NCX Electronic Logging Device (ELD) Technical Specifications

Overview

NCX's Electronic Logging Device is a fully telematic solution that provides full compliance with the FMCSA's Electronic Logging Device Mandate. Carrier Dispatchers can interact directly with Drivers, monitor Hours of Operation, Annotate Unauthorized Driver Events, be immediately alerted of any Drivers exceeding their Hours of Service, monitor Engine Diagnostics (Oil Temperature, Pressure, Engine Load, RPMs) and much, much more. It redundantly stores its data in three separate locations and can operate in temperatures exceeding 80 degrees Celsius (175 degrees Fahrenheit).

NCX's ELD supports the simultaneous tracking of up to three Global Navigation Satellite Systems (GNSS), and is capable of handling and processing 72 separate channels at the same time. By default, NCX's ELD is set to track GPS, GALILEO and GLONASS, also making use of the Quasi-Zenith Satellite System (QZSS) and the Satellite-Based Augmentation System (SBAS), supporting GAGAN, WAAS, EGNOS and MSAS types of SBAS when they are available. Simultaneously tracking three GNSS Satellite Systems while also making use of SBAS allows for very reliable service, even in areas where portions of the sky are obstructed, such as in cities with tall buildings.



To enhance its GNSS performance yet further, NCX's ELD also utilizes an external, amplified active antenna, which provides an additional 30-50 dB of GNSS signal gain through an integrated Low-Noise Amplifier (LNA) while at the same time increasing the effective aperture of the antenna by passing an active load through it. Supplementing its GNSS receivers, NCX's ELD also includes a highly accurate six-axis Gyroscope + Accelerometer, which can determine movement, momentum and heading even when no satellite signal is available.

NCX's ELD also contains an internal backup power supply, which allows it to continue operating for a period of time even if power is lost. Once the internal battery drops to 5% remaining life, the ELD will commence a clean shutdown, preventing any data loss or corruption.

GNSS Technical Specifications

GNSS Receiver Supported GNSS	72 Channels GPS L1C/A,	SBAS L1C/A, (QZSS L1C/A, QZ	SS L1 SAIF, GLONASS	L1OF, BeiDou B1I, (Galileo E1B/C
Velocity Accuracy Heading Accuracy	0.05 m/s (50% @ 30 m/s) 0.3 Degrees (50% @ 30 m/s)					
Time Pulse Accuracy	RMS30 nanoseconds99%60 nanoseconds					
Time Pulse Frequency	0.25 Hz to 10 MHz (configurable)					
Tracking Limits	50,000 meters Altitude (31 Miles) 500 meters/second Velocity (1,118 MPH)					
Position Accuracy	GPS & GLO	NASS: 2.5m	GPS: 2.5m	GLONASS: 4m	BEIDOU: 3m	GALILEO: TBD
Navigation Updates	GPS & GLO	NASS: 10 Hz	GPS: 18 Hz	GLONASS: 18 Hz	BEIDOU: 18 Hz	GALILEO: 18 Hz
Time-to-Fix (Cold) Time-to-Fix (Hot) Time-to-Fix (Aided)	GPS & GLO GPS & GLO GPS & GLO	NASS: 26s NASS: 1s NASS: 2s	GPS: 29s GPS: 1s GPS: 2s	GLONASS: 30s GLONASS: 1s GLONASS: 2s	BEIDOU: 34s BEIDOU: 1s BEIDOU: 3s	GALILEO: 45s GALILEO: 1s GALILEO: 7s
<u>Antenna Sensitivity</u> Tracking Reacquisition Cold Start Hot Start	GPS & GLO GPS & GLO GPS & GLO GPS & GLO	NASS: -167 dBm NASS: -160 dBm NASS: -148 dBm NASS: -157 dBm	GPS: -166 dl GPS: -160 dl GPS: -148 dl GPS: -148 dl GPS: -157 dl	Bm GLONASS: -166 dB Bm GLONASS: -156 dB Bm GLONASS: -145 dB Bm GLONASS: -156 dB	m BEIDOU: -160 d m BEIDOU: -157 d m BEIDOU: -143 d m BEIDOU: -155 d	Bm GALILEO: -159 dBm Bm GALILEO: -153 dBm Bm GALILEO: -138 dBm Bm GALILEO: -151 dBm

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CPU Technical Specifications

NCX's ELD utilizes an ARM® 32-bit Cortex® -M3 CPU with 64 KB of SRAM, 256 KB of Embedded Flash Memory and a 72 MHz Clock, achieving 1.25 DMIPS/MHz (Dhrystone 2.1) performance at 0 wait state memory access. This CPU provides single-cycle multiplication and hardware division, Sleep, Stop and Standby modes, a built-in Voltage Conversion range of 0 to 3.6 V, a Temperature sensor, 80 fast I/O ports -- all mappable on 16 external interrupt vectors and almost all 5 V-tolerant, a CRC calculation unit with a 96-bit unique ID, 2 Built-In Watchdog timers and much more.

OBD Protocol Specifications

NCX's ELD supports OBD Types SAE J1850 PWM, J1850 VPW, ISO 9141-2, ISO 14230 KWP2000, ISO 15765 CAN, J1939 and J1708.

Internal Backup Battery Specifications

NCX's ELD includes an internal 500 mAH Lithium-Polymer (LiPo) 3.6v Battery, offering a longer lifespan and safer operation than Lithium-Ion.

Cellular Data Specifications

NCX's ELD utilizes a Dual-Band UMTS/HSDPA 900/2100MHz / Quad-Band GSM/GPRS/EDGE 850/900/1800/1900MHz Cellular Transceiver that supports HSDPA transfer speeds up to 3.6 Mbps. Handles TCP/IP and SSL traffic for FTP / SFTP / HTTP / HTTPS / SMTP / POP3 / DNS, etc.

Acceleration and Gyroscope Specifications

The NCX ELD incorporates a three-axis Gyroscope and three-axis Accelerometer, providing six-axis analysis of movement and acceleration.

Data Storage Specifications

The NCX ELD incorporates 64 MB of Non-Volatile Memory Module to store historical driving data, as well as two external replicated datastores.

Bluetooth Specifications

The NCX ELD incorporates a Class-2 (2.5 mW / 4 dBm) SIG 4.0 Bluetooth Transceiver supporting EDR+BLE, with a 10 meter range. The Bluetooth Transceiver supports a full Piconet of up to 7 Connected Devices, with the ELD maintaining the Master role.

External Case Specifications

The case is formed from injection-molded, impact-resistant ABS plastic. Designed with durability in mind, NCX's case is capable of withstanding significant pressure and impact. The case is designed to mount under the dashboard of the vehicle. Two ports are provided for connection of the amplified external GPS antenna cable and a cable leading to the vehicle's OBD Port. Each of these two connectors lock securely into the Case.

Data Port and Operating Voltage Specifications

The NCX ELD supports both SAE J1962 Type A (12 Volt) and Type B (24 Volt) Connectors, allowing it to be used in the widest possible range of Manufacturers' vehicles. The NCX ELD comes with a set of 9-pin and 15-pin round adapters to ensure compatibility with any modern data port.

Audio Alert Specifications

The NCX ELD provides a strong internal alert beeper that signals when the vehicle is in an Unauthorized Driver state, prompting the Driver to log in.