



Cellocator Division
Pointer Telocation Ltd.

CELLOCATOR™ CELLOFAMILY

ADVANCED TELEMATICS
APPLICATIONS

CELLOCATOR CELLOFAMILY IS AN INNOVATIVE FAMILY OF PRODUCTS OFFERING ADVANCED TELEMATICS APPLICATIONS SUCH AS ENHANCED FLEET MANAGEMENT, VEHICLE SECURITY AND DRIVER SAFETY SERVICES.



CelloFamily units provide state of the art event-driven logic, configurable and flexible I/O settings for any type of common signal interfaces and advanced, cost effective and reliable OTA communication capabilities. The unit's internal memory allows logging of more than 9K full status events and up to 100 Geo-fences and waypoints.

In accordance with Cellocator's commitment to exceptional serviceability and maintainability CelloFamily units are fully integrated with Cellocator's OTA management web based platform - **Cellocator+**™. The embedded mechanism of periodical (or by request) communication with the maintenance server, enables intuitive remote configuration update and firmware upgrades upon request as well as monitoring of the health status of a device across customer's accounts.

CELLOCATOR CELLO-IQ*

High-end Driver / Fleet Safety and Eco-driving

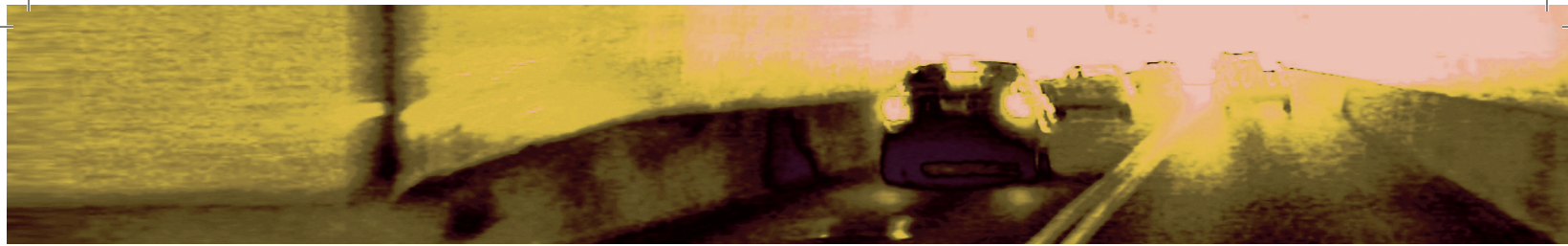
Cello-IQ is a driver safety and eco driving application, designed to improve fleet safety and reduce fleet operation costs. The device is one of a very few systems on the market that provides a fleet safety and ECO driving solution, while being simultaneously ready for integration with any TSP's SW platform with minimal integration and development effort.

The Cello-IQ device processes and interprets vehicle dynamics and vehicle operation patterns into driver's safety and ECO scores, reflecting the driver's relative level of risk, fuel consumption and emission footprint within the scope of a given population and/or a vehicle category. Cello-IQ is available in two flavors, Cello-IQ 50 - the Premium solution, and Cello-IQ 40 – the entry level solution.

*For detailed information on Cello-IQ please refer to Cello-IQ product brochure.



POINTER



CELLOCATOR CELLO-F

Fleet Management Services

Cello-F offers enhanced functionality and performance as well as advanced Telematics applications in the areas of journey and driver management, location and communication management for fleet managers, service companies, insurance companies, car manufacturers and more.

Some of these applications include route planning, vehicle access control, and event prioritization for distress situations. Cello-F is integrated with variety of 3rd party accessories such as Garmin terminals, 'hands free' voice kit, fuel sensor, car alarm system, driver identification devices and many more.

Cello-F is an innovative all-in-one GPS-GPRS device, equipped by built in quad band GSM/GPRS modem, powerful GPS engine, powerful ARM Cortex M3 CPU and 3D accelerometer. It is compatible with any road vehicle type and fully certified to meet automotive, radio and safety standards in Europe and North America.

