MINER-S™ Station Controller

Substation Automation

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The MINER-S™ Station Controller is a SCADA enabled fixed point remote terminal unit (RTU) with a data concentrator, event reporter, and built in communication protocols that enable remote monitoring and data communication to SCADA. The MINER-S architecture provides a balanced combination of I/O points and communication ports in a compact package, operating with just 8W consumption.

MINER-S™ RTU Controller (side view)

Features / Benefits

- Monitor and communicate data with up to 8 analog inputs, 16 digital inputs, and 8 digital output points

- Data Concentrator converts data between multiple communication protocols

- Simple IED configuration and diagnostics with integrated Web Server

- USB interface for easy software updates

- Powerful & fast processing power with 800MHz Dual Core microprocessor

- Designed for harsh outdoor environments with an operating temperature range of -40°C to +70°C and conformally coated boards

Applications

Poletop, Substation & Industrial Control Automation	• Remote monitoring and diagnostics for electrical distribution, pump stations, oil, gas, and transit
Data Concentrator	• Input data from multiple IEDs with different communication protocols to one concentrated output protocol interfacing with SCADA • Converts data between multiple protocols
Powerful Web-based Server	• Quick and easy operation, maintenance, and configuration of RTU • Simple configuration of IED mapping • No special proprietary software needed
Diagnostics	• Convenient remote monitoring of statuses • Download event reports to analyze historical data, event status, and analog data

| Typical Specifications	
Processor	• 800MHz Dual Core Processor
Memory	• 64MB Flash Memory
RAM	• 1GB SDRAM and 1Mb battery backed SRAM
Ethernet	• 1 - 10/100 Base TX • 2 - 10/100/1000 Base-T (Gigabit) • 1 - 10/100 Base FX/LX (Option Fiber port)
USB	• 2 USB Ports
Serial	• 3 - serial RS232 for master, IED, or terminal server • 1 - serial RS232 for diagnostic and configuration • 1 - serial RS485 for master, IED, or terminal server
Time Synchronization	• 1- Demodulated IRIG-B Input • Simple Network Time Protocol
Digital Inputs	• Up to 16 opto-isolated inputs (alarm / status / accumulator) • Configurable for dry or wetted field contacts • Internal Wetting Voltage Out: +12VDC • External Wetting Voltage Out: +48VDC (Standard); +125VDC Maximum (Optional)
Analog Inputs	• Up to 8 analog inputs • Configurable inputs (+/-1mA,+/-20mA, +/-10VDC) • Accuracy ±0.2% • Configurable dead band per point (protocol dependent)
Digital Outputs	• Up to 8 control outputs • Select—Check—Operate sequence • Momentary outputs supported • 1-Form A contact rated at 10 Amps @ 250VAC or 1 AMP @ 48VDC
Temperature	• -40°C to 70°C operating
Power	• 3 Input Voltage Options: 24VDC, 48VDC, 120/240VAC & 125/250VDC • Power Consumption: 8W maximum
Dimensions	• Panel mount: 10.78" x 9.25" x 2.79" (W x L x H)
Communication Protocols	
Client (SCADA Master)	• DNP 3.0 Serial, DNP 3.0 TCP/IP, Modbus Serial, Modbus TCP/IP, IEC 60870-101, IEC 60870-104
Server (IEDs)	• DNP 3.0 Serial, DNP 3.0 TCP/IP, Modbus Serial, Modbus TCP/IP, SEL (Fast Meter), Cooper 2179, IEC 60870-101, IEC 60870-103

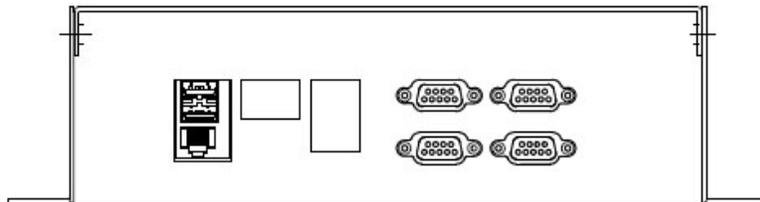*MINER-S™ RTU Controller*
(angled view)

