CelloTrack™ Nano Power Harness

Product Overview

Cellocator
– BY POINTER –

Proprietary and Confidential

Version 1.2

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POINTER

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1 Introduction

1.1 Scope and Purpose

The purpose of this document is to describe the features and capabilities of the CelloTrack Nano Power Harness, an add-on to the CelloTrack Nano family. It includes a description and technical specifications of the Harness, as well as installation instructions.

The document is intended for TSPs or IT integrators who want to permanently power the CelloTrack Nano device with a robust connector that is compatible with any vehicle.

The document is intended to provide all the required information for customers, customer support, and sales personnel.

1.2 Abbreviations

Abbreviation	Description
TSP	Telematics Service Provider
IT	Information Technology
GPIO	General Purpose Input / Output

1.3 References

All the reference documents listed in the following table can be searched for and downloaded from the Knowledge Base section of the Cellocator website (www.Cellocator.com).

#	Reference	Description
1.	CelloTrack Nano Introduction	
2.	CelloTrack Nano Installation Guide	
3.	CelloTrack Nano and MultiSense User Guide	

1.4 Revision History

Version	Date	Description
1.0	9/06/2016	Initial version
1.1	17/9/2018	Added warning in section 3.2
1.2	17/7/2019	Added Nano Power Harness with Lighter variant

2 Solution Overview

2.1 Overview

The CelloTrack Nano Power Harness is intended for use as a robust connectivity to power source for the CelloTrack Nano hub, while also providing one dry contact outlet.

The Power Harness is an add-on to the CelloTrack Nano family, ensuring its compatibility with existing models and part numbers belonging to the CelloTrack Nano family.

2.2 Dry Contact input

The 5th pin of the 5-pin connector for the CelloTrack Nano hub can be used as a dry-contact input. For more details, see section 3.5 below.

Nano Power harness can be used only with Nano devices manufactured after January 2016.

2.3 Highlights

This section includes the main features and highlights of the Power Harness.

- Uses the existing Nano cradle, together with the Nano Power Harness accessory.
- Easy and intuitive to install. See Installation for more information.
- Low cost solution.
- Input: 6-32V (meaning voltage from a variety of vehicles, ranging from motorcycles to trucks).
- Output: 5V.
- On-harness adapter means there is no need for adapter maintenance (the adapter also supports all standards for vehicle power protections).
- Dry contact input via the 5th pin of the 5-pin connector for the CelloTrack Nano hub.
- IP66 compliant
- Harness length: 130cm

2.4 Nano Power Harnes components

The Nano Power Harness requires the following items listed in Table 1 below.

Name/Part Number	Description	Picture
715-50400	CelloTrack Nano Power Harness	
715-50402	CelloTrack Nano Power Harness with lighter connector	
805-60903	CelloTrack Nano Cradle KIT	

Table 1: CelloTrack Nano Power Harness Components

3 Installation

This section describes how to first connect the Power Harness to the Nano cradle, and then how to install the Nano device in a vehicle (together with the connected Power Harness).

3.1 Connecting the Nano Power Harness to the Nano Cradle

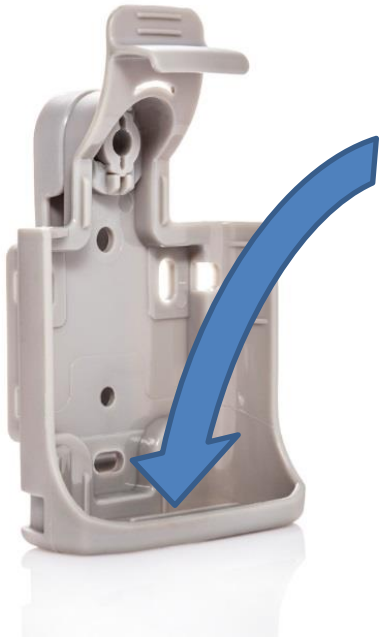
This section describes how to connect the Nano Power Harness to the Nano hub together with the Nano cradle. Once the Harness is connected with the Nano hub, the Nano hub can be inserted to the cradle and the internal battery recharged via external (vehicle) power.

➤ **To connect the Nano Power Harness to the Nano Cradle:**

1. Remove the silicon enclosure of the micro USB connector on the Nano hub by pressing on the slot with a screwdriver, as shown below.

