When attention matters.

Installation Guide

VERSION 4 APRIL 2022

Europa Incident and Journey Data Recorder

Contents

1. General Description

The **Europa Incident Data Recorder** (IDR) and the associated auxiliary equipment or Add-On units provide a comprehensive recording system for the logging of Journey Data, Incident/Accident Data and Statistical Data for the vehicle it is installed on.

The IDR samples and records vehicle data in combination with on board sensors such as accelerometers. All data is initially stored at high resolution, but if an incident is not triggered after a predefined period the data is then stored at a low resolution to optimise memory usage. Typical inputs include vehicle speed, RPM, foot/hand brake activation and intensity, indicator use, warning devices and any auxiliary equipment that requires monitoring. In addition, Driver Identification may also be logged.

Up to 4Mb worth of data can be stored on the IDR's internal memory; this is enough to record 130,00 events, or the equivalent of approximately 1-3 months depending on configuration worth of journey time and up to 22 incidents/accidents plus several months of statistical data.

Complimenting the IDR are various software tools namely, the Journey Viewer and powerful Incident Analysis Software, which provide vehicle performance, usage and incident information quickly and easily in the form of graphs, charts, reports and statistical data which, together with the IDR's unique logger numbering system, makes any data collected admissible in a court of law. The configuration tool allows set-up and calibration of the vehicle speed, RPM's, together with setting and checking data input signals.

1.1 Data Recorder Identification & Installation Records

Each Data Recorder is allocated its own Logger Number.

This Logger Number is embedded into all data stored within the IDR so that it is easy to cross reference the data collected with the vehicle to which the recorder is installed.

Once installed, all IDR's must be configured and calibrated by an authorised person. To maintain integrity of the data the IDR records the identity of who performed calibration and configuration checks and at what time and date. This process also takes place when data is collected

An authorised person can only access data stored in the IDR. When data is downloaded for analysis the details of the person downloading the data together with details of last calibrated the IDR and when are embedded in the data. It is important therefore never to allow another person use your ID to perform work on the recorder.

These features together with the fact that all data is time and date stamped makes any data collected admissible as evidence in a Court of Law.

In order that the data collected from the unit may be used as evidence in a court of law it is of paramount importance that records of the IDR's configuration and calibration setting are kept in a secure location and can be produced as evidence upon request.

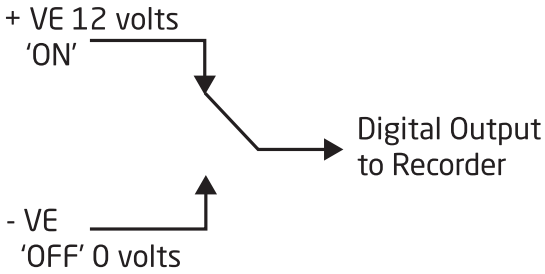
The configuration and calibration data for each vehicle is also required by the analysis software to operate and must be loaded into the computer's configuration files.

1.2 Definition of Digital and Analogue Signals

1.2.1 Digital Signals

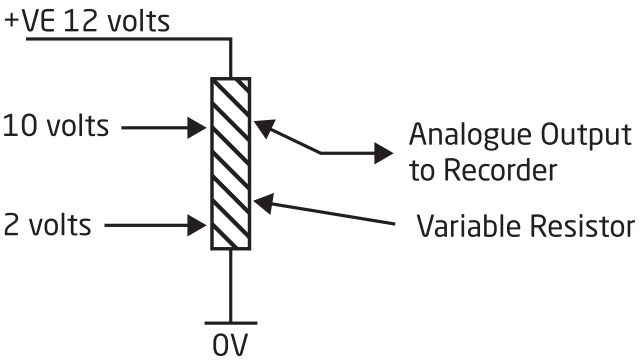
Digital Inputs are signals that are either on or off such as lights, brakes, sirens etc. The **'on'** is normally represented on a vehicle by a **high** voltage (e.g. 12 Volts) and the **'off'** represented by a **low** voltage (e.g. **0 Volts or Ground**).

Where the logic signal is the other way around (**'on'** represented by a **low** and **'off'** represented by a **high**) the input to the IDR is classed as **inverted**.



