

QUICK REFERENCE GUIDE INSTALL PSO 4000 CROSSING ASSEMBLY MODULES

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The following procedure should be used when installing Phase Shift Overlay 4000 (PSO 4000) Track Circuits utilizing PSO 4000 Transmitter, 7A471 and PSO Crossing Assembly, 7A474.

WARNING

VERIFY THAT THE PSO 4000 TRANSMITTER'S AND CROSSING ASSEMBLY'S SOFTWARE, FREQUENCY, AND ADDRESS FORMATS ARE AS SPECIFIED BY THE RAILROAD'S OR AGENCY'S APPROVED WIRING OR INSTALLATION DIAGRAM. FAILURE TO DO SO MAY LEAD TO INCORRECT OR UNSAFE OPERATION OF THE TRACK CIRCUIT.

IF ANY RECEIVER IS CALIBRATED IN POOR BALLAST CONDITIONS, IT MUST BE RE-CALIBRATED WHEN BALLAST CONDITIONS IMPROVE.

FAILURE TO FOLLOW THE RAILROAD'S OR AGENCY'S APPROVED WIRING OR INSTALLATION GUIDELINES REGARDING RECEIVER SETTINGS AND CALIBRATION MAY LEAD TO POSSIBLE UNSAFE OPERATION OF THE TRACK CIRCUIT.

AFTER CALIBRATION, VERIFY THAT THE TRACK CIRCUIT DE-ENERGIZES WHEN THE TRACK CIRCUIT IS SHUNTED WITH THE APPROPRIATE CALIBRATION RESISTANCE (0.06, 0.2, 0.3, 0.4, OR 0.5 OHMS). FAILURE TO DO SO MAY LEAD TO INCORRECT OR UNSAFE OPERATION OF THE TRACK CIRCUIT.

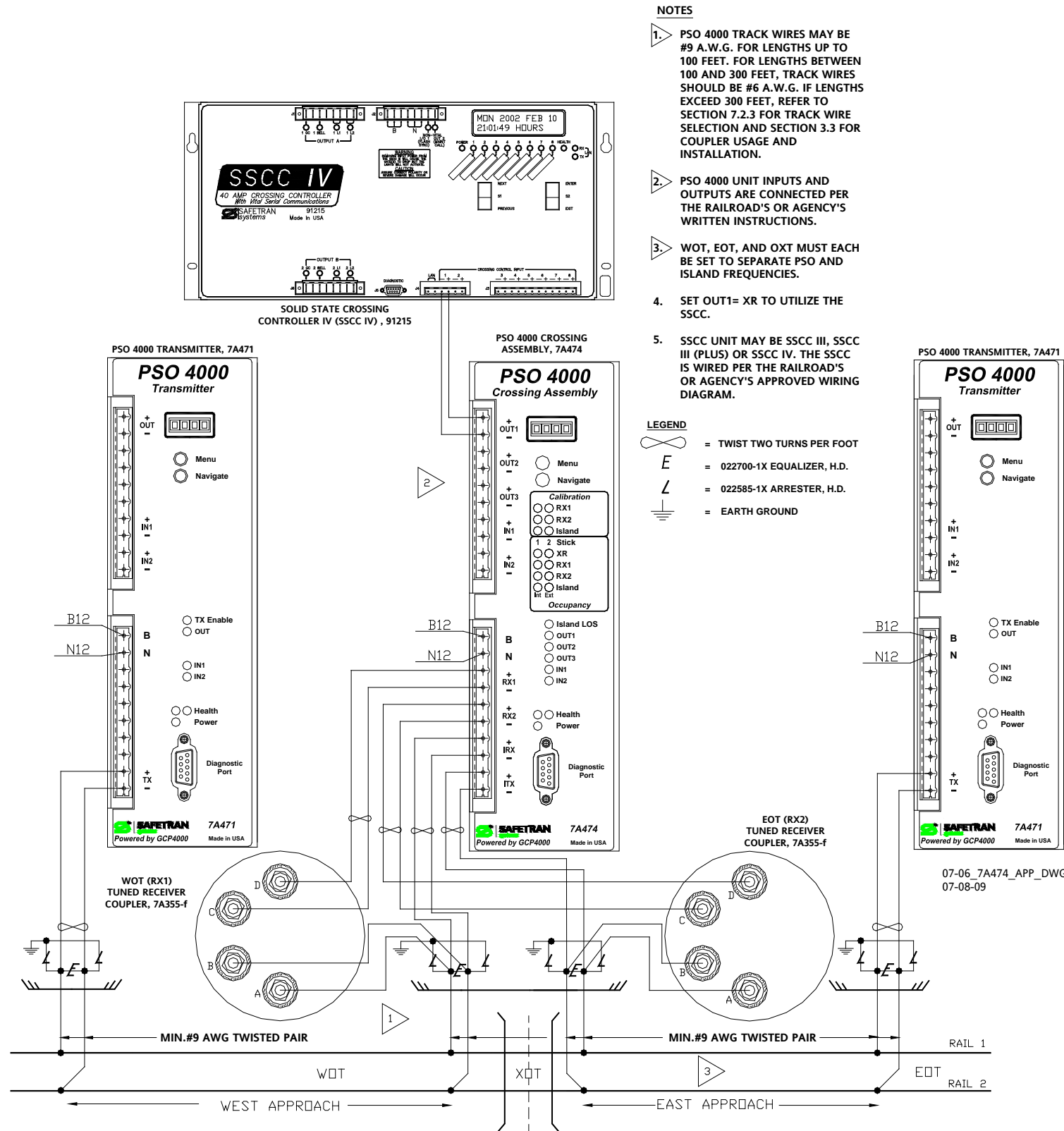
FOLLOWING INSTALLATION OR AFTER ANY RECEIVER MENU CHANGES HAVE BEEN MADE, RECALIBRATE THE RECEIVER AND TEST FOR PROPER OPERATION PER THE REQUIREMENTS SPECIFIED IN TABLE 7-2 AND TABLE 7-3 OF SIG-00-07-06, PSO 4000 I & I MANUAL.

