

Track Circuit Aid

by Unipart Rail

Helping to shunt signals in the leaf-fall season



- 50% more efficient than previous model
- 100 times reliability improvement
- Directional or Non-Directional versions
- PA Cert PA05/01414

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Track Circuit Actuator Interference Detector (TCAID)

TCAID shunts the track circuit signal when railhead contamination creates a high impedance electrical conductivity path between the rail, wheel and axle interface.

The technology is most effective in leaf fall areas during the Autumn period.

TCAID is a device that is installed on a stake close to the running rails and directly connected to the rails via a disbox. It receives the signal from the vehicle's TCA antenna at a distance of <200M and triggers the shunting of the track circuit for that block of line. Detects the 165kHz signal of the TCA antenna from a passing train within 200 meters of the unit. Once detected a solid-state relay shunts out the track circuit signal for the period the train is present. There are two types of TCAID:

- Type D (directional sensitive) for the detection of trains in one direction of travel. uses a loop aerial in the 4ft to detect the direction of the train
- Type N (non-directional sensitive) for the detection of trains in either direction of travel

The new TCAID is a line replaceable unit with the old TCAID 088/084146 (type D) and 088/084147 (type N)

Product Acceptance under PA05/01414

Catalogue Numbers

TCAID-D (Directional)	Cat N° 088/000051
TCAID-N (Non-directional)	Cat N° 088/000050
TCAID MK2 Test Set Unit	Cat N° 088/084150
Leads for TCAID Unit MK2	Cat N° 088/084148
1370mm Mounting Stake	Cat N° 086/088261
M8 Mounting Fastening Kit	Cat N° 086/047591

Replacement items

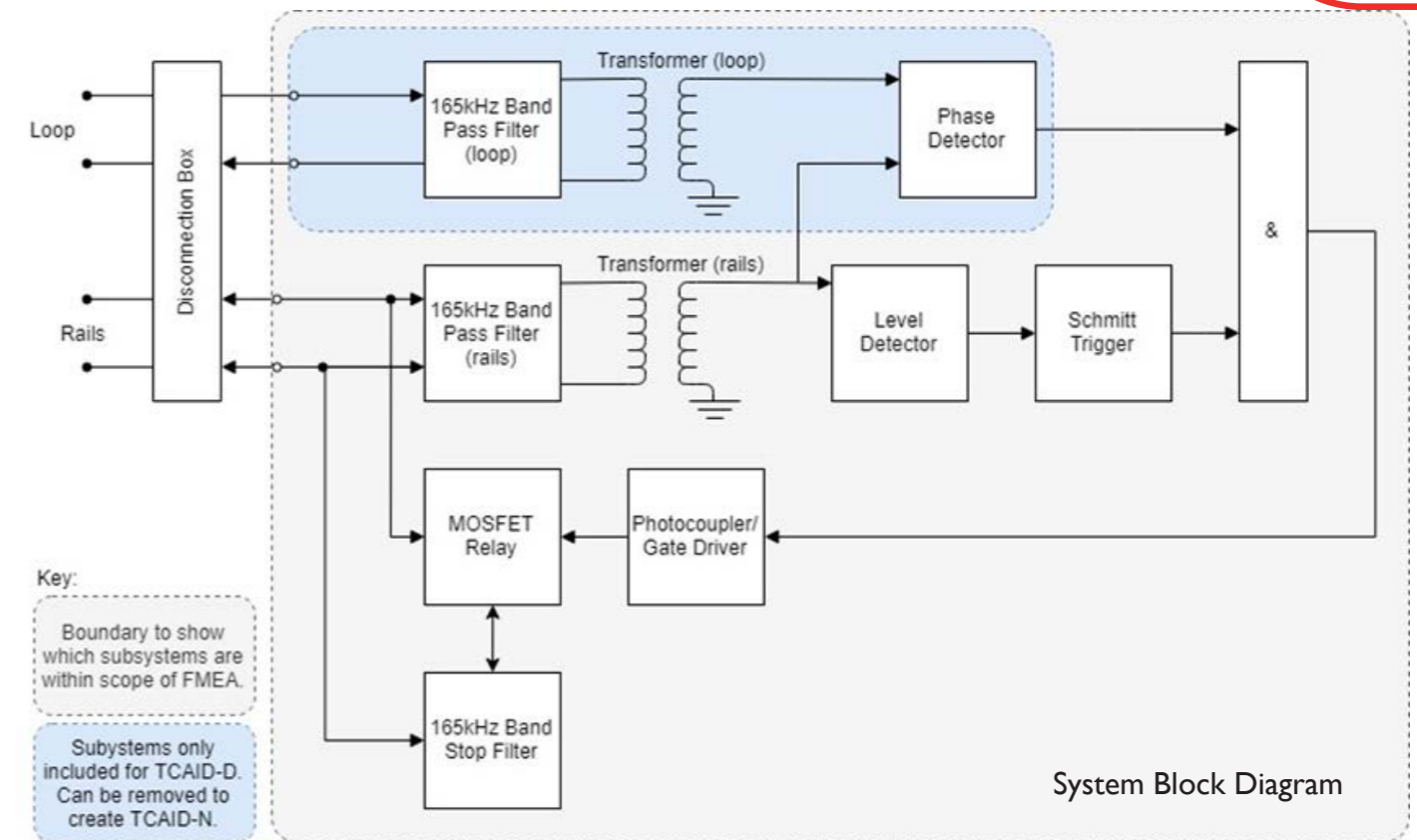
TCAID Battery Unit	Cat N° 0088/000056
TCAID Battery Clamp	Cat N° 0088/000057
TCAID Mounting Plate Assembly	Cat N° 0088/000058

