RAD-Galaxy

Multi Active Tap & Gateway for Automotive Ethernet with CAN FD Support

Intrepid’s RAD-Galaxy is a multi-purpose Ethernet active tap and media converter for Automotive Ethernet. Using the RAD-Galaxy, you can monitor both sides of up to 6 BroadR-Reach® (100BASE-T1) connections, or attach your laptop to as many as 12 BroadR-Reach® ECUs or other devices. As a gateway to standard 8-wire Gigabit Ethernet, RAD-Galaxy makes any standard Ethernet device, laptop, or data logger compatible with BroadR-Reach®. The RAD-Galaxy has 12 BroadR-Reach / 100BASE-T1 PHYs, allowing it to tap 6 links between ECUs and/or switch ports. It can also be configured to act as a media converter for up to 12 devices. In addition to its Automotive Ethernet capabilities, it offers 8x CAN FD channels, 1 LIN channel, DoIP support and standalone operation capability.

Features
• Taps copy full-duplex communications between Automotive Ethernet master and slave on each link with sub-microsecond latency
• Taps have basic filtering and routing capabilities
• Can serve as a BroadR-Reach® to Gigabit Ethernet bridge
• Precision Time Protocol (PTP) Support
• Audio Video Bridging (AVB) Support

Applications
The RAD-Galaxy’s broad network support and many features make it the ideal tool for a variety of applications, including:
• ECU level and system level automated testing
• Automotive Ethernet network monitoring
• Network simulation / Restbus simulation
• Automotive Ethernet to CAN FD or LIN gateway applications
• Standalone data logging applications
• Gang (multiple ECU) reflashing over CAN FD and Automotive Ethernet

Latency:
Non-Store-and-Forward Mode (without TX)
1. Rx PHY latency 780ns
2. Internal to RAD-Galaxy latency 300ns
3. Tx PHY latency 240ns
TOTAL tap latency from Rx wire to Tx Wire: 1320ns

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**RAD-Galaxy System Level / Gateway ECU Testing**

The RAD-Galaxy has the unique ability to test an entire system of up to 6 ECUs / nodes connected to an Automotive Ethernet switch, plus 8 CAN FD networks, with up to 10 ns time accuracy. This makes it ideal for Gateway ECU testing applications, as well as whole system testing.

**Active Tap Mode**
A primary use of the RAD-Galaxy is to act as an active tap, transparently interposing itself between up to 6 pairs of BroadR-Reach® (100BASE-T1) Automotive Ethernet devices. These can be any combination of 6 ECU-to-switch or ECU-to-ECU links. The traffic from each device on a tapped link is forwarded to its partner, ensuring seamless operation of the network. Copies of all messages are also sent to the PC over the RAD-Galaxy’s Gigabit Ethernet link, where they can be analyzed using the included Vehicle Spy software.

**Media Converter Mode**
The RAD-Galaxy can also be configured to act as a media converter, allowing a PC to interact with up to 12 Automotive Ethernet ECUs. This allows you to simulate nodes, or perform direct diagnostics or ECU flashing.

**Vehicle Spy Software**
One license for Intrepid’s powerful Vehicle Spy Professional software is included with each RAD-Galaxy. Vehicle Spy will allow you to view traffic on your tapped or media-converted Automotive Ethernet networks. You can also transmit messages from the PC to Automotive Ethernet ECUs, and much more.

**General Specifications**
- Fourth-generation neoVI architecture: over 10x the performance of earlier devices
- Low power consumption
- Power Supply: 4.5-40V operation
- 20 LEDs indicate link status and logger status
- Temperature Range: -40°C to +85°C
- One-year limited warranty
- Field-upgradeable flash firmware
- Four MISC I/O channels configurable as 0-40V analog input or PWM input or output
- Three 0-5V analog outputs
- Standalone mode including scripting, receive messages, transmit messages, expressions, I/O, and transport layers
- J2534 and RP1210 A/B compatible for CAN/ISO15765
- Full-size SD card slot with support for cards with capacities up to 128 GB (or the limit of newer SDHC cards); card is formatted using FAT32 for PC compatibility.
- Battery-backed real time clock (RTC).
- Dimensions: 10.63" x 4.53" x 1.57" (27cm x 11.5cm x 4cm)
- Weight: 1.42 lbs (645g)

**Timing Specifications**
- FPGA-measured 64-bit timestamping with 10 ns accuracy on all CAN/LIN/Ethernet networks
- Simultaneous operation on all CAN/LIN/Ethernet networks
- Transmit message double-buffering on all networks, allowing back-to-back message transmission

**Optional Accessories**
- neoVI MIC - for manual triggering and audio logging with GPS
- HD Camera - for capturing HD video and syncing it with GPS and vehicle network data

**Ordering Information:**

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<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>RAD-GALAXY</td>
<td>RAD-Galaxy Device</td>
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*Specifications subject to change. Please contact Intrepid for the latest information.*