CELLOCATOR CELLO-R

Vehicle Security and Stolen Vehicle Recovery Services

Cellocator Cello-R incorporates all of the Cellocator Cello-F features, and additional alarm system logic and emergency event features, allowing enhanced Vehicle Security and Stolen Vehicle Recovery Services. The built in alarm system supports various alarm states such as armed/unarmed, garage mode and more. The unit's output can trigger the car sirens, lights and car immobilization in response to car theft attempts.

CELLOCATOR CELLO-AR

Anti-theft Security system

Cello-AR is an economic anti-theft security system that provides an early alert to theft attempt and smart immobilizing capabilities, eliminating the need for an expensive alarm system. As such, it offers major cost savings for customers who deal with vehicle security and stolen vehicle recovery services (SVR).

Cello-AR offers driver authentication, robust and smart immobilizing system with redundancy option, theft and tamper attempts detection and OTA reporting, as well as E-call and B-call capabilities.



FEATURES

Driver and Trip Management

Vehicle Access Control - An iButton™ or any other compatible device, such as keypad and contactless proximity card, is used to monitor driver's identity. The Cello-F unit generates appropriate messages to report driver identification and authentication. An optional immobilizer can be used to immobilize the vehicle until the driver is authorized. An external buzzer can be activated as a reminder for driver authorization and feedback on a successful authorization process.

Rich vehicle status reporting - The standard trip data recorded includes: trigger of event, date and time, location with its validity status, total vehicle distance, momentary speed or maximum since the last (speed report), vehicle's internal batteries measurement, internal battery temperature and charging status, driver ID, and unit IO status, such as RPM and fuel level. The unit can maintain a log of up to 9k full time stamped location events when the engine is off.

Journey Monitoring - The standard trip monitoring capabilities include start and stop driving / trip alerts, time and distance reports, geo-fences and waypoints management and more.

Driver Privacy - providing the driver with the option to mask tracking capabilities in order to maintain privacy during private trips.

Location and vehicle status reporting – per time, distance and a dynamic rate of transmission sent in accordance to the vehicle speed.

Location and vehicle status reporting per event – the unit supports more than 100 events triggered by input interfaces, accelerometer, cellular network information, GPS information, driver behavior, geofences and many more. The unit reports its location and vehicle status as well as the event information for each event detected.

Online or Offline tracking - uploading generated events in real time as they are generated, or offline, by the end of the day or by command.

Curve smoothing – tracking the vehicle's location whenever it performs turns- in order to fit the logged route to the map in an optimal way. Traffic compression for this type of traffic can be activated.

Manage Locations - units can be programmed with 100 rectangular Geo Zones, which can be managed in

separate or combined manner. The geo-Zones can be configured as forbidden, only-enabled zone, modem disabled and more. A violation of zone might cause output activation, and each zone is equipped by validity time.

Route Planning - programming the unit with 100 rectangular way-points, which are passed in specific times, otherwise the unit will generate an alert.

Cellular Position System (Cell ID) - The unit provides CPS (Cellular Position System) information for defining the vehicle position as an alternative to GPS information. The CPS information can be used by FM applications and in particular SVR applications in places where the GPS information is not available. The CPS information contains signal characteristics, such as active sector and signal strength, from several cellular stations allowing the control center application to pinpoint the vehicle location using geometric calculations.

Real Time Status request - Enables querying the unit status at any given time, through SMS or GPRS.

