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# Bitronics

An Overview of the  
Bitronics Product Line

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# Precision Crafted Quality Backed by a Hassle-Free 10-Year Guarantee

Bitronics' tradition of quality craftsmanship stretches from the first hand-jeweled, coil-based instruments of the early 1900s to today's web-enabled, multifunction, and oscillographic Intelligent Electronic Devices (IEDs). Built with pride in our Bethlehem, Pennsylvania manufacturing facility and used worldwide in the most demanding applications, all currently manufactured Bitronics products are backed by a ten-year performance guarantee.



## Table of Contents

- 02 Introduction
- 04 SCADA Meters
- 06 SCADA & Automation Transducers
- 08 Event Recording IEDs
- 10 Legacy Products
- 12 International Presence
- 14 People Behind the Products

# SCADA Metering Simplified

With universal wiring, split-core Current Transformers (CTs), universal power supplies, wide operating temperature range (-40° to 70°C), capacitive-touch and web-based configuration, all Bitronics SCADA Meters simplify ordering, configuration, integration, commissioning, and spares. Models offer a variety of bright 3-line/5-digit displays, flexible connections (Ethernet, RS-232, and RS-485), and protocols (IEC 61850, Modbus, and DNP3 over TCP/IP) options.



Amp & Voltmeters	M350 A3	M350 V3
3-Line/5-Digit Display	x	x
Capacitive Touch Front Buttons	x	x
DNP/Modbus Serial	o	o
DNP/Modbus TCP/IP	o	o
Transducer Output	o	o
Universal Power Supply	x	x
100ms RMS Updates	x	x
Fiber Optic Port	o	o
0.1% Accuracy	x	x
3 Phase Amps	x	
Amp Demand/Max	x	
3 Phase Volts		x
Avg/Min/Max Volts		x

x = Standard o = Optional

SCADA Meters	M650	M660	M653
Volts with Min/Max	x	x	x
Amps with Demand	x	x	x
Power, Energy, Transformer/Line Loss, Frequency, THD, K-Factor	x	x	x
Single Display	x	x	
Triple Display			x
Split Core CTs	o		o
DNP/Modbus over TCP	o	x	o
IEC 61850 Over TCP		x	
RJ45 Ethernet	x	x	x
Fiber Ethernet	o	o	o
RS-232/485	o		o
Transducer Outputs	o		o
0.2% Revenue Accuracy	x	x	x
48-250V dc/55-240V ac Power Supply	x	x	x
Power Supply Monitoring	o	x	o

x = Standard o = Optional

# SCADA and Automation Transducers

The M651 and M661 SCADA transducers offer the same universal wiring, measurements, accuracy, and communications options of the M650 and M660 SCADA meters without the touch-front controls and display. The PowerPlex II is an automation transducer with two sets of 3-phase voltages and 1-cycle measurement update speeds for use in high-speed control, sync-check, and auto-synchronization applications.



SCADA & Automation Transducers	M651	M661	PowerPlex II
Volts with Min/Max	x	x	x
Amps with Demand	x	x	x
Power, Energy, Transformer/Line Loss, Frequency, THD, K-Factor	x	x	x
Synchronizing Measurements (Slip Frequency, Phase Angles)			x
Two Sets of 3 Phase Voltage Inputs			x
Split Core CTs	o		
DNP/Modbus over TCP	o	x	x
IEC 61850 Over TCP		x	o
RJ45 Ethernet	x	x	Dual (Switch)
Fiber Ethernet	o	o	
RS-232/485	o		
Transducer Outputs	o		
0.2% Revenue Accuracy	x	x	x
One-Cycle RMS Updates		x	x
660V ac Input			x
8-40V dc Power Supply			o
48-250V dc/55-240V ac Power Supply	x	x	o
Power Supply Monitoring	o	o	x
Display			o

x = Standard o = Optional

# Distributed Event Recording IEDs

Bitronics Event Recording IEDs provide 4ms RMS voltage and current measurements, all three PRC-002 Event Recording requirements (SOE Equipment, Fault Recording, and Dynamic Disturbance Recording), and IEC 61850-compliant communications in a single unit. They use high-resolution event capture to analyze network faults, verify protective relay and other substation equipment performance, test the dynamic response of the network, store long-term trends, and automate a substation – including supervisory control, distance to fault, sequence of events, oscillography recording, and other advanced measurements – while preserving existing investments in electromechanical relays.

