



Cello-CANiQ LTE™

Intelligent Solution for Real-Time Monitoring of Vehicles, Drivers and Cargo

The Cello-CANiQ is an advanced fleet management solution, based on the LTE CATM1/NB1 network, which utilizes a smart algorithm to combine data from various vehicle environment interfaces. These interfaces include standard CANBUS and OBD, driver identification, serial communication with third party devices, a wide range of measurement ports, and more. All of these interfaces are designed and configured for maximum flexibility with CAN data aggregation, filtering, processing and event triggering.

With advanced multi-source data analytics delivered by the Cello-CANiQ, your business intelligence is reinforced and operating costs are reduced, largely due to lower fuel consumption, reduced warranty expenses, improved driving habits, and optimized maintenance processes.

The Cello-CANiQ is suitable for a wide range of applications such as fleet management, driver behavior, cold chain, proactive maintenance, car sharing, and ELD/HOS.





Highlights

- Direct connectivity and data analytics for the vast majority of vehicle data buses and interfaces, enabling a wide range of applications driven by the vehicle CANBUS data.
- **Supports the following standards:**
 - OBDII (ISO 15765, ISO 14229)
 - CAN2.0 (ISO 11898, J1939, FMS)
 - K-Line (ISO 14230 parts 1&2, ISO 9141-2)
- **Supports the following hardware platforms:**
 - LTE CATM1/NB1/2G
 - Advanced multi-GNSS (GPS + GLONASS) with cutoff/short-circuit detection
 - Interface with the Bluetooth Extender accessory – supporting Bluetooth communication with ELD and MultiSense devices.
- Variety of embedded algorithms for calculating a trip's total fuel consumption, based on different available CAN parameters, resulting in increased ROI realization.
- K-Line vehicle interface and CAN interface can work simultaneously.
- Flexible 'Drag & Drop' CAN Editor GUI tool to configure vehicle-data collection and manage real-time and powerful on-board logic engine.
- DTC (Diagnostic Trouble Code) reporting logic over supported CANBUS/K-line protocols.
- Flexible and configurable maneuver and trip scoring logic; includes on-board ECO and trip safety scores calculations, and online & real-time driver feedback display.
- Professional Services (CAN libraries) - Cellocator offers more than 2,500 complementary vehicle libraries, which include vehicle models and parameters sampled by our field engineering team. The libraries are updated and published on a monthly basis. Cellocator's professional services also include the configuration of the device's data collection and triggering logic according to your defined use case and to ensure quick time to market.
- Real-time and on-board Triggering Logic - The Cello-CANiQ filters real-time data based on the vehicle's sensors and data it captures. It triggers logic based on the rules defined via the CAN Editor tool, and, as a result, generates events which are sent to the back-end and/or perform its I/Os.



Use Cases

Fuel Management

Easy, low-cost monitoring of the fuel tank includes fuel consumption rate, detection of fuel frauds (fuel syphoning), improved management of refueling time and place (gas station prices), accurate measurement of fuel efficiency, and so on. In addition, fleet managers can easily monitor driver behavior and improve their driving and vehicle operation skills in real-time by applying training plans. These plans can dramatically influence fuel usage and also reduce vehicle maintenance, thus increasing the fleet operational efficiency.



Fleet and Driver Safety with Driver Identification

The Cello-CANiQ enables flexible and configurable maneuver and trip scoring logic, including on-board trip ECO and safety scores calculations, and online, real-time driver feedback display leading to increased driver safety. Examples of related events include driver seat belt unbuckled; a hard right/left turn; and driving when the ESP lamp is on.



Proactive Vehicle Maintenance & Remote Diagnostics

Real-time vehicle performance profiling, including engine temperature, oil pressure, tire pressure, emission and fuel consumption are sent to the back-end with the DTC reporting in order to facilitate preventive maintenance. This enables an immediate reaction upon failure detection and dramatically reduces repair costs. In addition, it allows the workshop to receive advance data regarding the vehicle's health status and in turn, helps fine-tune the periodic maintenance work. Furthermore, it facilitates the daily vehicle checklist which is usually done by the driver and now can be partially or fully automated.



Car Rental / Car Sharing Companies

Effectively verify drivers by identifying who drives which car, allowing credential-based vehicle access. Real-time driver behavior feedback enables the rental company to take immediate preventive actions if required, such as disabling ignition.



Cold Chain

Assists in maintaining the required environmental conditions (temperature, humidity, etc.) during shipments of perishable goods or pharmaceuticals, using the MultiSense device which communicates with the Cello-CANiQ device over BLE. Drivers can receive real-time updates of any breaches of pre-defined thresholds and take action (such as reset the thermostat) to guarantee compliance with cold chain shipment requirements.



ELD/Hours of service

Assist in compliance with the Hour of Service/ELD mandate (USA & Canada) by providing ECU based data such as engine power status, vehicle motion status, miles driven, and engine hours to an ELD device using wired or BLE communication. To facilitate the off-site archiving, if necessary, the Cello CANiQ is also able to connect to a back-end platform using cellular communication.

Add-On Accessories



DFD

The real-time Driver Feedback Display (DFD) provides continuous real-time, visual and/or audible (via human speech in various languages) feedback to the driver via a dedicated feedback display device, indicating to the driver the risk level of their driving.



Harsh Acceleration



Hard Braking



Sharp Cornering



Over Speeding



Wrong Gear Handling



Excessive Idling



Off Road Warning



BT Extender

The BT Extender includes two variants:

- **Variant 1:** Support for MultiSense devices via wireless communication between the Cello-CANiQ and the MultiSense, which includes a range of internal embedded sensors including temperature, relative humidity, light, shock, door status and more.
- **Variant 2:** Serial communication output support - use this channel to implement any valid commands via serial communication in order to enable wireless interface for smartphone/tablet apps such as ELD, driver identification, installation, etc.



