

Arctic family of wireless communication products

Secure wireless connectivity

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Arctic family

Secure wireless communication solutions

- 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

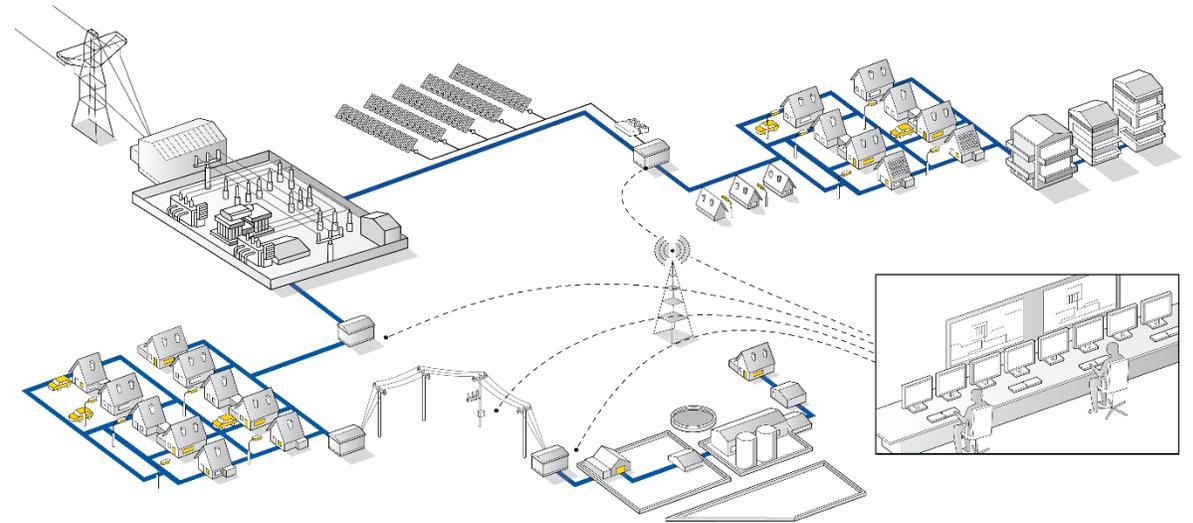


Arctic family

Secure wireless communication solutions

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

Arctic 600 series gateways

ARG600 Wireless Gateway



- LTE (GPRS/3G compatible)
- TCP/IP router
- Serial over TCP/IP
- VPN and firewall
- Single and dual SIM variants
- Protocol converter

ARR600 Wireless I/O Gateway



- LTE (GPRS/3G compatible)
- Integrated I/O
- Protocol converter
- TCP/IP router
- Serial over TCP/IP
- VPN and firewall

ARC600 Wireless Controller



- 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

Server products

ARM600 M2M Gateway

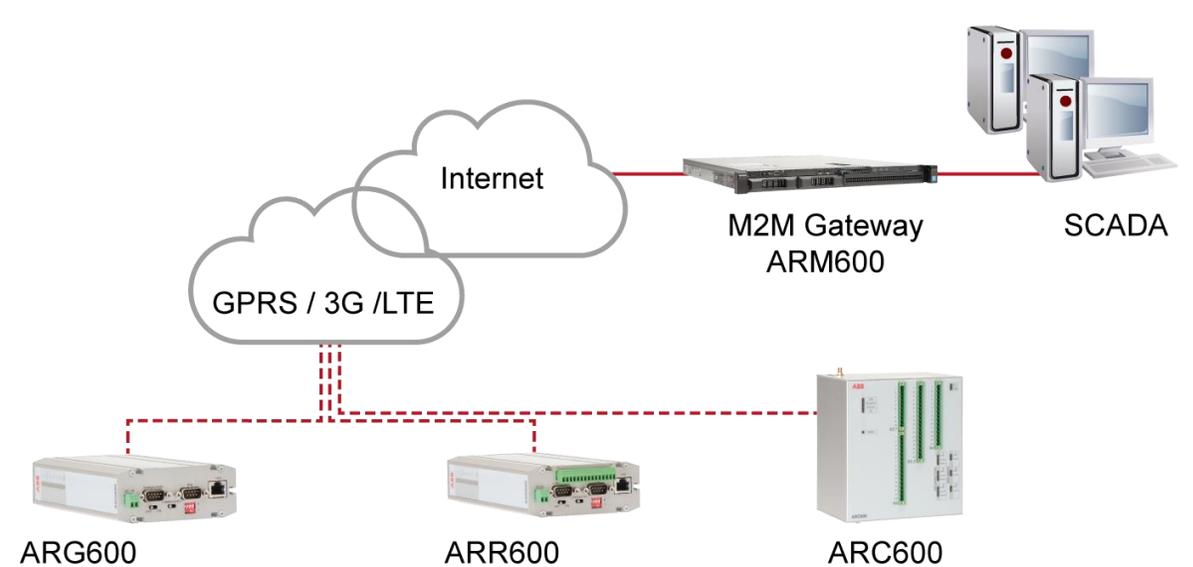


- Central communication server
- VPN concentrator
- Firewall and routing
- Arctic Patrol asset management
- Static IP addressing