1.2.2 Analogue Signals

Analogue Inputs are signals that vary between two set points such as a fuel tank that varies between full and empty. On a 12 volt vehicle 'full' may be represented by a voltage of 10 Volts and 'empty' by a voltage of 2 Volts



1.3 Definition of a Journey

In order that the IDR may record the data in a coherent manner that can then be presented in a meaningful way using the relevant software, a journey's start and finish need to be recorded.

A journey is defined as the period when the vehicles ignition is turned on, to the time when it is turned off. Given that the ignition "on" - ignition "off" scenario is applicable, once the driver has turned on the ignition, the data recorder is alerted to a start of a new journey. It begins to take samples of all the monitored inputs at high speed, during the whole extent of the journey. During this period, any changes that occur in the sampled data are recorded and stored in the recorder's on-board memory. This sequence of events continues until the journey ends.

When a new journey begins the IDR stores the data in the memory allocated for journey information, when this memory becomes full the earliest journey is deleted to make way for the next, doing away with the need to download information to ensure that recording continues.

It is recommended that the data stored be downloaded periodically in order to ensure that the system is functioning correctly. Ideally this should be carried out once every 3 months and at least once per year.

1.4 Definition of an Incident/Accident

In order that the IDR may record incident/accident data at higher speed, it needs to be notified when an event takes place.

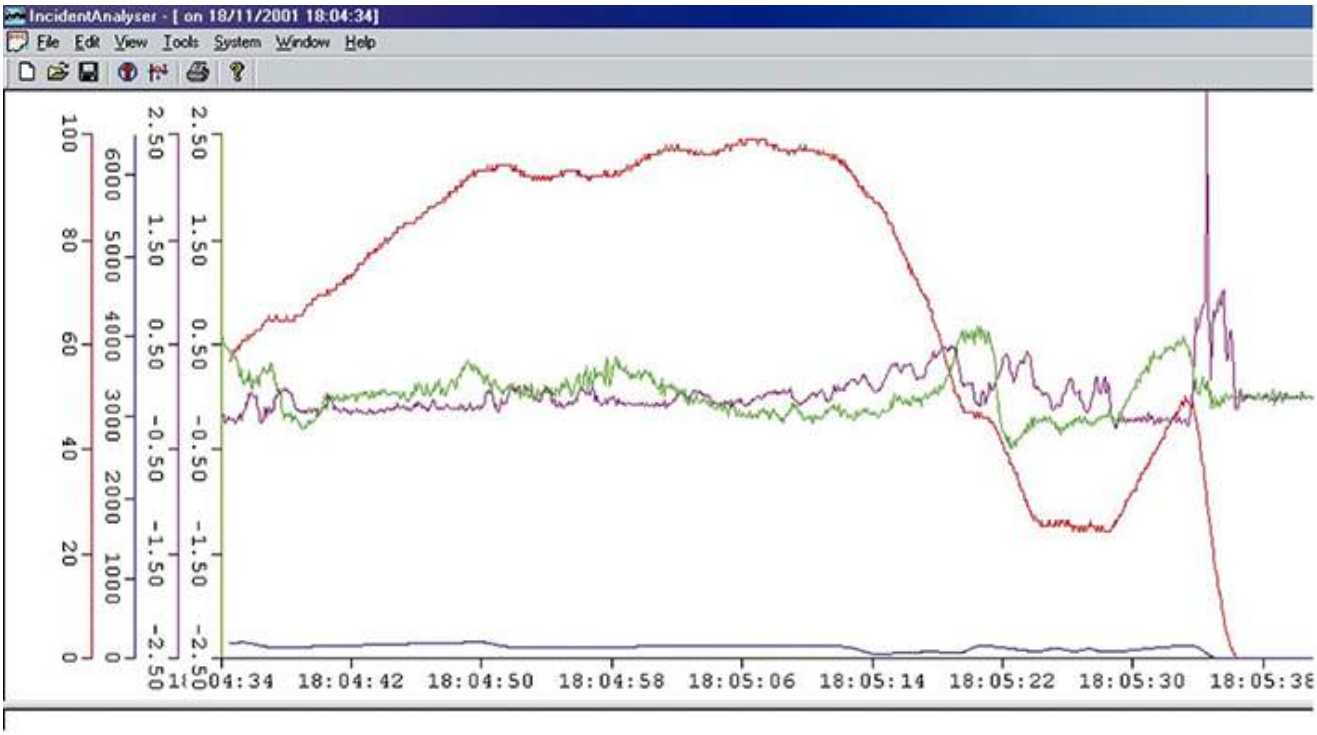
How does the IDR recognise that an event is occurring?