Safety and Eco-driving Applications Cello-IQ features

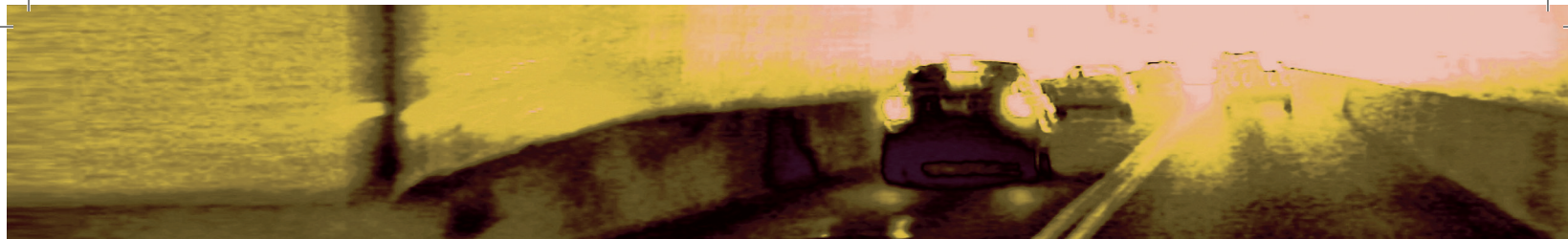
Driving behavior Management – the unit detects, processes, logs and reports a wide set of events (driving maneuvers) and/or raw data concerned with hazardous or aggressive driving behavior (“Safety” features).

E-Call & Emergency Data recording (EDR) – the unit detects, logs, reports and uploads accident events and accident raw data for later crash event reconstruction on the server side. Upon crash detection E-call functionality can be triggered to open voice channel between the vehicle and a control center.

ECO driving Management – the unit detects and reports events which feature uneconomic and environment-unfriendly driving in terms of fuel consumption, emission and accelerated wear and tear (brakes, axles, engine, tires etc. – “ECO” features).

On-Board trip processing – the unit provides trip statistics information, which includes Eco scoring and Safety scoring based on the information gathered and processed on-board during a trip.

Driver coaching – the unit provides continuous real time, visual and/or audible feedback to the driver, via a dedicated “Driver Feedback Display”, regarding the risk level of the driver's driving and hazardous / uneconomic events identification.



Communication

Communication Methods – the units includes a GSM/GPRS modem, allowing communication over TCP/IP or UDP/IP with auto-switching to SMS, which can also be configured to be the primary mode of communication.

Voice Calls – Cello units support hands free kit, enabling to receive voice calls from any number and initiate voice call to the control center or other predefined number.

Event prioritization – Priorities can be assigned to each event, so that distress events are immediately delivered using the first available communication channel.

GSM operator management selecting preferred and forbidden GSM operators for communication cost optimization.

Band control – allows presetting preferred GSM band and GPRS authentication method in order to speed up dial up time.

Traffic auto-optimization - auto-adjusting event generation frequency as a function of velocity, GSM operator and GSM status in order to optimize memory usage and cost of traffic.

Data forwarding from serial port (transparent mode) – the unit can transparently transfer location and time tagged information between devices connected to its serial port and the SW application server thru flawless / guaranteed delivery mechanism.

Jamming Detection and Reaction – embedded capability to monitor and detect GSM/GPRS jamming attempts and to trigger local reaction to avoid vehicle theft or drawing environment's attention.

Server Authentication - The Cellocator unit can be programmed to support communication only to / from authorized servers and applications and to block access from hackers or competitors.

Installation & Maintenance

Covert installation - the unit's small size and mono-block structure allows effective covert installation in various places in the vehicle.

Fast installation option – the device can generate start/stop ignition events based on the 3D accelerometer's movement detection. Using this feature, self OBDII-based, or 2-wire installation, is enabled.

Maintenance Server CelloFamily units support periodical and by command connection to a separate server for maintenance purposes, configuration and firmware

update, health status monitoring etc.. Maintenance services are provided through the **Cellocator+** software package.

OTA (Over-The-Air) programming – All parameters are fully configurable via remote connection.

OTA (Over-The-Air) firmware upgrade – full remote firmware upgrade for efficient and faster customer support and service provisioning.