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

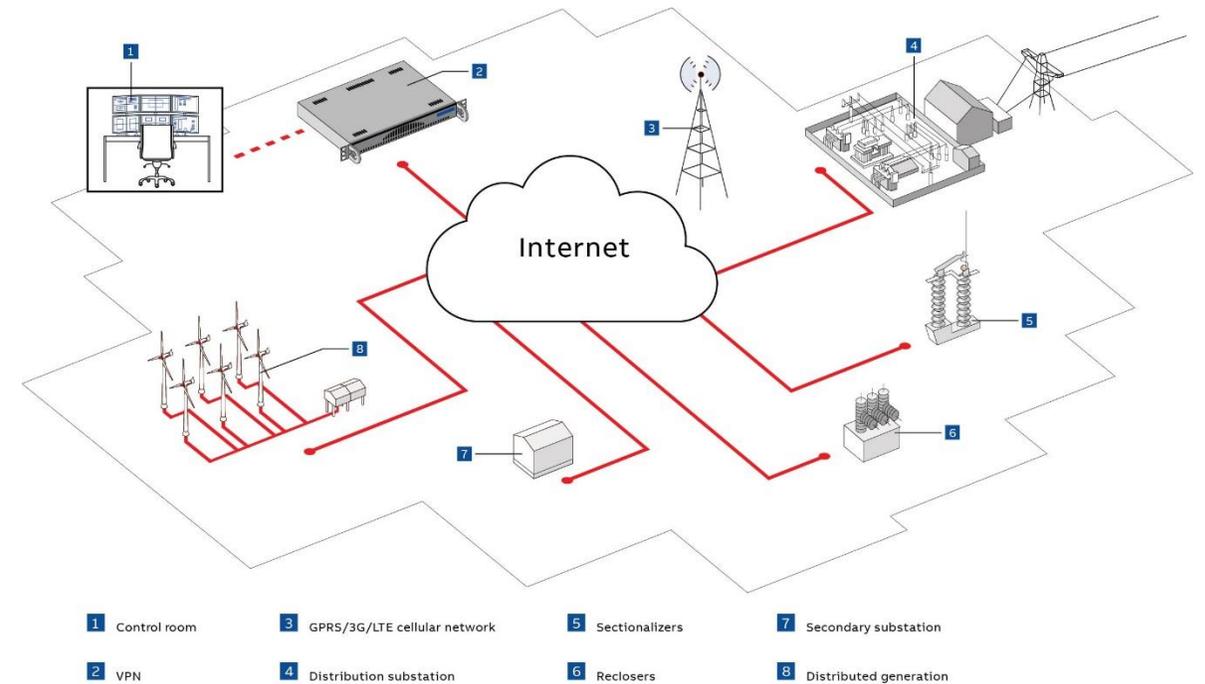


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Utility applications

- 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.

Utility Applications

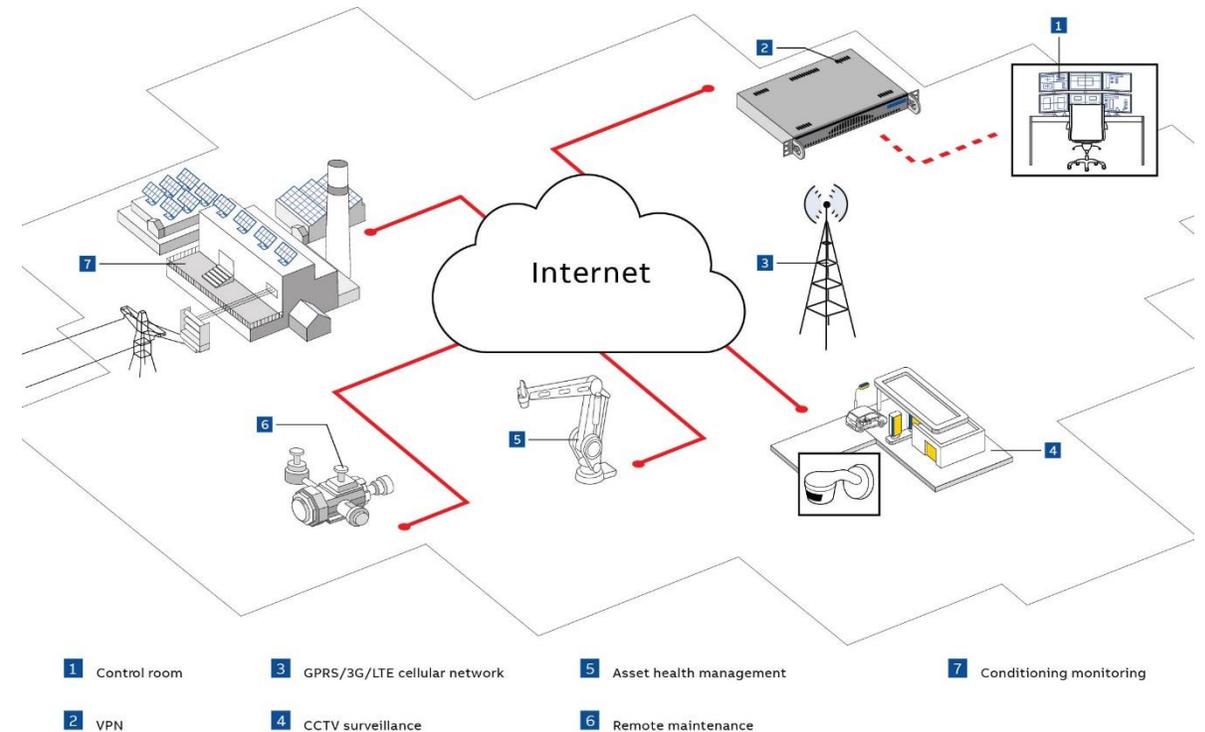


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Industrial applications

- 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.

