

Technical Bulletin

© 2021 Southern Technologies Corporation (STC). All rights reserved.

Bulletin Number: TB-2018271-RH01 Rev.2

Date Published: 05 10 2021

Summary: This bulletin provides instructions for installing the Zukinut **Z3 Plus**® Presence Detector in a SmartSCAN 2600-020 AEI Reader system.

Critical (Affects safe operation of system)

Informational

Distribution List: NA

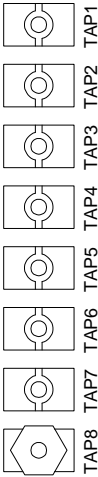
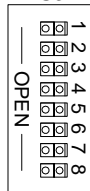
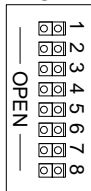


The **Z3 Plus**® 2-Wire Audio Overlay Presence Detector is the recommended replacement for the Zukinut Zepic III (now obsolete). The **Z3 Plus**® provides a normally closed relay output which can be tied directly to the Presence inputs of the 2600-020 AEI Controller.

Z3 Plus® Installation Procedure

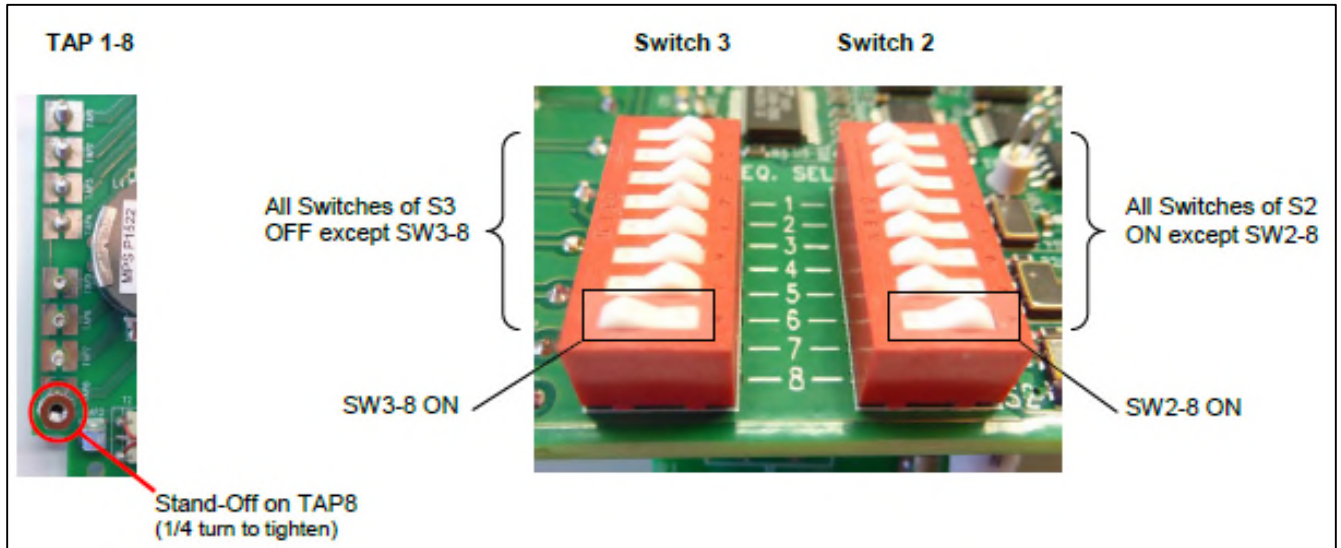
Step 1 – Set Track Frequency

The **Z3 Plus**® is field configurable for the following track drive frequencies: 8.2K, 10K, 11.5K, 13.2K, 15K, 17.5K, 20K, 26KHz. To change the track frequency - Remove the **Z3** cover, then configure DIP switches S3 & S2 and TAP to select the desired frequency (as detailed below).