The IDR has built-in on board accelerometers, which measures the "G-Force" undertaken and hence the acceleration and deceleration of a vehicle in both longitudinal and transverse directions.

These accelerometers are set to trip the start of an event when the vehicle exceeds a defined acceleration or deceleration.

When a new event begins the IDR stores the data in the memory allocated for incident information, when this memory becomes full the earliest event is deleted to make way for the next, doing away with the need to download information to ensure that recording continues.

It is recommended that the data stored be downloaded periodically in order to ensure that all systems are functioning correctly.



2. Identifying the Europa IDR Connector

There is one connector on the Europa IDR (refer to the drawing below). The plug is for power, data inputs and data output's and also provides an interface via a fly lead to the Driver ID Receptacle. There is a short usb lead wired to the connector and this can be extended to a maximum length of 5 Metres. The usb lead is used as an access port to a laptop for configuring and calibrating the IDR and an access port to a laptop for direct data collection by accident investigators for example or when no GSM/GPRS communications module is installed.

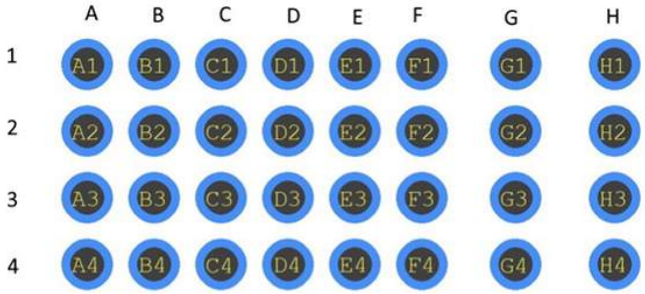
Molex 64334-0100

Plug	Description	Usage
1	32 Way Connector	Continuous Power, Main Outputs, Wired Digital Inputs 1 to 8, Analogue Inputs 1 and 2 and Driver ID, Comms port via USB connector and 2 x CANbus connections sharing up to 32 monitored signals

2.1 Connections to the 32-Way Connector

The 32-way connector is used to provide continuous battery power so that the IDR does not power down when ignition is turned off. The IDR is designed to operate with battery power between 9VDC and 32VDC it also provides the IDR with the essential input signals it needs to operate as well as optional inputs and outputs.

Note: It is important that the pre-designated pin connections are attached correctly to their respective function in order for the IDR to operate correctly.



View Looking into Back of Plug (Cable End)

Pin	Input/ Output	Pre-Designated	Signals
A1	Input	No	Analogue / Digital Input 1
A2	Input	No	Analogue / Digital Input 2
A3	Input	No	Digital Input A (Mappable)
A4	Input	No	Digital Input B (Mappable)
B1	Input	No	Digital Input C (Mappable)
B2	Input	No	Digital Input D (Mappable)
B3	Input	No	Digital Input E (Mappable)
B4	Input	No	Digital Input F (Mappable)
C1	Input	No	Digital Input G (Mappable)
C2	Input	No	Digital Input H (Mappable)
C3	CAN 1 Hi	Yes	**CANbus 1 high connection**
C4	CAN 1 Lo	Yes	**CANbus 1 low connection**
D1	CAN 2 Hi	Yes	**CANbus 2 high connection**
D2	CAN 2 Hi	Yes	**CANbus 2 low connection**
D3	Reserved for Driver ID device	Yes	**Driver ID 1 connection**
D4	Reserved for Driver ID device	Yes	**Driver id 2 Connection**

Pin	Input/ Output	Pre-Designated	Signals
E1	Reserved for Driver ID device	Yes	Driver ID 3 Connection
E2	Reserved for Driver ID device	Yes	Driver ID 4 Connection
E3	Reserved for Driver ID device	Yes	Driver ID 5 Connection
E4	Reserved for Driver ID device	Yes	Driver ID 6 Connection
F1	USB V+	Yes	**USB +ve**
F2	USB D-	Yes	**USB Data -**
F3	USB D+	Yes	**USB Data +**
F4	USB V-	Yes	**USB -ve**
G1	Not Used	No	No Connection - do not use
G2	Not Used	No	No Connection - do not use
G3	Output	Yes	Driver ID Output
G4	Output	Yes	Output 1 (status LED-optional)
H1	Output	Yes	Output 2 (Incident occurred LED - optional)
H2	Permanent Battery +ve Feed	Yes	Un-interrupted Power feed
H3	Ignition +ve	Yes	True ignition power feed
H4	Ground	Yes	Connection to Ground

