

**Recommended Instructions for Test of Positive Train Control Wayside Interface Units (WIU) before Placing in Service**

Revised 2025 (3 pages)

**A. Purpose**

This Manual Part makes recommendations for the testing of Positive Train Control (PTC) Wayside Interface Unit (WIU) installations or modifications before placing in service.

For the purposes of this Manual Part, the WIU functionality encompasses only the conversion of wayside device status into data messages and responses to incoming messages. This Manual Part addresses only the additional testing required for this functionality.

**B. General**

1. The WIU generally performs the tasks of:
  - a. Converting wayside device status information into messages that are transmitted to the communications network.
  - b. Receiving and responding (if appropriate) to messages from the communications network.
2. As applicable, the location, WIU address, and other characteristics of the WIU and associated wayside devices are identified in a track database maintained by the host railroad (or others). The validation of this information shall be verified prior to placing in service in accordance with railroad procedures.
3. This Manual Part generally applies to non-vital overlay, vital overlay, vital stand-alone, and mixed PTC systems.

**C. Installation**

1. WIU's shall be installed per Manual Part 1.5.1. Recommended Instructions for the Installation and Maintenance of Solid-State Equipment.

**D. Tests**

1. At the location or locations monitored by the WIU, all appropriate tests should either be conducted in conjunction with WIU tests or have been conducted on the wayside signal equipment before WIU tests are performed.

2. Tests which may interfere with safe operation of trains shall not be started until train movements have been fully protected as instructed per railroad procedures. Temporary repairs or adjustments, when required, shall be made in such a manner that safety of train operation shall not be impaired. When repair, adjustment, change, or replacement is made, tests shall be made immediately to determine the WIU functions as intended. When testing, proper instruments shall be used, and it shall be known that no unsafe conditions are created by the application of testing equipment. Protection for train movements shall be provided per railroad instructions. Consideration shall be given to data that may be transmitted over the communications network from the unit under test to prevent any unsafe condition.
3. All testing requires verification that the message corresponds to the proper wayside appliances and status. Additional system level tests may be required as defined in the PTC Safety Plan or as instructed per railroad procedures.
4. There are various ways to perform the testing as discussed below.
  - a. WIU tests may involve disconnecting communication connection between the WIU and the Wayside Message Server (WMS) or Communications Network. The testing device is then connected directly to the WIU under test.
  - b. WIU testing may be performed directly through the communications network from the testing device that simulates all scenarios available to the WIU location.
5. WIU testing device shall indicate all relevant WIU status information. As an example, the following types of information should be verified for WIU's developed in compliance with AAR Manual of Standards and Recommended Practices, Standard S-9202 Interoperable Train Control Wayside Interface Unit Requirements:
  - a. WIU address and other header information is correct.
  - b. All monitored device status changes are reflected in transmitted datagram (switch position, signal aspect, grade crossings, hazard detector, etc.) in the proper sequence. All valid switch, signal, and hazard detector states shall be tested.
  - c. Testing of many if not all of the states (for example; G/R, G/D, 1 Normal, 1 Reverse, or 1 not indicating,) may be performed in a lab environment for microprocessor based systems that control signals and switches, etc. This requires testing against a known logic

controller application program and set of vital configuration settings. Field testing in this case requires validation that the application program and all vital configuration settings used in lab testing are the same that exist in the field, and an alternative set of validation tests is performed.

- d. Additional testing requirements may be specified by manufacturers or individual railroads such as testing of invalid signal states. These tests may not be required to be done in the field.
  - e. WIU responds to locomotive request messages from the communications network or locomotive simulator if required for the location.
6. Results of tests required herein and all other tests that may be required shall be recorded, as instructed per railroad procedures, on the prescribed forms.

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