Benefits

- Reduces wrong side failures
- Reduces delays
- Reduces maintenance
- Reduces signalling interlocking failures
- Reduces signalling investigation
- Reduces installation time
- Reduces energy consumption
- Used on all track circuit types
- Used in all electrified areas

Unit characteristics

- IP65, IP67 & IK10 rating
- 5V internal battery supply
- 7.4mA trigger, 45µA idle
- Detects 165kHz TCA signal
- 60V, 4A input rating (MOD B)
- 160V, 60A input rating (MOD C)
- Shunts <3kHz signal
- M5 ring terminals
- M8, 85mm hole centers
- -25 to +70 °C operating temperature
- Two rail terminations
- Two loop terminations (Type D only)
- Dimensions 186mm (H) x 151mm (W) x 138mm (D)
- Weight max 3kg
- 91mS trigger delay from detection



Commenting on the development process, our customer in Network Rail Sussex said:

“The speed at which the engineers picked up the issues and developed the new product was excellent. Communication and updates were very good and we were very impressed with the the attention to detail.”

Improvements (from 0088/084146 - D Type and 0088/084147 - N Type)

- The device detects a TCA signal from a train at less than 200 meters away
- Can be directional or non-directional sensitive
- Nearly 50% more efficient
- Half the power consumption
- 100 times more reliable
- Over 1 million operations
- 7.2V, 19A/H lithium battery technology
- 10-year shelf life
- 0.1209 failures per million hours of operation
- Condensation and air pressure ventilation
- All parts are readily available, still manufactured and monthly obsolescence monitoring
- Tighter bandwidth of the filters
- Tighter component tolerances
- Improved robustness
- IP65, IP67 and IK10 rating (water ingress removal)
- Faster and easier to install
- Installs to railway approved stake
- Less Maintenance time with the battery being the only line replaceable part
- Withstand 60V, 4A input (MOD B)
- Withstand 160V, 60A input (MOD C)
- Bidirectional or Unidirectional
- Works with current MKII TCAID tester
- Conforms to environmental standard BS EN 50125-C:2003.
- RoSH, WEEE, LVD, RED and Battery directive compliant
- Conforms to EMC BS EN 50121-4:2015

Successful Trial and Rollout of the improved TCAID

In 2019-2020 the units completed a full 6 month trial with zero failures/concerns to both the unit and signalling system in the trial area, the customer recognises the improvements it made in the trial areas and is looking to replace all existing TCAIDS with the new version by Autumn 2020.