Perform the following steps to install the PSO 4000 units:

1. Install and connect all PSO equipment in the Wayside Signaling Station (WSS) per the railroad's or agency's approved wiring or installation diagram.
2. Connect all required wiring per the railroad's or agency's approved wiring or installation diagram.
3. Prior to beginning programming, verify LED functionality using the *CHECK LED portion of the TEST menu per Section 5.2.7.2. If any LED fails to light following test, replace the unit.
4. Program each unit by performing Set to Default. Then proceed through the setup (SETP) menu to program each unit per the railroad's or agency's approved written instructions.

With each unit properly installed and programmed per written instructions, calibrate the approaches (RX1 or RX2) as follows:

1. When the track ballast is good, connect a test shunt (hardwire, 0.06-ohm, 0.2-ohm, or as required) across the track at the receiver track connections of the approach. When the ballast is poor, connect the shunt across the track at a point 30 feet beyond the receiver track connections of the approach. Verify solid connections of the shunt to each rail. Scroll down the Main Menu until CAL appears on the display. Then:
 - Press the MENU Button for two (2) seconds until RX1 (RX2) CAL appears.
 - Hold the MENU Button down until the release (REL) message appears. Release the MENU Button immediately once the release (REL) message appears.
 - As soon as the MENU button is released, the armed (ARMD) message appears. Immediately press and release the MENU Button as soon as the ARMD message appears. This starts the calibration process. If the MENU Button is not pressed within two (2) seconds, the calibration process cancels and the calibration process must be restarted.
 - *RX1 (*RX2) CAL flashes during the calibration process.
 - PASS or FAIL appears for two (2) seconds when calibration is complete. When PASS appears, continue to Step 3. If FAIL appears, the CALIBRATION REQUIRED LED remains lit.