Common applications include:



Automate Electromechanical Relay Substations



Real-Time Sync



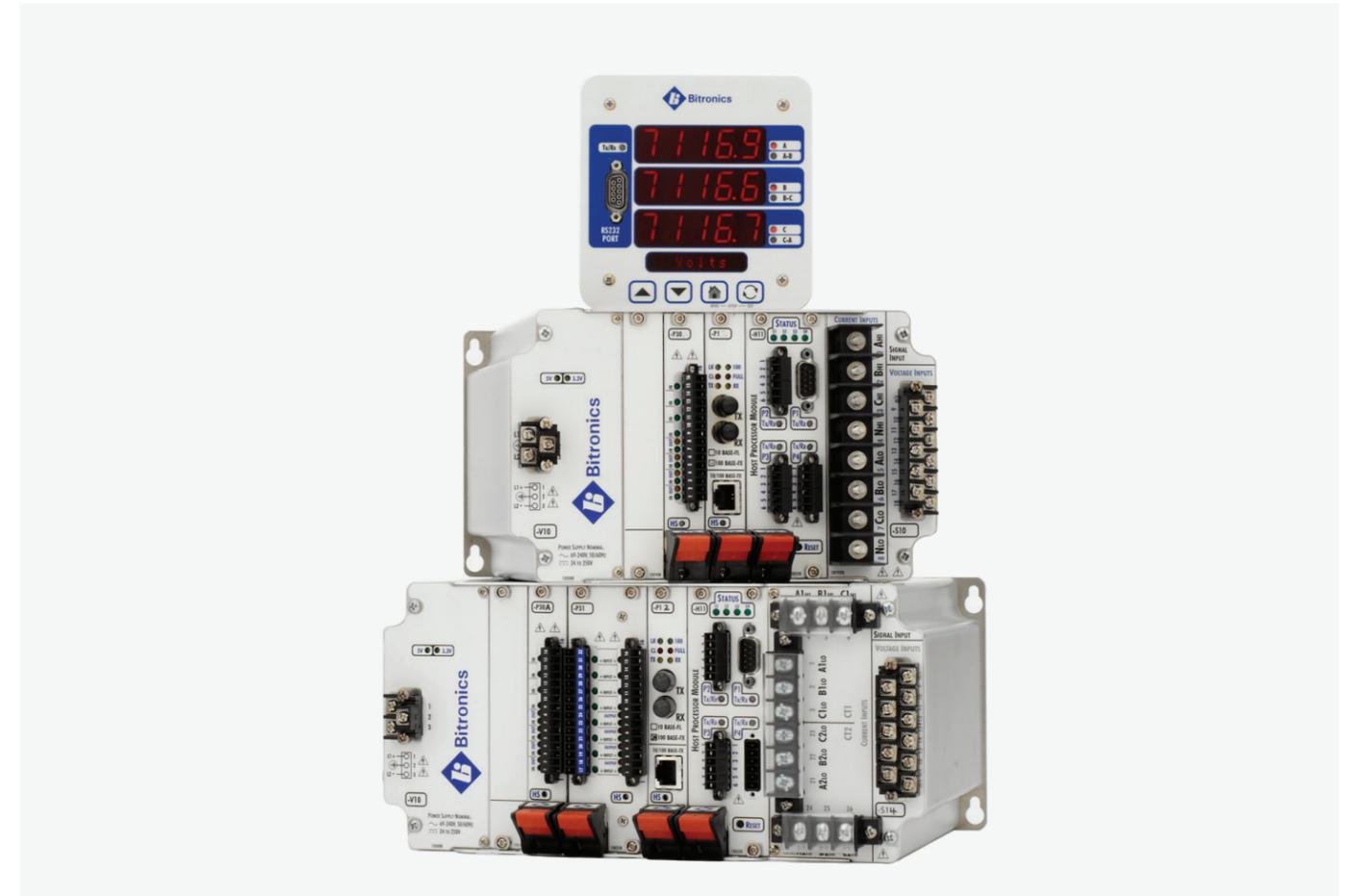
Power System Analysis



Disturbance Monitoring



Distributed Event Recording



Event Recording & Automation IEDs	M871	M872
Volts and Amps	X	X
Power, Energy, Frequency, Demand, Harmonics, K-Factor, Flicker, Impedance & Symmetrical Components	X	X
Detached Displays	O	O
0.2% Revenue Class Accuracy	X	X
4ms RMS Updates	X	X
RJ45 Ethernet	O	O
Fiber Ethernet	O	O
Dual 3- Phase Current Inputs		X
Directly Monitored Neutral Current	X	
DNP/Modbus Over TCP	X	X
IEC 61580 with GOOSE over TCP	X	X
Trend Recording	X	X
Disturbance & Event Capture	X	X
Battery Voltage Inputs	X	
Distance-to-Fault	X	X
Digital/Analog I/O	O	O
Modular Component Flexibility	X	X

x = Standard   o = Optional

# Legacy Meters and Transducers

Bitronics Meters and Digital Transducers have set the gold standard for reliability and accuracy in the electric utility substation for decades. All models feature heavy duty CT circuits for high continuous over range operation and built-in secondary transformers for superior isolation and low burden at all input levels. All models feature bright, crisp displays (except the PowerPlex), built-in diagnostics, non-volatile memory, and require no periodic maintenance or calibration.



Features	MultiComm	PowerPlex	TriPlex	Watt/VAR
Channels	6	6	1-3	2-6
Single Phase			o	o
Three Phase	x	x	o	o
Amps & Volts	x	x	x	
Power, Power Factor	x	x		x
Frequency, Energy	x	x		
Min/Max, Demand, Harmonics, K-Factor	o	o		
Synchronizing Measurements		o		
Local Display	x		x	x
Serial/Master RTU	x	x		
Modbus Plus	o	o		

x = Standard o = Optional

# Wherever Quality Counts

From the Tennessee Valley Authority to the Three Gorges Dam in China, Bitronics delivers unparalleled reliability and accuracy. Over 140,000 Bitronics products are deployed worldwide and in over 1,200 U.S. utilities.



North America



Europe



Asia



South America



Australia



Africa