2. Ensure the Nano is slotted securely into Nano Power Harness silicon casing, as shown in the image below. Make sure to connect the Nano Power Harness connector to the micro-USB connector of the Nano hub (the male micro-USB connector connects to the female micro-USB on the Nano hub).

3. Thread the Nano Power Harness through the bottom of the cradle (USB slot), ensuring the cable end is threaded through first. The connector end attached to the Nano hub should then slot into the bottom of the cradle, as shown in the following images.



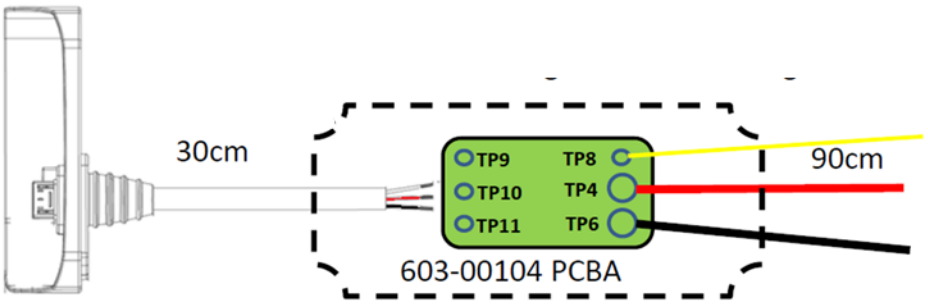
4. Make sure the Power Harness is connected securely to the Nano hub, and that the Nano hub is fastened securely within the cradle.

   Note that the Nano Power Harness does not cover the small hole within the silicon casing for the barometric pressure sensor at the bottom of the Nano hub.

   You can now install the Power Harness and connected Nano cradle into the relevant vehicle, as described in the following section.

3.2 Pinout Scheme of Nano Power Harness

The following image shows the Power Harness pinout scheme.



	COLOR	DIAMETER
TP8	YELLOW	22AWG
TP4	RED	16AWG
TP6	BLACK	16AWG

3.3 CelloTrack Nano Power Harness with Lighter

This special harness variant (P/N 715-50402) is for installing inside the vehicle.

The harness is connected in the same way to the Nano as the Cellocator Nano Power harness, but instead of having a three-wire connection, it has a vehicle lighter connection, which connects to the vehicle's cigarette lighter socket.

This harness is the same length as the regular Nano Power harness.

NOTE: Even though the lighter has an LED indicator, the LED does not function.

In addition, note that the Nano Power harness with the lighter connection adheres to IP66 on the Nano side, but not on the lighter connection end.

3.3.1 *Embedding the Harness inside the Nano's Cradle*

In order to embed the Nano Power Harness with lighter into the Nano cradle, you need to insert the soft silicon inside the USB hole on the Nano cradle, as shown below:

Stage 1

Stage 2

Stage 3

CAUTION: To avoid possible bodily injury, or damage to the vehicle, the installer must be a certified technician who has been qualified to install the system.

WARNING: Connecting the CelloTrack Nano to the vehicle power should be done ONLY by using Cellocator approved accessories (such as the Nano Power harness). Using any other accessories may harm the unit and invalidate the Cellocator warranty.

3.4 Installation guideline

3.4.1 *Safety Instructions*

- Do not mount the device in a possible impact zone in the passenger area or in airbag unfolding area. A device pushed by an inflating airbag may cause serious injury.
- Do not attempt to operate a defective product. If you find a defect, please contact Cellocator Customer Support.
- Attempts to repair the system by unqualified personnel can be dangerous. Only qualified staff should be authorized to carry out inspections.

3.4.2 *Location of the CelloTrack Nano and Power Harness*

When locating the CelloTrack Nano and Power Harness please consider the following:

- The device is designed to meet IP66 and is therefore immune to the penetration of water, rain, dust, dirt and smoke to that degree. If you need special solutions to special environmental conditions, please consult your customer support or account manager.
- The device will not function well in excessive temperatures beyond its operation temperature range specifications (see the *CelloTrack Nano Product Overview* specifications for details).
- The device requires minimal maintenance.

3.4.3 *Device Orientation*

The Nano device should have a clear sky view to improved GNSS sensitivity, unobstructed by any metal or shields. Plastic, wood and glass do not usually affect reception.

3.4.4 *Installing the CelloTrack Nano*

This section describes how to install, or mount, the CelloTrack Nano hub and Power Harness.

