

Technical Specification

**Transport and Main Roads Specification
MRTS205 Remote Power Reset (RPR)**

March 2026

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1 Introduction

This Technical Specification defines the design, supply, installation, testing, commissioning, performance, documentation, training, and maintenance requirements for Remote Power Reset (RPR) devices for Intelligent Transport System (ITS) devices.

RPR devices are an Operational Technology (OT) device with built in relays that allows for remote monitoring and power control of connected devices. RPR devices allow for remote restoration of faults that can be resolved by power cycling affected devices. This can help with minimising device downtimes, particularly at installations that are located far from maintenance depots.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements*, MRTS201 *General Equipment Requirements*, and other Technical Specifications as listed in Table 3.1.

This Technical Specification forms part of the Transport and Main Roads Specification Manual.

2 Definition of terms

The terms defined in Clause 2 of MRTS01 *Introduction to Technical Specifications* apply to this Technical Specification. Additional terminology relevant to this Technical Specification is defined in Table 2 below.

Table 2 – Definition of terms

Term	Definition
ACMA	Australian Communications and Media Authority
CLI	Command Line Interface
HTTP	Hypertext Transfer Protocol
IoT	Internet of Things
IP	Internet Protocol
ITS	Intelligent Transport System
MIB	Management Information Base
MRTS	Transport and Main Roads Technical Specification(s)
N/C	Normally Closed
N/O	Normally Opened
OID	Object Identifier
Principal	As defined in the Contract

Term	Definition
RoHS	Restriction of Hazardous Substances Directive
RPEQ	Registered Professional Engineer Queensland
RPR	Remote Power Reset
SAT	STREAMS acceptance test
SIL	Safety Integrity Level as defined in AS/NZS 61508
SL	Safety Level as defined in AS/NZS 62443
SNMP	Simple Network Management Protocol
SSL	Secure Socket Layer
TCP	Transport Control Protocol
TLS	Transport Layer Security

3 Reference documents

The requirements of the referenced documents listed in Table 3 below apply to this Technical Specification. Where there are inconsistencies between this Technical Specification and the referenced documents, the requirements specified in this Technical Specification shall take precedence.

Table 3 – Reference documents

Reference	Title
AS/NZS 3000	<i>Electrical installations (known as the Australian/New Zealand Wiring Rules)</i>
AS/NZS 3100	<i>Approval and test specification – General requirements for electrical equipment</i>
AS/NZS ISO 8601	<i>Date and time – Representations for information interchange</i>
AS IEC 62682	<i>Management of alarm systems for the process industries</i>
AS IEC 62443	<i>Security for industrial automation and control systems</i>
MRTS01	<i>Introduction to Technical Specifications</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS91	<i>Conduits and Pits</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS208	<i>Roadway Ancillary ITS Infrastructure Monitoring and Control</i>
MRTS234	<i>Communications Cables</i>

Reference	Title
MRTS245	<i>ITS Telecommunications Network (ITS TN)</i>
MRTS263	<i>Standalone Solar (PV) Power Systems</i>

4 Quality system requirements

The quality system requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional requirements relevant to this Technical Specification are defined in Table 4.1 below.

4.1 Hold Points, Witness Points, and Milestones

General requirements for Hold Points, Witness Points, and Milestones are specified in Clause 5.2 of MRTS01 *Introduction to Technical Specifications*.

The Hold Points applicable to this Technical Specification are summarised in Table 4.1. There are no Witness Points and Milestones defined.

Table 4.1 – Hold Points, Witness Points and Milestones

Clause	Hold Point	Witness Point	Milestone
12.4	1. Commissioning Test		

5 Functional requirements

5.1 General

The functional requirement of RPR devices is to remotely control and monitor the power to ITS devices. Each outlet or terminal connector of the RPR device can power cycle the connected ITS device.

The RPR device shall have the capability to monitor the communication status of connected ITS devices that have an IP address (such as via ICMP ping). When the RPR device detects a communication loss to the connected ITS device, it shall have the capability to power cycle the device after a configurable timeout.

The RPR device shall report back the status of the connected ITS devices to the Principal’s traffic management centre through the remote management software as specified by the Principal.

