



GridLink

THE INTELLIGENT CHOICE
FOR DISTRIBUTION
AUTOMATION

HARRIS® TECHNOLOGY TO CONNECT,
INFORM AND PROTECT™

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GRID VISIBILITY AND CONTROL

Improving distribution grid operations with real-time remote monitoring and control of grid assets has become simple and affordable with wide-area digital Land Mobile Radio.

Our communications infrastructure provides full feature voice services and wide area data transport services based on Digital Mobile Radio (DMR) standards.

Delivering power reliably and safely is a constant challenge for electrical distribution utility companies. The diverse environments that many utilities operate pose reliability and resilience challenges for their distribution network. Improving their grid visibility and control over their distribution network is a key priority.

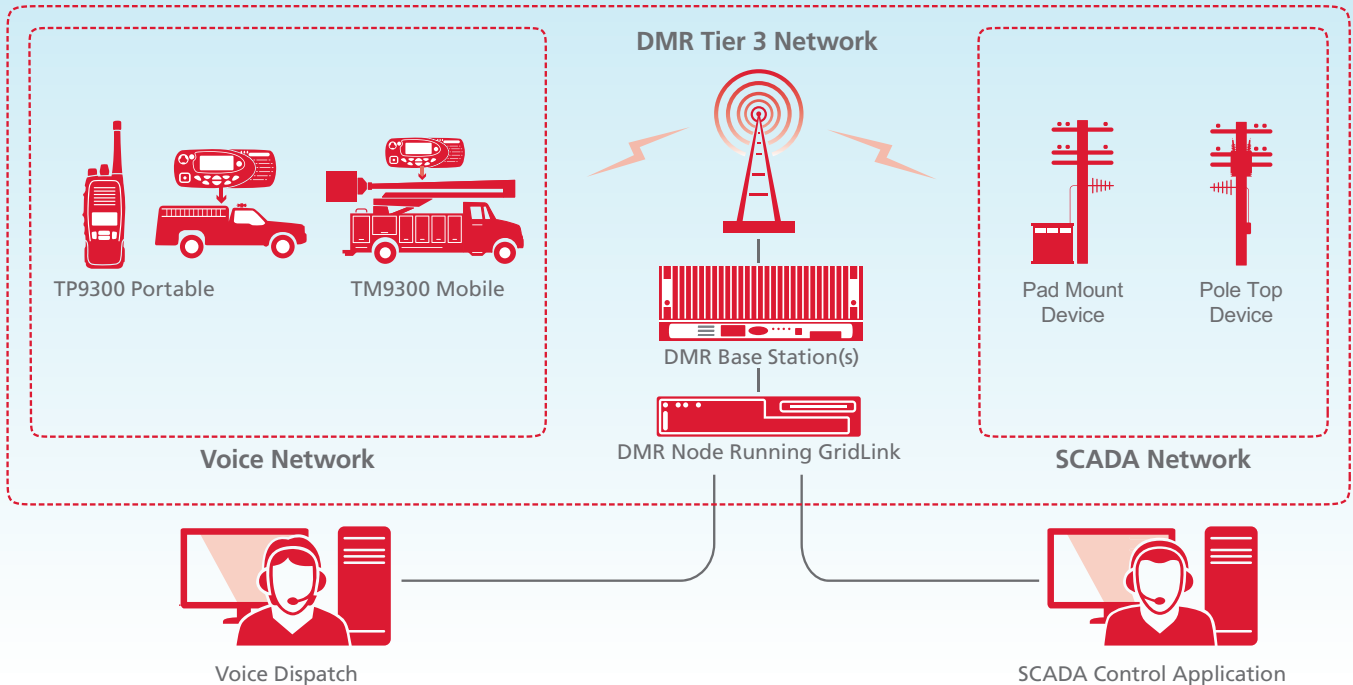
Grid managers around the world have leveraged various types of communications to connect distribution line infrastructure and substations to their Supervisory Control and Data Acquisition (SCADA) systems. However, large parts of distribution grids remain off limits and are not visible or manageable due to the cost of connecting them.

Providing data communication for Distribution Automation (DA) in remote areas with a low density of pole top and pad mount transformers, reclosers and capacitor banks is commercially challenging. In rural areas cellular coverage can be too inconsistent, unreliable and a security risk for mission-critical communications.