Note that although you can install and mount the CelloTrack Nano and Power Harness as is (with standard double-sided tape), in order to preserve the unit and to ensure it can be reused and relocated in the future, we recommend you use the additional kits mentioned in each procedure in the following sections.

In addition, note that the Nano hub has a power on/off button. If required, install the Nano hub in such a way that enables the user to have access to that button.

3.4.4.1 Mounting the CelloTrack Nano and Power Harness

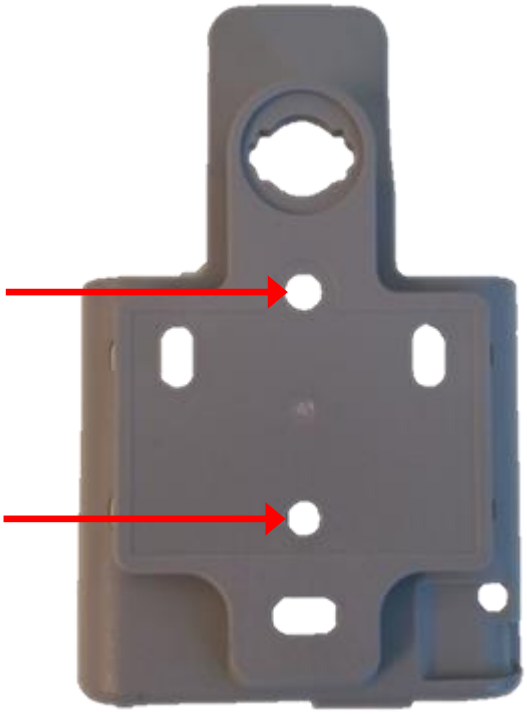
Using the Nano cradle, you can mount the Nano hub together with the Power Harness in the following ways:

- Using two coin magnets to attach the hub to a metallic surface.
- Using three screws to attach to non-metallic surfaces.
- Using double-sided adhesive tape.
- Using cable ties.

Note that once you have mounted the Nano cradle using one of the above methods, the Power Harness itself should be fastened to the vehicle using cable ties.

➤ **To mount the CelloTrack Nano to a metallic surface:**

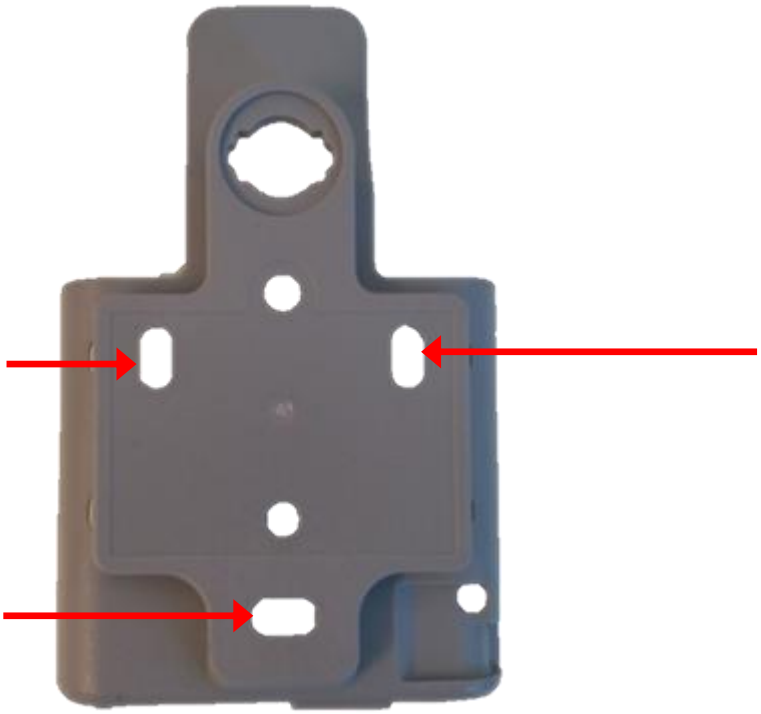
1. Using the **CelloTrack Nano Magnetic Cradle Kit** (which includes the cradle, two magnets, and two screws), insert the two screws into the two round holes on the cradle unit, as indicated below, and screw them into the coin magnets, making sure the magnets are facing out.