The RPR device shall be compatible with a control system software and support industrial protocols listed in Clause 7.1.

The ITS devices selected for RPR will vary by site application and should be determined based on merit factors such as criticality, history of being in fault suitability for hard power cycling and maintenance considerations, however, Safety Integrity Level (SIL) rated traffic management devices shall not be controlled by RPR devices.

6 Operational requirements

6.1 General

The operational requirements defined in MRTS201 *General Equipment Requirements* apply to the RPR device. Additional equipment requirements are described below.

The RPR device shall:

- a) **Not** be used to power cycle any devices that contributes to a safety instrumented function that has a Safety Integrity Level (SIL).
- b) Have individual remote control for each outlet or terminal connector with N/C and N/O relay contacts.
- c) Have integrated IP Ping Watchdogs to monitor the status of connected ITS devices:
 - i. the watchdog shall have capability to be enabled/disabled, and
 - ii. the timeout settings for the watchdog shall be configurable.
- d) Have an ethernet port in accordance with MRTS245 *ITS Telecommunications Network (ITS TN)*.
- e) Ethernet interfaces shall support interface auto-negotiation and capability for speed, duplex, and flow control matching. Additionally, ethernet interface parameters shall support manual override.
- f) Be able to be integrated into a system with a Security Level (SL) of 2 in accordance with AS IEC 62443 *Security for industrial automation and control systems*.
- g) Have the capability to switch on / off connected ITS assets by power cycling.
- h) If the RPR device has power distribution capability, the relay shall operate on a separate system to the power distribution.

- i) Have the capability to be monitored and controlled remotely by the department's remote management software to cycle power of the connected ITS assets.
- j) Support remote firmware upgrade capability, and
- k) Be either rack or DIN mount form factor / package

In addition, the vendor shall provide a management facility for bulk firmware updates for the RPR device.

6.2 Recommended functions

The following functions are recommended:

- a) have the capability to monitor electrical information such as voltage, power consumption and current of connected ITS devices
- b) have the capability to monitor or connect to sensors that can monitor environmental conditions such as temperature and humidity inside the enclosure
- c) automatic notification of detected faults as required by the Principal
- d) have customisable / definable fault conditions, such as exceeding low / high thresholds for monitored data (i.e. current, voltage, power etc.)
- e) support Command Line Interface (CLI) as per Clause 6.6.a of MRTS245 *ITS Telecommunications Network (ITS TN)*:
 - i. using SSH for local and remote device configuration (Clause 6.14.1.a.i of MRTS245 *ITS Telecommunications Network (ITS TN)*)
- f) load shedding capabilities, and
- g) the RPR device should have capability to configure alert conditions to customise what is considered a fault:
 - i. Thresholds for monitored parameters should be configurable, and a notification should be sent to the remote management software (specified by the Principal) if the monitored parameter breaches the configured threshold.

7 Control system

7.1 General

The control system requirements defined in MRTS201 *General Equipment Requirements* apply to the RPR device. Additional equipment requirements are described below.

The RPR devices shall:

- a) support IPv4 and IPv6 as per Clause 6.6 of MRTS245 *ITS Telecommunications Network (ITS TN)*:
 - i. with capability to disable these protocols, and
 - ii. where IPv6 is not supported, Contractor may seek approval from the Principal.
- b) support HTTPS as per Clause 6.14.a.ii of MRTS245 *ITS Telecommunications Network (ITS TN)*
- c) support the configuration of non-default port numbers for supported protocols
- d) support the capability to disable protocols, and
- e) support for Industrial Communication Protocols or Operations Technology protocols specified in MRTS208 *Roadway Ancillary ITS Infrastructure Monitoring and Control*.

8 Electrical requirements

8.1 General

The electrical requirements defined in MRTS201 *General Equipment Requirements* apply to work provided under this Technical Specification. Additional requirements are as described below.

An electrical wiring diagram shall be provided with details specific to each installation. Diagrams shall have identifications for individual cables and terminations and shall be labelled accordingly in the field installation.