Dimensional View 1
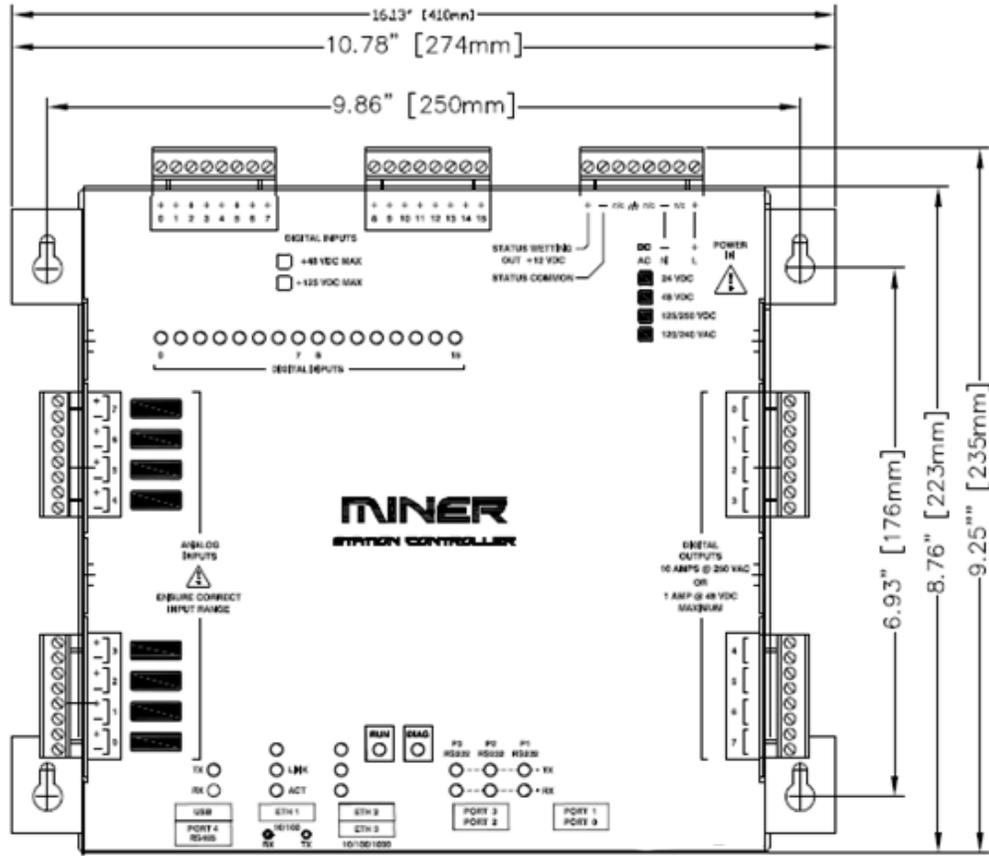
BASE/COVER — TOP
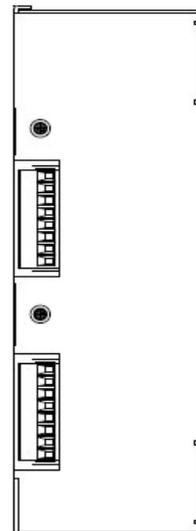
Dimensional View 2

Base / Cover / Front

Base / Cover - Right

MINER-S Diagnostics (Communication Status)