# How Can We Help?

All NovaTech products are designed with decades of expertise and backed by a courteous and professional staff dedicated to your satisfaction. In addition to outstanding product support, we offer a full range of additional design, development, fabrication, installation, and training services to meet all your automation and engineering needs.

## Graphics Development

Customized HMI graphics developed using the open source Inkscape graphics package are available in addition to an existing library of standard one-lines, IED faceplates, and other screens.

## Cabinetry & Packaging

Full service cabinetry and custom enclosure design, fabrication, and testing available for substation equipment monitoring, cabinet or pole-top RTUs, and other applications.

## Applications Engineering

NovaTech products are built to make the end application easier, and our experienced and professional staff can help you implement even the most ambitious automation schemes on time and on budget.

## Training & Conferences

We offer on-site and classroom instruction in the use of our products and broader topics like Cyber Security. Meet your fellow users and learn from NovaTech experts at one of our ongoing technical symposium user events - visit our website for upcoming dates and locations.

Bitronics began in 1908 as the Bethlehem, Pennsylvania instrumentation group of Roller-Smith, supplying government, telecoms and mining operations with highly-reliable precision measurement devices. Manufacturing was labor-intensive and involved precision techniques carried out by skilled craftspersons. This craft-based manufacturing created a pride in quality workmanship that still resonates in our products today. As technology advanced, Bitronics designed and manufactured the first all-electronic digital power meters rugged enough for continuous use in the electric utility substation. Acceptance of the new digital instruments in the traditionally analog world of the utility substation was accelerated by the performance and quality of Bitronics products. By the early 1990s, Bitronics instruments were in use in 40% of U.S. utility substations, specified 4-to-1 over the nearest competitor.

◆ The Bitronics Design Team



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