2.2 Driver ID Interface

The device can be operated in a number of ways; the driver 'kissing' their personal key ring fob, which contains a discrete, uniquely, coded memory device, into a dash-mounted receptacle; a MIFARE Type swipe card; or by entering a unique PIN into a touch pad. Refer to relevant guide.

This, in turn, transfers the coded ID information to the IDR. Driver information is then tagged to the vehicles journey and incident data in order to create a personal range of reports.

As well as using the Driver ID as an identification device it is also possible to use the system to trigger various IDR outputs, therefore, controlling certain vehicle functions based on the drivers identifying themselves. A typical example of this would be locking and unlocking the vehicle's ignition circuit. Thus inhibiting the vehicle's ignition unless the ID action is performed.

The Driver Identification reader will connect via a Molex 6 way connector which will be available on the relevant input loom with the following connections to the 32-Way Connector.

Terminal	Connection
E1	Red Wire on RJ11 Plug
E2	Green Wire on RJ11 Plug
G3	Starter Inhibit Output
D4	Ground

2.2.1 Connecting the HID ProxPoint Plus Reader

The HID Reader is connected to the Europa IDR by way of a 6-Way lead terminated with a Molex type connector. The HID is activated by briefly holding the appropriate ID Card close to the front of the reader. The drivers ID will then be stored in the IDR and will be "linked" to the subsequent journey.

To allow for problems in starting the vehicle, the system will remain activated for approximately 30 seconds to allow for restarts etc.

The numbering of the RJ11 connections is as follows:

Pin Number on Molex Connector	Connection on HID Reader Pigtail
1	Red - +12 volts (5 to 16VCD)
2	White - Data 1
3	Brown - LED (Red)
4	Black - Ground
5	Yellow - Beeper
6	Green - Data 0

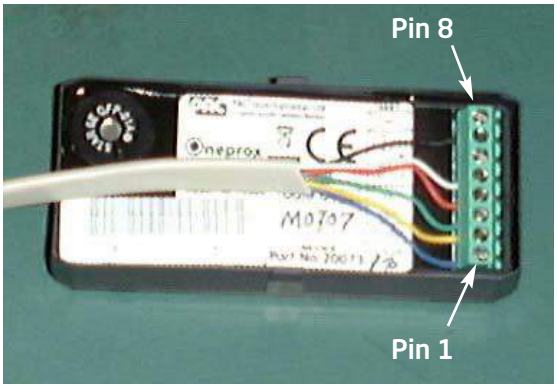
2.2.2 Connecting the PAC Token Readers

The PAC Token Reader is connected to the Europa IDR by way of a 6-Way lead terminated with a Molex type connector. The HID is activated by briefly holding the appropriate ID Card close to the front of the reader. The drivers ID will then be stored in the IDR and will be "linked" to the subsequent journey.

To allow for problems in starting the vehicle, the system will remain activated for approximately 30 seconds to allow for restarts etc.

The numbering of the RJ11 connections is as follows:

Pin Number on Molex Connector	Connection on PAC Reader
1	Pin 1 - +12 volts (10.5 to 28VCD)
2	Pin 2 - Data 1/SIG
3	Pin 3 - VCA
4	Pin 4 - Ground
5	Pin 7 - Buzzer
6	Pin 5 - Data 0/CLK

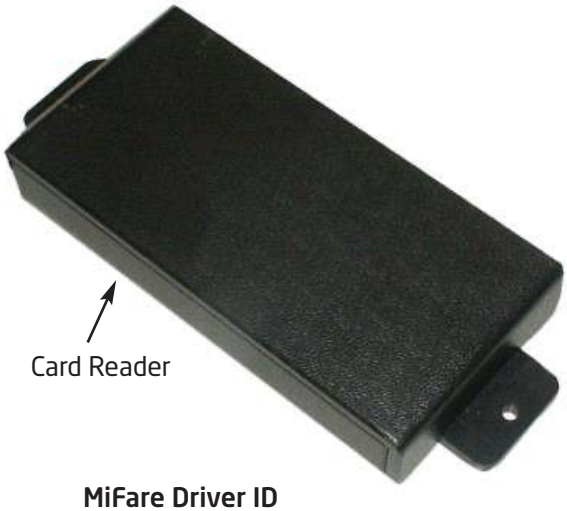


Typical wiring configuration

2.2.3 Connecting the iButton and MiFare Readers

Connection for both the iButton and MiFare Driver ID is by way of a 6-Pin RJ11 cable.

