ENHANCED ETHERNET SWITCH

AUTOMOTIVE ETHERNET SWITCH WITH AVB/TSN FEATURES TO TEST AND ANALYZE VEHICLE NETWORKS

DESCRIPTION

With the constant need for higher bandwidth in the in-vehicle network, Technica Engineering features a family of advanced Automotive switches called "Enhanced Ethernet Switch (EES)". They allow the user to connect to eight Gigabit Ethernet ports and two 1 Gigabit / 10 Gigabit ports available through SFP+ connectors.

The EES product family has three variants that cover the possibility to select physical layer technology as well as the connectors for the eight Gigabit Ethernet ports of the switch. Current options include variants with Automotive Ethernet Gigabit ports such as MATEnet or H-MTD connectors as well as a variant with regular IEEE 1000BASE-T Ethernet ports with RJ-45 connectors.

These switches can establish virtual point-to-point connections, using single-tagged VLANs (802.1Q) and double-tagged VLANs (802.1Q-in-Q), thus enabling filter and control over data streams. Each port provides 8 levels of Quality of Services (QoS) classes and advanced traffic filtering capabilities with ingress and egress rules, which ensures the prioritization, resource reservation, and control mechanisms over the data received.

Through an internal configuration website, the user can easily configure the device for their use cases, abstracting the complex underlying switch hardware without using any additional software for configuration. This includes configuration of VLANs, port mirroring, forwarding, or filtering, deep inspection through TCAM rules, port segmentation, and many other features offered by standard Layer 2 switches. The user can also import/export configurations of the switch in .json format for ease of management. Moreover, these products also provide wake-up and sleep features.

The Enhanced Ethernet Switch provides a reliable gPTP Automotive profile stack following the AVnu standard for time synchronization that allows strong customization possibilities for time-aware systems. EES is also capable of Audio Video Bridging (AVB) functions with the possibility to statically configure bandwidth reservation and traffic shaping features (802.1Qav).

With an advanced firmware package for our Enhanced Ethernet Switch, you not only have the possibility of supporting gPTP and 802.1Qav but also support for TSN functionalities like 802.1Qci, Qbv, and Qbu to a certain extent becomes possible. These features can be developed on request, provided with a solid Automotive use case. Unique and powerful features like multiple time partitions within the switch, gPTP to PTPv2 Bridges, and APIs for remote configuration of the switch make this device one of the most powerful switches available today. Contact Technica Engineering's sales team for more information.

ENHANCED ETHERNET SWITCH HARDWARE PRODUCTS

Control system/ Logger	1000BASE-T Ethernet (RJ-45)	Enhanced Ethernet Switch MATEnet, H-MTD or RJ-45	IEEE regular 1000BASE-T	Vehicle Ethernet Devices
	10Gigabit Ethernet (SFP+)		100/1000BASE-T1	

FACTS

- 8× 100/1000BASE-T1 ports (MATEnet, H-MTD variants) or 8× 1000BASE-T ports (RJ-45 variant)
- 2× SFP+ ports for Logging data output (up to 10Gbps each)
- 1× 100BASE-TX Fast Ethernet Port for configuration
- Selectable connector interface between MATEnet, H-MTD, or RJ-45 connector, depending on the intended customer use case
- Extended voltage range: 12-to-24-volt Automotive battery voltage systems compatible
- Extended operating temperature range: -40°C to +85°C
- Robust steel case
- Size 164×120×35 mm

FEATURES

- Easy configuration via webserver and remote-control APIs
- Import and export of configurations
- Wake-up/sleep functionality through dedicated lines or a CAN-FD bus
- Possibility to reset to default settings by push button
- Automotive Ethernet variants (MATEnet and H-MTD) are dual-speed capable 100/1000BASE-T1
- Advanced traffic filter
- AVB/TSN functionalities:

CORE FEATURE PACKAGE

- Single partition time synchronization (gPTP) on up to 10 ports
- Advanced filters with basic and expert modes

ADVANCED FEATURE PACKAGE

- Single and multiple partition time synchronizations (gPTP) on up to 10 ports
- PTPv2 to gPTP Bridge (gPTP, IEEE 1588-2008 Slave only)
- Bandwidth Reservation (IEEE 802.1Qav)
- Ingress Rate Limiter (IRL) (as part of IEEE 802.1Qci)

ON-DEMAND SUPPORT

- Per-Stream Filtering and Policing (IEEE 802.1Qci)
- Enhancements for Scheduled Traffic (IEEE 802.1Qbv)
- Frame Preemption (IEEE 802.1Qbu)

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