LOCOMOTIVE INTERFACE GATEWAY

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.
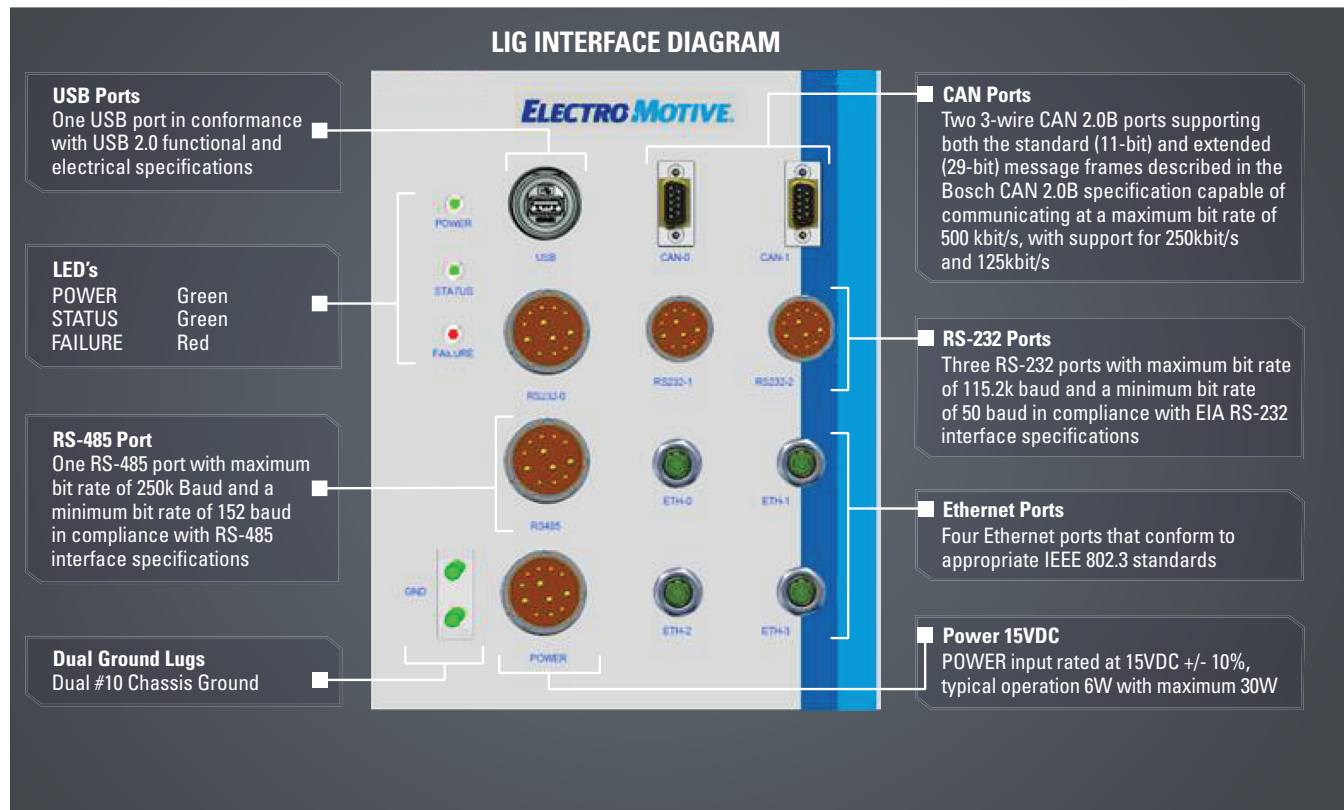
LIG serves as a base platform for the following products:

- Remote software upload

  Phase I — EM2000
  EMDEC®
  CAL Codes,
  FIRE

  Phase II — MPU
  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

LIG INTERFACE DIAGRAM

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 RS-485 interface specifications

Dual Ground Lugs
Dual #10 Chassis Ground

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

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

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

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A Caterpillar Company

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LOCOMOTIVE INTERFACE GATEWAY

FEATURES		GEN 1 LIG	GEN 2 LIG
	PART NUMBER	40200309	40255875
	PROCESSOR FAMILY	N/A	Freescale iMX351 @ 533MHz
	OPERATING SYSTEM	N/A	LINUX
	MEMORY	N/A	FLASH 2 GB RAM 256 MB
	CAN	N/A	YES
	SERIAL COMMUNICATIONS	N/A	YES
	ETHERNET (IEEE 802.3)	1	4
	CAN 2.0B	N/A	2
	SERIAL RS232 (3 WIRE)	N/A	2
	SERIAL RS232 (5 WIRE)	N/A	1
	SERIAL RS485 (4 WIRE)	N/A	1
	USB (USB 2.0)	2 (USB 1.1)	1
	POWER	5VDC (3W, 7W max)	15VDC (6W, 30W max)
	LSI COMPLIANT	NO	6 MCU
	WEIGHT	1.1 Lbs.	15 Lbs.
	STATUS INDICATORS	NO	POWER ..... Green STATUS ..... Green FAILURE .... Red
	S9401 COMPLIANT	NO	YES
	BS EN 50121-3-2:2006	NO	YES
	CISPR 11:2010 EDITION 5.1	NO	YES
PRODUCTS	INTELLITRAIN™ ON NON-FIRE	NO	YES
	REMOTE SOFTWARE UPLOAD	NO	YES
	AUTOCONTROL	YES (discontinued)	YES
	LCCM (STANDARD NOW)	NO	YES
KITS	GENERIC		40232398
	SD70ACE KIT (GEN1)	40219881	
	GP20/SD30 KIT		40264502
	SD70ACE KIT		40262138
	SD70ACE KIT		40236103
	M-2 KIT		40252628
	ACE KIT		40241208

ENVIRONMENTAL TESTS ON LOCOMOTIVE INTERFACE GATEWAY

TESTING — ENVIRONMENT

TEST DESCRIPTION	SPECIFICATION SECTION	TEST RESULTS
TEMPERATURE VIBRATION (RANDOM)	59401, IEC 61373, and IEC 60729-3-5	Pass
MECHANICAL SHOCK	Customer Instruction with ref. Mil-STD-810G, Method 516.6, Procedure II	Pass

TESTING EMI

TEST	DESCRIPTION	TESTED RANGE	RESULTS
CE	Conducted Emissions	9kHz to 30MHz	Pass
RE	Radiated Emissions	150kHz to 4GHz	Pass
RI	Radiated Immunity	80MHz to 2.5GHz	Pass

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

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