



## Arctic IEC-104 Gateway



## Connect Your Remote IEC-101 Devices to IEC-104 Control System with Arctic IEC-104 Gateway

## Communication Gateway for Energy Networks

The IEC 60870 protocol family is a vendor-independent communication standard for electricity industry. With Arctic IEC-104 Gateway conventional IEC-101 devices can be attached to a modern TCP/IP based IEC-104 control system. Ethernet and GPRS network interfaces provide a seamless communication solution for most of the applications. Secure (Firewall, VPN) and two-way GPRS communication (static IP addresses) is provided with Viola M2M Gateway or with operator APN. Finally the complete solution for upgrading the communication system to take advantage of the efficient and low-cost IEC-104 approach!

The IEC-101 protocol is designed for circuit-switched data links such as conventional PSTN modem and leased-line whereas the IEC-104 takes advantage of modern packet-switched TCP/IP networks. The fundamental difference between

these two approaches is the way they handle event transmission. The IEC-101 protocol uses synchronous polling where SCADA continuously sends requests and devices respond. In IEC-104 the devices can send

events asynchronously as they arise while SCADA performs only slow-period background scans. The result is a more efficient use of network resources and faster delivery of data, alarms and other events.

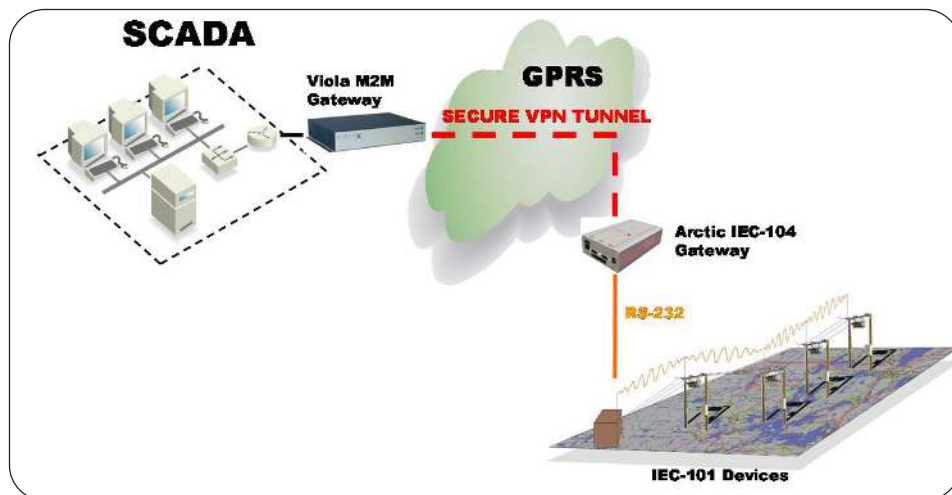
Polling IEC-101 devices over the network becomes unpractical and costly on slow-speed (such as Mobitex) or pay-per-use (such as GPRS) networks. Arctic IEC-104 Gateway can poll the IEC-101 devices locally and send the events to IEC-104 network only if they arise. If there is no event available Arctic IEC-104 Gateway only sends slow-period link test polls. Another advantage of IEC-104 is the use of communication window. Instead of sending acknowledgement after every packet the IEC-104 allows multiple packets to be acknowledged collectively. Arctic IEC-104

Gateway buffers every packet until it receives acknowledgement from SCADA. The packet compressor of Arctic IEC-104 Gateway can also send multiple events in single TCP/IP packet instead of sending them individually.

In many applications the IEC-101 field devices need to be time-synchronized for e.g. tracking the order of events between several electricity substations or feeders. Due to packet switching the network delays can be unpredictable and cause even several seconds of variance in time when synchronization is done from SCADA. External GPS module can be connected to Arctic IEC-104 Gateway to get an exact time reference from a GPS satellite atom clock and accurately synchronize the IEC-101 devices locally.

