
POINTER
Cellocator Division
Pointer Telocation Ltd.
CELLOCATOR
Cello-IQ Installation & Calibration
Cello-IQ – Driving Intelligence Delivered. January, 2013.

Objectives

By the end of this lesson you will be able to:

- Get familiar with Cello-IQ installation principles and emphases
- Get familiar with Cello-IQ harnesses and accessories
- Understand and manage the calibration process

Topics

- **Introduction**
- Installing Cello-IQ and DFD
- Harness types
- Calibration process
- Troubleshooting & FAQ

Introduction

Cello-IQ functionality is based on continuous sampling of vehicle dynamics

Cello-IQ functionality

- A calibration process is required to compensate installation tilt and rotation of the device
- Driver behavior analysis starts after the completion of the automatic calibration process
- Correct installation of the device is crucial for the success of the calibration process and continuous device functionality

Installation process

Determine Installation Type

- Vehicle type
- Service provided
- Operation scenario

Select Harness Type

- Cello IQ Harness
- Cello Full Harness
- OBD Harness
- Fuse Harness

Select Location

- Select Cello-IQ Installation Location
- Optional - Select Location for external GPS antenna

Installation

- Install Cello-IQ
- Install Cello-IQ and DFD
- Optional - Install external GPS antenna

Validate installation

- Test system communication and functioning

Calibration

- Automatic Calibration

Topics

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Location of Cello-IQ in the Vehicle

- **When choosing location for the device installation within the vehicle, please consider the following:**

Conceal the device

The device is not weather proof

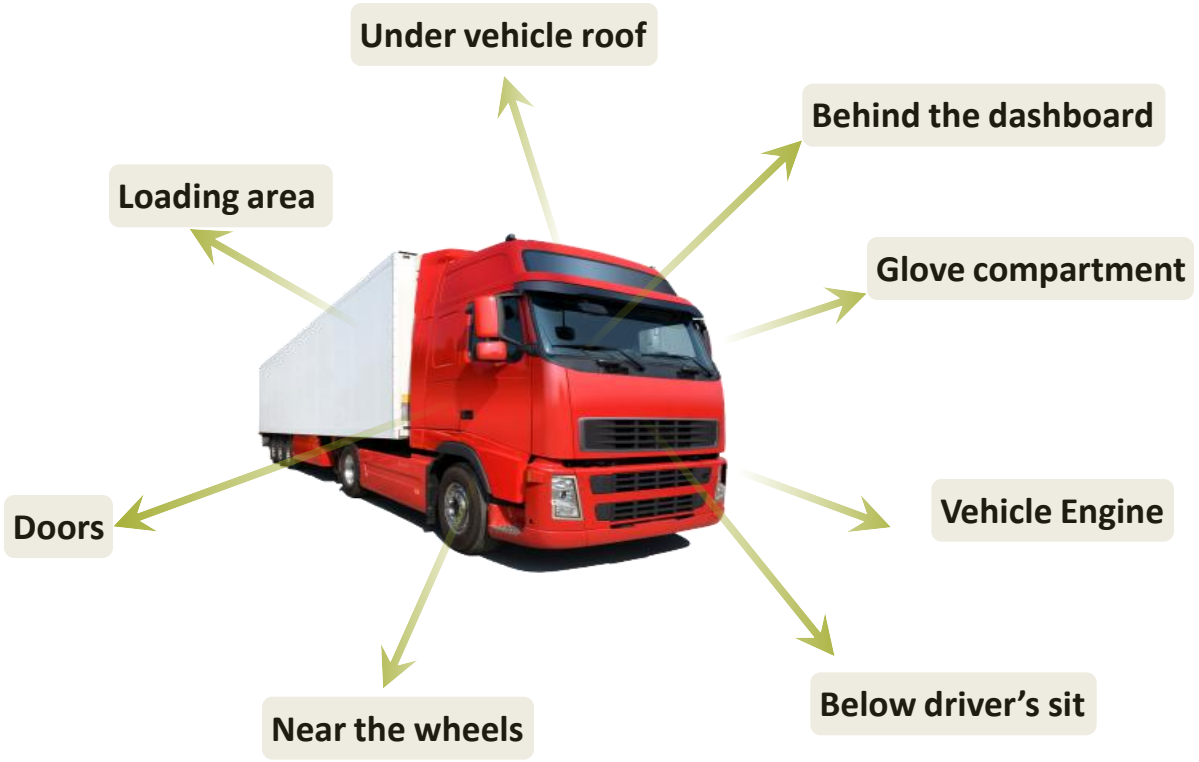
Not in proximity with heating source

Radio energy in GSM & GPS frequencies

Device requires zero maintenance

Location of Cello-IQ in the Vehicle

- **Where would be the best location for the installation?**



- **The most common location is behind the dashboard**
- **For private vehicles, the trunk is also an option**