Cello-CANiQ LTE



BT Extender



Cello-CANiQ LTE Specifications

Communication

Cellular Communication	LTE Dual mode CAT M1/NB1 WW with 2G Fallback CAT M1/NB1: B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B26, B28 2G: GSM850, GSM900, DCS1800, PCS1900
Data Rates	CAT M1: uplink up to 375kbps, downlink up to 300kbps NB1: uplink up to 62.5kbps, downlink up to 21kbps 2G (EGPRS): uplink up to 236kbps, downlink up to 296kbps
Power Output	2W 33db GSM, 0.5W 27db EDGE, 0.2W 23db LTE, ALL with ± 2 db (1.5mW)
SIM	Internal, replaceable, remote PIN code management
Antenna	Internal, multi bands LTE bands + GSM bands
Packet Data	TCP/IP or UDP/IP for commands and events, FTP and TFTP for crash files upload
SMS	PDU, text SMS for data forwarding

GNSS

Technology	STM STA8088 Chipset
Sensitivity (tracking)	-162dBm
Acquisition (normal)	Cold <35Sec, Warm<35Sec, Hot<1Sec
Internal Antenna	On board, internal patch antenna
External Antenna	External active antenna (2.85V \pm 0.5%), SMA connector. External antenna short/disconnect detection circuitry. Firmware controlled receiver antenna source selection.

Inputs and Outputs

Inputs	1 internally pulled down input dedicated for ignition switch. 1 internally pulled up Discrete Dry input with assignable functionality and configurable threshold for logical high and low states. 2 configurable inputs capable of serving as: Frequency counters - configurable resolution; up to 5kHz input signal; signal level (3V < Vin \leq 30V), accuracy $\pm 2\%$ Analog inputs with variable resolution - 8bit, adapted to 0-2.5V signal, resolution 20mV, accuracy ± 20 mV; 8bits, adapted to 0-30V Signal, resolution 100mV, accuracy ± 100 mV Discrete Dry - configurable threshold for logical high and low states. Discrete Wet - configurable threshold for logical high and low states.
Outputs	4 general purpose open drain outputs (250mA max) with assignable functionality.

Interfaces

COM port (RS232)	Selectable baud rate (9600 or 115000bps) True RS232 levels; 8-bit, 1 Stop Bit, No Parity MDT Interface Garmin™ Interface PSP™ (Car Alarm) Interface	Cellocator Serial Protocol Transparent data mode Configuration update Firmware upgrade
Debug port (RS232 out)	External monitoring of modem-CPU dialog 115000bps True RS232 levels; 8-bit, 1 Stop Bit, No Parity	
CAN interface	CAN-H, CAN-L signals Bus-Pin Fault Protection up to ± 36 V Bus-Pin ESD Protection exceeds 16-kV HBM ISO 11898; Signaling rate up to 1 Mbps	Extended -7V to 12V Common-Mode range SAE J1939 Standard Data Bus Interface ISO 15765 for OBDII connectivity ISO 11783 Standard Data Bus Interface
K-Line interface	A bi-directional one-wire-bus interface compliant with ISO 9141-2 and ISO 14230 1&2	
D8 interface (HW variant)	D8 serial protocol Rx line for interfacing Digital Tachograph (DTCO).	
1-Wire™ (Dallas port)	DS1990A, DS1971 compliant Extended bus current source with 7 mA driving capability Driver management (up to 100 driver IDs) Car alarm authorization	
Accelerometer	3D, ± 2 g/8g range, 12-bit representation, 1mg resolution, I2C interface	
Connectors	20pin Molex, automotive SMA switch for optional external GPS antenna	

CONTINUED ON BACK COVER →

Cello-CANiQ LTE Specifications - Continued

Power	
Input Voltage	9-32VDC
Average Current Consumption	Normal: 40mA Economic: 23mA Hibernation: <2mA Shipment (Off): <20uA (Internal Battery)
Internal Battery	Li-Ion Polymer, 3.7V, 1Ah, rechargeable Up to 200 Tx @ 1Msg/min @ 25°C Embedded NTC for temperature-controlled charging Operating temperature: -20°C (65% charge) to 60°C Protections: over current, overcharge and over discharge
Vehicle Environment Immunity	
Immunity	Compliant with ISO 7637 test level #4 (in accordance with e-mark directive)
Environment	
Temp, operation	-30°C to +70°C full performance
Temp, storage	-40°C to +85°C
Humidity	95% non-condensing
Ingress Protection	IP40
Vibration, Impact	ISO 16750
Power transients	ISO 7637 Test level 4 (e-mark directives compliant)
Mounting	Tie-wraps and/or double-sided adhesive
Certifications	
FCC	Part 15 Subpart B, part 22/24 compliant
Dimensions & Weight	
Dimensions	91x73x23mm
Weight	110gr
Harnesses	
711-00321	Cello-CANiQ basic harness
711-00368	Cello 18 wire harness without mold
711-00369	Cello 18 wire harness with mold
711-00371	Cello full installation
711-00385	OBDII splitter (supports K-Line)
Contactless CANBUS adapter (P/N: AR0288)	Ensures no writing to the bus. Listening mode only! Avoids warranty loss
Add-On Accessories	
BT extender	Variant 1: 715-50510 – Wireless interface to Multi-Sense Variant 2: K090-063 - Serial, K090-064 – Secured Serial

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