

# Smart RTU 2000

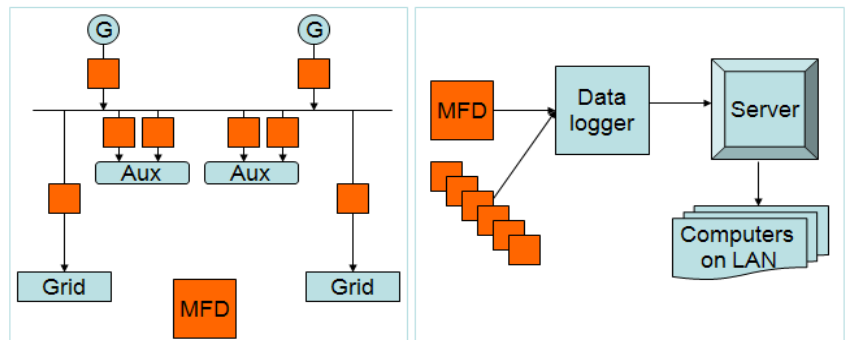


Smart RTU 2000 is a new generation of Remote Terminal Unit (RTU) that combines the traditional RTUs I/O functions with Remote Monitoring, Real-time Event & Data Logging, Alarm Notification, On-exception Reporting and Remote Maintenance & Troubleshooting. A built-in RF Modem/ZigBee enables wireless communication, lowering cost and simplifying installation and support.

Each Smart RTU 2000 provides no. of I/Os - 8 Analog Inputs, 10 Digital Inputs including 2 specialised as pulse counter, 8 Digital Outputs, 2 RS232 Ports, & 1 RS485 Ports. It also provides a built-in RF Modem/ZigBee for Wireless communication & an Ethernet Port for Direct-connect communication. This makes Smart RTU 2000 ideal for remote monitoring power system devices.

Smart RTU 2000 performs real-time data logging of Analog, Digital, Pulse Counter, RS485 and RS232 input data at user-defined interval and at the same time raises alarm to the Control Center when any inputs value is not under the min/max range of its permissible value. It is also capable of transmitting signals to the external devices through 8 channel digital output ports for user-defined events.

Smart RTU 2000 also performs real-time data logging of energy parameters from MFD's. It communicates with the MFD's on a Modbus protocol. It has on-board 16 MB non-volatile memory for retaining data in case of any power outage.



Smart RTU 2000 is bundled with a Control Center application that act as a human interface for process monitoring by logging the data captured by the Smart RTU's.

When you need a rugged Remote Terminal Unit, Smart RTU 2000 is an excellent technology for service in harsh and extreme industrial environments. Easy installation, low cost, low power consumption, wide temperature range make Smart RTU's a great choice for monitoring power system devices.

## Suitable for . . .

- For power station
  - ABT regime
  - Income calculations based on Energy-Frequency dispatch relationship
  - Auxiliary consumption monitoring
  - Next day planning of generation
- For substation
  - ABT regime
  - Load shedding
  - Load trend monitoring
  - Substation losses
  - Power purchase costing based on Energy-Frequency relationship
  - Power sale

## Advantages...

- ✓ For power station
  - Every 1 minute data logging of generator, load dispatch, auxiliary feeder parameters
  - Every 5 minutes data logging of energy generated, energy dispatched, energy consumed for internal use
- ✓ For Substations
  - Every 1 minute data logging of incoming feeder, outgoing feeder parameters
  - Every 5 minutes data logging of energy input/output for all feeders individually

## Monitors the following energy parameter...

- Power (W, VA, VAR), Energy (WH, VAHr), Power factor, Frequency, Voltage (LL, LN), Current (line & phase), THD (V & I)

## Monitors at the following locations...

- Power station: Generation, Load dispatch, Auxiliaries, Station transformers
- Substations: Incoming feeders, Outgoing feeders

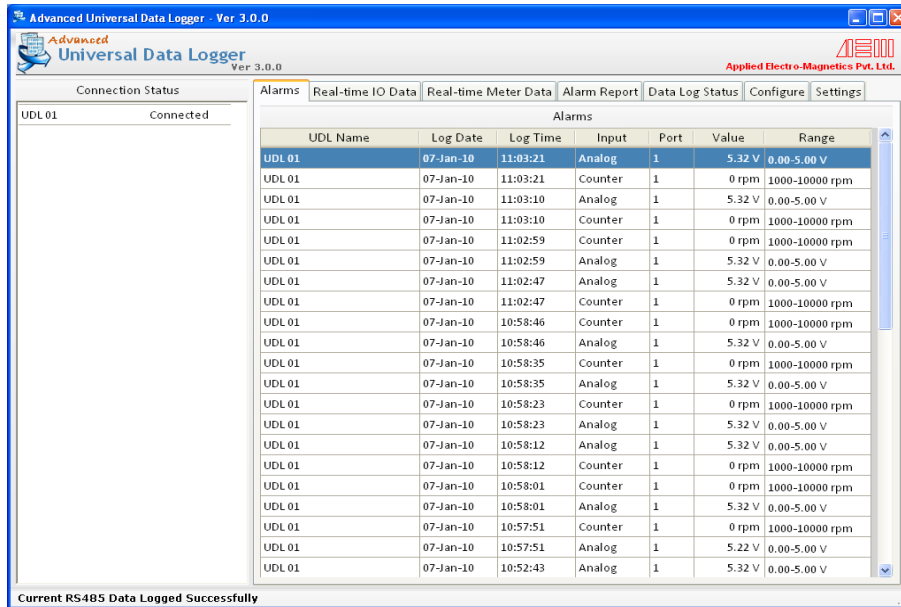
## Lower cost . . .

