EMD’s Locomotive Interface Gateway (LIG) is an innovative, integrated design solution that utilizes a state-of-the-art Cat® A5:N2 controller. The secure OEM platform relies on various ports that interface with proprietary networks for EM2000, Functional Integrated Railroad Electronics (FIRE) and EMDEC®. These ports also enable the system to communicate with legacy equipment— including Positive Train Control (PTC), event recorders, end of train (EOT) devices, fuel monitors and more. LIG’s robust design offers a common network architecture for all third party applications, no matter what vintage EMD® locomotive. Ruggedized for the rail environment, the solution’s 6 Modular Concept Unit (MCU) requires no forced air cooling and meets or exceeds industry EMI standards.

LIG serves as a base platform for the following products:

- Remote software upload
  - Phase I — EM2000 with EMDEC®
    - CAL Codes, FIRE
  - Phase II — MPU with EMDEC® Software
- 3rd Party Systems
- LEADER® Autocontrol
- Locomotive Command and Control Module (LCCM)
- IntelliTrain™ without FIRE

**Features:**

- Collects data from Locomotive Control System (LCS) and other on-board systems for consumption, per industry standard
  - Provides periodic data to any approved onboard systems (Class C)
  - Provides interface for “command and control” functions (Class D)
  - Provides “standardized” Positive Train Control (PTC) data set to PTC system
- Interface with onboard communications system to provide railroad back office with real-time alerts and fault data
- Physical attributes
  - 6 MCU size
  - 15 pounds
  - Locomotive system integration shelf or wall bracket mount

**USB Ports**
- One USB port in conformance with USB 2.0 functional and electrical specifications

**LED’s**
- POWER: Green
- STATUS: Green
- FAILURE: Red

**RS-485 Port**
- One RS-485 port with maximum bit rate of 250k Baud and a minimum bit rate of 152 baud in compliance with EIA RS-485 interface specifications

**RS-232 Ports**
- Three RS-232 ports with maximum bit rate of 115,2k baud and a minimum bit rate of 50 baud in compliance with EIA RS-232 interface specifications

**CAN Ports**
- Two 3-wire CAN 2.0B ports supporting both the standard (11-bit) and extended (29-bit) message frames described in the Bosch CAN 2.0B specification capable of communicating at a maximum bit rate of 500 kbit/s, with support for 250kbit/s and 125kbit/s

**Ethernet Ports**
- Four Ethernet ports that conform to appropriate IEEE 802.3 standards

**Power 15VDC**
- POWER input rated at 15VDC +/- 10%, typical operation 6W with maximum 30W

**Power Green**
- STATUS Green
- FAILURE Red

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### ENVIRONMENTAL TESTS ON LOCOMOTIVE INTERFACE GATEWAY

#### TESTING — ENVIRONMENT

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Specification Section</th>
<th>Test Results</th>
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<tr>
<td>Temperature Vibration</td>
<td>59401, IEC 61373, and IEC 60729-3-5</td>
<td>Pass</td>
</tr>
<tr>
<td>Mechanical Shock</td>
<td>Customer Instruction with ref. Mil-STD-810G, Method 516.6, Procedure II</td>
<td>Pass</td>
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#### TESTING EMI

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Tested Range</th>
<th>Results</th>
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<tbody>
<tr>
<td>CE</td>
<td>Conducted Emissions</td>
<td>9kHz to 30MHz</td>
<td>Pass</td>
</tr>
<tr>
<td>RE</td>
<td>Radiated Emissions</td>
<td>150kHz to 4GHz</td>
<td>Pass</td>
</tr>
<tr>
<td>RI</td>
<td>Radiated Immunity</td>
<td>80MHz to 2.5GHz</td>
<td>Pass</td>
</tr>
</tbody>
</table>

#### TESTING STANDARDS

**BS EN 50121-3-2:2006**
- Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock -Apparatus

**CISPR 11: 2010 Edition 5.1**
- Industrial, scientific and medical equipment.
- Radio-frequency disturbance characteristics.
- Limits and methods of measurement

**AARS-9401**
- Railroad Electronics Environmental Requirements