Industrial Applications



Arctic family

ARG600 Wireless Gateway

Arctic family

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

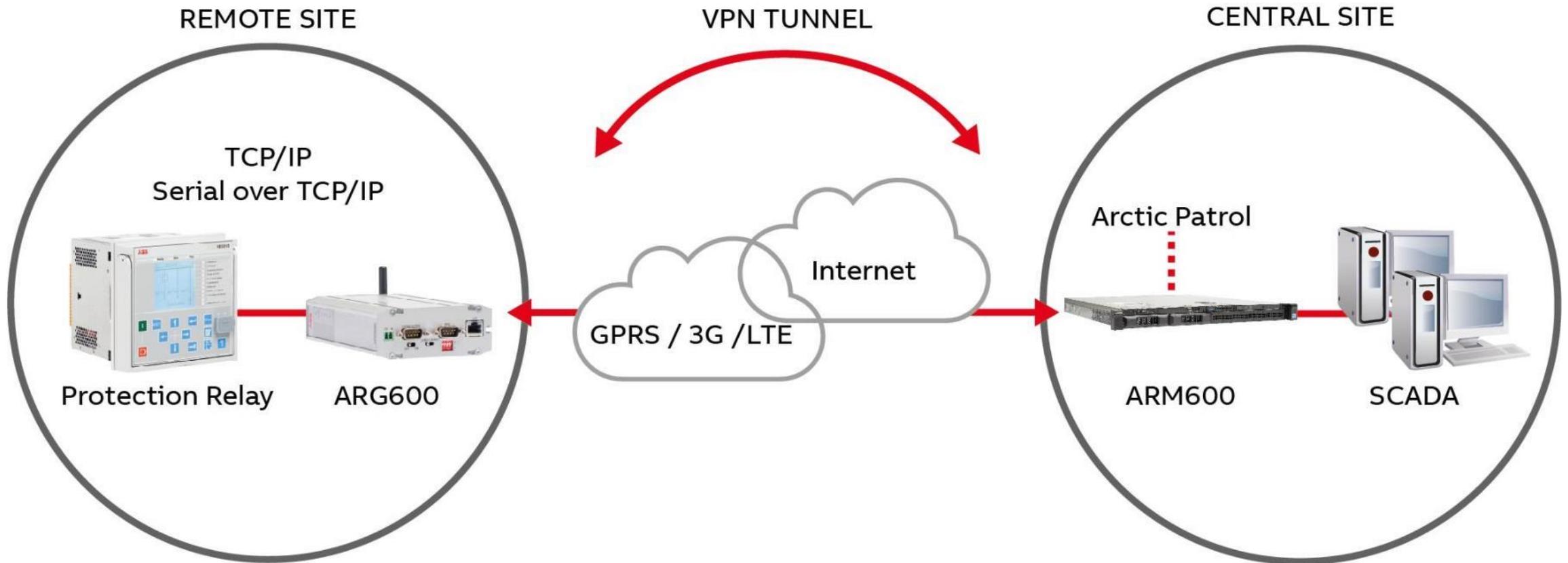
- Connectors:
 - 4 x LAN/WAN RJ-45
 - 1 x RS232
 - 1 x RS232/422/485
 - 1 x RS232 RJ-45 console

