Arctic Substation Gateway

Provides wireless monitoring and control of IEC-101 and IEC-104 field devices via 3G network.

High Speed Remote Communication for Energy Networks

Arctic Substation Gateway is an industrial grade wireless gateway utilizing the high speed 3G networks (HSPA) with quad band frequency support. When this is combined with the possibility for multiple field devices connectivity by Serial and Ethernet ports together with IEC-101 to IEC-104 protocol conversion, Arctic Substation Gateway is the ideal solution for monitoring and controlling devices at substation when high data bandwidth and low latency is required.

In industrial applications, reliability of the communication device and the wireless connection is essential. This is achieved by using sophisticated connection and self-diagnostics features of Arctic Substation Gateway. With Arctic Substation Gateway conventional IEC-101 devices can be attached to a modern TCP/IP based IEC-104 control system via 3G mobile network. This is possible because of the protocol conversion from IEC-101 to IEC-104 made by Arctic Substation Gateway.

In Arctic Substation Gateway high communication security level is achieved by robust data encryption protocols and an internal firewall.

Mobile operator independent static IP addressing and VPN connections are established with Viola M2M Gateway. Multiple VPN encryption protocols supported for data security and system integration for central monitoring systems (SCADA). Arctic Substation Gateway also has Dual SIM card support which can be used for additional system reliability.

Internal Ethernet switch in Arctic Substation Gateway makes possible to use various backup routing options.

The IEC-101 protocol is designed for circuit-switched data links such as conventional PSTN modem and leased lines whereas the IEC-104 takes advantage of modern packet switched TCP/IP networks. The IEC-101 protocol uses synchronous data 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. Another advantage of IEC-104 is an advanced data acknowledgement mechanism. IEC-104 allows multiple packets (and multiple events in single packet) to be acknowledged collectively and packets are buffered until acknowledgement from SCADA.

The result is a more efficient use of network resources, less costly and faster delivery of data, alarms and other events when the protocol conversion feature of Arctic Substation Gateway is used.
**KEY FEATURES**
- IEC 60870-5-101 to IEC 60870-5-104 conversion
- Possibility to use dual SIM card
- Support for HSPA in 3G network
- Support for several encryption protocols for secure communication
- 3-port LAN switch
- Backup routing
- Mobile operator independent static IP addressing with Viola M2M Gateway
- Also serial devices can be connected (RS-232/485)
- LEDs for status monitoring
- Robust aluminum casing

**APPLICATION EXAMPLES**
- Distribution automation
- Connecting RTUs and IEDs with low latency demands
- Transformer monitoring
- Substations
- Connecting multiple remote devices demanding high data bandwidth
- Backup routing for fiber optics and satellite communication in substations
- Video surveillance
- Live video streaming for high security critical assets

**HARDWARE**

**Processor Environment**
- 32 bit RISC processor
- 32 MB FLASH memory
- 64 MB SDRAM memory

**Power**
- 12 – 36 VDC

**Other**
- Temperature sensor
- Real time clock

**Environment**
- Temperature ranges: -25 to +70 °C
- -40 to +85 °C (storage)
- Humidity 5 to 85 % RH

**Approvals**
- CE

**SOFTWARE**

Network protocols
- PPP, IP, ICMP, UDP, TCP, ARP, DNS, DHCP, FTP, TFTP, HTTP, POP3, SMTP
- SSH server and client
- OpenVPN
- IPsec

Management
- WEB, SSH, Telnet and console
- FTP, TFTP and HTTP software update

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

**CONFIGURATION & MANAGEMENT**

There are several possibilities to configure Arctic Substation Gateway:
- Graphical user interface to be used with an internet browser
- Conventional console interface (Telnet or via serial console)

**SERIAL PORTS**

**Serial 1**
- RS-232 DTE, Male DB-9 connector
- Speed: 300 – 460 800 bit/s
- Data bits - 7 or 8
- Stop bits - 1 or 2
- Parity - none/even/odd
- Flow control - RTS/CTS

**Serial 2**
- Male DB9 connector DTE
- RS-232/422/485
- Speed: 300 – 460 800 bit/s
- Data bits - 7 or 8
- Stop bits - 1 or 2
- Parity - none/even/odd
- Flow control - RTS/CTS

**Console**
- RS-232 (RJ45)
- Speed: 115200 bit/s
- 8 data bits, 1 stop bit, no parity

**NETWORK INTERFACES**

**Ethernet**
- 1 x WAN
- 3 x LAN (switch)
- 10/100 Base-T Shielded RJ45
- Ethernet (IEEE 802.3)
- 1.5 kV isolation transformer

**3G/EDGE/GPRS**
- HSUPA, HSDPA, EDGE, GPRS, GSM
- WCDMA 850/900/1900/2100 MHz
- EGDE/GPRS 850/900/1800/1900 MHz

**Data speed (HSPA)**
- 7.2 Mbps downlink
- 5.76 Mbps uplink

- FME external antenna connector (50Ω)
- (Stub antenna included)

**DIMENSIONS**

167 mm
114 mm
46 mm

**ORDERING INFORMATION**

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<thead>
<tr>
<th>Code</th>
<th>Product</th>
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<tbody>
<tr>
<td>2651</td>
<td>Arctic Substation Gateway</td>
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**OPTIONS**

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<tr>
<th>Code</th>
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<tr>
<td>3000</td>
<td>DIN rail mounting kit</td>
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<tr>
<td>3020</td>
<td>Power supply (110 -230 VAC / 12 VDC)</td>
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<tr>
<td>3221</td>
<td>Arctic accessory kit</td>
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<tr>
<td>3440</td>
<td>Magflex antenna with 2.5 m cable</td>
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<tr>
<td>3550</td>
<td>Rooflex antenna with 2.5 m cable</td>
</tr>
<tr>
<td>3551</td>
<td>Rooflex (puck) antenna with v2.5 m cable</td>
</tr>
</tbody>
</table>

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