

Cello-CANiQ™

Intelligent Fleet Management, Driver Behavior & Diagnostics Solution

Intelligence is all about processing multi-source data to achieve effective results. This is the Cello-CANiQ in a nutshell.

With the 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 a fleet management solution, utilizing 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, discrete, analog and frequency measurement ports, voice channel, and others. All of which are designed and configured for maximum flexibility with CAN data aggregation, filtering, processing and event triggering.

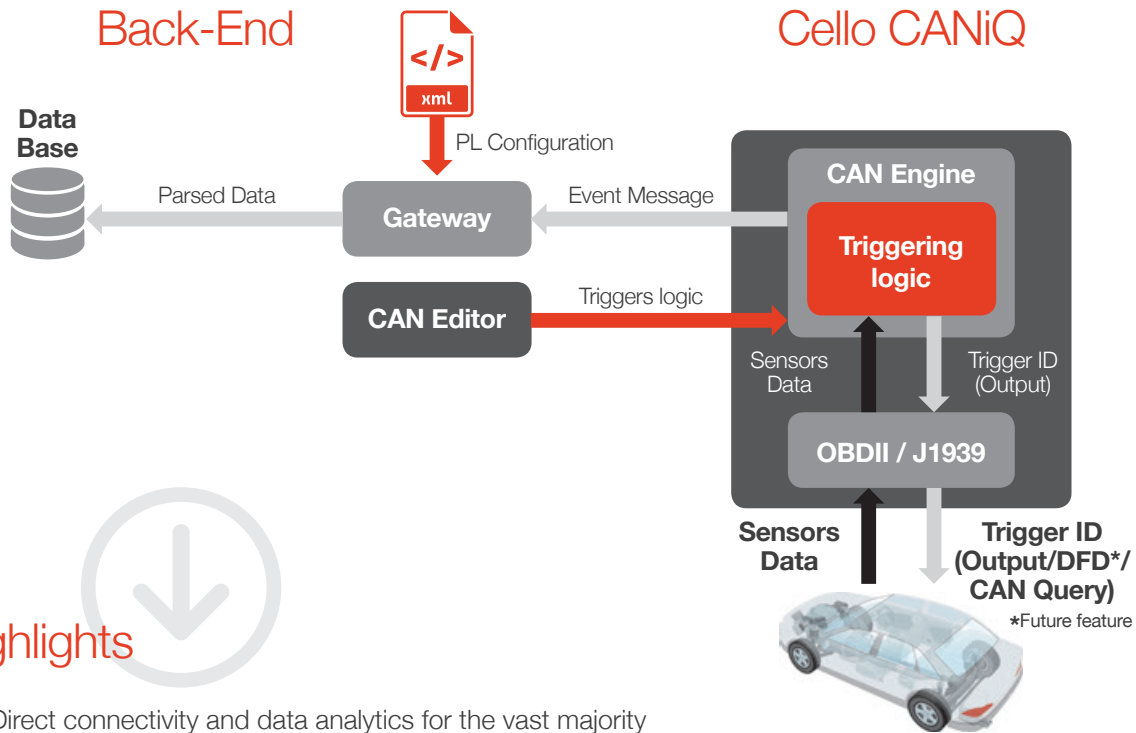
The Cello-CANiQ is available in two feature packages which both include the CAN interface:

- **Cello-CANiQ 30** - Fleet management solution with various interfaces (I/Os), security capabilities and basic driver behavior (GPS-based).
- **Cello-CANiQ 50** - All Cello-CANiQ 30 features in addition to advanced driver behavior capabilities, including accident event logging, recording and reconstruction.



Real-Time and On-Board Triggering Logic

The Cello-CANiQ filters real-time data based on the vehicle's sensors and data received from the Cello-CANiQ unit, triggers logic based on the rules defined via the CAN Editor, and, as a result, generates events which are sent to the back-end and/or operate its I/Os.



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)
- **Supports the following hardware platforms:**
 - 2G/3G (EU, NA)
 - Advanced multi-GNSS (GPS + GLONASS) with cutoff/short-circuit detection
 - Multi-purpose 1-wire (Dallas port)
 - Digital Tachograph (DTCO): D8 serial data output info link in addition to remote company card authentication and remote data downloading^[1]
 - Interface with the Bluetooth Extender accessory – supporting Bluetooth classic communication with ELD devices and BLE communication with the MultiSense devices.
- Variety of embedded algorithms for calculating total fuel consumption in a trip, based on different available CAN parameters, leading to increased ROI realization.
- Flexible 'Drag & Drop' CAN Editor GUI to configure vehicle-data collection and manage real-time and on-board powerful logic engine.
- DTC (Diagnostic Trouble Code) reporting logic over supported CANBUS protocol.
- Flexible and configurable maneuver and trip scoring logic. Includes on-board ECO and safety scores trip calculation, and online & real-time driver feedback display.
- Professional Services (CAN libraries) - Cellocator offers 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 for quick time to market.
- Ability to upgrade from the Cello-CANiQ 30 feature package to the Cello-CANiQ 50.

1. Remote data downloading is a future development

Use Cases

The CAN Editor is a graphical UI tool, designed to configure CAN related information sources with user defined behavior at the back-end and create triggers that can be downloaded to the Cello-CANiQ unit. The user selects CAN variables via the drag and drop functionality in the tool and associates them with operators - logical data manipulation functions, manipulating CAN data and generating events. The Cello-CANiQ checks the triggers that were defined via the CAN Editor in real-time and when fulfilled, creates and sends an event to the fleet manager, who can define category-based alerts at the back-end. Each category can include the required actions that need to be taken.