Location of Cello-IQ in the Vehicle

- **Preferred Locations for Installing vs. Non Recommended Locations**

Best locations

- Behind the dashboard
- In or behind the glove compartment
- Front of the passenger compartment under the console and above the leg space
- Under the driver's seat
- In passenger car's trunk
- External GPS antenna providing greater flexibility - close to the front windshield or rear window

Never Install

- Outside passenger compartment or vehicle trunk
- In the engine compartment
- Inside bumpers or fenders
- Behind the front lights
- In air ducts
- Close to airbags
- Under the vehicle
- In a location susceptible to rain or water
- Inside a metal pocket or box
- In the loading area of a truck or pickup
- Near the fuel tank
- Near the wheels
- Near any radio transmitter or its antenna

Installing Cello-IQ

- **Rigid installation**

- Avoid installation near a moving or rotating part of the vehicle
- Preferably attached to the vehicle's chassis or a solid part strongly attached to it
- Use thick double-sided adhesive and plastic ties to secure the device firmly to its location

Installing Cello-IQ

- **Ensure optimal reception**

- Keep at least 30 cm between the device and any computerized system in the vehicles, to avoid electromagnetic interference
- Install the device face up with a clear sky view
- Avoid installing under a metal cover or within metal pocket or box
- Lookout for transparent metallic coating on windows
- In these cases, use external GPS antenna and consult with the dealer regarding best locations for installation

Installing Cello-IQ

- **Device protection**
  - Avoid installation exposed to a direct sun light
  - If installing inside doors space, make sure it is not susceptible to cleaning water and rain
  - Conceal device to avoid theft

Device Orientation

- **The device orientation may influence reception and calibration process**

"This side Up" installation

Clear sky view

Up to 60 degrees tilt/rotation

Using External GPS Antenna

- **Best Practices when using an external GPS antenna**

- As close as possible to unshielded glass of the front windshield
- Facing upwards with a clear sky view
- Unobstructed by any metal
- Not blocking driver's view
- For concealment , place it directly under front console facing upwards
- Consider antenna cable length
- Do not bend coaxial cable to less than 3 cm radius
- Secure antenna cable and avoid squeezing or pressing it
- Attach it firmly by using adhesive tape

Installing DFD

- **When installing the DFD (Driver Feedback Display):**
  - Select a location that provides clear view of the device display without taking driver's eyes off the road
  - Make sure it does not block driver's view of the road
  - Rotate device to be angled towards the driver's face
  - Avoid direct sun light for device protection and better view of lights and icons
  - Mount it to the dashboard using either double-sided adhesive or screws
  - Connect the DFD cable to the DFD thread of the Cello-IQ harness

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Introduction

- **There are 4 types of harnesses available for Cello-IQ**
  - Cello-IQ Harness
  - Cello Full Harness
  - OBD Harness
  - Fuse Harness

Cello-IQ Harness

- **The Cello-IQ utilizes a special harness, PN 711-00299**
  - Harness designed for DFD connectivity and common DBM operations
  - Special connector that fits the DFD cable connector for easy installation
  - Dallas (driver identification) , LED, I/O ports supported
  - Voice kit not supported

Cello Full Harness

- **The full harness (PN 711-00196) for Cellocator Cello unit**
  - 15 jacketed cables, connected to a 20-pin connector
  - Enables utilization of all available interfaces such as I/O, driver identification devices, hands free kit, serial communication external device (including DFD) etc.
  - Allows for future expansion of other device I/Os