Order code: ARG600A2625NA



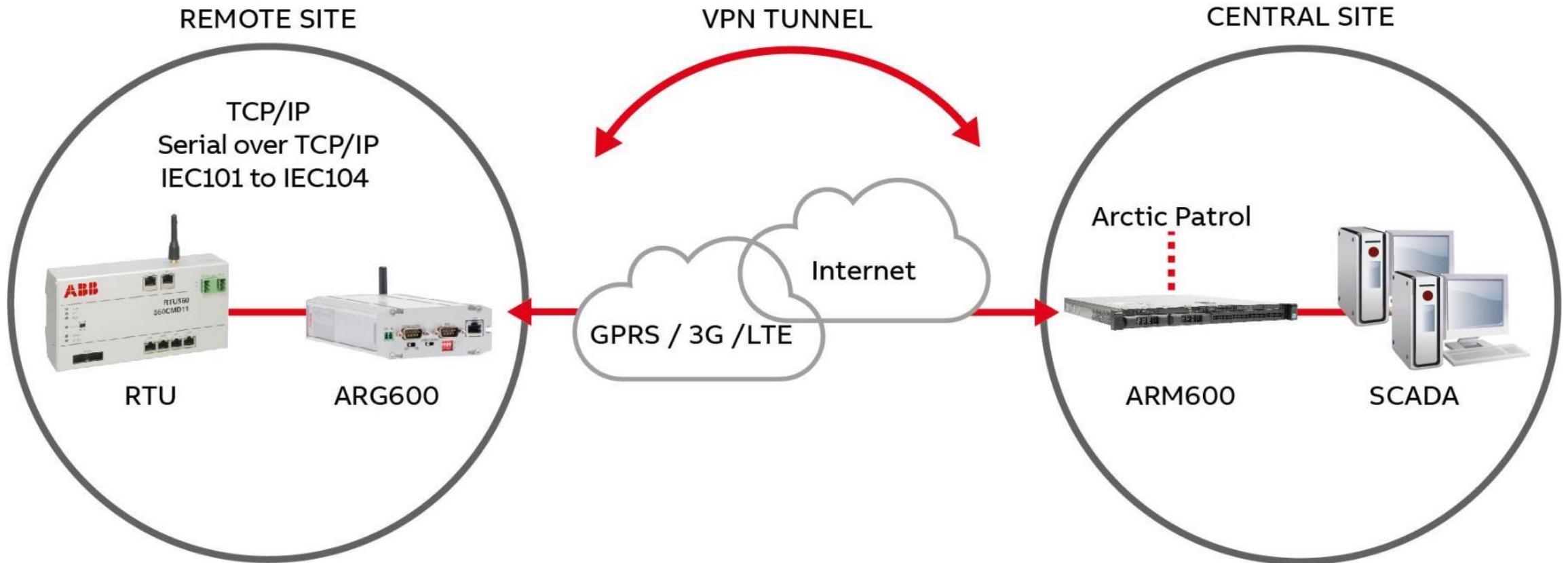
ARG600 Wireless Gateway

Application example – TCP/IP based communication



ARG600 Wireless Gateway

Application example – Integrating IEC101 devices



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ARR600 Wireless I/O Gateway

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ARR600 Wireless I/O Gateways

- 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

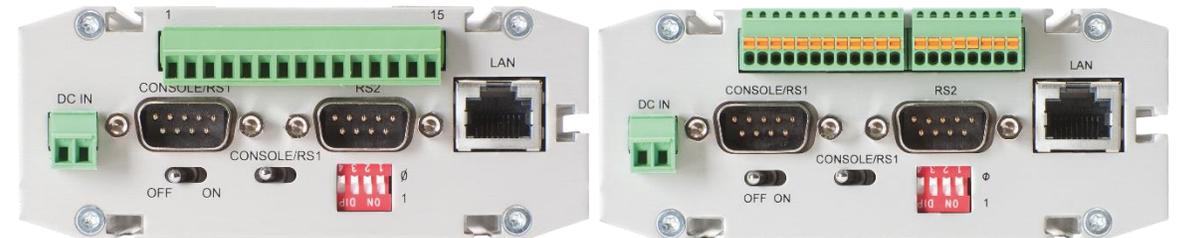
- Provides all benefits of ARG600 Wireless gateway and ARP600 Wireless protocol gateway
- In addition, the integrated I/O can be controlled via remote communication
 - Primary switching devices can be controlled remotely
 - Resetting of alarms
 - Binary and mA signals can be gathered from remote stations
 - 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

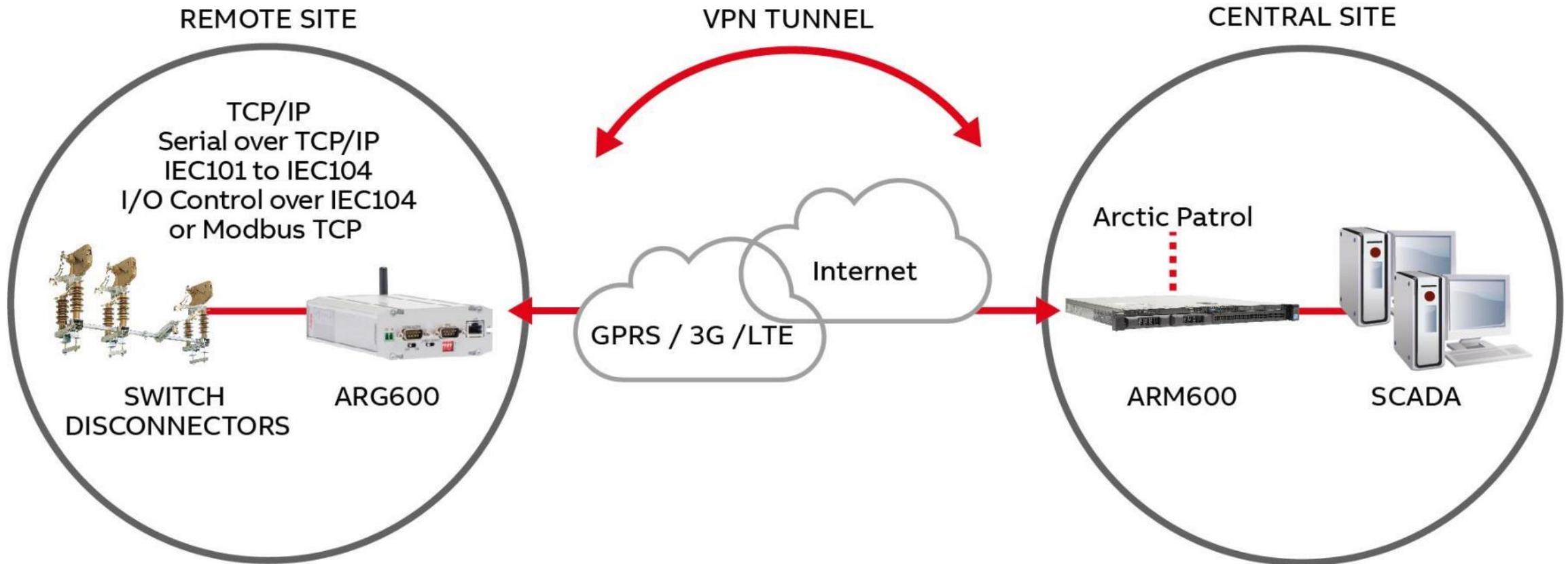
- Designed for LTE, also supports GPRS and 3G
- Two I/O options
 - 8 binary inputs + 2 binary outputs
 - 6 binary inputs + 4 binary outputs + 2 mA input
 - I/Os can be controlled via IEC104, Modbus TCP or SNMP
- Integrated protocol conversion
 - IEC101 to IEC104
 - Modbus RTU to IEC104/IEC101
 - Modbus 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 disconnecter control



