

Cellocator™ CelloTrack 10y USER Manual



Cellocator Division
Pointer Telocation Ltd.

Proprietary and Confidential

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POINTER



CelloTrack 10y Overview



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FCC Compliance Statement

The FCC Wants You to Know

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause such interference, which can be verified by turning the device off and on, the user is encouraged to eliminate the interference by one or more of the following measures:

Re-orient or re-locate the receiving antenna.

Increase the distance between the device and the receiver.

Connect the device to an outlet on a circuit different from the one that supplies power to the receiver.

Consult the dealer or an experienced radio/TV technician.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This device complies with FCC Rules Part 15 and with Industry Canada licence-exempt RSS standard(s). Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may be received or that may cause undesired operation.

- a) Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes :(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

This device complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment.

The device should be installed and operated with a minimum distance of 20cm between the radiator and your body.

This device must not be collocated or operating in conjunction with any other antenna or transmitter.

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1 Introduction

1.1 About this Document

This document provides a brief overview of the CelloTrack 10y. It includes descriptions of CelloTrack 10y special features and modes of operation, battery life tables and technical specifications.

1.2 Abbreviations

Abbreviation	Description
FB	Front Button
GSM	Global System for Mobile communications
GPS	Global Positioning System
GNSS	Global Navigation Satellite System
OTA	Over the Air
SMS	Short Message Service (GSM)
IP	International Protection Rating
3Y	Three Years
8M	Eight Months
AH	Amper Hour
3D	3 Dimensions
LED	Light Emitted Diode
APS	Automatic Power Save (modem feature)
GPIO	General Purpose Input / Output

1.3 References

#	Reference	Description
1		
2		

1.4 Revision History

Version	Date	Description
1.0	May 29, 2018	Initial release



2 The CelloTrack 10y

2.1 CelloTrack 10y Overview

Cellocator's CelloTrack 10y, designed for advanced asset tracking and asset management applications, provides enhanced functionality, ease of installation and support for a wide range of applications.

The capabilities provided by the CelloTrack 10y can greatly reduce an enterprise's financial losses incurred as a result of the often difficult task of successfully tracking and remotely managing the location, usage profile and security aspects of transportation equipment such as trailers, containers, train wagons or any kind of valuable mobile asset such as electricity generators, heavy machinery, chemical toilets and waste containers.

The CelloTrack unit is designed for unpowered assets. It is ideal for trailers, containers, trains and other high value mobile assets.

The unit includes a USB connector for programming, covered by a rubber cover for dust and water protection (IP67).

The CelloTrack 10y provide a durable and long life solution that support up to 10 years of continuous operation with single GNSS reading and Cellular transmissions per day.

The CelloTrack 10y supports the required network standards for NA and supports all the big service providers and their affiliates, such as AT&T, T-Mobile, Telus and Rogers.

The CelloTrack 10y is based on Cello and CelloTrack Technologies and supports similar tracking, communication, GNSS location-based features and maintenance capabilities as per those available in the Cello and CelloTrack families.

Other CelloTrack 10y features include:

- ◆ Stand-alone tracking device. Can be installed and operated for long time periods without a power supply.
- ◆ Houses all components in the same enclosure, including battery, GNSS positioning engine, Cellular modem and antennas.
- ◆ Highly rugged durable IP67 weatherproof casing for outdoor long-life service, with brackets for easy mounting.
- ◆ Long operation time (up to 10 years @ 1 transmission / day) via a 42.5 Ah of primary Lithium-thionyl Chloride (Li-SOCl₂) battery capacities.
- ◆ design for minimum idle current consumption on hibernation
- ◆ Support NA LTE network with user equipment category CAT 1.
- ◆ Scalable Cellular communication technology – can support any cellular network supported by Cinterion modem family .
- ◆ CSR SiRFstarV™ based, GPS and GLONSS, positioning engine for reduced acquisition time and better accuracy.
- ◆ Support Wireless Sensor Network and up to 16 MultiSense devices
- ◆ A 3D accelerometer that detects crash (accident), movement and vibrations of assets and enables different transmission rates for a moving asset and a standing asset.
- ◆ A programmable (on/off/test/panic) push button.
- ◆ Two monitoring LEDs for GSM and GNSS status indication.
- ◆ A charging and communication connector.



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- ◆ Easy mounting using screws or magnets.
- ◆ tampering detection
- ◆ Designed for operation w/o or minimal maintenance. (environment tests, Halt tests, Formal reliability assessments)
- ◆ Operating temperature range -30°C to 75°C
- ◆ ISO16750 compliance (Shock, temperature, humidity, UV, chemical, salt, and so on)
- ◆ Supports up to 9000 time-stamped events.
- ◆ Support variety of operation (logging and reporting frequency) profiles to meet required transmissions and power budget
- ◆ Advanced carrier selection algorithm.
- ◆ Built-in Geo-fence capabilities.
- ◆ Support an internal USB connector allowing RMA and debugging.
- ◆ Support OTA FW upgrade (FOTA).

