

RAD-Star 2

Active Tap with Error Capture & Dual Gateway for Automotive Ethernet

Intrepid's RAD-Star 2 is a multi-purpose, dual Ethernet gateway for Automotive Ethernet applications. Using the RAD-Star 2, you can monitor both sides of a BroadR-Reach® (100BASE-T1) connection or connect your laptop to BroadR-Reach® (100BASE-T1) networks as a physical layer gateway. As a gateway to standard 8 wire Gigabit Ethernet, RAD-Star 2 makes any existing standard Ethernet device, laptop, or data logger compatible with BroadR-Reach® (100BASE-T1).



Intended Applications:

- Silently monitor the full duplex connection between a BroadR slave and BroadR master
- Capture all Ethernet Network Errors normally discarded by standard Ethernet MAC hardware
- Timestamp all Ethernet and CAN FD traffic at sub microsecond resolution for testing gateways
- Transmit host Ethernet frames to either master or slave device for in system ECU flashing or diagnostics
- Media converter that timestamps both CAN FD and Ethernet simultaneously
- Flexible design: FPGA based design allows updated Ethernet MAC designs for future Ethernet TSN standards
- Standalone mode for creating own Ethernet/CAN FD gateways using a real time scripting language



Active Tap with Transmit Capability

To monitor the full duplex BroadR-Reach® (100BASE-T1) Ethernet physical layer, you need to insert an active gateway. This specialized gateway passes all traffic between the BroadR-Reach® (100BASE-T1) devices at nearly zero latency and also makes two copies for the connected 10/100 Mb Ethernet tool - also at wire speeds. Errors are also recorded and passed to the host tool.

Gateway

The RAD-Star 2 acts as a gateway between your laptop or other standard Ethernet device and the physical layer of your target ECU. It translates BroadR-Reach® (100BASE-T1) traffic in the vehicle to standard Ethernet traffic you can view and analyze on your computer using Intrepid's Vehicle Spy software.



Features

- Tap copies full duplex communications between master and slave with low latency.
- Can serve as a BroadR-Reach® (100BASE-T1) to 10/100/1000 Mb Ethernet bridge.

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RAD-Star 2

RAD-Star 2 has three Ethernet ports. Two Ethernet ports are BroadR-Reach® and are connected to a Nano MQS connector. The third Ethernet port is Gigabit Ethernet and is connected to a RJ45 connector. RAD-Star 2 also contains an isolated USB 2.0 device port. Either of the Gigabit Ethernet and USB ports can be used to communicate with Vehicle Spy software on the PC. RAD-Star 2 has a custom switch mode in which it implements a forwarding table to intelligently transfer the Ethernet frames between PC and the connected devices without mentioning the BroadR network in Vehicle Spy.

Device Specifications

- neoVI 4G Architecture over 10x performance over previous devices
- Power Consumption (typical): 0.5A @ 12.0 VDC
- Power Supply: 4.5-36 Volt Power Operation
- Multi colored LEDs to indicate status/activity on all the networks
- Temperature Range: -40C to +85C
- Warranty: One Year Limited Warranty
- Firmware: Field upgradeable design (flash firmware)
- J2534 and RP1210 A/B compatible for CAN/ISO15765, Keyword, and ISO 9141
- Isolated USB 2.0. Operates up to 240 Mbps throughput
- Time synchronization - can sync its local 10ns resolution RTC with other Intrepid devices through CAN/ LIN/ BroadR networks
- Power management - supports sleep and wake up on CAN networks
- Dimensions: 5.35" x 3.46" x 1.46" (13.6 x 8.8 x 3.7cm)
- Weight: 11.1oz (314.7g)

Networks - General

- FPGA measured 64 bit timestamping with 10ns accuracy on all CAN/LIN/Ethernet networks.
- Simultaneous operations on all CAN/LIN/Ethernet networks.
- Transmit message double-buffering on all networks allows back to back message transmission.

2x BroadR-Reach® (100BASE-T1) Channels

- 2 BroadR-Reach® PHYs (BCM89810)
- Automatic Master / Slave Configuration
- Link Up / Down Status monitoring
- Signal integrity monitoring
- Ethernet error reporting through specially designed MAC.
- 780ns Rx, 240ns Tx and 300ns internal latency (Total: 1,320ns)
- PTP - Precision Time Protocol support
- BroadR ports can be configured to be in Media converter/ Tap modes
- LEDs in the membrane to display the link, activity, mode and signal strength for the BroadR networks
- Implements Intrepid's specially designed MAC layer. This allows future layer 2 changes as a firmware update to the device allowing same hardware to support growing industry changes.

Network Specifications

2x CAN FD Channels

- 2 Dedicated ISO11898 Dual Wire CAN Physical Layer (MCP2561FD)
- Software switchable between ISO CAN FD and Non ISO CAN FD versions
- Up to 1 M-Bit Software Selectable Baud Rate for arbitration phase
- Up to 8 M-Bit Software Selectable Baud Rate for data phase
- Listen only mode support
- CAN FD implemented using the Bosch MCAN CAN Controller IP

Ordering Information:

Part Number	Description
RAD-STAR-02	RAD-Star 2 Device

*Specifications subject to change. Please contact Intrepid for the latest information.

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