NOTES

1. PSO 4000 TRACK WIRES MAY BE #9 A.W.G. FOR LENGTHS UP TO 100 FEET. FOR LENGTHS BETWEEN 100 AND 300 FEET, TRACK WIRES SHOULD BE #6 A.W.G. IF LENGTHS EXCEED 300 FEET, REFER TO SECTION 7.2.3 FOR TRACK WIRE SELECTION AND SECTION 3.3 FOR COUPLER USAGE AND INSTALLATION.
2. PSO 4000 UNIT INPUTS AND OUTPUTS ARE CONNECTED PER THE RAILROAD'S OR AGENCY'S WRITTEN INSTRUCTIONS.
3. WOT, EOT, AND OXT MUST EACH BE SET TO SEPARATE PSO AND ISLAND FREQUENCIES.
4. SET OUT1= XR TO UTILIZE THE SSCC.
5. SSCC UNIT MAY BE SSCC III, SSCC III (PLUS) OR SSCC IV. THE SSCC IS WIRED PER THE RAILROAD'S OR AGENCY'S APPROVED WIRING DIAGRAM.

- LEGEND**
- = TWIST TWO TURNS PER FOOT
 - = 022700-1X EQUALIZER, H.D.
 - = 022585-1X ARRESTER, H.D.
 - = EARTH GROUND

WARNING

IF “FAIL” APPEARS ON THE DISPLAY, THE CALIBRATION REQUIRED LED (LEFT COLUMN) REMAINS LIT, OR THE CALIBRATED LED (RIGHT COLUMN) DOES NOT LIGHT, THE CALIBRATION PROCESS DID NOT COMPLETE. SHOULD THIS HAPPEN, CYCLE THE UNIT POWER AND THEN REPEAT STEP 2 ABOVE. IF “FAIL” APPEARS AGAIN, FURTHER TROUBLESHOOTING IS REQUIRED.

2. Remove the test shunt. The RX1 (RX2) Occupancy LED should light. If the RX1 (RX2) Occupancy LED fails to light, the calibration process has failed (refer to the WARNING above). Inspect all equipment and connections and repeat steps 1 & 2. If the calibration fails again, further troubleshooting is required.
3. To calibrate the Crossing Assembly Island (ISL), proceed to Section 7.4.1.3.

Island Calibration Procedures

1. Temporarily connect a hardwire shunt across the track at the appropriate distance beyond the island receiver rail connections as specified in the hardwire shunt distance chart of Table 7-2 (0.12, 0.3, 0.4 and 0.5 ohms).
2. Scroll down the Main Menu until CAL appears on the display. Then:
 - Press the MENU Button for two (2) seconds until ISL CAL appears.
 - Hold the MENU Button down until the release (REL) message appears. Release the MENU Button immediately once the release (REL) message appears.
 - As soon as the MENU button is released, the armed (ARMD) message appears. Immediately press and release the MENU Button as soon as the ARMD message appears. This starts the calibration process. If the MENU Button is not pressed within two (2) seconds, the calibration process cancels and the calibration process must be restarted.
 - *ISL CAL flashes during the calibration process.
 - PASS or FAIL appears for two (2) seconds when calibration is complete. When PASS appears, continue to Step 3. If FAIL appears, see the WARNING below.

WARNING

IF “FAIL” APPEARS ON THE DISPLAY, THE CALIBRATION REQUIRED LED (LEFT COLUMN) REMAINS LIT, OR THE CALIBRATED LED (RIGHT COLUMN) DOES NOT LIGHT, THE CALIBRATION PROCESS DID NOT COMPLETE. SHOULD THIS HAPPEN, CYCLE THE UNIT POWER AND THEN REPEAT STEP 2 ABOVE. IF “FAIL” APPEARS AGAIN, FURTHER TROUBLESHOOTING IS REQUIRED.