Fuel Management

Easy, low-cost monitoring of the fuel tank, including 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.

Fleet Efficiency

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. Examples of related events: long brake presses; starting engine with the acceleration pedal pressed; and faulty use of air retarder.

Fleet and Driver Safety

The Cello-CANiQ enables flexible and configurable maneuver and trip scoring logic, including on-board trip ECO and safety scores calculation, and online, real-time driver feedback display leading to increased driver safety. Examples of related events: Driver seat belt unbuckled; hard right/left turn; driving when 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. Examples of related events: deviation from engine coolant.



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 serves as a Bluetooth dual mode gateway to RS232, supporting the wireless communication channels between the Cello-CANiQ device and other devices with BT/BLE capabilities:

- **BT Classic** - supports the Serial Port Profile (SPP), enabling the usage of any device supporting BT SPP, such as smartphones and Electronic Logging Devices (ELDs).
- **BLE Mode** - supports the communication channel between the Cello-CANiQ and the MultiSense devices, which include a range of internal embedded sensors that create a Wireless Sensor Network (WSN) and sense temperature, relative humidity (in the MultiSense TH model), light, freefall, impact, movement, orientation change, door status, and more.



Cello-CANiQ Specifications

Communication		
GSM Modes:	3G:	NA: UMTS/HSPA/GSM/GPRS/EDGS: 5.76[UL]/7.2[DL] Mbps, 850/1900 MHz EU: UMTS/HSPA: 5.7[UL]/7.2[DL] Mbps, 900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz
	2G:	GSM/GPRS: 24[UL]/48[DL] Kbps, 850/900/1800/1900 MHz
Power Output		2W, 1W
SIM		Internal, replaceable, remote PIN code management
Antenna		Internal, multi band GSM antenna
Packet Data		TCP/IP, UDP/IP
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 ± 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 ≤ 30V), accuracy ±2% Analog inputs with variable resolution - 8bit, adapted to 0-2.5V signal, resolution 20mV, accuracy ±20mV; 8bits, adapted to 0-30V signal, resolution 100mV, accuracy ±100mV 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

Voice Interface	Cellocator HF compliant Full duplex Echo cancellation Noise suppression	Spy listening option Auto-answer option Volume control by single button or two buttons Distress voice call and simple call generation
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
D8 interface	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, ±2g/8g range, 12 Bit representation, 1mg resolution, I2C interface	
Connectors	20pin Molex, automotive SMA switch for optional external GPS antenna	

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)	
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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 two sided adhesive	

Certifications

FCC	Part 15 Subpart B, part 22/24 compliant	
CE	CE EMC & R&TTE according to 89/336/EEC or 1999/5/EC CE Safety EN60950-1:2001+A11:2004 CE number - CE 1177,1909 Automotive Directive 2004/104/EC (E-Mark)	
IC	Industrial Canada	
PTCRB	TRP, TIS, Spurious and harmonics emission	
EN12830 Compliance	Suitability: T	
With 1-wire Temperature Sensor	Climatic environment: w/o Cello Protector – B with Cello Protector – D Accuracy class: -10°C to +85°C - 1 <-10°C, > +85°C - 2 Range: -55°C to +125°C	

Dimensions & Weight

Dimensions	91x73x23mm	
Weight	110gr	

Harnesses

Basic OBDII (P/N:711-00321)	Harness designed for self-installation, supports DFD	
Cello-CANIQ Generic Harness (P/N:711-00318)	Fully featured, 17-20 wires	
OBDII Splitter (P/N:711-00335)	Provides access to CAN and power wires + selected I/O's Does not disturb normal diagnostics services	
Contactless CANBUS adapter (P/N: AR0288)	Ensures no writing to the bus. Listening mode only! Avoids warranty loss	

DFD Specifications

Interfaces

COM1 Port (RS232)	True RS232 levels 8 bit; 1 Stop Bit; No Parity, 115200 BPS. Proprietary Serial Protocol
Connectors	4 pin connector: GND, power supply, RS232 TX, RS232 RX

Power

Input Voltage	7-32VDC
Power Consumption	Hibernation: 760uA at 12 V Operational : up to 5.4 W assuming all LEDs are illuminating

Display

LED Array	12 white LEDs
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Audio

Recorded Messages	128Mbytes SDCARD holding voice recordings
Loudspeaker	1W
Recording Format	Sampling rate: 16Khz Encoding: Signed 16 Bit PCM RAW data file format

Environment

Temperature, operating	-15°C to +65°C full performance
Temperature, storage	-20°C to +85°C
Humidity	95% non-condensing
Protection	IP40

Certifications

FCC	Part 15 Subpart B, part 22/24 compliant
CE	CE EMC & R&TTE according to 89/336/EEC or 1999/5/EC CE Safety EN60950-1:2001+A11:2004 Automotive Directive 2004/104/EC (E-Mark)
IC	Industrial Canada

Mechanical Attributes

Dimensions	~ 73 x 47 x 18.6 mm
Weight	~ 62 grams
Stand	Manually adjustable view angle with screw
Mounting	Double-sided adhesive tape or screws
Cable	4 wires, 28 Gauge, 30 cm long
Connector	4 Pins, 2.54 mm Pitch, Single row

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