Improving distribution grid operations with real-time remote monitoring and control of grid assets has become simple and affordable with wide area digital Land Mobile Radio. Harris' DMR Tier 3 based communications infrastructure provides full feature voice services and wide area data transport services through our GridLink Solution.

GridLink employs wide-area, trunked digital radio coverage to deliver a DA solution that is highly economic, reliable and secure, providing visibility and control of your entire grid.

COMBINES VOICE AND SCADA NETWORKS



GR16021v5

LEFT: Mobile field workers rely on voice based, work-group centric dispatch services for a safe and efficient work environment under all conditions—from business-as-usual to black start. RIGHT: Remote devices on the distribution lines monitor and control the distribution grid. A SCADA control room application polls for and responds to remote event notifications from the remote devices using SCADA protocols such as DNP3 or IEC 60870-5-10x, which provide robust communication over narrow band PMR networks.

GridLink BUSINESS BENEFITS

GridLink, powered by Tait, provides utility managers with a layer of network intelligence that delivers both visibility and control over their grid, ensuring operational cost reductions, optimized energy usage, and improved grid reliability and resilience.

OPERATIONAL COST REDUCTIONS

With better grid visibility, utilities reduce operational costs with the ability to rapidly isolate and resolve faults and limit the scale of outages. All this is less time and with fewer people.

OPTIMIZED ENERGY USAGE

Electricity grid control enables utilities to optimize Volt/VAR, which in turn improves power delivery effectiveness and management. With better usage management, it is easier to ensure budgeted asset life cycles are realized and premature equipment failure or replacements are avoided.

IMPROVED GRID RELIABILITY AND RESILIENCE

GridLink gives managers improved visibility and control of electricity distribution networks, helping them predict potential weaknesses and improve grid reliability and resilience. That ensures better SAIDI and CAIDI metrics resulting in improved customer service and increased utility profits.

The combined Voice and SCADA Network delivers two independent network services over a common infrastructure. This network topology ensures utilities benefit from a single communications vendor with only one network to design, deploy, maintain, harden and secure.



HIGHLIGHTS OF THE GridLink SOLUTION

GridLink builds on the Harris DMR Tier 3 radio platform to provide extremely reliable and robust voice and data communications.

IMPROVED COVERAGE

DMR Tier 3 delivers affordable wide area coverage for suburban and rural networks—equivalent to analog radio systems. Combined, DMR Tier 3 and GridLink provide significantly wider area coverage for both voice and data than other industry technologies. Depending on terrain, DMR coverage allows outstations to be located up to 43 miles (70 km) from the base station sites. This minimizes the requirement for multiple base station sites, reducing capital costs to create a wide area DA network.

RELIABILITY AND RESILIENCE

GridLink and the DMR Tier 3 radio network are designed for highly reliable network services. All infrastructure equipment is offered in redundant configurations to ensure business critical SCADA communications continue operations in the rare event of an equipment failure. GridLink employs DMR Tier 3 trunking capability to dynamically reassign traffic to radio channels, so if channels are lost, data will continue to pass through the network to its destination.

SCALABILITY

GridLink is a highly scalable solution, making it easy for a utility to deploy a small number of GridLink data terminals and then gradually scale up the solution, pole-by-pole, to a grid-wide system when required.

EASE OF INTEGRATION

The integration of GridLink with SCADA control systems and outstation equipment is seamless. GridLink supports global SCADA communication standards with extensive experience integrating equipment from multiple vendors.

Harris provides comprehensive support during system integration and roll out including tailored acceptance testing, deployment planning and project management to guarantee the successful operation of SCADA systems.

SECURING GridLink

All SCADA communications are encrypted to prevent unauthorized access to your electricity network. Access to the DMR radio network is also restricted to authorized terminals using DMR standard security authentication protocols.

REMOTE MANAGEMENT AND CONTROL

GridLink provides remote management and diagnostics facilities allowing console access to RTU/IED equipment, removing the need to physically visit outstations for routine maintenance activities. The status of all the GridLink equipment is made accessible via SNMP/MIB interfaces for display through industry standard Network Management Systems.