ARR600 Wireless I/O Gateway

Selection table

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

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ARC600 Wireless Controller

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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

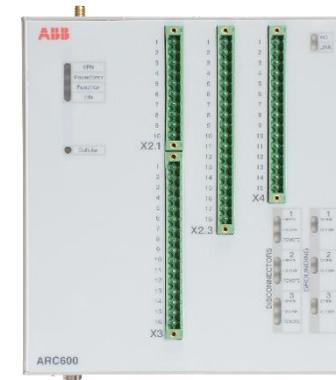
- Provides a powerful, all-in-one package for control and monitoring secondary substations – no need for separate equipment for battery charging, wireless communication, protocol conversion and control interface
 - Allows the utility to remotely manage their network and receive accurate measurements 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 disconnecter 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

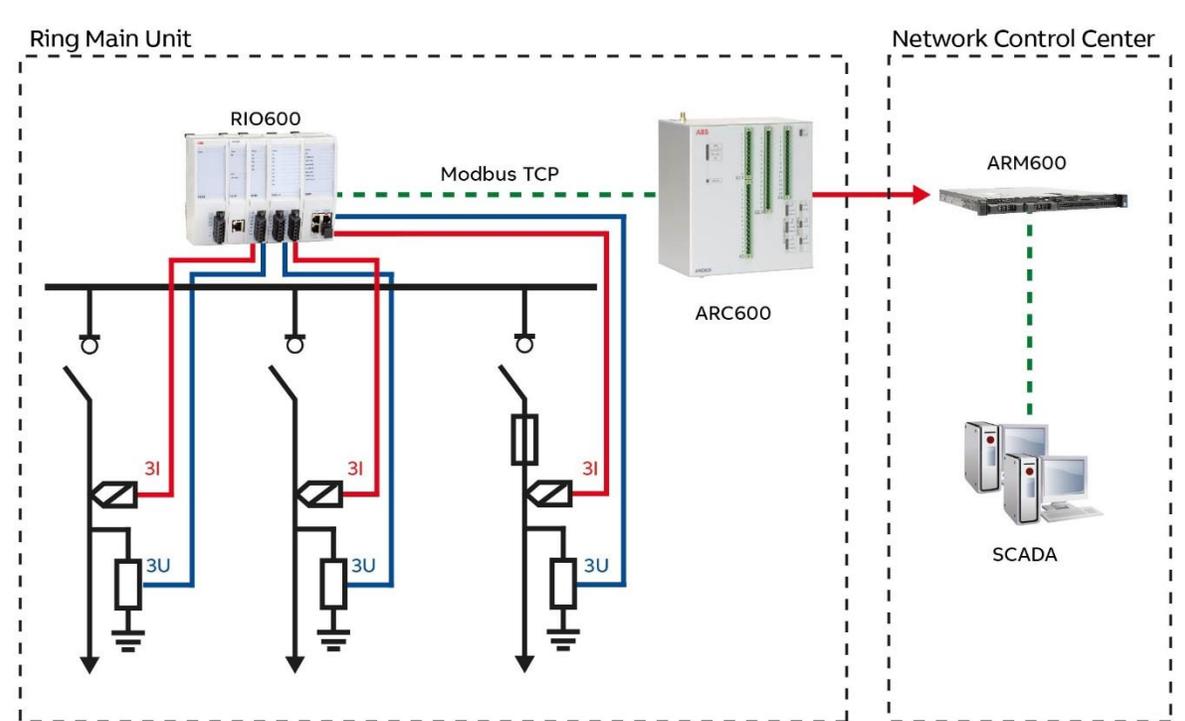
- Built-in intelligent battery charger
- Actuator motor overload protection
- Local HMI panel with LED indication
- Order code: ARC600A2324NA



