Arctic family of wireless communication products
Secure wireless connectivity
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The Arctic family offers a wide range of products that can be combined into reliable, cost-efficient and secure wireless communication solutions – The solution utilizes public cellular networks – excellent worldwide coverage at reasonable cost – The family includes wireless communication gateways, wireless controllers and server products
Product family highlights

- Enables industrial Internet of Things (IoT)
- Allows wireless connection to any remote asset within any application
- Utilizes secure and cost-effective wireless cellular networks with global coverage
- Involves no network investment or maintenance costs other than for data transfer
- Allows wireless access to geographically remote areas inaccessible before
- Ensures optimal cyber security throughout the entire wireless communication system
## Arctic family

Products in the family

<table>
<thead>
<tr>
<th>Products in the family</th>
<th>Arctic 600 series gateways</th>
<th>Server products</th>
</tr>
</thead>
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<tr>
<td>ARG600 Wireless Gateway</td>
<td>ARG600 Wireless I/O Gateway</td>
<td>ARM600 M2M Gateway</td>
</tr>
<tr>
<td>- LTE (GPRS/3G compatible)</td>
<td>- LTE (GPRS/3G compatible)</td>
<td>- Central communication server</td>
</tr>
<tr>
<td>- TCP/IP router</td>
<td>- Integrated I/O</td>
<td>- VPN concentrator</td>
</tr>
<tr>
<td>- Serial over TCP/IP</td>
<td>- Protocol converter</td>
<td>- Firewall and routing</td>
</tr>
<tr>
<td>- VPN and firewall</td>
<td>- TCP/IP router</td>
<td>- Arctic Patrol asset management</td>
</tr>
<tr>
<td>- Single and dual SIM variants</td>
<td>- Serial over TCP/IP</td>
<td>- Static IP addressing</td>
</tr>
<tr>
<td>- Protocol converter</td>
<td>- VPN and firewall</td>
<td></td>
</tr>
</tbody>
</table>

- Control and indication of three switching devices
- Indication of three earthing switches
- Protocol converter
- Battery charger
- LTE (GPRS/3G compatible)
- TCP/IP router
- VPN and firewall
Arctic family

Typical solution layout

- A typical communication solution includes:
  - Central control and monitoring application (e.g. SCADA)
  - ARM600 M2M Gateway at SCADA location
  - Public networks (cellular network and Internet)
  - Arctic 600 series wireless gateways
  - Remote applications
- Together with the ability to connect remote applications, the end-to-end security and condition monitoring of the connections are the main unique features of the ABB solution
Arctic family
Utility applications

- Wireless communication products that utilize public cellular networks offer a secure and cost-effective platform for substation automation.
- The Arctic family allows easy access to remote assets as well as remote maintenance and condition monitoring.
- Any remote asset, such as an outdoor breaker or a ring main unit (RMU), can be connected to any central monitoring and control application, such as SCADA.
- The Arctic products support a variety of standard communication protocols for effortless integration with SCADA.
- The Arctic products can also be used as wireless backup for any primary communication link.
The Arctic wireless communication products allow industries to remotely manage their assets. Remote access to field devices and valuable information such as condition monitoring data significantly facilitates preventive maintenance.

- Asset health information can be gathered from the devices in the field for convenient, centralized asset health management.

- Other applications include weather monitoring stations, live video streaming, CCTV surveillance (Closed Circuit Television), building automation and smart traffic management systems, to mention a few.
Arctic family
ARG600 Wireless Gateway
ARG600 Wireless Gateways

- ARG600 Wireless Gateways offer protocol conversion as well as TCP/IP routing
- Protocol conversion allows integration of legacy serial devices into a TCP/IP based SCADA system
- Also supports serial over TCP/IP traffic
  - DNP3 serial devices can be connected to a DNP3 TCP/IP SCADA system
- Application independent – any type of remote application can be connected to any type of central application
- Easy configuration via web UI
- Available in single and dual SIM variants
ARG600 Wireless gateway
Customer benefits