DETAILED COMMUNICATION SYSTEM REPORTING

GridLink systems monitor and provide detailed reports of system performance for both individual outstation and base station sites, including:

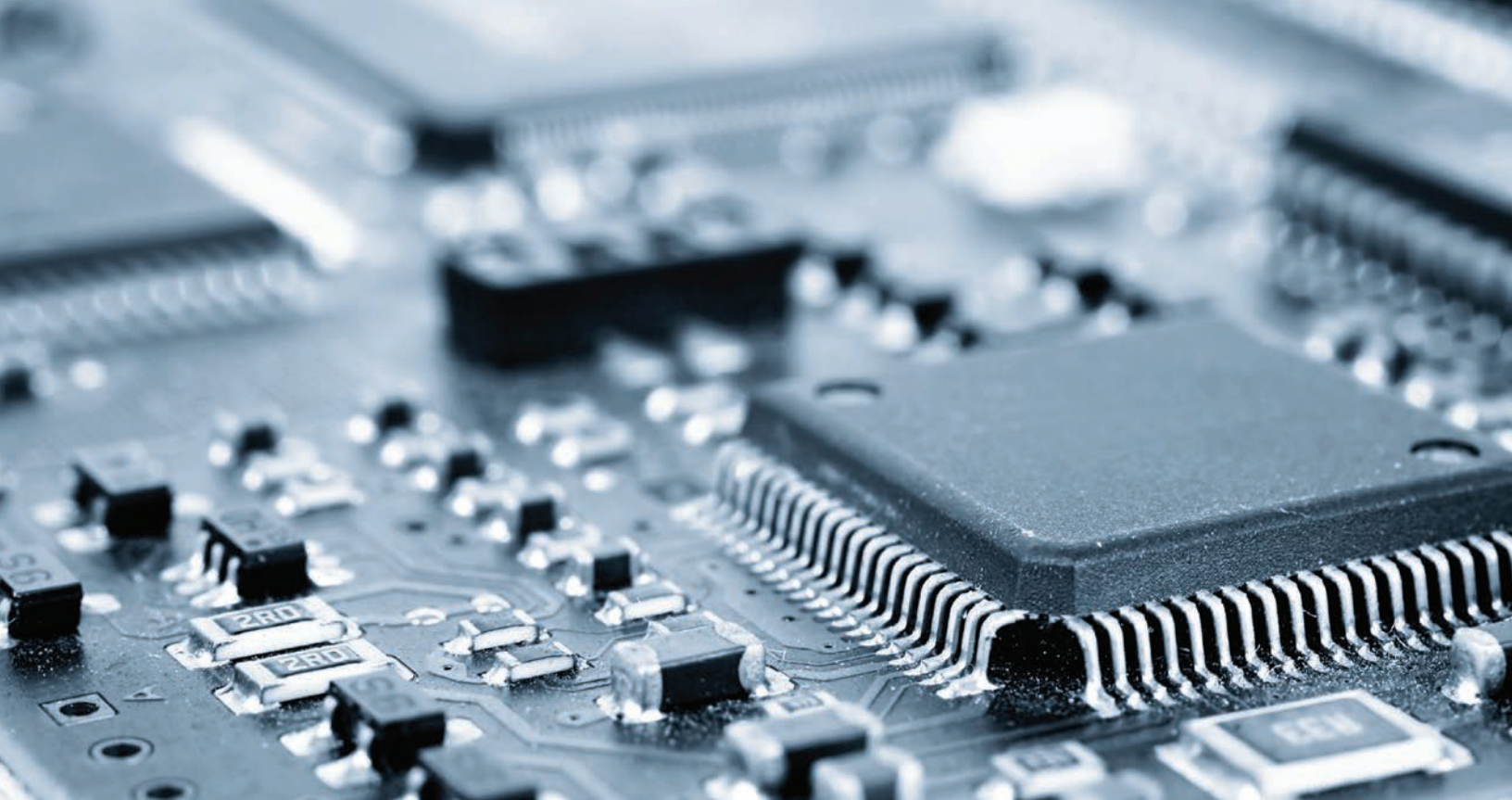
- Transaction latency and volumes to identify overloaded communication paths
- Transaction failure and retry metrics to identify failing equipment
- Received signal-strength and bit-error counters to identify interference or faulty antennas
- Supply voltage readings to confirm performance of outstation power supplies

INDUSTRY STANDARDS

DMR Tier 3 is a proven, open-standards-based radio protocol and GridLink supports major SCADA communications standards, including:

- DNP3 over both TCP/IP and serial
- IEC60870-5-101 and 104
- Other communications protocols can be made available on request





INTELLIGENT VOICE AND DATA NETWORKS

GridLink builds on the proven value of DMR-based mission-critical voice by adding SCADA monitoring and control.