Various Compatible Accessories

Additionally, CelloFamily units support numerous proprietary and 3rd party accessories to meet a variety of Telematics needs. Accessories supported include:

- DFD - Driver Feedback Display (for Cello-IQ)
- Temperature, Fuel level, Door, and Accident sensors
- Fuel cap protector
- Driver Identification Dallas key, keypad and proximity reader
- Distress / Assistance button
- MDT for bi-directional communication with the driver
- Full compliance with Garmin™ PND FMI
- CTR - Cellocator Temperature Recorder
- Cellocator Hands free kit
- Cellocator Cello protector
- Cellocator Water Proof Case
- Cellocator CFE - Communication & Functionality Expander
- Immobilizer relays
- External GPS antenna
- Automatic passenger counting
- Various harnesses

TECHNICAL SPECIFICATIONS

Communication

GSM Modes	GPRS class 10, PDU SMS
Bands	Quad band: 850, 900, 1800, 1900MHz
Power Output	2W, 1W
SIM	Internal, replaceable, remote PIN code management
Antenna	Internal, quad band GSM antenna
Packet Data	TCP/IP, UDP/IP
SMS	PDU, text SMS for data forwarding

GPS

Technology	Chipset: SiRFIII GSC3F/LP single chipset (sirfstar IV upcoming)
Sensitivity (tracking)	-159dBm
Acquisition (normal)	Cold <42Sec, Warm<35Sec, Hot<1Sec
Antenna	On board, internal patch antenna Optional external Active antenna (2.85V ± 0.5%), automatic switching, standard SMA connector

Inputs and Outputs

Inputs	<p>1 internally pulled down input dedicated for ignition switch</p> <p>3 internally pulled up general purpose inputs with assignable functionality and configurable polarity - $0V < V_{il} < 0.25V$; $0.25V < V_{ih} \leq 30V$</p> <p>2 configurable inputs capable to serve as:</p> <p>Frequency counters - Configurable resolution; Up to 5kHz input signal; Signal level $3V < V_{in} \leq 30V$; Accuracy ±2%</p> <p>Analog inputs with variable resolution 8/12 bit, adapted to 0-2.5V or 0-30V signal, max resolution 0.611mV, max accuracy ±5mV;</p> <p>Discrete pulled up - $0V < V_{il} < 0.25V$; $0.25V < V_{ih} \leq 30V$</p> <p>Discrete wet (configurable levels)</p>
Outputs	5 general purpose open drain outputs (250mA max) with assignable functionality

Interfaces

Voice Interface	Cellocator hands free compliant Full duplex Echo cancelation Noise suppression Spy listening option Auto-answer option Volume control by single button or two buttons Distress voice call and plain call generation
COM (RS232) port	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 Firmware upgrade
Debug port (RS232 out)	External Monitoring of Modem-CPU dialog 115000bps True RS232 levels 8 bit; 1 Stop Bit; No Parity
1-Wire™ (Dallas port)	DS1990A compliant Driver management Car Alarm Authorization
Accelerometer	3D, 2g/8g range, <70mg resolution, I2C interface
Connectors	20pin Molex, Automotive SMA switch for optional external GPS Antenna
Power	
Input Voltage	7-32VDC
Average Current consumption	Normal: 40mA Economic: 23mA Hibernation: <2mA Shipment (Off): <20uA (Internal Battery)



Internal Battery	Li-Ion Polymer, 3.7V, 900mAh, rechargeable Embedded NTC for temperature controlled charging. Operating Temperature: -20 (65% charge) to 60°C.
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Internal Battery	Battery Monitoring: Temperature (NTC) & voltage Autonomy: Up to 200 Tx @ 1Msg/min @ 25°C Protections: over current, overcharge and over discharge
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Vehicle environment immunity

Immunity	Compliant with ISO 7637 test level #4 (in accordance with e-mark directive)
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Environment

Temp, operating	-30°C to +70°C full performance -40°C to +85°C – degraded communication
Temp, storage	-40°C to +85°C

Humidity	95% non condensing
Protection	IP40
Vibration, Impact	ISO 16750
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 Automotive Directive 2004/104/EC (E-Mark)
IC	Industrial Canada
PTCRB	TRP, TIS, Spurious and harmonics emission

Dimensions & Weight

Dimensions	91x73x23mm
Weight	110gr

FOR MORE INFORMATION

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