

# EMPURON HARDWARE PARTS

## Hardware Parts for EMPURON Solutions

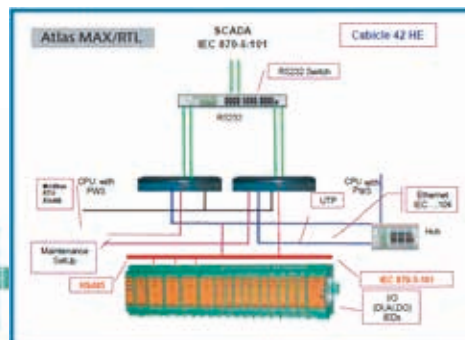
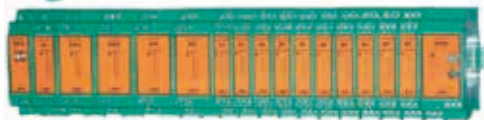
### EMPURON ATLAS - Modular RTU

The **EMPURON ATLAS RTU** device is a miniature modular remote terminal unit (RTU) for data acquisition and control, with the possibility of PLC algorithm implementation. It consists of one master CPU module and several I/O slave modules, maximum 8 modules of each type. All modules are connected through I2C bus.

The EMPURON ATLAS RTU is connected with the rest of the system through two serial ports. One serial port can be optical or RS485/ RS232. The other one is for RS485/ RS232. TCP/IP connection is established with a dedicated serial to Ethernet converter.

EMPURON ATLAS RTU supports IEC 60870-5-101 unbalanced and balanced slave protocol as well as MODBUS RTU master protocol.

PLC function is realized through specialized FBD (Function Block Diagram) editor. For station setup and basic monitoring a special application called pATLAS Setup and Monitoring is used.



### EMPURON ATLAS I/O slave modules:

- Digital input modules configurable as simple digital inputs or counter digital inputs with 1ms synchronization for simple digital inputs (max. 8 digital input modules, 8 digital inputs per each module).
- Digital output modules configurable as persistent commands, single-step pulse commands or two-step pulse commands.
- Analogue current input modules with 8 inputs: 0 to +20mA or 0 to +10mA.
- Analogue current input modules with 4 galvanic isolated inputs with software configurable input range.
- Analogue current output modules with 2 outputs, 0 to 20mA.
- Analogue voltage output modules, -10 to 10V.
- GPS module.

### EMPURON ATLAS RTU

#### Usage together with:

- Data-Warehouse
- Calculation Engine
- EMPURON SCADA
- Middleware
- Reporting and Business-Intelligence (BI)
- EMPURON Portal
- Application Server



## EMPURON Atlas RTU

The **EMPURON Atlas** is a powerful system for local and remote process monitoring and control. It is optimized for space limited and environmentally critical implementations in electrical power systems, water supply systems, gas supply systems, as well as other industrial control systems.

### CPU Modules

- Atmel ATMEGA128 (ATMEGA2561) on 16 MHz
- 32 KB of FRAM memory
- Real time clock
- 2 serial ports (optical and RS-485/RS-232)
- TCP/IP connection through serial to Ethernet converter
- Input for external time synchronization from GPS receiver
- Configuration and setup logged in SD card

### Digital Inputs modules

- number of inputs: 8
- connection mode: in groups of 2 inputs
- interface type: optocoupler
- galvanic separation: 2 kV persistent and 5kV peak between output and electronics
- input voltage:  $V_s = 24/48/110$  VDC

### Digital Outputs modules

(CO-permanent, CO1-single-step pulse, CO2-two-step pulse)

- number of outputs: 8
- galvanic separation: 2 kV persistent and 5kV peak between output and electronics
- connection mode: in groups of 4 outputs
- output specifications:
  - maximal voltage: 300 VDC, 250 VAC
  - maximal current: 1A
- command pulse duration: from 100 ms to 25.5 s, selectable

### Analog Inputs modules (AI)

- number of inputs: 8
- connection type: single ended
- galvanic separation: 1 kV persistent and 2.5kV peak between inputs and electronics
- current input: 0 to 10 mA or 0 to 20 mA
- resolution: 12-bit

- sample rate: 110 kS/s
- input resistance: 205 Ohms (0-20mA) or 412 Ohms (0-10mA)
- common ground

### Modules with galvanic separated analog inputs (AI4)

- number of inputs: 4
- input current: configured by software in range from -20mA to 20mA
- resolution: 21-bit
- sample rate: 12.5 S/s
- input resistance: 50 Ohms
- all channels with separate ground

### Analog Current Outputs modules

- number of outputs: 2
- galvanic separation: 1kV between input and electronics
- output current: 0 to 10mA or 0 to 20mA
- maximum load resistance: 500 Ohms

### Analog Voltage Outputs modules

- number of outputs: 4
- galvanic isolation: 1kV between input and electronics
- output voltage: -10 to 10V

### GPS modules

- protocols: NMEA, TSIP, TAIP, IRIGB
- synchronization pulse: PPS, PPM, PPH on RS-485 or TTL level
- serial connection: RS-232/RS-485 I2C termination
- active termination of I2C bus

### Power Supply

- + 12 V DC
- Consumption: 1.5A for +12V