



VIOLET EDGE 800

TECHNICAL SPECIFICATION

System Overview

The Wi-Tronix Violet Edge is a multi-purpose, high performance IoT for Rail platform that integrates multiple functions into one sustainable solution. Violet Edge is offered in three configurations and can be customized to meet a railway’s event recorder, video and audio recording needs. This rugged, modular hardware connects automatically to sensors – regardless of age or manufacturer, in one central location. The Violet Edge advanced platform condenses the technology footprint of traditional onboard systems, reduces the overall cost and improves reliability through the consolidation of hardware.

Device Use

Violet Edge is the primary onboard hardware component of the Wi-Tronix® IoT for Rail Ecosystem. Video, audio, event recorder and multiple onboard system data is gathered processed and time-synchronized at the edge, then transmitted securely to the cloud. Data and video is fully accessible to customers through a secure online portal using an internet browser.



FOUNDATION PACKAGE HARDWARE	
Weight	<ul style="list-style-type: none"> • Approximately 25 lbs.
IoT for Rail Platform	<ul style="list-style-type: none"> • Intel dual core CPU • 64 GB flash memory • V-Power intelligent power supply • Integrated reset-only circuit breaker • 1 USB port • LED lights on front panel indicating device status and reporting functionality • Wi-NAV™ inertial navigation <ul style="list-style-type: none"> • Automatic collision detection, fuel level measurement accuracy, track quality and train forces monitoring, train forces, dead reckoning • 3-axis digital accelerometer, 3-axis digital gyroscope, digital compass
Wireless Communication	Allows transparent, intelligent and optimized use of available wireless communication modes: <ul style="list-style-type: none"> • 4G LTE • Integrated Wi-Fi 802.11 b/g/n • Advanced Options: <ul style="list-style-type: none"> • Second 4G LTE Cell Modem • Satellite Modem • Wireless Routing to allow other onboard devices to share communication
GPS	Differential GPS (Multi-constellation support including GPS, GLONASS and Galileo)
Power	<ul style="list-style-type: none"> • Power Supply Voltage: 74VDC (45V – 80V) (wider range voltage input available in the future) • Maximum Power Consumption: 1.25 A @ 74 VDC (typical loading, depends on camera configuration) • V-Power Intelligent power supply features: <ul style="list-style-type: none"> • Contains over voltage and brown out protection on input voltage • Enables power management of external devices such as auxiliary devices e.g. fuel sensor • Monitoring, control and diagnostics of the power supply system results in improved system reliability
USB Interface	Single USB 2.0
Serial Interface Inputs	<ul style="list-style-type: none"> • Software configurable serial ports <ul style="list-style-type: none"> • 6 RS-232/422/485 Isolated asynchronous • 2 RS-232/422/485 Asynchronous or RS-422 synchronous isolated
Ethernet Interface	Ethernet IEEE 802.3 10/100/1000 Mbps
Connector Specifications	<ul style="list-style-type: none"> • J1: Power • J2: Serial (1 RS232) • J3: Serial (1 RS485, 1 RS232) • J4: Serial (1 RS485, 3 RS232) • J5: Serial (1 RS232) • J6: Audio out / audio in (optional) / USB 2.0 • J7: Ethernet IEEE 802.3 10/100/1000 Mbps, M12 8 Pin, female • J9, J11: 4G LTE, female jack TNC • J10: GPS, reverse polarity jack TNC • J12, J13: WLAN 802.11 b/g/n, Female Jack SMA

Other Specifications	<ul style="list-style-type: none"> • Certifications: EN 50155:2017 (optional), AAR S-9401:2014 • Operating temperature: -40° C to +70° C (-40° F to 158° F) • Storage temperature: -40° C to +70° C (-40° F to 158° F) • Operating humidity: 40 - 95% • IK rating: IK10 • IP rating: IP52
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FOUNDATION PACKAGE SOFTWARE AS A SERVICE

Foundation Package Subscription	<p>Fully Managed Service: SOC 2 Type 2 Compliant, cloud hosting, over-the-air software releases allows the platform to evolve to meet future needs.</p> <ul style="list-style-type: none"> • Unlimited user licenses to website portal with configurable access rights • Data storage (2 years) • Weather information and alerts • Railroad milepost and subdivision asset tracking (location, user defined Geo-Fences and more) • API/Web Services: Locomotive Position, Asset Information, Vehicle Operations Meter Log, Asset Health <p>Real-time Locomotive Operation Crew Monitoring and Reporting</p> <ul style="list-style-type: none"> • Operations Safety Alerts and Reports: Over speed alerting by subdivision and milepost • Maintenance: Locomotive engine and vehicle control systems telemetry data, alerts and reports, shop scorecard, configuration management tracking of connected devices • Incident Reporting: On demand and automated downloads of 3rd party event recorder and outward video files • Maintenance of Way: Potential track Issue alerts includes heat map reporting
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OPTIONAL | ADVANCED PACKAGES