9 Telecommunication requirements

The telecommunications requirement defined in MRTS201 *General Equipment Requirements* apply to work provided under this Technical Specification. In addition, all telecommunication equipment shall comply with the relevant regulatory requirements and standards of Australian Communications and Media Authority (ACMA).

The RPR device shall connect to the enclosure network switch or router via ethernet RJ45 port.

Communication provisions as part of the RPR system shall comply with MRTS245 *ITS Telecommunications Network* (ITS TN) and MRTS234 *Communications Cables* for the network and physical cabling requirements.

10 Installation requirements

The RPR system and associated equipment shall be installed according to the design documentation. The Contractor shall allow access for inspecting the installation for the representative of the Principal.

RPR devices shall be either rack mounted or DIN rail mounted in a telecommunications field enclosure that comply with MRTS201 *General Equipment Requirements* or traffic signal controller enclosures.

RPR device contact relays shall be normally closed to prevent disconnection of connected devices during the failure of the RPR device.

The RPR device relay contact current rating shall be equal to or greater than the current rating of the connected ITS devices. For loads that exceed the rated voltage or current ratings, an external relay shall be connected to the RPR device.

10.1 Solar powered Remote Power Reset installations

Where the RPR device is powered by solar, the requirement of the MRTS263 *Standalone Solar (PV) Power Systems* shall apply to the Technical Specification.

11 Mechanical and physical requirements

The mechanical and physical requirements defined in MRTS201 *General Equipment Requirements* apply to work under this Technical Specification. Additional mechanical and physical requirements relevant under this Technical Specification are described following.

The RPR device shall comply with Restriction of Hazardous Substances (RoHS) directive.

12 Testing and commissioning

12.1 General

The testing and commissioning requirements defined in MRTS201 *General Equipment Requirements* apply to work under this Technical Specification. Additional testing and commissioning requirements relevant under this Technical Specification are described following.

12.2 Factory Acceptance Test (FAT)

The FAT shall include all the performance parameters in this Technical Specification that can be tested under laboratory / factory conditions. The test sheets shall demonstrate compliance with the technical requirements of this Technical Specification prior to the delivery of the equipment to the site.

12.3 Installation Acceptance Test (IAT)

The Installation acceptance test requirements defined in MRTS201 *General Equipment Requirements* apply to works under this Technical Specification.

12.4 Commissioning Test (CT)

The Contractor shall populate and submit any configuration and object library files required for the protocol used. A register of SNMP objects and the MIB file for the RPR device shall be provided where SNMP is used. The SNMP register shall include a table with the OID, object syntax, object name, object description, and access class. Where Standard Modbus is used, the Contractor shall populate and submit a Standard Modbus register the table showing Standard Modbus register addresses of control, alarms and sensor variables to be read values by the Principal's traffic management system. Where DNP3 is used, a common object register and object library shall be provided. **Hold Point 1**

13 Documentation

The documentation requirements defined in MRTS201 *General Equipment Requirements* apply to work under this Technical Specification.

Additional documentation requirements relevant to this Technical Specification are defined below:

- a) commissioning documents for the RPR device that includes the device configuration setting such as IP address, subnet mask, gateway, and Control system integration

- b) backup copy of the device's configuration
- c) the communications connections and electrical wiring diagram of the RPR device
- d) system operating manuals
- e) SNMP objects register, MIB file, Standard Modbus register table and/or DNP3 common object register and object library as per Clause 12.4
- f) As Constructed plans
- g) electrical test certificate
- h) recommendation for routine maintenance tasks, and
- i) recommendation on spare parts holding.

14 Training

The training requirements defined in MRTS201 *General Equipment Requirements* apply to work under this Technical Specification.

Additional training requirements relevant to this Technical Specification are defined below:

- a) training shall be provided to the Principal's representative on programming and debugging the RPR device.

15 Maintenance

The maintenance requirements defined in MRTS201 *General Equipment Requirements* apply to work under this Technical Specification.

16 Handover

The handover requirements defined in MRTS201 *General Equipment Requirements* apply to work under this Technical Specification. In addition, the commissioning and configuration software and manual.

17 Compliance evaluation form

The compliance evaluation form for this Technical Specification is published on the [Intelligent Transport System and Electrical Approved Products and Suppliers](#) webpage.

