RAD-Mars

Autonomous SerDes Analyzer, Tap Gateway, Vehicle Interface & Data Logger

Today's autonomous vehicles are capable of generating gigabytes of data per second. Testing and verifying these vehicles requires the ability to record large amounts of data at high speed.

For these applications, Intrepid Control Systems introduces the RAD-Mars, the Autonomous Vehicle Gateway Module. RAD-Mars performs complex tasks such as transferring information from SerDes systems to other bus or network technologies. RAD-Mars interfaces over seven different networks.

Applications - Log Everything!

- ADAS Vehicle Gateway Module, with seven different networks
- Time Aligned synchronous recording
- Camera Benchmarking
- Image Sensor Raw Pixel Recording and Analysis
- Automated SerDes Frame Analysis, FPS, Frame Width, Height
- Automated Raw to JPG image conversions
- Real Time Data Recorder
- Supports Virtual ECU Simulator Testing
- Data Playback Analysis for CAN, Ethernet and Image data all on the same time base.
- Export of CAN, Ethernet and Image data in various formats
- Real time register manipulation and verification
- Camera , Real Time Streaming and Translation
- Camera Link Analysis and Optimization with advanced Virtual Cable tester eye diagram analysis
- Camera to Controller SerDes Tapping
- Camera Technology Converter to Ethernet or between FPD-Link III ↔ GMSL
- Automotive Ethernet Media Converter 2x100base-T1 to 2x1000BaseT ports

Features

- Ethernet Ports:
  - 1x 10GBASE-T
  - 2x 1000BASE-T
  - 2x 100BASE-T1
- Up to 4x high-speed SerDes (FPD-Link III or GMSL2)
- USB 3 for data offload and configuration via USB-C connector
- 2x USB 2 host for neoVI MIC2
- Programmable tactile switches and LEDs to show network and storage status
- 8x ISO CAN FD channels
- 2x FlexRay receive-only channels
- 8+TB of storage
- On-board UPS for safe shutdown on power loss
- Low power: 36W (3.0A @ 12V)
- Time synchronization with other Intrepid tools and autonomous logger systems (ICS Time Sync, PTP, gPTP*)
- High-speed serial interface input and output supporting TI FPD-Link III or Maxim GMSL for direct camera or sensor connection, simulation and tapping
- Internal IMU and GPS chipsets with map reporting in Vehicle Spy
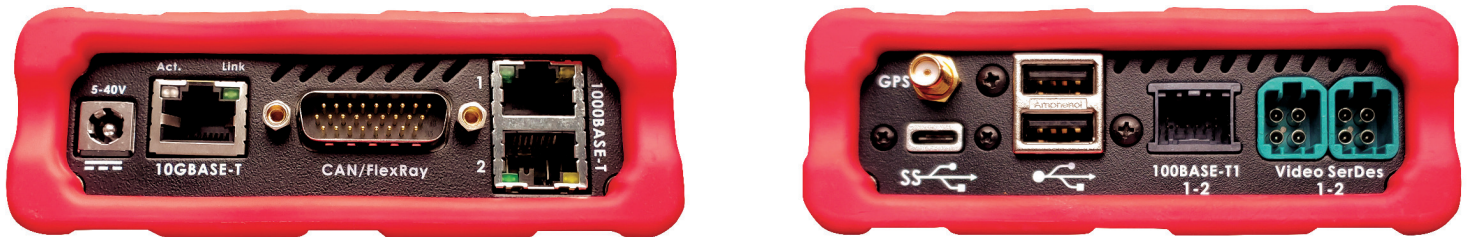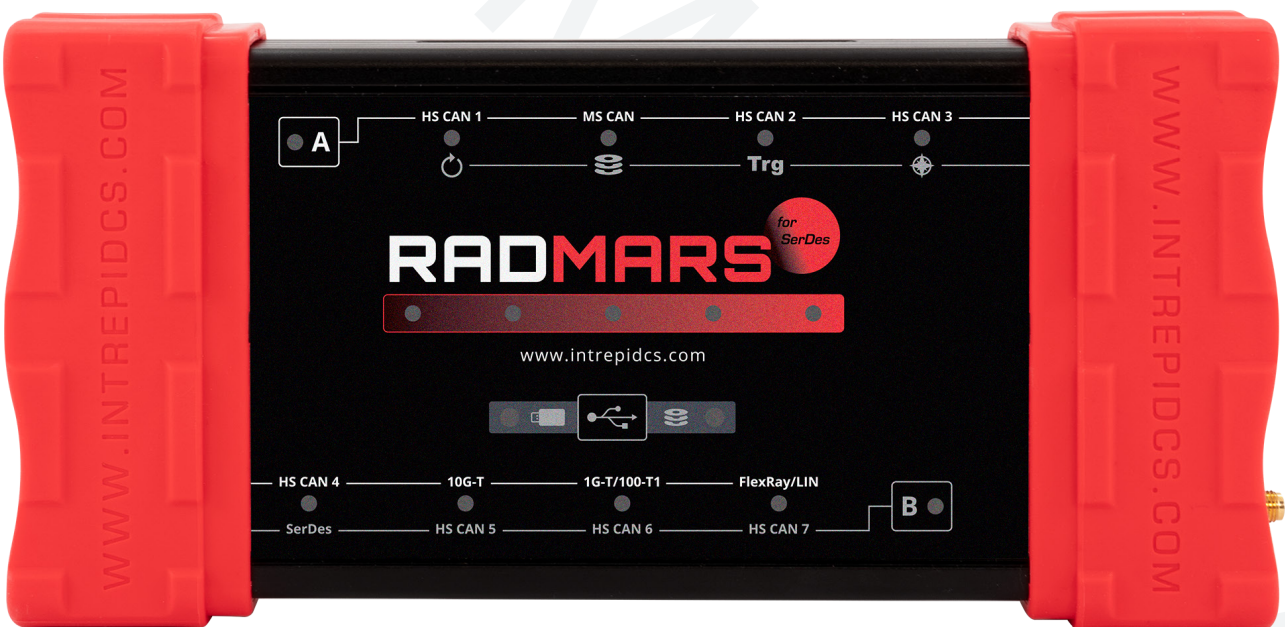- FPGA video frame compression/decimation