OBDII Harness

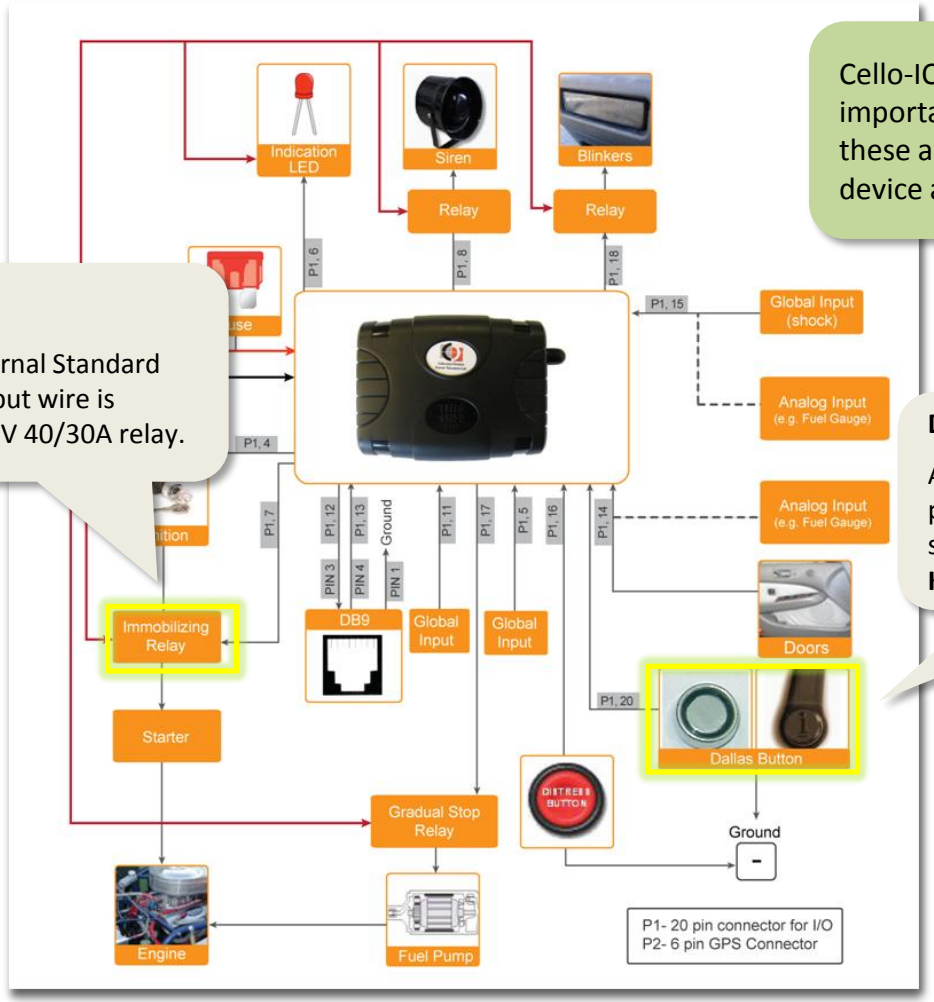
- **711-00250 OBDII Harness for fast and easy installation**
  - 2-wires power only harness
  - Connects the Cello unit to an OBDII standard connector in the vehicle or driver cabin
  - Very fast and easy installation that doesn't require professional technician
  - Ignition sense replaced by 3-D accelerometer movement and engine status detection embedded in Cello-IQ unit
  - Attractive low cost solution for rental or leased cars, vehicle owners, low-end fleet management etc.

Cellocator Fuse Harness

- **Fuse Harness for quick and easy installation**
  - 2-wires power only harness
  - Connects Cellocator unit to a standard or mini fuse holder, located in a fuse box in the vehicle or driver cabin
  - Shortens installation time dramatically when simple track and trace applications are involved
  - Ignition sense replaced by 3-D accelerometer movement and engine status detection embedded in Cello unit
  - Attractive low cost solution for many applications

Cello-IQ connectivity

- **Connectivity to important interfaces for DBM applications such as Driver identification device and Immobilizer**



Cello-IQ support different applications that are important for **Driving Behavior Management**. Among these accessories you'll find the Driver Identification device and the Immobilizer.

Immobilizer

The harness External Standard Immobilizer Output wire is connected via 12V 40/30A relay.

Driver Identification

An electronic component which provides driver identification. Cello-IQ support **Dallas button, Cellocator Keypads** and **RFID.**

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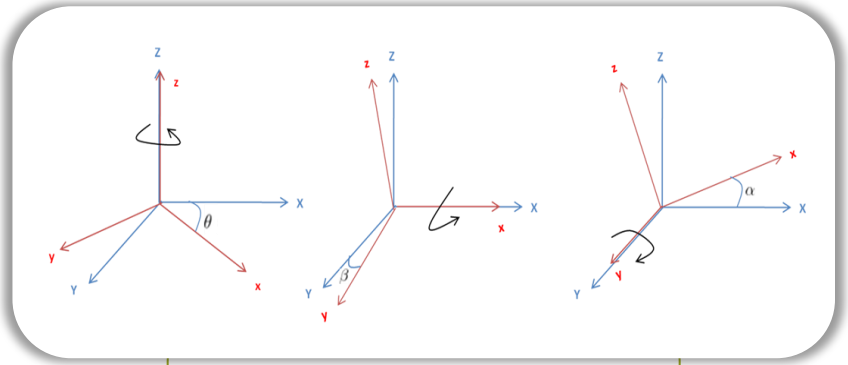
Introduction to calibration