iButton Driver ID



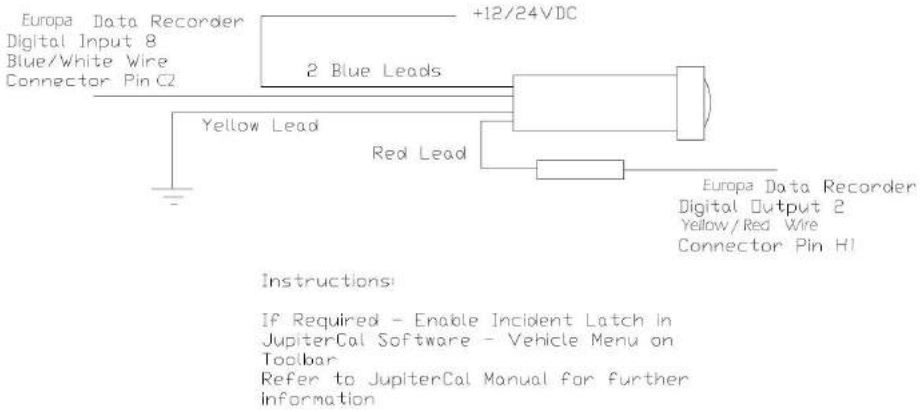
MiFare Driver ID

2.3 Manual Incident Switch

If the System is fitted with a manual incident switch this will allow the user to manually activate the recording of an incident. If an incident is activated, whether it be manually or automatically the LED within the switch will illuminate for 20 seconds unless it has been set to latch in which case it will remain illuminated until manually extinguished.

The Manual incident switch utilises a connection to any of the mappable inputs A1 to C2 (but must be mapped to Digital 8 (EuropaCal 3.0) and set up in the vehicle tab under incident Latch within the EuropaCal 3.0 software) and H1 on the Input Wiring Loom as well as requiring a permanent +12VDC and 0VDC feeds.

Manual Incident Switch Wiring Diagram

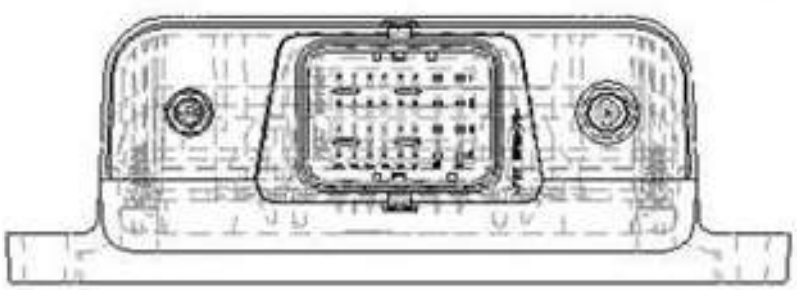


2.4 Simplified Schematic for Europa DVR

The IDR is designed for ease of installation. For a tabular method of identifying connections please refer to the Section on Identifying the Europa IDR Connector.

Because of the vast range of vehicles and models, it is not possible, in this manual, to identify specific vehicle connection points for data inputs. Configuration sheets are provided with each IDR for recording data connection points for future reference both for installing similar vehicles and for fault finding purposes.

It is advisable, when installing vehicles with like for like data inputs, to standardise connection to the IDR. For example, when the detecting siren signal always connect this to the same pin on every IDR.