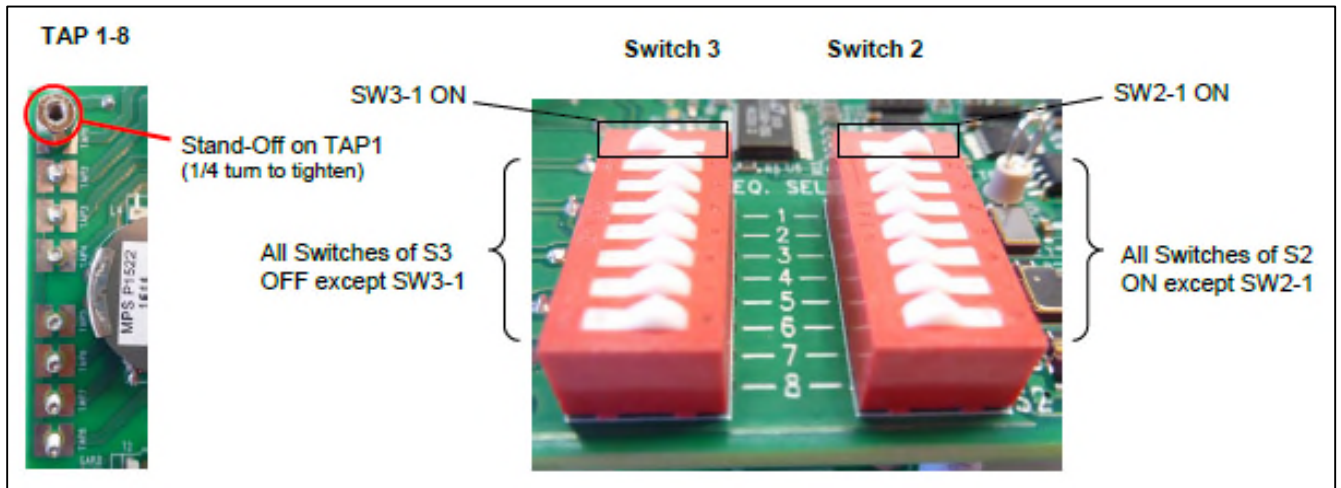
 <p>TAP1 TAP2 TAP3 TAP4 TAP5 TAP6 TAP7 TAP8</p>	<p>S3</p> 	<p>S2</p> 	<p style="text-align: center;">FREQUENCY SELECTION</p> <table border="0"> <tr> <td>S3-1, S2-1, TAP1 = 8.2KHz</td> <td>S3-5, S2-5, TAP5 = 15KHz</td> </tr> <tr> <td>S3-2, S2-2, TAP2 = 10KHz</td> <td>S3-6, S2-6, TAP6 = 17.5KHz</td> </tr> <tr> <td>S3-3, S2-3, TAP3 = 11.5KHz</td> <td>S3-7, S2-7, TAP7 = 20KHz</td> </tr> <tr> <td>S3-4, S2-4, TAP4 = 13.2KHz</td> <td>S3-8, S2-8, TAP8 = 26KHz</td> </tr> </table> <p>NOTE: Always use same switch # and TAP #. DO NOT MIX! Example: 26KHz = S3-8 ON, S2-8 OFF, AND TAP8</p> <table border="0"> <tr> <td style="text-align: center;">S3</td> <td style="text-align: center;">S2</td> </tr> <tr> <td>All OFF except desired Frequency One and only one on at a time</td> <td>All ON except desired Frequency One and only one off at a time</td> </tr> </table> <p>To select TAP, unscrew the hex std-off and move to desired TAP. DO NOT over tighten.</p>	S3-1, S2-1, TAP1 = 8.2KHz	S3-5, S2-5, TAP5 = 15KHz	S3-2, S2-2, TAP2 = 10KHz	S3-6, S2-6, TAP6 = 17.5KHz	S3-3, S2-3, TAP3 = 11.5KHz	S3-7, S2-7, TAP7 = 20KHz	S3-4, S2-4, TAP4 = 13.2KHz	S3-8, S2-8, TAP8 = 26KHz	S3	S2	All OFF except desired Frequency One and only one on at a time	All ON except desired Frequency One and only one off at a time
S3-1, S2-1, TAP1 = 8.2KHz	S3-5, S2-5, TAP5 = 15KHz														
S3-2, S2-2, TAP2 = 10KHz	S3-6, S2-6, TAP6 = 17.5KHz														
S3-3, S2-3, TAP3 = 11.5KHz	S3-7, S2-7, TAP7 = 20KHz														
S3-4, S2-4, TAP4 = 13.2KHz	S3-8, S2-8, TAP8 = 26KHz														
S3	S2														
All OFF except desired Frequency One and only one on at a time	All ON except desired Frequency One and only one off at a time														

Note: Always perform the calibration procedure after changing the track frequency.