		Serial Ports	RTU		Network Ports	Eth 1 192.168.75.218 255.255.0.0	Eth 2 0.0.0.0 255.255.255.255	Eth 3 0.0.0.0 255.255.255.255
RS-232: 115200 8, N, 1	Maintenance Port	Stop 5M	0	16	TX **RX**	Master 1: DNP	TCP Server Any: 20016	
RS-232: 9600 8, N, 1	IED: DNP SEL-3518	TX RX	1	17	**TX** RX	Master 2: DNP	TCP Server Any: 20017	
RS-232: 19200 8, N, 1	IED: SEL-FM SEL-3518	TX RX	2	18	TX RX	Master 3: DNP	TCP Server Any: 20018	
RS-232: 9600 8, N, 1	IED: Cooper F6 Recloser	TX RX	3	19	TX RX	Master 4: DNP	TCP Server Any: 20019	
RS-485: 9600 8, N, 1		TX RX	4	20	**TX** RX	IED: IBC101 Scout	TCP Server Any: 20020- 192.168.75.214:20016	
			5	21	TX RX		TCP Server Any: 0	
			6	22	TX RX		TCP Server Any: 0	
			7	23	TX RX		TCP Server Any: 0	
RS-485: 9600 8, N, 1		TX RX	8	24	TX RX		TCP Server Any: 0	
RS-485: 9600 8, N, 1		TX RX	9	25	TX RX		TCP Server Any: 0	
RS-485: 9600 8, N, 1		TX RX	10	26	TX RX		TCP Server Any: 0	
RS-485: 9600 8, N, 1	IED: MODBUS Cur.Mod.	TX RX	11	27	TX **RX**	IED: DNP 2	TCP Client Any: 20027- 192.168.75.218:20017	
RS-485: 9600 8, N, 1		TX RX	12	28	TX RX	IED: DNP 3	TCP Client Any: 20028- 192.168.75.218:20018	
RS-485: 9600 8, N, 1		TX RX	13	29	TX RX	IED: DNP 4	TCP Client Any: 20029- 192.168.75.218:20019	
RS-485: 9600 8, N, 1		TX RX	14	30	TX RX		TCP Server Any: 0	
RS-485: 9600 8, N, 1		TX RX	15	31	TX RX		TCP Server Any: 0	

Type Tests	
Test	**Standard / Level**
Conducted Emissions	• IEC 61000-6-4 or EN 61000-6-4 CISPR 11, EN 55011 Class A, Group 1
Radiated Emissions	• IEC 61000-6-4 or EN 61000-6-4 CISPR 11, EN 55011 Class A, Group 1
Electromagnetic Compatibility Immunity	• Tested in accordance with IEC/EN 61000-6-5: 2015 - Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Immunity for equipment used in power station and substation environment.
Electrostatic Discharge	• IEC 61000-4-2, EN 61000-4-2, +6 kV Contact Discharge, +8 kV Air discharge
Radiated RF Immunity	• IEC 61000-4-3, EN 61000-4-3, ENV 50204, 10 V/m, 0.8-1 GHz, 3 V/m, 1-6 GHz
Electrical Fast Transient	• IEC 61000-4-4, EN 61000-4-4 , 0.5kV + 1kV + 2kV on AC Lines, + 0.5kV + 1kV + 2kV on DC, I/O Lines
Surge Withstand Immunity	• IEC 61000-4-5, EN 61000-4-5, + 0.5kV + 1kV Differential Mode, + 0.5kV + 1kV + 2 kV Common Mode
Conducted Disturbances Immunity	• IEC 61000-4-6, EN 61000-4-6, 10 V, 0.15-80 MHz, on AC, DC, 3V, 0.15-80 MHz, on I/O Lines
Magnetic Field Immunity	• EC 61000-4-8, EN 61000-4-8, 100 A/m-Continuous, 1kA/m for 1sec
AC Voltage Dips /Short Interruption	• IEC 61000-4-11, EN 61000-4-11, 60% UT during 60 cycles, 30% UT during 1 cycle
Conducted RF Immunity	• IEC 61000-4-16, EN 61000-4-16, 30 Vrms Continuous Disturbance on DC, I/O, 300 Vrms 1 sec Disturbance DC, I/O
Damped Oscillatory Wave Immunity	• IEC 61000-4-18, EN 61000-4-18, 2.5kV Common mode (1 MHz) on AC/DC/I/O line, 1kV Differential mode (1MHz) on AC/DC/I/O lines
Harmonic Current Emissions	• IEC 61000-3-2, EN 61000-3-2, Class A (Other), Class B (Portable Equipment), Class C (Lighting Equipment)
Voltage Fluctuation and Flicker	• IEC 61000-3-3, EN 61000-3-3
Environmental Cold	• IEC 60068-2-1, 18 hours at −40°C
Damp Heat, Cyclic	• IEC 60068-2-30, 25°C to 55°C, 6 cycles, Relative Humidity: 95%
Dry Heat	• IEC 60068-2-2, 18 hours at +70°C

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