## Key Features

- Ethernet and GPRS wireless network interface
- Secure communication with internal VPN and firewall
- Mobile operator independent static IP addressing with Viola M2M Gateway
- Self diagnostics for communication and the device
- Packet compression for slow-speed links
- IEC 60870-5-104 to IEC 60870-5-101 communication gateway
- Local IEC-101 polling of Class 1 and Class 2 events
- Internal heater and battery back-up options
- One RS-232 and one RS-232/422/485 port up to 460800 bps
- -40 °C to +55 °C operating temperature with internal heater
- I/O extension option
- DIN rail mounting option



## Application Examples

- Integrate existing devices to a modern control system with a field-proven product
- Use the IEC-104 event-based communication instead of polling
- Feeder automation
- Substation automation
- Utility automation
- Protection relays

### Hardware

#### Processor Environment

32 bit RISC processor  
8 MB FLASH memory  
32 MB SDRAM memory

#### Power

6 – 26 VDC nominal input voltage  
1 – 5 W power consumption  
Resettable fuse and ESD protection

#### Console

RS-232 at 19200 bps  
8 data bits, 1 stop bit, no parity (8N1)

#### LEDs

10 Status LEDs on side panel

#### Other

Temperature sensor, Real time clock

#### Approvals

CE

### Network Interfaces

#### Ethernet

10/100 Base-T, Shielded RJ-45  
1,5 kV isolation transformer  
Ethernet IEEE 802-3, 802-2

#### GPRS

Internal module and SIM card socket  
Compliant to GSM phase 2/2+  
FME external antenna connector (50 Ω)  
Dual-band EGSM 900(2W) and GSM 1800  
GPRS  
GPRS multi-slot class 10  
GPRS mobile station class B  
Max. 85.6 kbps GPRS downlink speed  
Max. 42.8 kbps GPRS uplink speed  
Coding schemes CS1, CS2, CS3, CS4  
USSD Support

### Software

#### Network Protocols

PPP, IP, ICMP, UDP, TCP, ARP,  
DNS, DHCP, FTP, TFTP,  
HTTP, POP3, SMTP

#### Tunneling (VPN)

SSHv1 and v2 server and client

#### Management

WEB, SSH, Telnet and console  
FTP, TFTP and HTTP SW update

#### Routing Related

Static routing, Proxy ARP, Port Forward  
IP Masquerading/NAT, Firewall

#### GPRS

Automatic, manual or constant  
GPRS connection management

#### IEC-104 and IEC-101

IEC-104 over TCP or UDP  
IEC-101 FT 1.2 framing  
Local IEC-101 polling  
ASDU replacer  
Packet compressor

#### Other

Mobitex TCP/IP driver (option)

### Serial Ports

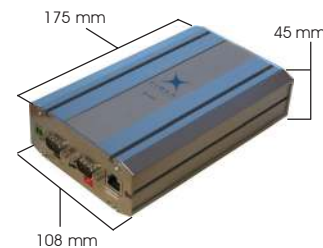
#### Serial 1 / Console / Modem

RS-232 DTE, Male DB-9 connector  
Full serial and modem signals  
Speed 300 – 460 800 bps  
Data bits - 7 or 8  
Stop bits - 1 or 2  
Parity - None, Even, Odd  
Flow control – None, RTS/CTS  
Protection – 15 kV ESD and short circuit

#### Serial 2 / IEC-101

RS-232 DTE, RS-422, RS-485  
(DIP selectable)  
Male DB-9 connector  
Full serial and modem signals  
Biasing and termination (DIP selectable)  
Speed 300 – 460 800 bps  
Data bits - 7 or 8  
Stop bits - 1 or 2  
Parity - None, Even, Odd  
Flow control – None, RTS/CTS  
Protection – 15 kV ESD and short circuit

### Dimensions



### Configuration and Management

Arctic IEC-104 Gateway is configured using a www browser. A conventional console interface is also provided. The software of Arctic IEC-104 Gateway can be updated over the network.



### Ordering Information

|                                        |      |
|----------------------------------------|------|
| Arctic IEC-104 Gateway (Ethernet only) | 2204 |
| Arctic IEC-104 Gateway (GPRS)          | 2205 |

### Options

Internal battery back up  
Internal heater  
I/O extension (8xDI, 2xDO)  
DIN rail mounting kit  
Magnetic antenna with 2,5 m cable  
Rooflex antenna with 2,5 m cable  
Power supply 100/240VAC-12VDC  
Accessory kit (Power, cables)

### Ordering Address

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