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KAVACH

Product Flyer

KAVACH

Train Collision Avoidance System TCAS-G620

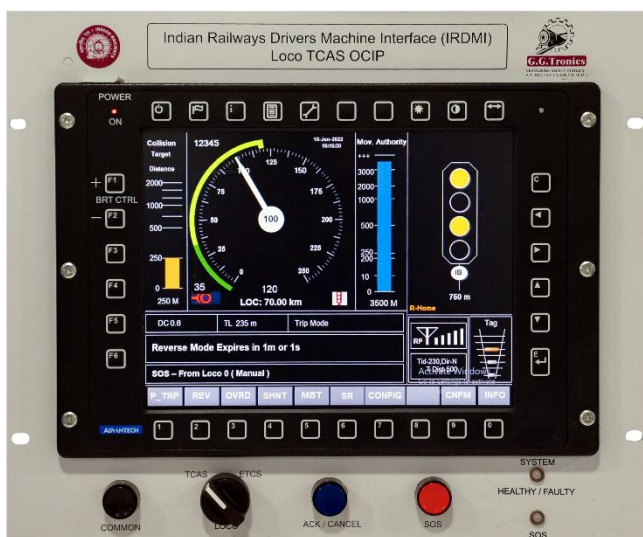
A scalable KAVACH system

Overview

- TCAS-G620 is a fail-safe, reliable and user-friendly 2x2oo2 architecture-based Train Collision Avoidance System called KAVACH and is also known as Indian Railways Automatic Train Protection System (IRATP).
- Complies with RDSO specification No. RDSO/SPN/196/2012 Version 3.2.
- Developed to meet CENELEC SIL-4 standard EN50126, 50128, 50129, 50159 Part A and B and also being processed for ISA certification from M/s ITALIA Certifier Italy
- Environmental Testing completed meeting RDSO/SPN/144 specification. EMI / EMC tests are being carried out to meet EN61000 and EN5016 standards.
- Kavach prevents Signal Passing at Danger (SPAD), to control train speed within specified limits, to indicate Movement Authority or/and display Signal Aspect in Loco pilot's cab and to further reduce the probability of train collisions in block sections and on running lines at stations through certain non-signaling based protections

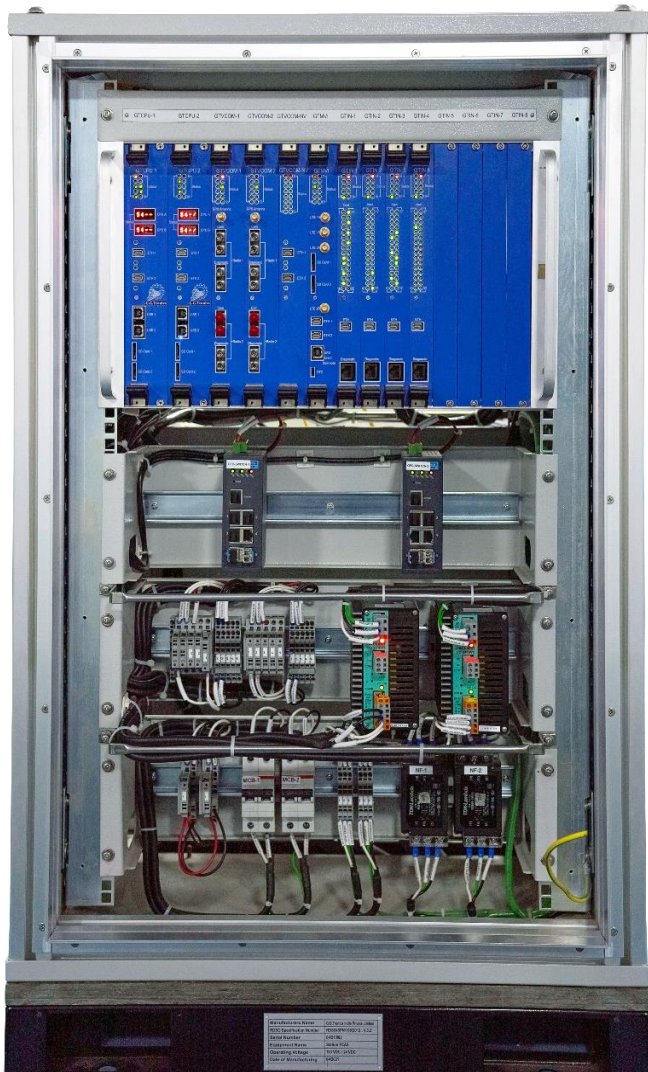
Configuration

- Station TCAS can handle a maximum of 1024 inputs.
- 2 CPU modules, with 2 Micro Controllers on each card working in 2oo2 architecture with diversified hardware
- All the 32 input channels of each TIN card are isolated from each other.
- GTO module drives 16 isolated vital outputs.
- Communication card consists of interfaces like On-Board OFC, RS485/422 and Ethernet to interface with the other subsystems.
- Multi Visual Interface with GSM/LTE to communicate with Network Monitoring System and Key Management System.
- GTRI module provides the necessary interface between Station TCAS and Radio Modem over OFC to reduce transmission loss.
- GTCC module has 6 non-resettable 6-digit counters for BIU Isolation, SoS and Trip operation. Three 6-digit counters are spare for future use.