ARC600 Wireless Controller

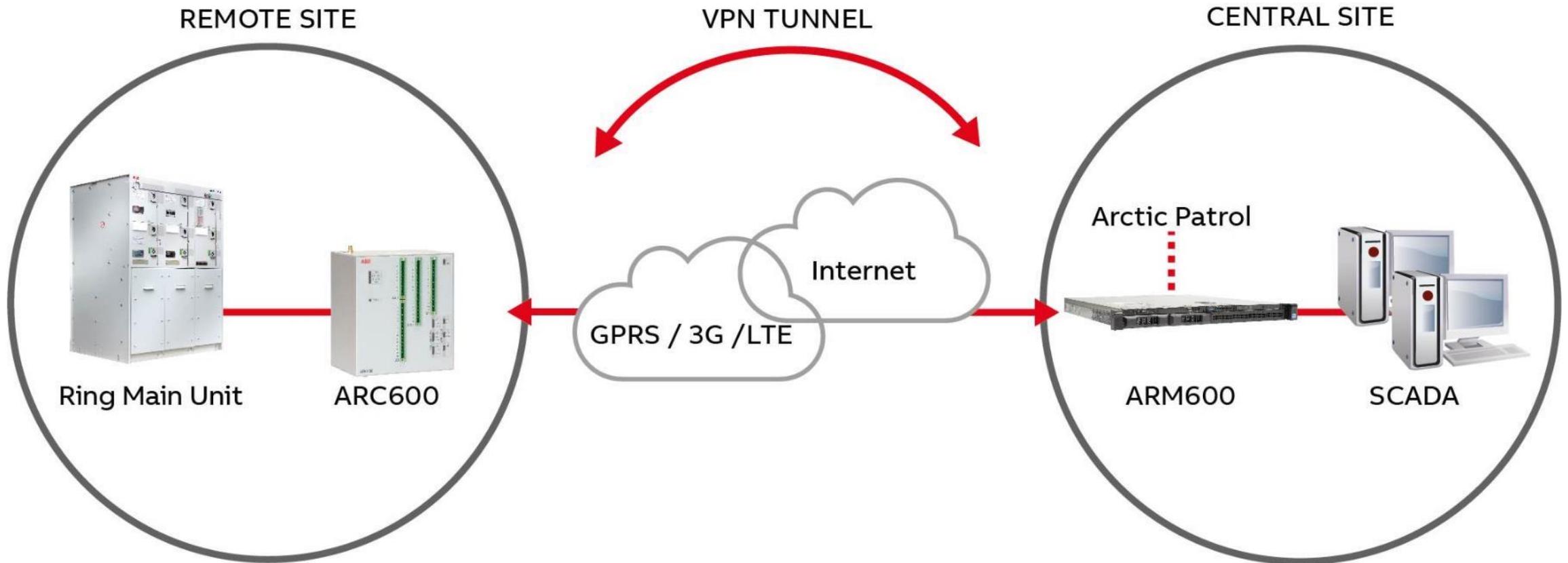
Extended functionality together with RIO600

- 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



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ARM600 M2M Gateway

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ARM600 M2M Gateway

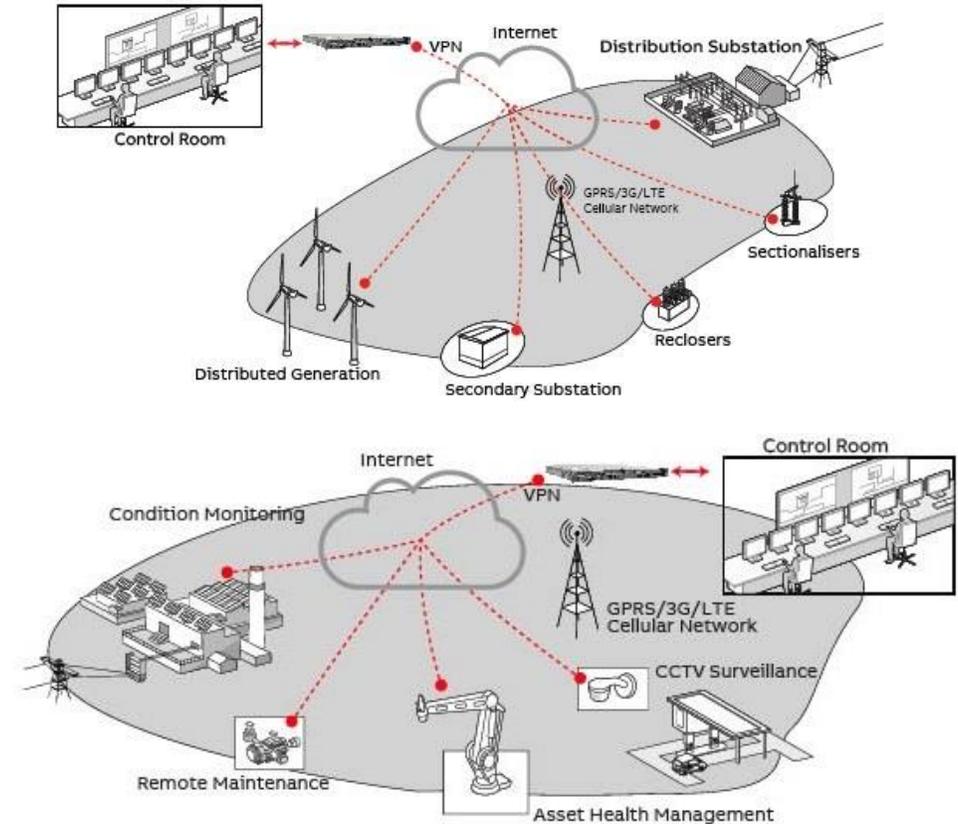
- ARM600 M2M Gateway is the VPN concentrator between all remote Arctic 600 series gateways and the central control and monitoring application
- Two variants available depending on system size and redundancy requirements
- ARM600 is typically installed in the Network Control Center (NCC) where it can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