- Enables industrial Internet of Things (IoT)
- Allows the user to wirelessly connect to any remote asset within any application (application independent)
  - Less site visits needed
  - Allows more efficient remote condition monitoring and asset management
- Can be used to provide back-up connectivity for fixed communication systems
- In addition, can be used to connect legacy serial devices into modern systems
  - Allows full utilization of serial communication-based assets in a modern TCP/IP-based control system
  - No need to upgrade station level serial equipment when upgrading control system
ARG600 Wireless Gateway (single SIM)
Industrial-grade wireless router

- Designed for LTE, also supports GPRS and 3G
- Integrated protocol conversion
  - IEC101 to IEC104
  - Modbus RTU to Modbus TCP/IP (for selected devices)
- Always-on TCP/IP routing and serial over TCP/IP based two-way communication
- Several VPN options for authentication and encryption
- Integrated firewall
- Operator independent – any standard SIM cards can be used
- Connectors:
  - 1 x RJ-45
  - 1 x RS232
  - 1 x RS232/422/485
- Order code: ARG600A1260NA
ARG600 Wireless Gateway (dual SIM)
Industrial-grade wireless router

- Designed for LTE, also supports GPRS and 3G
- Integrated protocol conversion
  - IEC101 to IEC104
  - Modbus RTU to Modbus TCP/IP (for selected devices)
- Always-on TCP/IP routing and serial over TCP/IP based two-way communication
- 4-port LAN/WAN switch
- Several VPN options for authentication and encryption
- Integrated firewall
- Operator independent – any standard SIM cards can be used
- Two SIM card slots for operator redundancy

- Connectors:
  - 4 x LAN/WAN RJ-45
  - 1 x RS232
  - 1 x RS232/422/485
  - 1 x RS232 RJ-45 console
Order code: ARG600A2625NA
ARG600 Wireless Gateway
Application example – TCP/IP based communication
ARG600 Wireless Gateway
Application example – Integrating IEC101 devices
Arctic family
ARR600 Wireless I/O Gateway
ARR600 Wireless I/O Gateway has integrated inputs and outputs, protocol conversion and TCP/IP routing

- Integrated I/O can be used e.g. for controlling switching objects or receiving alarms
- Protocol conversion allows integration of legacy serial devices into a TCP/IP based SCADA system
- Ideal for connecting TCP/IP based traffic between remote sites and a central control room
- Also supports serial over TCP/IP traffic
  - DNP3 serial devices can be connected to a DNP3 TCP/IP SCADA system
- Application independent – any type of remote application can be connected to any type of central application
- Easy configuration via web UI
ARR600 Wireless I/O Gateways

Customer benefits

- Provides all benefits of ARG600 Wireless gateway and ARP600 Wireless protocol gateway
- In addition, the integrated I/O can be controlled via remote communication
  - Primary switching devices can be controlled remotely
  - Resetting of alarms
  - Binary and mA signals can be gathered from remote stations
    - Fire alarm, intrusion alarm, temperature measurement etc.
- Provides a generic I/O interface in a remote location
ARR600 Wireless I/O Gateways
Integrated protocol conversion and I/O

- Designed for LTE, also supports GPRS and 3G
- Two I/O options
  - 8 binary inputs + 2 binary outputs
  - 6 binary inputs + 4 binary outputs + 2 mA input
  - I/Os can be controlled via IEC104, Modbus TCP or SNMP
- Integrated protocol conversion
  - IEC101 to IEC104
  - Modbus RTU to IEC104/IEC101
  - Modbus TCP to IEC104/IEC101
  - Modbus RTU to Modbus TCP/IP (for selected devices)
- Always-on TCP/IP routing and serial over TCP/IP based two-way communication
- Several VPN options for authentication and encryption

- Integrated firewall
- Operator independent – any standard SIM cards can be used
- Connectors:
  - 1 x RJ-45
  - 1 x RS232
  - 1 x RS232/422/485
ARR600 Wireless I/O Gateway
Application example – switch disconnector control
## ARR600 Wireless I/O Gateway