- Pre-engineered to lower installation costs
- Fits in smaller, lower cost panels
- Wide temperature range- eliminates fans & heater in outdoor enclosures

## Features

- ✓ Smart RTU with Remote I/O, Real-Time Event & Data Logging, and Alarm Notification
- ✓ Built-in Analog Inputs and Digital Inputs/Outputs – I/O's are Opto-isolated and protected
  - 8 Analog Inputs (AI), 16-bit, Differential 0-5V DC
  - 10 Digital Inputs (DI), 12-24V DC
  - 2 Digital Inputs used as Pulse Counter Inputs, 16-bit, 12-24V DC
  - 8 Digital Outputs, 12-24V DC
- ✓ Scanning Period – 1ms on Digital Inputs & 100ms on Analog Inputs
- ✓ Full duplex RS-485 Input port & 2 RS-232 Input ports
- ✓ RF Modem, 250000 bps data rate & Ethernet, 10 Mbps data rate
- ✓ On-board Non-Volatile Memory for data storage
- ✓ Modbus RTU Protocols supported
- ✓ Battery-backed Real-time Clock – with a resolution of 1ms
- ✓ Easy-to-use window based data logging & configuration software
- ✓ Live datalog download & configuration upload over data link
- ✓ Powerful software tool for extensive system analysis and troubleshooting
- ✓ Easy field setup & maintenance
- ✓ Wide operating temperature range (0°C to +60°C)
- ✓ Compact package, easy mounting for lower panel costs

## USER INTERFACE



## SPECIFICATIONS

### ANALOG INPUTS

Quantity	8
Analog Input Signal	0-5V, 1mA
Resolution	12 bits (1 part in 1024)
Input Configuration	Single-ended/Differential
Scanning Period	100ms

### DIGITAL INPUTS/OUTPUTS

#### Digital Inputs

Quantity	Up to 10 (2 for pulse counter)
Input Type	Opto isolated to RTU power, internal resistance pull down
Scanning Period	1ms

#### Digital Outputs

Quantity	Up to 8
Output Type	Power transistor, on source to field voltage
Output Voltage, nominal/max.	12/24V DC / 0 to 28V DC
Output Switch Current Rating	.50A @ 20°C, derate to .25A @ 80°C

### RS-485 & RS-232 INPUTS

Ports	1 RS-485, 2 RS-232
Port Interface	9 Pin D receptacle
Data Rate & Framing	2400 to 115K baud, No Parity
Protocol	Modbus RTU

### COMMUNICATIONS

#### Wire Connect

Interface	Ethernet
Protocol	TCP/IP
Data Rate	10/100 Mbps

#### Wireless

Radio Type	Spread Spectrum
Protocol	ZigBee

Frequency Range	ISM 2.4 GHz
RF Output Power	Up to 1.0 watt (2.4 GHz)
Spreading Method	Direct Sequence Spread Spectrum (DSSS)
Modulation	BPSK & O-QPSK
Over-the-air Data Rates	120Kbps to 170Kbps
Data Rate	Up to 115 K baud
Format	Full duplex, asynchronous
Error Checking	16-bit CRC
Antenna Connector	SMA Female

### DATA LOGGING

Storage	On-board: 16 MB non-volatile memory Optional: supports up to 128 MB XD card
Data/Event Logging Capacity	Up to 62000 latest records/events
Logging Interval	User-defined, 5 sec to 255 min per record

### OPERATOR INTERFACE

Indicator	3; R (power), G (processor), Y (comm.)
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### MICROPROCESSOR

Type	Rabbit 3000@44 MHz
Memory	512 k Flash, 512 k SRAM

### ENVIRONMENT SPECIFICATIONS

Dimensions	177mm (W) × 66mm (D) × 114mm (H)
Power	12/24V DC
Temperature	
Operating	0°C to +60°C
Storage	-20°C to +70°C
Humidity	95% RH @ 40°C

### SOFTWARE TOOLS

Configuration & Data Logging Platforms	Universal Data Logger v3.0.1 Windows XP, 2000, NT, 98
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