Cello-IQ installed

Automatic
Calibration phase



Elevation and rotation angles

Calibration problems notifications

2-5 driving hours calibration

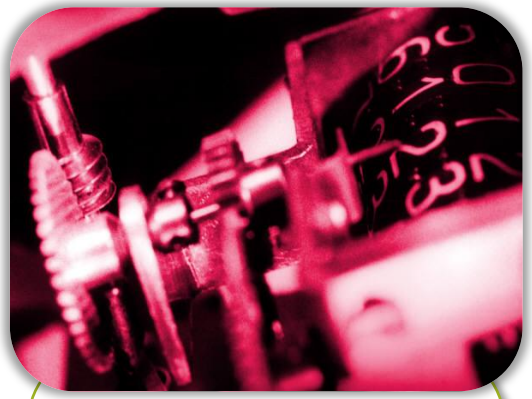
"Gravity-free" Vehicle Movement Dynamics

Introduction to calibration

- **Cello-IQ functionality is depended on an accurate calibration process**
  - Calibration process results in a calibration matrix, which compensates installation tilt and rotation of the device
  - The device functionality will start upon a successful calibration
  - On-board automatic calibration frees the installer from aligning the device to the vehicle movement direction or ground level
  - Requires device orientation of less than 60 degrees tilt, facing up to sky view
  - Calibration process normally last 2-5 driving hours
  - The calibration matrix can be obtained at any time

Calibration methods

- **There are 2 methods to operate calibration:**



Automatic calibration

Calibration during normal driving is needed to determine the orientation of the equipment in a vehicle.

Manual calibration

Operated during evaluation / debugging in order to accelerate calibration time in a newly installed device.

How to start calibration?

- **A calibration process will start upon three events:**

Automatically

- This process begins automatically upon power up if the unit is not found to be already calibrated

Manually

- Triggered by a command from the server

Upon Calibration Error Detection

- If enabled, upon detection of error, an event is initiated to the CSA server then auto-start the calibration process
- If disabled, the system will wait for an OTA calibration command

What happens during calibration process?

- **During the calibration process, the unit learns its exact position relative to the driving direction and ground level**
  - Calibration is identified as a CSA event - a message containing general information of an occurrence including GPS stamps
  - During calibration the system will detect and analyze only Idling, Speeding and Excessive RPM events

What happens during calibration process?

The Calibration goes through 2 phases

- Stationary events and decelerations are detected and analyzed during the 2 phases in order to calculate the compensation required for the unit's installation orientation

Each phase is a test (step) repeated until convergence is reached

- Non similar test result will fail the step

Multiple steps without convergence causes Calibration Failure

- Non secured unit that changes position during vehicle movement, might cause calibration failure

Unit starts functioning on calibration success

- Only **Over Speeding**, **Excessive Idling** & **Excessive RPM** detected during calibration
- **Off Road** calibration starts upon phase 1 completion and managed independently

Process status monitoring

- **How will you know the calibration status?**

In Cab

- **Phase 1**
- DFD will display Green Led light in the color array display
- Idling, speeding and Excessive RPM visual and audio notification only
- **Phase 2**
- DFD will turn off Green light and display Yellow Led light in the color array display
- Idling, speeding and Excessive RPM visual and audio notification only
- **Calibration Success**
- DFD starts visual and audio notifications for ALL maneuvers

Server

- **Phase 1**
- Continuous report of Calibration state thru CSA Events
- **Phase 2**
- Continuous report of CSA Event for each step
- Total of 20 notifications for all steps
- **Calibration Success**
- Event sent with reason of Calibration status - **success**
- Calibration matrix sent to server
- Status bit **ON**
- **Calibration failure**
- No completion of calibration process
- Calibration Auto-Start initiated over and over again
- Event sent with reason of Calibration status - **Error**

Manual calibration

- **How can you shorten calibration process time?**
  - Manual calibration can be operated in order to accelerate the time to reach calibration
  - Calibration process can be done within less than 30 minutes
  - Manual calibration involves idling events and decelerations performed as detailed in the **CSA Programming Manual**
  - Any type of reset in the middle of a stage will restart it

Replacing a unit

- **What happens if the unit needs to be replaced?**
  - If installed at exactly the same location and deviation, there is no need for re-calibration
  - If not re-installed exactly at the same previous position, the unit will not behave correctly. Therefore, It is crucial to send "calibration leave" and "calibration start " commands

Cellocator Cello-IQ – Let’s take a ride

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