RAD-Mars

USB 3.1 Gen 1 (5 Gb/s) provides high-speed offload, while a USB 2 high-speed host port allows use of accessories such as the NEOVI-MIC2, GPS or other HMI for triggering with the ability to power Intrepid accessories, such as the RAD-Moon (100BASE-T1) or RAD-Moon 2 (1000BASE-T1) media converters. FPD-Link III and GMSL input and output provide direct connections to cameras and radar sensors.

The device can be powered from either the barrel jack or DB26HD vehicle connector. The DB26HD connector carries the RAD-Mars' 8 ISO CAN FD channels and 2 FlexRay receive channels, while three RJ45 jacks are provided for 10G/5G/2.5G and 10/100/1000 Ethernet.

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RAD-Mars Options

Rad-Mars base storage options

- RAD-Mars-512GB
- RAD-Mars-2TB
- RAD-Mars-4TB
- RAD-Mars-8TB

Rad-Mars accessories included with each base model

- NEOVI-PS(1)
- CAT6-2(2)
- USB3-USBC-CABLE(1)
- GPS-GSM-4G-ANT (1)
- DB26-DB26-DB9FR(1)
- RS2-NANO-MQS-KIT(1)

Rad-Mars SerDes Module options

- F3-953-F3-954 FPD-LINK III, TI953 / 954, 2 output, 2 inputs w/ POC
- F3-951-F3-958 FPD-LINK III, TI951 / 958, 1 output, 1 input w/ POC
- GL2-9295A-GL2-9296A GMSL2, MAX9295A / 9296A, 2 outputs, 2 inputs w/ POC
- GL2-9295A-F3-954 Translator, MAX9295A to TI954, 2 outputs, 2 inputs w/ POC
- GL2-9295A-F3-958 Translator, MAX9295A to TI958, 1 output, 1 input w/ POC
- Custom modules are possible

Rad-Mars SerDes POC options

- All modules have variable POC supply from 5-18v
- Cameras can be powered with two methods
    - Passing power from controller through Rad-Mars to Camera
    - Supplying POC from Rad-Mars

Rad-Mars Accessories with purchase of SerDes Modules

- MX-FRA-BREAKOUT-CABLE
    - Mate-AX to Farka Breakout 4 position Mini-Coax (Mate-AX) to 4x Male Fakra connector, CodeZ, using RTK031 type cable, length 612mm
- FRA-F-FRA-F-CABLE-1M
    - Coax Cable, 1x Female Fakra to 1x Female Fakra harness, using RG174 type cable, length 1000mm, Code Z both sides

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RAD-Mars Options

Rad-Mar compatible additional accessories for purchase

- MX-FRA-2M2F-CABLE-1M
    - Mate-AX to Farka Breakout 4 position Mini-Coax (Mate-AX) to 2x Male and 2x Female Fakra sealed connectors, CodeZ, length 1000mm
- MX-FRA-2M2F-CABLE-3M
    - Mate-AX to Farka Breakout 4x Mini-Coax (Mate-AX) to 2x Male and 2x Female Fakra sealed connectors, CodeZ, length 3000mm
- RS2-BR-MINI50-CABLE
    - This cable adapts the NanoMQS connector of the RAD-Star 2 to 2 x MINI50 male connectors.
- BR-CABLE-1-MINI50
    - BroadR-Reach (100BASE-T1) unshielded twisted pair cable designed for use with Intrepid's Automotive Ethernet products, terminated with Molex Mini50 connectors.