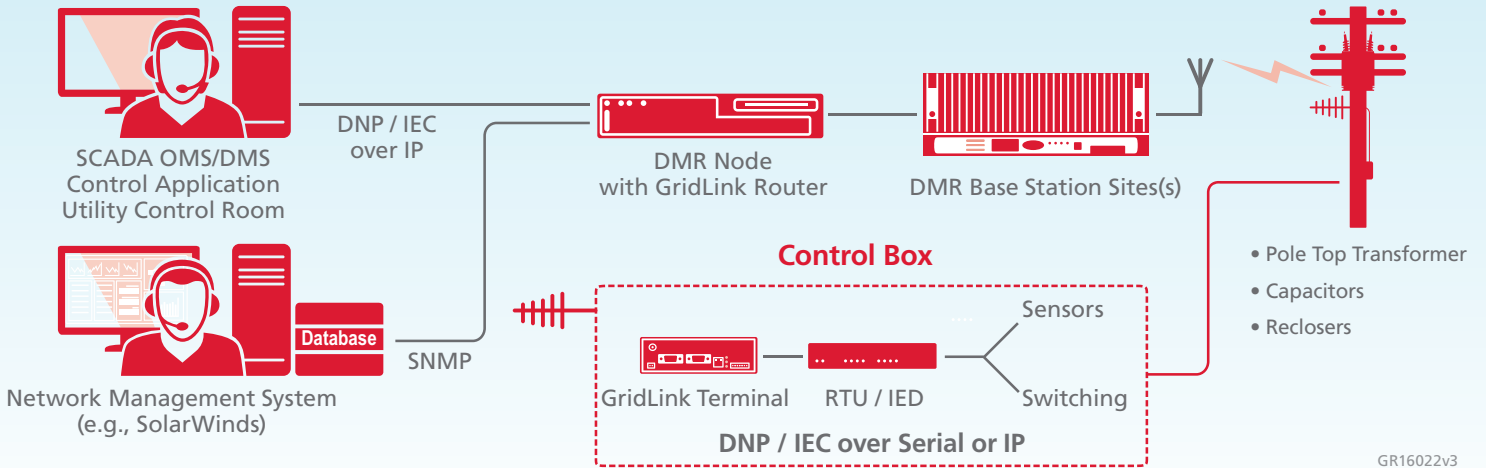
Traditionally, wide area networks have delivered voice and data communications on separate networks. Network managers have accepted this duplication and associated costs as necessary to avoid complexities of combining voice and data interactions within their required Quality of Service metrics.

The effectiveness of any DA solution depends on the reliability of the communications link between each device and the SCADA system. Intelligent technologies in digital TDMA-based trunking standards that effectively manage system resources are key to delivering combined voice and SCADA networking. GridLink leverages the Harris DMR Tier 3 radio platform to provide a robust communications link with market-leading security, reliable LMR voice communications and digital data functionality.

The capacity doubling effect of two-slot TDMA combined with trunking resource management gives network operators new opportunities to:

- Prioritize network resources for voice or SCADA traffic
- Reserve channel resources for voice or SCADA, so dynamic network loading does not impact the quality of essential services
- Preempt call queues based on call priority and network loading

GridLink SOLUTION



HOW DOES GridLink WORK?

GridLink builds on Harris' proven experience in operations-critical voice solutions for electrical utilities companies with added expertise in data-enabled grid device monitoring and control.

SCADA communications are passed from the control application to the GridLink communications server, located on the DMR Node and transmitted via the DMR Base Station sites to GridLink terminals at outstation sites.

- The GridLink solution passes SCADA messages using the packet data service on DMR traffic channels.
- In the event of RF interference, the GridLink terminal and communications server automatically resends communications ensuring messages are reliably passed between the SCADA equipment.
- More than 50,000 GridLink data terminals may be provisioned on a single network, subject to channel capacity constraints. The number of outstation RTUs and associated GridLink SCADA terminals supported by a logical¹ DMR channel is dependent on a number of factors, including the number of outstations and the frequency of status checks being conducted.

¹ A single physical DMR channel provides two logical channels or timeslots.

About Harris Corporation:

Harris Corporation is a leading technology innovator, solving customers' toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports government and commercial customers around the world.

Learn more at harris.com

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