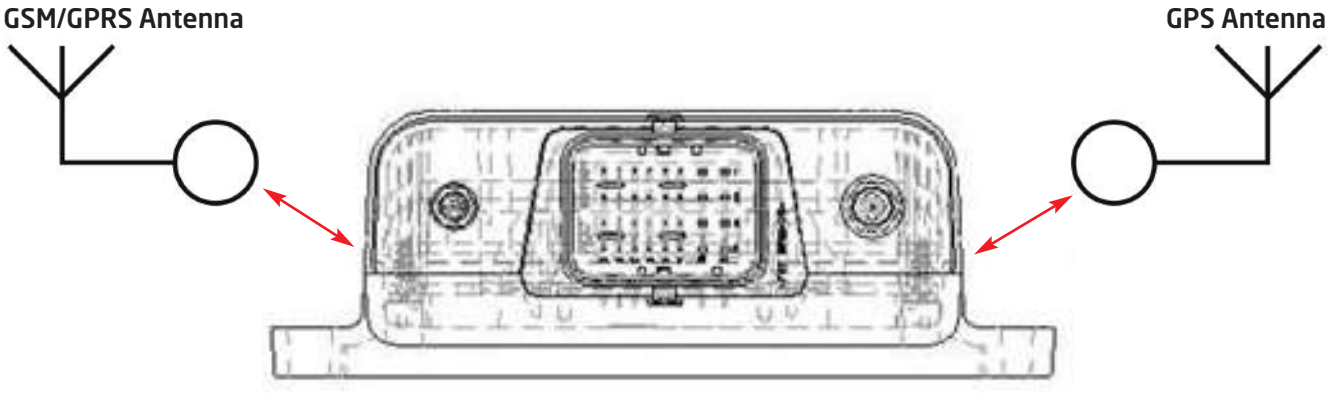


32-Way Connector

- 2 – Analogue/Digital Inputs
- 8 – Wired Digital Inputs (mappable)
- Up to 32 – CANbus inputs
- Ignition Feed
- Permanent Power Feed
- Ground
- Driver Identification Feed
- Notification that an incident has occurred (Dash LED)
- Speed & RPM/Revs if available
- Driver ID Output to Inhibitor Relay (0 VDC when Driver ID Confirmed)

3. Identifying the Europa GSM/GPRS Connectors

The Europa is supplied with a GPS antenna connector, if the Europa is fitted with a GPRS board then a second antenna connector will be mounted (refer to the drawing below).



GPS Antenna - SMA Plug Connection

Mini-Wing Aerial
Designed to be fitted to the inside of the rear side windows.

4. Installation Process

These instructions are aimed at individuals who are taking part in Europa IDR Installation Training Course and that the installer is an experienced and competent Auto-Electrician.

As there are a large number of vehicle types and models, the instructions and information contained in this manual are by necessity generic in nature. It is the responsibility of the installation engineer to determine the best source of data inputs to the IDR.

Note: Only trained and authorised installers are authorised to install and calibrate Europa Data Recorders. Each authorised installer is allocated a unique identification that is used to gain access to the Calibration Software. This identification is recorded on the IDR each time access is made to the recorder.

4.1 Europa IDR Vehicle Equipment

Prior to commencing your installation it is advisable to ensure you have all the materials required to complete the work.

It is advisable for someone to check the contents of Europa IDR Kits against the enclosed packing list as and when they are delivered. Ancillary items such as Siren Signal Detectors and CAN-Bus Passive connection Modules may be shipped separately as they are not required for all vehicle types.

4.2 Identify the Optimum Location for Installation

For correct operation of the IDR, in particular for the internal accelerometers, it is important that IDR is installed on a flat level surface with the arrow on the IDR casing pointing along the vehicle's forward to rear axis or alternatively along the vehicle's left to right axis.

The IDR should be fitted as near as possible to the vehicle's centre of gravity and as low as possible on the floor.

Note: The direction of the arrow must be noted in the appropriate place on the Configuration Sheets

It has been found in practice that the best location for installing the IDR is underneath the front passenger seat.

The IDR Circuitry is installed into a protective enclosure, so remember to check that there is sufficient space to fix the enclosure plus associated wiring in the location selected.

Note: Before finalising the location for installing the IDR and drilling any holes in the floor:

- *Check that there is no cable looms beneath the carpet*
- *Check the underside of the vehicle for cable runs, fuel lines and brake pipes etc.*
- *Select a location where the IDR is least likely to be damaged or cause discomfort to passengers*
- *Consider IDR cable loom routing and connection to auxiliary equipment*
- *Consider access for Data Extraction and Calibration*

4.3 Installing the Europa IDR

Assuming that the IDR is to be installed under the front passenger seat, remove the seat for better access.