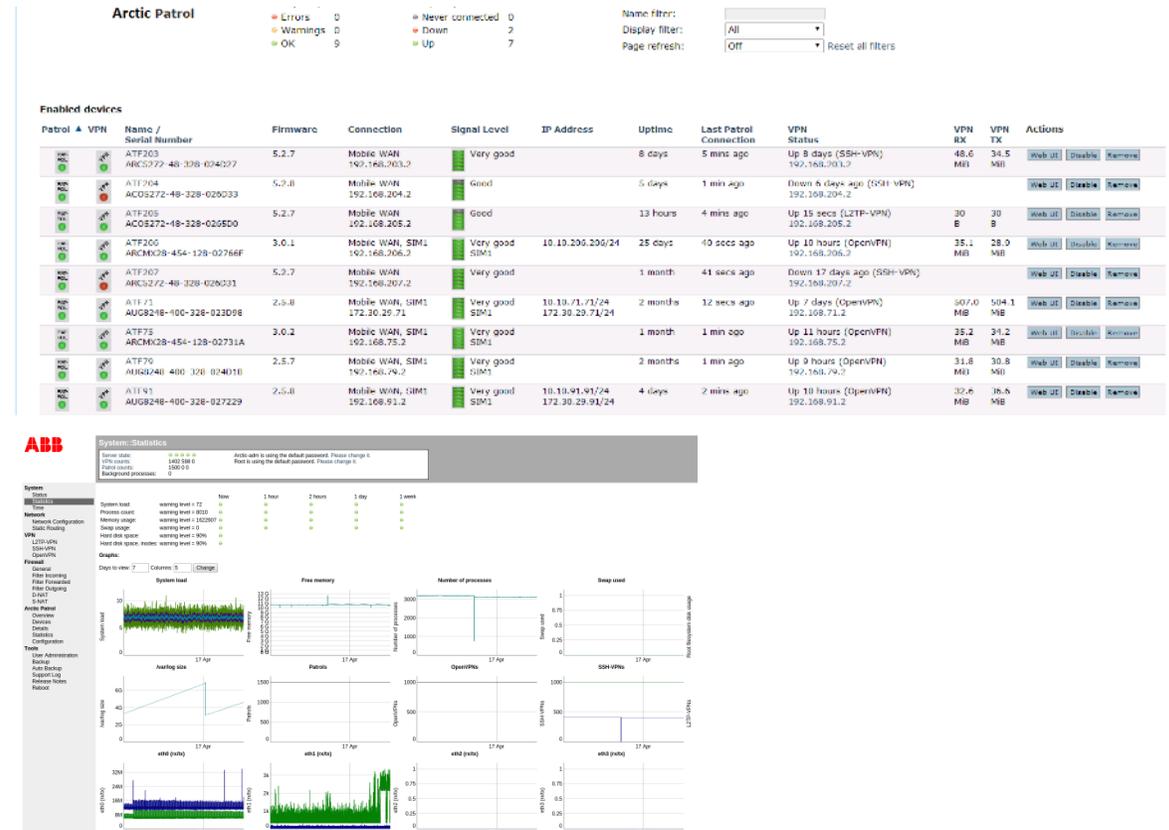
Benefits of asset management

- 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

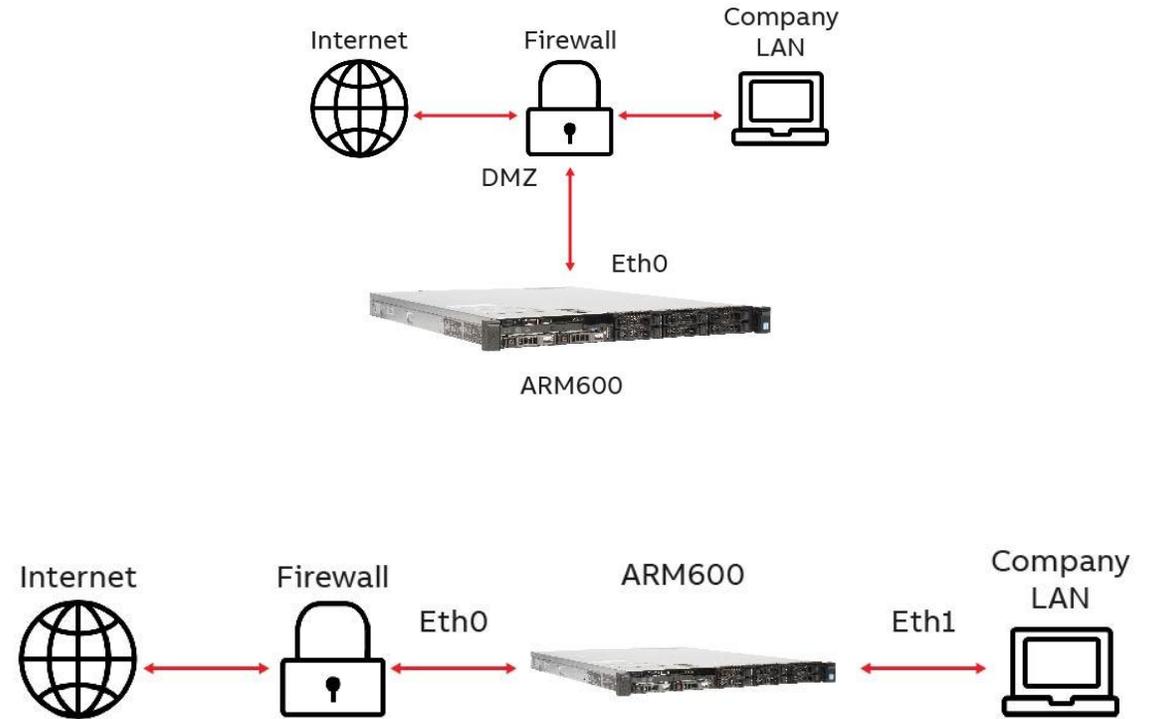
- Arctic Patrol is an asset management application for remotely managing the installed and connected Arctic 600 series gateways. Patrol includes comprehensive condition monitoring, communication network statistics and remote firmware updating.
- Arctic Patrol allows individual or mass updates of all 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

	ARM600B2500NA	ARM600B2505NA
Max. Arctic connections	300	3000
Power supply	Single	Dual
HDD	Single	Dual
Size	1U 19"	1U 19"
Depth	495 mm	607 mm

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Secure features and tools

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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

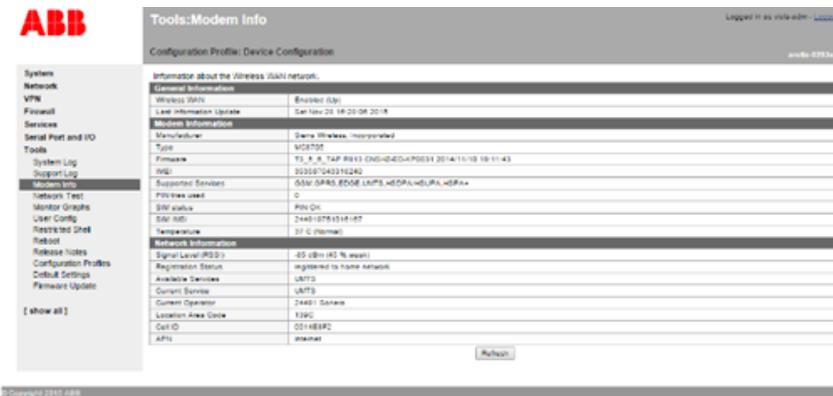


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Tools