Features: - Driver Machine Interface

- Hardware compliance to EN-50155 specification.
- Built on Linux platform for more robustness & reliability.
- Vibration-proof MIL grade connectors.
- Mounting flexibility to suit all types of CABs.
- Audible buzzer to attract driver attention.
- Operating voltage 72 to 110 V DC for compatibility with all types of Locos.



Features: - Stationary KAVACH

- More reliable with 2 X 2oo2 of architecture.
- Onboard OFC connectivity for efficiency & future ready.
- Extendable to 1024 Input is one of the highest with the scalable feature.
- On-Board Diagnostic port in each card.
- LEDs on each card for status analysis.
- On-board FPGA for future expansion.
- Double cutting provision for input.
- Modules common in STCAS, LTCAS & RIU are interchangeable. Reduces spare handling cost.
- Dedicated Modules for EULYNX for compatibility with all vendors and to reduce the lifecycle cost of signalling systems
- Nominal Input Voltage is 110V DC for normal functioning of STCAS, however, STCAS works normally for the input voltage between 88V to 143V.
- Ethernet-OFC bidirectional Switch to form ring between STCAS & RIUs in six directions.
- Supports hot-swapping of modules in STCAS .
- Hardware compatible for the next version of TCAS and supports communication over the LTE network. of Railways.
- Stable operation at -20 to +70 Degree Celsius.

Features: - Loco KAVACH

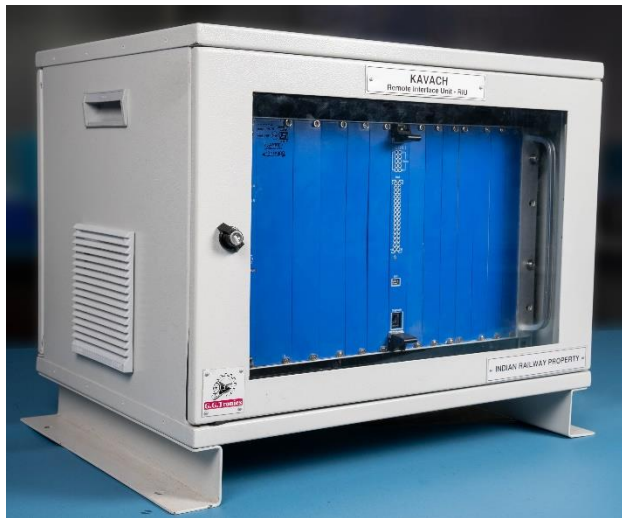
- More reliable with 2 X 2oo2 of architecture.
- On-board LTE capability to suit LTE-R
- Hot-swappable technology to reduce downtime & hindrance free.
- Vibration effective MIL grade connectors with locking arrangements.
- It can handle 32 cab input with Double cutting provision.
- On-Board Diagnostic port in each card.
- Provision to include Balise for compatibility to work in ETCS area
- LEDs on each card for status analysis.
- Modular power supply architecture.
- Supports hot-swapping of modules in LTCAS .
- On-board FPGA for future expansion.
- Wide range input power supply compatibility.
- Nominal Input Voltage is 110V DC for normal functioning of LTCAS, however, LTCAS works normally for the input voltage between 88V to 143V.





Features: - GTSM-OCIP

- GTSM-OCIP module works on power supply 24V DC.
- GTSM-OCIP module has 2 independent redundant serial interfaces to communicate with GTVCOM of STCAS.
- GTSM-OCIP module has SM-KEY interface for actuating (i.e., SM-KEY IN) GTSM-OCIP operations.
- The SOS generation and cancellation are not allowed under un-actuated SM-KEY (OUT).
- Audible buzzer to attract station manager attention.
- GTSM-OCIP has LCD display for GPS, GSM, radio modem status information.



Features: - RIU KAVACH

- RIU is a subsystem of Kavach placed at End cabins/Gate/Auto Section Huts.
- Reliable with 2oo2 of architecture.
- Dual ethernet to connect with two adjacent stations.
- Expandable up to 256 Input.
- Hot-swappable technology to reduce downtime & hindrance free.
- Ethernet-OFC bidirectional Switch to form ring between STCAS & RIU.



Features: - RFID reader and TAG

- RFID Reader capable of reading tag at high speed.
- RFID TAG is passive energized by reader even at high speed.
- RFID TAG has IP 67 protection with 5 Ton impact resistance tested.
- Different types TAGs for signal foot, signal approach LC gate etc.
- RFID reader has serial communication with LTCAS for share tag information