

How do I reduce field visit expenses and still comply with NERC PRC-005-2?

The Scenario:

A utility is using Power Line Carrier equipment for Blocking Pilot Protection schemes through an On/Off carrier. The On/Off carrier is advantageous to this type of protection scheme due to its speed and reliability. However, due to the nature of the On/Off carrier the communications signal is normally “Off” and not in the “On” state. Consequently, it becomes impossible to tell whether the communications path is healthy or not until a test signal is sent. The NERC Protection System Maintenance standards as defined by PRC-005-2 requires “Any unmonitored communications system necessary for correct operation of protective functions...”⁽¹⁾ to be verified at a maximum of every 4 months. In order to comply with this standard, personnel must be sent to each station to manually test and verify this unmonitored communications circuit. With a significant install base of similar On/Off Power Line Carrier systems it would consume a great deal of resources to conduct manual testing of each system at a minimum of three times per year. However, the “...defined time limits allow for longer time intervals if the maintained component is monitored.”⁽²⁾ A communications system with periodic automated testing for presence of channel function requires not only less manual intervention, but benefits from an extended implementation period, requiring only 30% compliance five years after regulatory

approval. To minimize operational expenses, the utility wants to ensure its On/Off PLC equipment has automated performance testing.

The Solution:

Since On/Off Power Line Carrier systems do not inherently provide automatic monitoring of the communications circuit, Checkback systems have been developed to automate this monitoring. GARD 8000 PLC Checkback functionality allows the user to perform automatic and semi-automatic testing of the communications circuit to ensure its functionality before an event occurs. With this Checkback feature installed, the communications equipment will now classify as a “...communications system with continuous monitoring or periodic automated testing for the presence of the channel function, and alarming for loss of function.”⁽³⁾ With this classification maintenance activities will need to be performed at maximum interval of 12 years, 36 times less frequently. In order to provide evidence of the automatic testing, the utility utilizes the GARD 8000 system Sequence of Events (SOE) logging as well as test and alarm reporting via DNP-3 and SCADA.

The Results:

With the implementation of automatic GARD 9000 PLC Checkback testing the utility realized a significant reduction in operating expenses related to complying with Protection System Maintenance

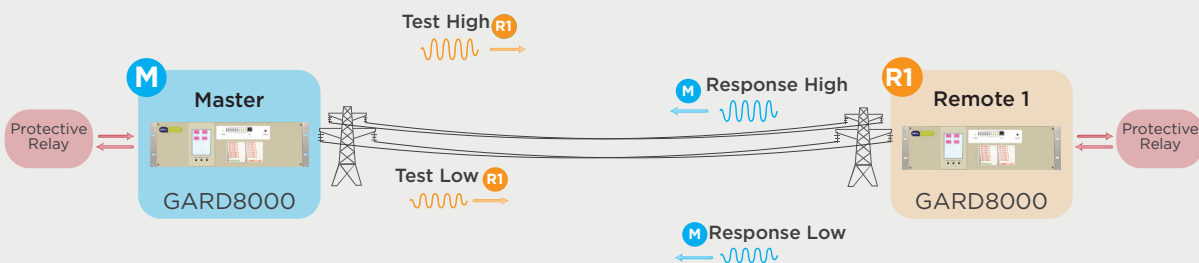


Figure 1: Example of a basic checkback sequence for two-terminal testing

Standards. The GARD 8000 PLC system helps the utility to keep record of scheduled automatic testing and evidence of any pass or fail events. With the automatic checkback set to run every 24 hours, the utility has the added assurance that their communications system is fully functional each day. This further allows the utility to provide reliable power to their customers by quick and effective response in the case of loss of communications.

Related Products:



GARD 8000 PLC

The RFL GARD 8000 is a revolutionary product platform that provides the user with a fully programmable system that can be used for all teleprotection and line protection

needs.

The system can be programmed as an FSK power line carrier system or an ON/OFF power line carrier transmission. The unit is designed for pilot protection relaying applications, requiring high-speed reliable communications.

About RFL

RFL designs and manufactures a comprehensive line of highly-reliable, mission-critical, cost-effective communications and protection solutions for the electric utility and transportation markets, oil and gas markets, government agencies and engineering consulting firms. RFL is focused on guaranteeing mission-critical data will arrive on-time, every time.

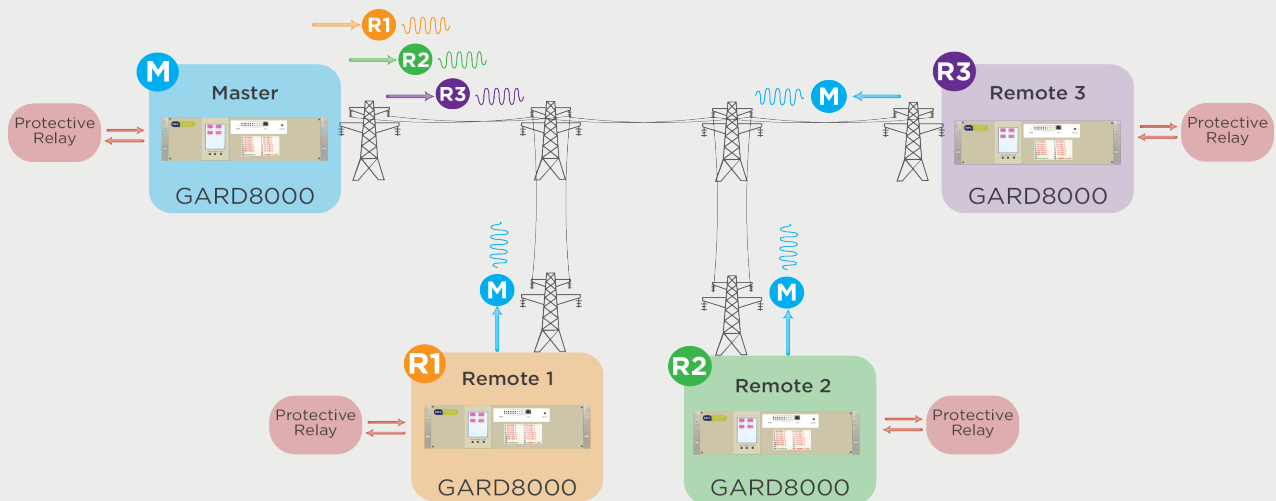


Figure 2: Example of a checkback response for multiple remotes

⁽¹⁾ "Standard PRC-005-2 - Protection System Maintenance" North American Electric Reliability Corporation

⁽²⁾ "Supplementary Reference and FAQ: PRC-005-X", North American Electric Reliability Corporation, April, 2014 draft.

⁽³⁾ "Implementation Plan: Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance, PRC-005-X", North American Electric Reliability Corporation, April 17, 2014 draft.



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