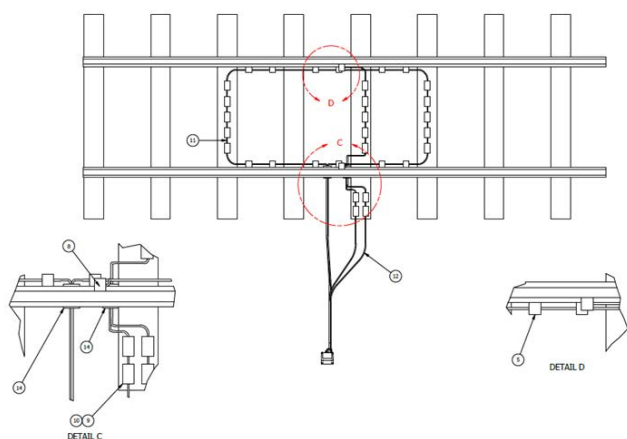
In 2020-2021, 40 units completed a 4 month trial in an HVI track circuit area showing that the unit could be used in all track circuit areas. The trial also showed the benefits for reduction/removal of wrong side failures from previous years.

Trial report conclusion

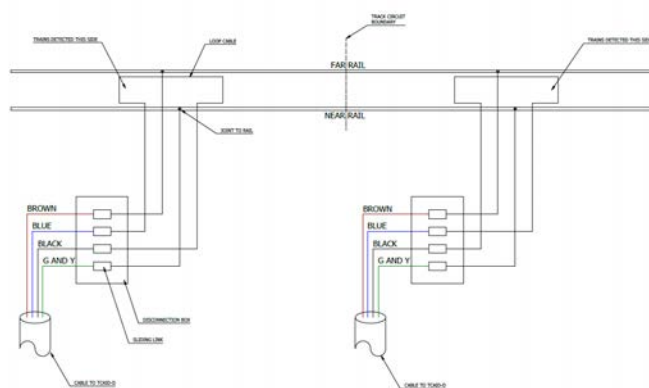
The trial of twenty TCAID units that were installed to the trial PA certificate passed functional testing from manufacture, installation, midpoint of trial and the end of the trial. The customer has stated that there were zero wrong or right side failures during the leaf fall season 2019/2020 in the two areas that the trial units were installed.

The trial & further rollout of 650 units has been a great success to the route as the areas in which they were installed have been problem areas in the past. The trial has shown that the units fully complied with the requirements set out for PIC134 project.

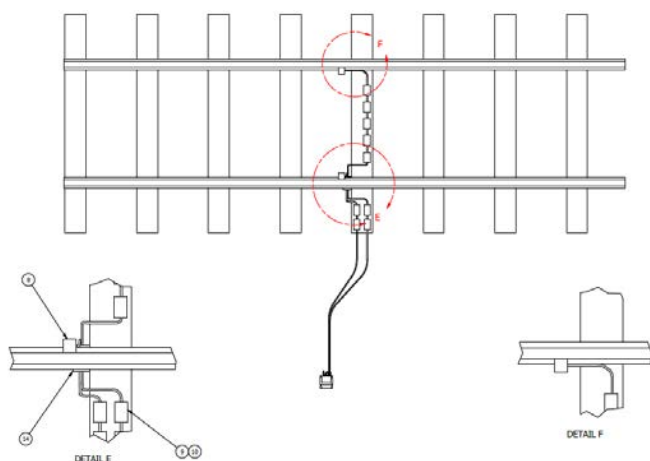
Type D Typical Installation



Type D Typical Wiring

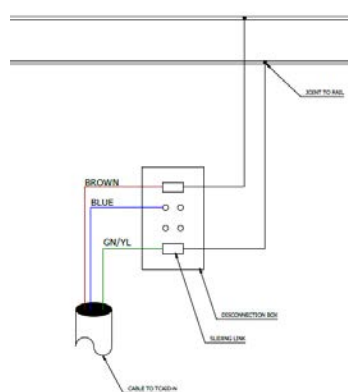


Type N Typical Installation

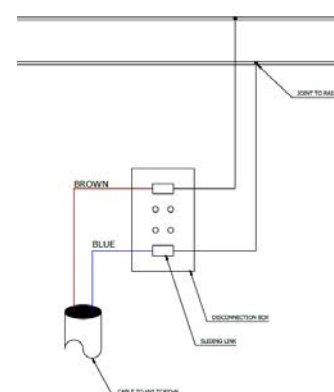


Type N Typical Wiring

MOD B



MOD C



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