Connected Crashworthy Event Recorder Package	<p>Features</p> <ul style="list-style-type: none"> • Fleet agnostic expandable system for your entire fleet • On-demand access to all event recorder signals real-time via Live Signals and Violet Live (*) • A continuous dataset recorded on CHM and removable SSD • Access to two years of the continuous history of second-by-second event recorder data via Violet View (*) • Incident investigation support • Secure legal hold of your cloud-based data • Meets 49 CFR Part 229.135 certified (optional event recorder of record) • Meets AAR S-9101B.V.1.0 <p>Crash Hardened Memory Module</p> <ul style="list-style-type: none"> • 32 GB /128 GB options • Meets 49 CFR Appendix D to Part 229 • Meets IEEE 1482.1-2013, Section 4.6 Crashworthiness • Records up to 14 days of FRA and PTC data <p>Data Sources</p> <ul style="list-style-type: none"> • Records up to 2000 signals from multiple onboard systems that include: • Locomotive Interface Gateway (GE, EMD) • GE Control System (PCM, ILDR emulation) • Vehicle Bus (MVB, LON) • Violet I/O Device • Existing event recorder • Positive Train Control (I-ETMS, E-ATC, ACSES) (ITCS coming soon) <p>Power Hold Up</p> <ul style="list-style-type: none"> • Preserves up to 5-6 seconds of data after power loss
Wireless Communication Packages	<ul style="list-style-type: none"> • Satellite Communication Subscription Package <ul style="list-style-type: none"> • Monthly satellite service, monitoring/maintenance and support • Basic position reporting every 5 minutes and transmission of key alerts • Wi-Router Internet Sharing <ul style="list-style-type: none"> • Wi-Tronix Cell Subscription Package
Mobile Phone Detection Package	<ul style="list-style-type: none"> • Visual intelligence • Confirmation of personnel and in-use mobile device(s) in the cab • Requires a Violet Video Package

Violet Edge Video	Connected Digital Video Recorder
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Packages	<ul style="list-style-type: none"> • Meets Locomotive Voice and Video Recorder (LVVR) Regulation: SOR/2020-178 • Meets Locomotive Image and Audio Recording Devices for Passenger Trains Regulation: Docket No. FRA-2016-0036 (FAST act configuration) • Unlimited licenses for video/audio/event recorder web viewer (Violet View) • Secure online access and sharing using role-based security with an option to use SSO, user activity logs and data integrity validation using chain of custody • Continuous thumbnail imagery to support rapid indexing of video • Real-time visibility to video information via live thumbnails (Violet Live) • Online access to digital video recorder health • Inward camera obstruction alert • Incident investigation support • Secure legal hold of your cloud-based data <p>Standard Digital Video Recorder Recording</p> <ul style="list-style-type: none"> • Supports recording of up to 7 high definition IP cameras • Typical configuration – 2 cameras, 1 microphone • LVVR configuration – 3 cameras, 3 microphones <p>PoE Capabilities</p> <ul style="list-style-type: none"> • A-coded 8 Pin – M12 connectors • 30 W maximum across all ports (future planned increased power availability) • IEEE 802.3af/at PoE+ compliant, Mode B • 4 ports 10/100/1000 Mbps Compliant to IEEE 802.3ab <p>Solid State Drive</p> <ul style="list-style-type: none"> • Removable 1 TB drive (larger size available upon request) • Records up to 5 days video, audio on standard drive size (typical configuration) <p>Crash Hardened Memory Module (Optional)</p> <ul style="list-style-type: none"> • Records up to 4 hours of outward video and audio (*Typical configuration) • Records up to 48 hours on inward video and audio (LVVR configuration) • Records up to 12 hours on inward and outward video and audio (FAST act configuration)
Fuel Monitoring Packages	<ul style="list-style-type: none"> • Wi-Nav™ inertial navigation for enhanced accuracy and functionality. • Wi-Tronix Fuel Sensor Packages <ul style="list-style-type: none"> • First sensor PLUS subscription packages • Per additional sensor PLUS subscription packages (up to 4 additional sensors) • Fuel Display Package supports 2 fuel displays • Auxiliary Power Unit (APU) Monitor subscription packages PLUS hardware package <ul style="list-style-type: none"> • Teleflex / EcoTrans / IET • HotStart Gen 5 • Powerdrive Interface
In-Cab Audio Alerts Package	<ul style="list-style-type: none"> • Real-Time In-Cab Audio system provides advanced situational awareness to crews (i.e. speeding) • Installation kit includes: speaker, cabling and hardware

* Recording capacity depends upon number of cameras, recording quality, and frame rate.

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