	•	
Amp Demand					•



## Watt/VAR Power Meters

### Features

- ◆ Simultaneous display of total Watts, Total VARs or other combinations
- ◆ Push-button, in-field scaling
- ◆ Modular construction simplifies maintenance
- ◆ Non-volatile memory requires no batteries for settings retention
- ◆ Optional transducer outputs: 0-1mA or 4-20mA

Measurements	Watt/VAR Meter	Watt Meter	VAR Meter	Power Factor Meter	Watt/Power Factor Meter	Watt/VAR Meter & Ammeter	Watt/VAR Meter & Voltmeter
Amps						•	
Volts							•
Power	•	•	•	•	•	•	•



## Triple II Amp Demand and Volt Min/Max Meters

### Features

- ◆ One button to reset demands
- ◆ Push-button rescaling
- ◆ Heavy duty CT circuits to withstand fault currents
- ◆ Optional transducer outputs: 0-1mA

Measurements	Amp Demand Meter	Volt Min/Max Meter
Amps	•	
Volts		•
Demand/Min/Max	•	•



## Other NovaTech Products and Services



### Education and Training

NovaTech offers Utility Training Courses, Utility Webinars and Utility Technical Symposiums. Courses are designed to train engineers and technicians in the application of NovaTech products and technologies. Twenty courses currently available. Schedules posted on our website.



### Engineering Services

NovaTech provides custom hardware engineering, SCADA integration, panel engineering, Orion configuration, substation automation system design, HMI and SCADA configuration, and on-site commissioning support.



### D/3® DCS

Open, configurable, and highly reliable, the D/3® Distributed Control System (DCS) provides continuous and batch process automation worldwide. The D/3 DCS combines state-of-the-art features like Online Upgrades with a guaranteed migration path unmatched by any other process automation supplier.



### Orion Automation Platform

Orion provides rapid integration and secure SCADA and engineering access to substation IEDs. OrionLX and Orion Distributed I/O can be used with the 70 Series IEDs to provide a distributed RTU with a web-browser interface and automatically consolidate high resolution fault and disturbance recordings.



## How Can We Help?

For more detailed information on NovaTech products, services, or electric utility customer references, contact the NovaTech representative in your area, email [info@novatechweb.com](mailto:info@novatechweb.com) or call us at **800.253.3842**

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