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

	Radio	Data speed bps at GPRS/3G/LTE	LAN/WAN	RS232/485	SIM	Supply voltage	Protocols	I/O	Antenna connector
ARG600A1260NA	LTE	85.2k / 42M / 100M	1	2	1	12 – 48 VDC	IEC101/IEC104, Modbus RTU/Modbus TCP	-	SMA (f)
ARG600A2625NA	LTE	85.2k / 42M / 100M	4	2	2	12 – 36 VDC	IEC101/IEC104, Modbus RTU/Modbus TCP	-	FME (m)
ARG600A1270NA	LTE*	85.2k / 42M / 100M	1	2	1	12 – 48 VDC	IEC101/IEC104, Modbus RTU/Modbus TCP	-	SMA (f)
ARG600A1290NA	LTE**	85.2k / 42M / 100M	1	2	1	12 – 48 VDC	IEC101/IEC104, Modbus RTU/Modbus TCP	-	SMA (f)
ARR600A3261NA	LTE	85.2k / 42M / 100M	1	2	1	12 – 48 VDC	IEC101/IEC104, Modbus RTU/Modbus TCP	X	SMA (f)
ARR600A3262NA	LTE	85.2k / 42M / 100M	1	2	1	12 – 48 VDC	IEC101/IEC104, Modbus RTU/Modbus TCP	X	SMA (f)
ARC600A2324NA	LTE	85.2k / 42M / 100M	1	2	1	90-264 VAC / 85-200 VDC	IEC101/IEC104, Modbus RTU/IEC104	X	SMA (f)

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