2.2 The Need / Use in the Field

The following applications / markets require a solution which can be only provided or better provided by the CelloTrack 10Y, based on a non-rechargeable battery.

- ◆ Nearly or completely static assets located in difficult to reach locations where CelloTrack or CelloTrack Power cannot be used / maintained. In such cases, CelloTrack LL will be a better economic solution than the regular CelloTrack.
- ◆ Assets which can be maintained only after a very long period, such as train cabins with maintenance period of 5-6 years.
- ◆ Customers who prefer minimum maintenance to units and who will use the product which has the longest life period.
- ◆ Install and forget applications; the unit is installed for several years after which the vehicle or asset are no longer important. For example: long term leasing where the unit is needed to track the vehicle / asset in case of payment issues. Once the last payment is received the unit is no longer needed.
- ◆ Tracking as an integral part of the asset applications, where the unit life matches the estimated life of the vehicle / asset. For example, a container's life time is estimated to be 10 years; a practical solution would be a CelloTrack with a 10 year life time, which will be an integral part of the container with no maintenance needed.
- ◆ Applications which require extreme operating temperatures in which charging is impossible or rechargeable batteries do not perform well.

2.3 Main Advantages over the Regular CelloTrack

- ◆ Longer life time between maintenance procedures
- ◆ Low maintenance efforts and cost
- ◆ Wider operating temperature range (-30°C to 75°C instead of -20°C to 60°C)



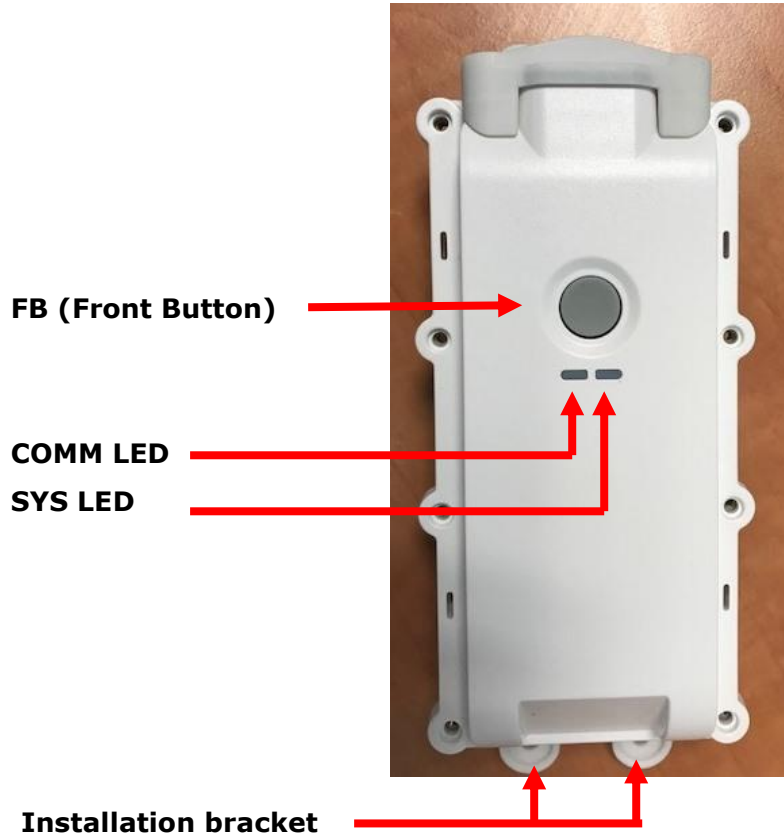
2.4 CelloTrack 10y Feature List

The following list details the features and capabilities of the CelloTrack 10y. These features are actually a combination of the Fleet management capabilities derived from Cellocator's Cello product line and specific asset management capabilities designed solely for the CelloTrack family.