### Selection table

<table>
<thead>
<tr>
<th>Feature</th>
<th>ARR600A3261NA</th>
<th>ARR600A3262NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio IF</td>
<td>LTE</td>
<td>LTE</td>
</tr>
<tr>
<td>Data speed max.</td>
<td>100 Mbps</td>
<td>100 Mbps</td>
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<tr>
<td>LAN/WAN</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RS232/485</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SIM card</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>12-48 VDC</td>
<td>12-48 VDC</td>
</tr>
<tr>
<td>Modbus RTU to Modbus TCP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IEC101 to IEC104</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DNP3.0 serial over TCP/IP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IO-1 (8 binary inputs + 2 binary outputs)</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>IO-2 (6 binary inputs + 4 binary outputs + 2 mA input)</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>Supported protocols for I/O control</td>
<td>IEC-104, Modbus TCP, SNMP</td>
<td>IEC-104, Modbus TCP, SNMP</td>
</tr>
</tbody>
</table>
Arctic family
ARC600 Wireless Controller
Arctic family
ARC600 Wireless Controller

- Powerful wireless control device with integrated communication
- Ideal for controlling Ring Main Units with several feeders and any type of overhead switches
- Designed to be integrated into a grid automation cabinet solution – integrated battery charger and actuator motor overload protection
- Compatibility with Fault Passage Indicators means that advanced fault information can be sent to a central control and monitoring system
ARC600 Wireless Controller

Customer benefits

- Provides a powerful, all-in-one package for control and monitoring secondary substations – no need for separate equipment for battery charging, wireless communication, protocol conversion and control interface
  - Allows the utility to remotely manage their network and receive accurate measurements and other critical information
- Ideal for controlling remote objects such as Ring Main Units or overhead switching devices
  - Always-on communication provides accurate and real-time information from the distribution network
  - Less site visits are required as control and resetting operations can be performed remotely from a central network control center
- Together with RIO600 Remote I/O extends the functionality to include relay-grade protection and measurement with minimal equipment and cabling
ARC600 Wireless Controller
All-in-one control and communication

- Dedicated wireless control unit and protocol converter with integrated I/O
- Designed for LTE, also supports GPRS and 3G
- Optimised for disconnector control
  - Control of three disconnectors
  - Indication of three earthing switches
- Offers advanced Fault Management together with the Remote I/O RIO600
- Protocol conversion:
  - IEC101 to IEC104
  - Modbus (RTU and TCP) to IEC-104/IEC-101
  - Support for selected Fault Passage Indicators

- Built-in intelligent battery charger
- Actuator motor overload protection
- Local HMI panel with LED indication
- Order code: ARC600A2324NA
ARC600 Wireless Controller
Extended functionality together with RIO600

- ARC600 can be combined with RIO600 to form an unparalleled remote control, protection and measurement package
- The number of controllable objects can be extended with the Smart control module in the RIO600
- ARC600 with RIO600 can be used for:
  - Operation of RMU primary objects
  - Advanced fault management
  - Accurate power measurements
  - Harmonics detection
  - Secondary signals – UPS, battery charger and physical protection alarm
  - Temperature supervision
  - Generic mA input/output signals
ARC600 Wireless Controller
Application example – Ring Main Unit control
Arctic family
ARM600 M2M Gateway
Arctic family
ARM600 M2M Gateway

- ARM600 M2M Gateway is the VPN concentrator between all remote Arctic 600 series gateways and the central control and monitoring application
- Two variants available depending on system size and redundancy requirements
- ARM600 is typically installed in the Network Control Center (NCC) where it can be directly connected to SCADA
ARM600 M2M Gateway
Central communication server and VPN concentrator

- VPN concentrator – manages VPN tunnels to Arctic 600 series gateway
- Provides static IP addressing
- Firewall and full routing capability
- Arctic Patrol – asset management
  - Supervises connections to Arctic 600 series gateways
  - Remote configuration and firmware update of connected Arctic devices
  - Automatic configuration back-up
- Standard Edition: 300 Arctic 600 series gateway connections
- Enterprise Edition: 3000 Arctic 600 series gateway connections
Arctic Patrol
Benefits of asset management

- An asset management application is essential when the network of Arctic devices is large or geographically scattered
- Asset management aims at maximizing uptime and availability of the communication network:
- Thanks to Arctic Patrol, the user is able to remotely supervise and manage their Arctic 600 series gateways
  - Being able to remotely mass update all Arctic firmware means less site visits are needed and all security and usability improvements are available in the entire installed base
  - Immediate alarms when connection failures occur
- Statistics offer a comprehensive view of the performance of the network
Arctic Patrol

