High Availability Single Section Digital Axle Counter (DACF-720P)

- Phase reversal type axle detectors with trackside electronic axle counting equipment
- Designed as per RDSO Specification No. RDSO/SPN/177/2012 Ver 3.0 or latest
- Redundancy in counting, processing, communication, output relay and power supply
- Auto resetting facility to reduce human intervention in case of single unit failure
- Meets CENELEC SIL-4 standards
- Fail safe, reliable and easy to install and maintain
Why HASSDAC...?

With High Availability Single Section Axle Counter (HASSDAC) we are beginning a new era of signalling system for providing track circuiting and block working in railways. HASSDAC is developed with the aim to enhance the availability of Digital Axle Counters. In HASSDAC redundancy is provided at every level of the system which ensures the higher availability of system resources.

Principle of Operation:
- The basic principle of system is based on counting the number of axles passing at each detection point.
- These stored counts are transmitted to the second unit of the system and vice versa by means of modem communication.
- If counts registered at both detection points are equal then section is cleared. Otherwise the section is shown as occupied.

HASSDAC System Design:
- 21KHz & 23KHz High frequency axle detectors.
- Pulse detection and counting through Microcontroller.
- 2 out of 2 decision making.
- V.21 FSK Modem communication between two distant units (2 independent channels).
- Opto isolated Dual Vital Relay drive.
- Fail safe operation.

Features of HASSDAC:
- No trolley protection circuit required.
- Web mounted type Axle Detectors.
- Auto resetting facility to normalize the failed subunit.
- In built event logger.
- Compatible with 90R, 52 Kg & 60Kg rail profiles.
- Unaffected by 4 or 8 spokes push trolley wheel with flange height <22mm, width <10mm and wheel base <100mm.
- Monitors section length up to 20 Kms.
- Low power consumption (<2.5A at 24VDC for complete system).
- Can use Quad Cable and OFC simultaneously for communication.
- Single reset box to display the status and for resetting of both subunits of a HASSDAC unit.
- Q type 24V, 1000 Ohm Vital Relays.
- Provides two parallel outputs which prevents detention of trains in case of one unit failure.

Functional Block Diagram of HASSDAC Unit:
**System Description:**

The HASSDAC System consist of several components. The description of these components is as follows:

**Axle Detector:**

An Axle Detector consist of 2 transmitter (Tx) and 2 receiver (Rx) coils. One pair of Tx & Rx coil works on 21KHz frequency and other on 23 KHz. HASSDAC unit feeds the Tx coils and receives signals from Rx coils. The phase type axle detectors remains unaffected by passing of push trolley, i.e. there is no need of trolley protection circuit for working of HASSDAC.

**HASSDAC Unit:**

The HASSDAC unit is a microcontroller based embedded system and comprise of two SSDAC subunits with some advancement. Each subunit takes signals from Axle Detectors and perform wheel detections and counting, it simultaneously sends and receive the wheel counts from other side of the section, independently. On the basis of comparison of wheel counts of both side Clear or Occupied status of section is given.

HASSDAC unit keeps track of its health and logs the status of each subunit in separate event loggers to record event statistics.

**Vital Relay Box:**

The Vital Relay Box (VR Box) encases the Vital Relays of both subunits of HASSDAC. Along with these it contains a dual Preparatory Relay and a Reset Relay. The auto reset cards of HASSDAC is installed in VR Box which send reset voltage to failed unit in case of one unit failure. The final output is ORed and extended for railway interlocking to prevent the train detention when one unit is failed.

**Reset Box:**

Reset Box of HASSDAC sends reset command to trackside unit to normalize the system on failure of both subunits. It provides the status of system and error information to station master. Status of both subunits can be seen on the same display using the select switch.

**Filter and Surge Voltage Protection Device:**

To protect the system from noise all the modem signals and 24V input power line are passed through a specially designed noise filter and to overcome the effect of surge voltage the 24V input power line and 48V resetting signal are passed through surge voltage protection device (SVPD).
Uses of HASSDAC:
HASSDAC can be used in:
- Block Working
- Track Circuiting
- Intermediate Block Signalling
- Auto Block Signalling

Specification of HASSDAC:

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<tr>
<th>Models</th>
<th>DACF-720P with Single Sensor</th>
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<tr>
<td>Communication</td>
<td>ITU-T V.21, 300bps, Full Duplex</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>&lt;60W @ +24VDC</td>
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<tr>
<td>Reset Voltage</td>
<td>+48VDC</td>
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<tr>
<td>Casing</td>
<td>Mild Steel (CRCA)</td>
</tr>
<tr>
<td>Dimension HASSDAC DACF-720P (L<em>B</em>H)</td>
<td>360mm<em>482.6mm</em>138mm</td>
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<tr>
<td>Dimension Vital Reset Box VR-722 (L<em>B</em>H)</td>
<td>320mm<em>305mm</em>210mm</td>
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<tr>
<td>Dimension Reset Box RB-259A (L<em>B</em>H)</td>
<td>280mm<em>255mm</em>168mm</td>
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Ordering Information:

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<tr>
<th>S. No.</th>
<th>Item</th>
<th>Model No.</th>
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<tbody>
<tr>
<td>1.</td>
<td>HASSDAC</td>
<td>DACF-720P</td>
</tr>
<tr>
<td>2.</td>
<td>Axle Detectors</td>
<td>AD-711</td>
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<td>3.</td>
<td>Vital Relay Box with PR &amp; Reset Relay</td>
<td>VR-722</td>
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<td>4.</td>
<td>Reset Box</td>
<td>RB-259A</td>
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<td>5.</td>
<td>Surge Voltage Protection Device</td>
<td>Din Rail Mounted Type</td>
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