Z3 Plus® Frequency Options



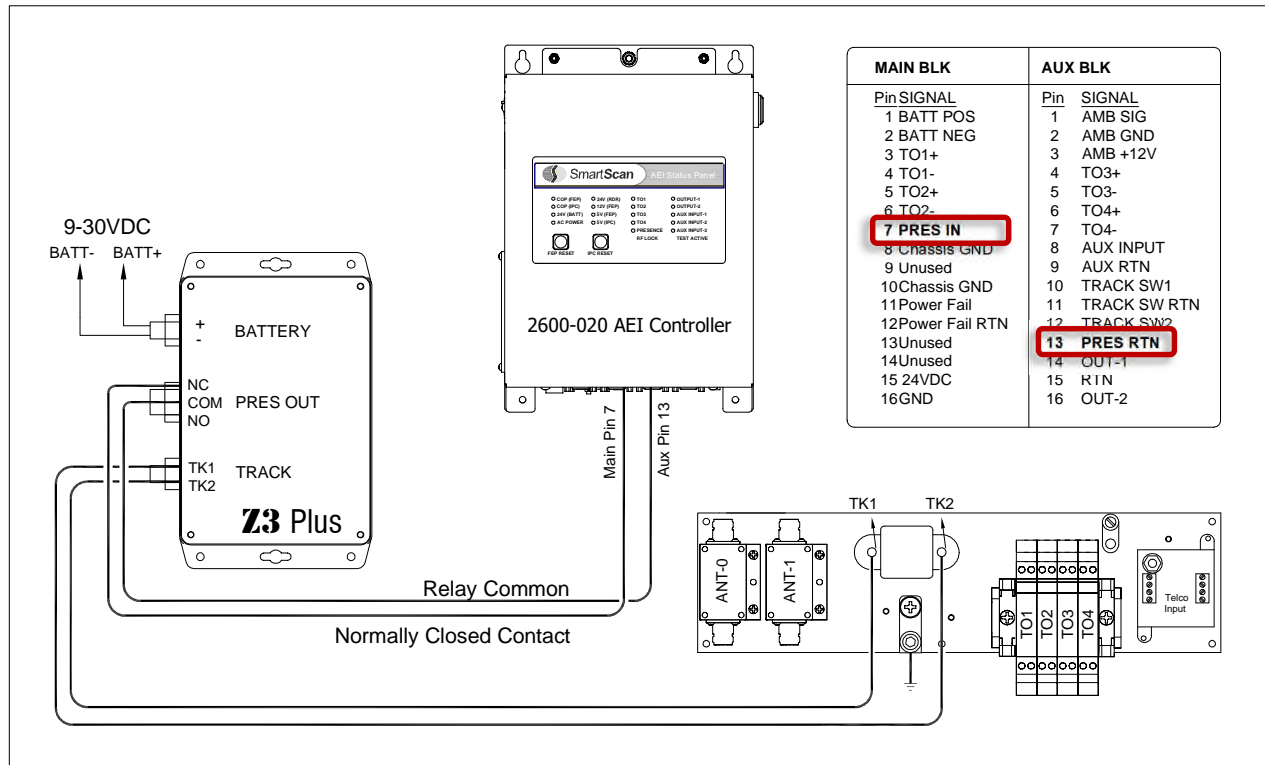
The example above depicts a PD8-Plus configured for 26 kHz operation.



The example above depicts a PD8-Plus configured for 8.2 kHz operation.

Step 2 – Connect the Z3 Plus[®] to the 2600-020 AEI System

Mount the **Z3 Plus[®]** in the desired location, then complete all wiring as detailed below.