3. Remove the hardware island shunt. The Island Occupancy LED should light. If the Island Occupancy LED fails to light, the calibration process has failed (refer to the WARNING above). Inspect all equipment and connections and repeat steps 1 & 2. If the calibration fails again, further troubleshooting is required.
4. Review the face of the PSO 4000 Crossing Assembly. In the Calibration section, the green RX1, RX2, and ISL LEDs are lit, indicating that the circuits have been calibrated. In the Occupancy section the red XR, RX1, RX2 and ISL LEDs are lit, indicating that the circuits are not occupied.
5. Once the Island has been calibrated, proceed to Crossing Assembly Checkout Procedures, Section 7.5.2.

Crossing Assembly Checkout Procedures

1. Scroll down the Crossing Assembly Main Menu until INFO appears on the display.
2. Scroll down the sub-menu one step until “+RX1 SIG LVL =” appears on the Display.
3. Take note of RX SIG LVL. This is the normal receive signal value. Verify the RX SIG LVL value is >300. If not, set TX LVL to High and perform calibration and checkout procedures again. If the value remains below 300 after selecting TX LVL=High, select a lower frequency where RX SIG LVL value is >300.
5. In the WSS containing the transmitter for the receiver 1 (RX1) track circuit, remove the transmitter’s signal to the track by disconnecting a transmitter lead from the track surge equipment.
6. On the Crossing Assembly, take note of the Signal Level. If the Signal Level is greater than 20, an unintended signal of like frequency is present.

WARNING

DO NOT PROCEED TO STEP 6 AND BEYOND UNTIL THE UNINTENDED SIGNAL OF LIKE FREQUENCY IS NO LONGER PRESENT (THIS MAY REQUIRE A FREQUENCY CHANGE TO AVOID UNINTENDED HARMONICS.) THIS CONDITION MUST BE RESOLVED.

7. Verify that the RX1 and XR indicator LEDs found in the Occupancy portion of the face of the unit de-energize. If the LEDs fail to de-energize, replace the unit.
8. Restore the receiver 1 (RX1) track circuit Transmitter signal to the track by reconnecting the lead in the transmitter’s track surge equipment.
9. Verify that the RX1 and XR indicator lights found in the Occupancy portion of the face of the unit energize. If the LEDs fail to energize, replace the unit.
10. Press and release the NAVIGATE button. “+RX2 SIG LVL =” appears on the Display.
11. In the WSS containing the transmitter for the receiver 2 (RX2) track circuit, remove the transmitter’s signal to the track by disconnecting a transmitter lead from track surge equipment.
12. Repeat Steps 5 – 9 for receiver 2 (RX2), then proceed to Step 13.
13. Momentarily press the MENU Button and release it. “+ISL SIG LVL =” appears on the Display.
14. Take note of the Signal Level
15. Remove the Island Transmitter signal to the track by opening one of the wires that runs to the rail connection.
16. Take note of the Signal Level. If the Signal Level is greater than 20, an unintended signal of like frequency is present.

WARNING

DO NOT PROCEED TO STEP 6 AND BEYOND UNTIL THE UNINTENDED SIGNAL OF LIKE FREQUENCY IS NO LONGER PRESENT (THIS MAY REQUIRE A FREQUENCY CHANGE TO AVOID UNINTENDED HARMONICS.) THIS CONDITION MUST BE RESOLVED.

17. Verify that the Island and XR indicator LEDs found in the Occupancy portion of the face of the unit de-energize. If the LEDs fail to de-energize, replace the unit.

18. Once the unintended signal has been removed, restore the Transmitter signal to the track by reconnecting the wire that runs between Pin 9 of the Lower 10-pin Connector and the surge equalizer at the Surge Panel.
19. Verify the Island and XR indicator lights found in the Occupancy portion of the face of the unit energize. If the LEDs fail to energize, replace the unit.
20. Verify proper operation of the track circuit equipment before placing in service in accordance with railroad or agency procedures and applicable FRA rules.
21. Verify proper PSO 4000 operation by observing train moves, per railroad or agency policy.
22. The system is now ready for operation.

NOTE

All references to Section numbers are those section numbers found within the Siemens Phase Shift Overlay 4000 (PSO 4000) Installation and Instruction Manual, SIG-00-07-06.