Benefits of asset management

- Arctic Patrol is an asset management application for remotely managing the installed and connected Arctic 600 series gateways. Patrol includes comprehensive condition monitoring, communication network statistics and remote firmware updating.
  - Arctic Patrol allows individual or mass updates of all connected Arctic 600 series gateway firmware
  - Allows the operator to get a better understanding of the status of the communication network
  - Automatic back-up of connected Arctic 600 series gateway configurations
  - Provides statistical information about cellular network performance
  - Allows access to all connected Arctic gateway user interfaces
  - Integrated in both ARM600 M2M Gateway variants and is accessed via the ARM600 web user interface
  - Supports also management of ABB RIO600 devices when connected through ARC600
ARM600 M2M Gateway
Installation examples

- Typically the user will have a Demilitarized Zone (DMZ) to manage traffic between company LAN and external networks (such as the Internet)
  - M2M Gateway can be installed within the DMZ
- It is also possible to install the M2M Gateway directly behind the company firewall
  - The firewall of the M2M Gateway can also be utilised
ARM600 M2M Gateway

Selection table

<table>
<thead>
<tr>
<th></th>
<th>ARM600B2500NA</th>
<th>ARM600B2505NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Arctic connections</td>
<td>300</td>
<td>3000</td>
</tr>
<tr>
<td>Power supply</td>
<td>Single</td>
<td>Dual</td>
</tr>
<tr>
<td>HDD</td>
<td>Single</td>
<td>Dual</td>
</tr>
<tr>
<td>Size</td>
<td>1U 19”</td>
<td>1U 19”</td>
</tr>
<tr>
<td>Depth</td>
<td>495 mm</td>
<td>607 mm</td>
</tr>
</tbody>
</table>
Arctic family
Secure features and tools
Arctic family
System security features

- Virtual Private Network (VPN) connections between ARM600 M2M Gateway and remote Arctic 600 series wireless gateways
  - L2TP, SSH or OpenVPN
  - OpenVPN server when Arctic devices are connected point-to-point
- Private addressing within communication solution network
  - Not accessible from external networks
- Firewalls in all Arctic family devices
- SIM cards protected by PIN codes
- Arctic Patrol supervises all connections – any disruptions trigger an alarm
Arctic family

Tools

Arctic 600 series configuration

- ARG600, ARR600 and ARC600 gateways can be configured via a user-friendly web user interface
- ARG600 Dual SIM variants also allow console access via an RS232 RJ-45 connection
- A back-up of the device configuration can be downloaded as an xml file

ARM600 M2M Gateway configuration

- ARM600 user interface can be accessed via a web user interface
  - Arctic Patrol can be accessed via the same web UI
- Traditional console access is also available
## Arctic family

### Selection table

<table>
<thead>
<tr>
<th>Radio</th>
<th>Data speed bps at GPRS/3G/LTE</th>
<th>LAN/WAN</th>
<th>RS232/485</th>
<th>SIM</th>
<th>Supply voltage</th>
<th>Protocols</th>
<th>I/O</th>
<th>Antenna connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARG600A1260NA</td>
<td>LTE 85.2k / 42M / 100M</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>12 – 48 VDC</td>
<td>IEC101/IEC104, Modbus RTU/Modbus TCP</td>
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<td>SMA (f)</td>
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<tr>
<td>ARG600A2625NA</td>
<td>LTE 85.2k / 42M / 100M</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>12 – 36 VDC</td>
<td>IEC101/IEC104, Modbus RTU/Modbus TCP</td>
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<td>IEC101/IEC104, Modbus RTU/Modbus TCP</td>
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<td>ARR600A3261NA</td>
<td>LTE 85.2k / 42M / 100M</td>
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<td>12 – 48 VDC</td>
<td>IEC101/IEC104, Modbus RTU/Modbus TCP</td>
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<td>12 – 48 VDC</td>
<td>IEC101/IEC104, Modbus RTU/Modbus TCP</td>
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<td>SMA (f)</td>
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<td>LTE 85.2k / 42M / 100M</td>
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<td>90-264 VAC / 85-200 VDC</td>
<td>IEC101/IEC104, Modbus RTU/IEC104</td>
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<td>SMA (f)</td>
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