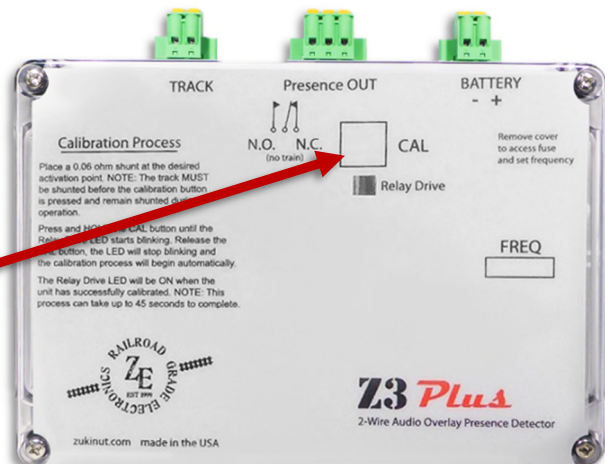
Z3 Plus[®] Wiring Schematic

Step 3 – Calibrate the Track Circuit

- i. Obtain track & time authority.
- ii. From the center of one of the double-wheel detectors (wheel detector pairs), measure the shortest distance you want the track circuit to pick up the presence of a train. The distance must be at least 50' (15.2 m) and no more than 150' (45.7 m).
- iii. At the point just measured, place a 0.06Ω shunt across both rails.

*** IMPORTANT: The track must be shunted before the calibration button is pressed.**
- iv. Press and HOLD the CAL (calibration) button until the Relay Drive LED starts blinking. Release the CAL button, and the LED will stop blinking. The **Z3 Plus[®]** will automatically begin the calibration process. *The track shunt MUST remain in place throughout the calibration process.*

* After the track has been shunted, press and hold the CAL (calibration) button until the relay drive LED begins to blink.



- v. The Relay Drive will pick up (LED on) when the unit has successfully calibrated. *This process can take up to 45 seconds to complete.* If the **Z3 Plus**[®] cannot achieve calibration, it will blink the Relay Drive LED three (3) times in rapid succession, indicating a calibration error. The unit will continuously repeat the calibration procedure (there is no need to press the CAL button), allowing you to troubleshoot the track circuit, wiring, and battery. Once the issue has been corrected, repeat the calibration procedure outlined above.

Step 4 – Verification

- i. After calibration, lift the shunt, and the relay drive should drop (LED off). Replace the shunt, and the relay drive will pick up (LED on).
- ii. Move the shunt approximately 10' farther out from the calibration point. The relay drive should not pick up (LED stays off). If this test fails, perform Short Track Calibration (detailed below).
- iii. The **Z3 Plus**[®] is now operating properly and will activate at an equal distance on either side of the track feed point.
- iv. After trackside calibration procedures have been successfully completed, place a temporary shunt across the track wires inside the bungalow and verify that the signal system goes to stop. Once verified, remove the shunt. Installation and verification are now complete.

PD8-Plus Short-Track Circuit Calibration (if applicable)

- i. The system may fail the 10 ft calibration verification step noted above if the installation is using 26KHz and the desired CAL point is ~30 ft from the feed points (Short track circuit), and the bungalow is near the track (short track wires).
- ii. If this is the case, reconfigure the PD8-Plus to a lower frequency that is compatible with other equipment that may be on the track. In general, changing from 26KHz to 20KHz or 17.5KHz should solve the short-track circuit calibration issue.
- iii. Once the module has been reconfigured for the new operating frequency, repeat the normal calibration procedure detailed above.

Troubleshooting and Application Notes

- i. If the unit will not calibrate, watch the relay drive LED for approx 45 seconds. If it blinks, this means the PD8-Plus has turned its receiver gain to the maximum setting and cannot see the track shunt. Look for open circuits between the PD8-Plus and the shunt on the track. I.e., track wires, bond wires, etc.
- ii. The PD8-Plus will look equally in both directions. If one side of the circuit has insulated joints, the PD8-Plus will operate. However, the activation distance will not be the same. In general, track circuit equipment cannot see past insulated joints.
- iii. Audio overlay systems like the PD8-Plus will not work with wideband shunts in their track circuit range.
- iv. If the relay drive is stuck ON, look for short circuits between the PD8-Plus and the desired pick point.
- v. The greater the distance between the PD8-Plus and track connections, the greater the effects ballast will have on the PD8-Plus performance.
- vi. Presence output is a dry contact configuration Form –C dry contact, 225mA max current. (N.O. contact with no train presence)
- vii. In good track ballast conditions, a PD8-Plus circuit can travel up to 500ft in each direction. Rotating operating frequencies to avoid interference with other equipment is recommended.
- viii. The higher the operating frequency, the shorter the track circuit.