- ◆ Geo-Fences (100)
- ◆ Way Points
- ◆ Roaming List (100)
- ◆ Usage counters (PTO)
- ◆ Server authentication
- ◆ Automatic SIM PIN lock
- ◆ DNS support
- ◆ Virtual odometer
- ◆ Road curve smoothing
- ◆ Offline Tracking
- ◆ Wake up event
- ◆ Movement detection
- ◆ Crash detection
- ◆ Time based events (adaptive to movement status)
- ◆ Specific time (in day) reporting
- ◆ Distance based events
- ◆ Velocity Adaptive message rate
- ◆ Home/Roam adaptive message rate
- ◆ Distress reporting mode (higher priority)
- ◆ Over speeding alerts
- ◆ Go/Halt reports
- ◆ Internal excessive temp
- ◆ A/D threshold events
- ◆ Frequency threshold events
- ◆ GNSS status events
- ◆ Watchdog
- ◆ Battery level reporting
- ◆ Network dependent traffic Opt
- ◆ Cellocator+ (Maintenance) server support
- ◆ OTA/Serial Firmware upgrade
- ◆ OTA/Serial configuration update

3 CelloTrack Interfaces

3.1 The CelloTrack Interface



- ◆ The Front Button allows activation/de-activation, battery status check, battery replacement sequence, and MultiSense communication pairing.
- ◆ The SYS LED is a dual color (Green and Red) LED, which indicates unit activation/de-activation, panic, and battery status/replacement.
- ◆ The COMM LED is a dual color (Green and Red) LED, which indicates the unit Cellular communication and position status.

3.2 CelloTrack COMM LED description

3.2.1 Overview

The COMM LED shall be used to indicate unit Cellular communication and position in Green light.

The blinking pattern is constructed from cycles of 2 blinking zones each, which will be repeated by unit continually. The first zone represents the functionality of Cellular communication (GSM), the second zone – the GNSS status.

Each zone will last 3 seconds with 1 second of LED off interval between them. 5 seconds LED Off interval will separate between each cycle.



4 CelloTrack 10y Specifications

4.1 CelloTrack 10y Specification

Communication	
Cellular communication	LTE Cat 1 NA with 3G Fallback LTE NA: Bands 2, 4, 5, 12 (700, 850, 1700/2100 (AWS), 1900 MHz), data rates: 10.2[DL] / 5.2[UL] Mbps 3G NA: UMTS Bands 5, 4, 2 (850, 1700/2100 (AWS), 1900); HSPA 5.76[UL]/7.2[DL] Mbps Packet Data: TCP/IP, UDP/IP SMS: PDU mode
SIM	Internal, full size replaceable, 1.8/3V Optional SIM on chip Remote PIN code management
Antenna	Internal, multi band antenna
GNSS	
Technology	Internal module, CSR SiRFstarV™ based GPS and GLONSS supported.
Sensitivity (tracking)	-165dBm
Acquisition (normal)	Cold <27 Sec, Warm<10 Sec, Hot<1 Sec
Antenna	Internal, on board patch antenna
Interfaces	
COM port	Via USB 2.0 interface over standard micro-USB connector Debug, Configuration, FW upgrade
3D Accelerometer	3D, ±8g range, 12 Bit representation, 4mg resolution Movement detection
MMI	2 dual colored LED status indication Activation / Distress button Reed relay and magnet based Tamper detection
Wireless	2.4 GHz Proprietary wireless interface for MultiSense integration.
Power	
Internal Battery	lithium-thionyl chloride (SOCl ₂), 3.6V, 42.5 Ah, primary (non-rechargeable)
Average Current Consumption	On taking location and transmission session: 85mA



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	Hibernation: < 130 μ A Shipment (Off): < 80 μ A
Environment	
Temp, operating	-30 $^{\circ}$ C – 75 $^{\circ}$ C.
Temp, storage	0 $^{\circ}$ C – 30 $^{\circ}$ C (battery limitation)
Humidity	95% non-condensing
Ingress Protection	IP67
Vibration, Impact, Humidity, chemical	ISO 16750 part 3 & 4
Mounting	Screw or magnetic mounting
Regulatory compliance / certification	
CE	CE Safety EN60950-1:2001+A11:2004
FCC	Part 15 Subpart B, part 22/24 compliant
IC	ICES-003, Issue 5:2012 Class B. CAN/CSA-CEI/IEC CISPR 22:10
PTCRB	TRP, TIS, Spurious and harmonics emission
AT&T	Yes
Environment	ISO 16750 part 3 & 4
UL	compliant
Reliability assessment	Annual Failed Ratio <0.5%
HALT (Highly Accelerated Life Test)	passed
RoHS and conflict minerals	compliant
Dimensions & Weight	
Enclosure material	Lexan 943
Dimensions	~203mm x 81mm x 50mm
Weight	~ 510 gr

4.2 CelloTrack 10y – 42.5 AH Battery Life

TX / 24Hrs	Life time [years]
96	0.35
48	0.7



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TX / 24Hrs	Life time [years]
24	1.3
12	2.4
8	3.3
6	4
4	5.2
2	7.8
1	10.7