

# Bitronics® M653

Bitronics has been providing excellence in digital metering for local indication and SCADA communications for over 15 years. The Bitronics 50 Series of panel meters continues this tradition of excellence, providing single function and multifunction solutions for 3-phase metering. The Bitronics M653 is a family of multifunction three display meters with a range of measurement capabilities. The M653 meters have three incomparable displays, are simple to set up and use, and offer superior communications flexibility. Having three separate displays in one panel allows for fast identification of three-phase conditions without scrolling. There are two M653 models (B3 and M3) with the following features:

## Display

- Three separate 3-line at once, easy-to-read, long-life LED displays that can be read from far away in all substation conditions including bright sunlight
- Ultimate precision with five digits per line
- Instant recognition of the displayed function from the trademark alphanumeric display of engineering units
- Easy setup and scrolling from front display with "Touch-Sense" buttons
- Left and right displays are easily populated via arrow keys that transfer the currently displayed values from the center display
- Ultimate flexibility by utilizing pre-set measurement screens or customizing screens including engineering units

## Communications

- DNP3 or Modbus protocol available via configurable RS-232/485 serial port
- No need for PC software - Ethernet service port provides access to web server in the instrument so meters can be interfaced with just a web browser for viewing and configuration
- Available Ethernet protocol support for DNP3 or Modbus TCP
- Optional fiber port that replaces standard Ethernet service port and includes Modbus and DNP3
- Ethernet protocol support
- Optional transducer output to interface with older generation RTUs
- An option for both standard secondary "optimal resolution" or primary units makes communications with SCADA/RTU more flexible

## Measurements

- Full basic measurement set with optional demand and harmonic values (M3)
- Option for compensated Watts/VARs (transformer/line loss) for energy values
- Option to monitor power supply voltage
- 0.2% revenue accuracy
- Updates every 100ms

## Built for the Substation

- Wide-range universal power supply for all substation installations
- Rugged aluminum case
- Reduce inventory cost as one model covers all wiring options
- Easy to mount with 3U high, 19" rack (optional panel mount)



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The M653 emphasizes simplicity. Primary settings can be programmed using the front display buttons. Simple and advanced settings are easily configured through the Ethernet service port. Pre-set register/point sets and display screens coupled with the universal power supply and universal wiring make it easy to go from the box to up and running in no time. Standard 19" panel and wiring for power, inputs and communications to only one meter further simplify installation. The external, split core CTs option streamlines upgrade and retrofit applications as the CT circuit does not need to be interrupted.

## Applications

- Digital front-end to SCADA systems
- Intelligent Electronic Device (IED) interfacing to RTUs and PLCs
- Local indication of substation conditions; three displays at once
- Plant equipment, line, power & energy monitoring
- Voltage control, power factor control, load shedding

## Specifications

**Dimensions:** 19" (w) x 5.25" (h) x 6.5" (d) rack mount, 14" (w) x 4.5" (h) x 6.5" (d) panel mount

**Weight:** 3.5 lbs.

**Power Supply:** Universal 48-250V dc/55-240V ac nominal

**Current Inputs:** 1 or 5A nominal to maximum of 2A or 10A (2x overload)

**Voltage Inputs:** 120V ac nominal, 45-65Hz

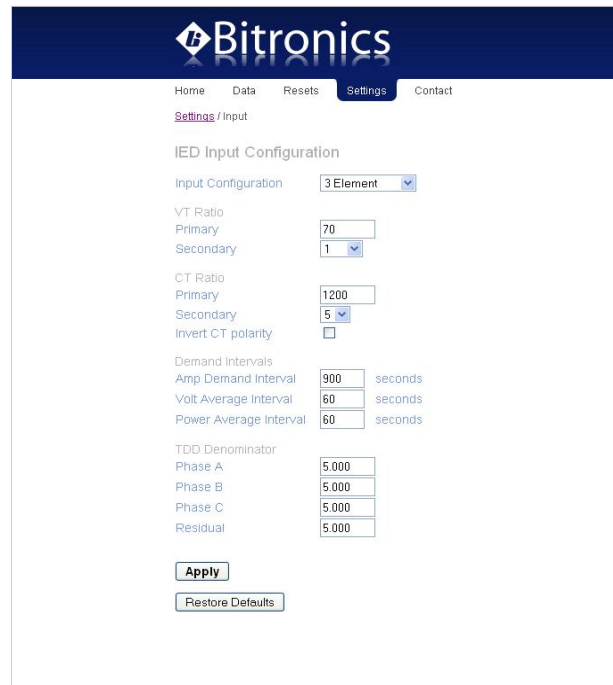
### Outputs:

- Optional Configurable RS-232/RS-485 port, configurable from 9600bps to 115.2kbps
- Standard RJ45 10BaseT/100BaseTX port for service port functions, optional Modbus or DNP3 TCP/IP support
- Optional LC 100Base FX fiber port with Modbus or DNP3 TCP/IP support
- Optional transducer output: Three 0-1mA (active) or 4-20mA (loop powered, passive)

### Environmental:

- Operating temperature range -40° to 70°C, storage temperature -40° to 85°C
- Humidity 0-95% non-condensing
- Surge withstand to ANSI/IEEE C37.90.1: 2002
- UL/CSA Recognized, File Number E164178, CE Marked

| Available Measurements                             |         |         |
|--|---------|---------|
| Available Measurements                             | M653 B3 | M653 M3 |
| Amps A, B, C, Residual                             | x       | x       |
| Demand/Max. Amps A, B, C, Residual                 | x       | x       |
| Volts AN, BN, CN, NG, AB, BC, CA                   | x       | x       |
| Fundamental Frequency                              | x       | x       |
| Watts A, B, C, Total                               | x       | x       |
| VARs A, B, C, Total                                | x       | x       |
| VAs A, B, C, Total                                 | x       | x       |
| 3-Phase Avg. Amps                                  |         |         |
| 3-Phase Avg. L-N Volts                             |         | x       |
| 3-Phase Avg. L-L Volts                             |         | x       |
| Power Factor A, B, C, Total                        | x       | x       |
| Watt-Hrs Normal                                    | x       | x       |
| Watt-Hrs Reverse                                   | x       | x       |
| Watt-Hrs Net                                       | x       | x       |
| VA-Hrs   | x       | x       |
| VAR-Hrs Lag  | x       | x       |
| VAR-Hrs Lead                                       | x       | x       |
| Fund. Amps A, B, C, Residual                       |         | x       |
| Fund. Volts AN, BN, CN, AB, BC, CA                 |         | x       |
| Phase Angle Amps A, B, C                           |         | x       |
| Phase Angle Volts AN, BN, CN, AB, BC, CA           |         | x       |
| K-factor Amps A, B, C, Residual                    |         | x       |
| TDD Amps A, B, C, Residual                         |         | x       |
| TDD Denominator A, B, C                            |         | x       |
| THD Volts AN, BN, CN, AB, BC, CA                   |         | x       |
| Demand/Max. Fund. Amps A, B, C, Residual           |         | x       |
| Average/Max./Min. VARs A, B, C, Total              |         | x       |
| Average/Max./Min. VAs A, B, C, Total               |         | x       |
| Average/Max./Min. Volts AN, BN, CN, NG, AB, BC, CA |         | x       |
| Average/Max./Min. Watts A, B, C, Total             |         | x       |
| Displacement Power Factor A, B, C, Total           |         | x       |



Configuration of the M653 can be done from a standard web browser. Measurement values can also be viewed remotely this way.



M653 offers five digits of precision and easy recognition of measured values via alphanumeric display on each of three displays. Most settings can be made using "touch sense" buttons on front.