2. Thread the Nano Power Harness and the connected Nano hub through the Nano cradle, ensuring the Power Harness is securely connected to the Nano unit.
3. Attach to the required metallic surface.

➤ **To mount the CelloTrack Nano hub to a non-metallic surface:**

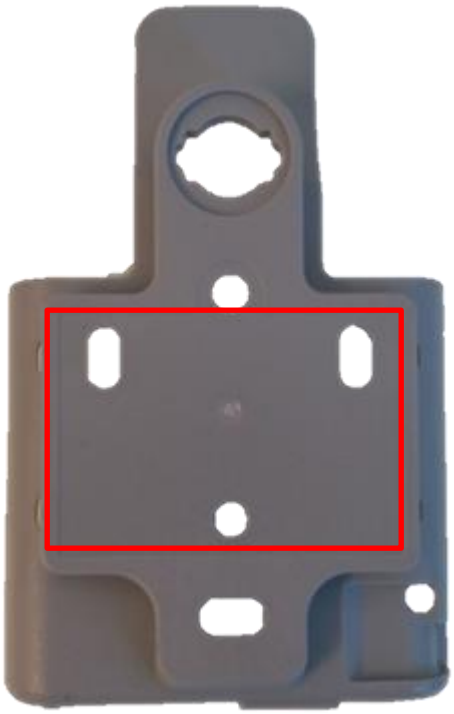
1. Using the **CelloTrack Nano Cradle Kit** (which includes the cradle, three screws, and double-sided adhesive tape), insert the three screws into the three ellipse-shaped holes on the cradle unit, as indicated below, making sure the screws are facing out.



2. Screw into place (on a non-metallic surface).
3. Thread the Nano Power Harness and the connected Nano hub through the Nano cradle, ensuring the Power Harness is securely connected to the Nano unit.

➤ **To mount the CelloTrack Nano with the double-sided adhesive tape:**

1. Using the **CelloTrack Nano Cradle Kit** (which includes the cradle, three screws, and double-sided adhesive tape), place the double-sided adhesive tape in the rectangular area on the back of the cradle, as indicated below.



2. Thread the Nano Power Harness and the connected Nano hub through the Nano cradle, ensuring the Power Harness is securely connected to the Nano unit.
3. Attach to the required surface.

➤ **To mount the CelloTrack Nano with cable ties:**

1. Using two cable ties (not supplied), run each cable tie through the small holes that are accessed from the side of the cradle, as indicated below.

2. Attach to the required surface by fastening the cable ties to a suitable mounting point.
3. Thread the Nano Power Harness and the connected Nano hub through the Nano cradle, ensuring the Power Harness is securely connected to the Nano unit.

3.5 Working with the Dry-contact input

The 3rd (Yellow) wire of the harness is the "Dry-contact input", which means it can detect either "Short" (to GND) or "Disconnection" (from GND), usually fed from a dry-contact output.

In addition, high voltage (6-32V) will be considered as "Disconnection".

Its binary state is always reported in the I/O first byte in Type-0 (as well as at encapsulated module-41). See the following excerpts from the wireless protocol doc:

1st Byte of I/O Status

CelloTrack Nano	Package is open	USB power connected	Movement sensor	Button_1		GP input1 (Power harness)	Button_2	Tamper Switch
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

There is a set of PL parameters related to the configuration of this input (aka GP1):

Name	Value	Type	Address	Units	Size/Bit index
Dry contact input mode selection	0 (Normal)	Bitscript	2046		2/4
Enable GP1 Distress on Falling	0 (Disable)	Flag	0128		2
Enable GP1 Distress on Rising	0 (Disable)	Flag	0130		2
Enable GP1 Event on Falling	0 (Disable)	Flag	0124		2
Enable GP1 Event on Rising	0 (Disable)	Flag	0126		2
Invert GP1	0 (Not inverted)	Flag	0100		2

4 Technical Specifications

Item	Description
Operation Voltage Range	Input: 6-32V (from motorcycles to trucks) Output: 5V
IP	IP66 – Self declaration
Operating temperature range	-20°C to +60°C full performance (based on Nano spec)
Storage temperature range	-40°C to +85°C (based on Nano Nano spec)
Certifications	ISO 7637 comply (E-mark) EN60950 comply (Safety)
Cable length	30 cm between the board to the micro-USB connector 90 cm from the board to contactless cable
Connector type	Micro-USB

Table 2: Technical Specifications