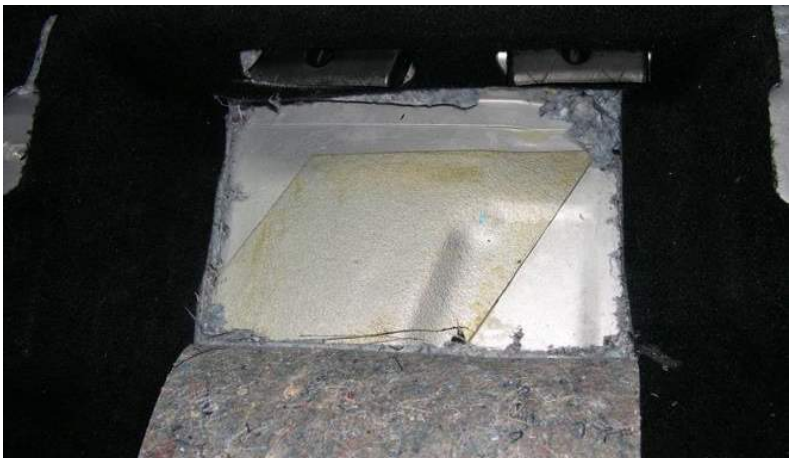
Caution: Follow the manufacturers instructions for disabling airbag system

Note: The vehicle ignition should be turned off.

Roll back the carpet from under the seat and using the Enclosure as a template mark the mounting feet holes for drilling, alternatively cut the carpet along three edges and fold back the carpet. The carpet can be folded back over the IDR once installation is completed. Remove any sound proofing to ensure a solid base for fixing the Enclosure

Caution: Before cutting carpets and drilling any holes in the floor:

- *Check that there is no cable looms beneath the carpet*
- *Check the underside of the vehicle for cable runs, fuel lines and brake pipes etc.*



Drill holes in the floor pan as appropriate and firmly fix the Enclosure using the supplied self-tapping screws.

Use the pre-made terminated cable looms to the IDR and note cable colours against pin numbers on the Configuration Sheet.

4.4 IDR and Auxiliary Equipment Details

It is important for future reference to note details of the IDR and auxiliary equipment on the Configuration Sheets. Now would be a good time to do this while all serial numbers etc are easily available.

Note: Record the following information should be entered on the Configuration Sheets:

- *Where the IDR and auxiliary equipment is installed in the vehicle*
- *The Logger ID (This is different to the serial number)*
- *The serial number of the IDR and auxiliary equipment*
- *Note the direction of the IDR logger (Arrow on top of the IDR)*
- *The telephone number of the GSM/GPRS module*

The next stage of the process involves the identification of outputs from the vehicle for connection to the IDR – CANbus connection location, blues, rear reds and any other ancillary equipment, etc.

Prior to connecting the vehicle outputs and hazard warning equipment outputs to the IDR inputs, use a multi-meter to check that the correct signal is being detected.

Note: Record the source, location and colour of wire details on the Configuration Sheets.

The cables from the IDR can now be split into required runs and length.

Remove all necessary Panels from the vehicle. Care should be taken to ease replacement.

To ensure security of fitting, all connections should be made using soldered joints. Power feeds should be made using the supplied fuse holders and fuses.

The Siren Signal Detector is connected via the two whites onto the Siren Speaker Wires the black wire connects to ground and the red wire connects to the IDR. The Siren Signal Detector fits on to the vehicle backboard.

4.5 Installing the GSM/GPRS and/or GPS Antenna

Using the relevant Tax Disc, Block or Mini-Wing Antenna provided, affix this to the Windshield and run the relevant lead to the correct connector on the IDR. If required use the relevant extension leads

Note: Record the GSM/GPRS SIM card data telephone number.

4.6 Installing the Driver ID Unit

To enable easy access for kissing the Driver ID button on to the Driver ID receptacle, the receptacle should be installed in close proximity to the steering column without obstructing other vehicle controls. The lead from the Driver ID receptacle should run directly back to the IDR.

4.7 Check Functionality

Before vehicle panels are replaced, the operation of the IDR should be verified.

Connect the USB Lead and Laptop to the IDR. Using the Calibration Software Manuals check the operation of the IDR.

Once you are sure that the IDR is operating correctly, replace the panels and passenger seat.

4.8 Road Test

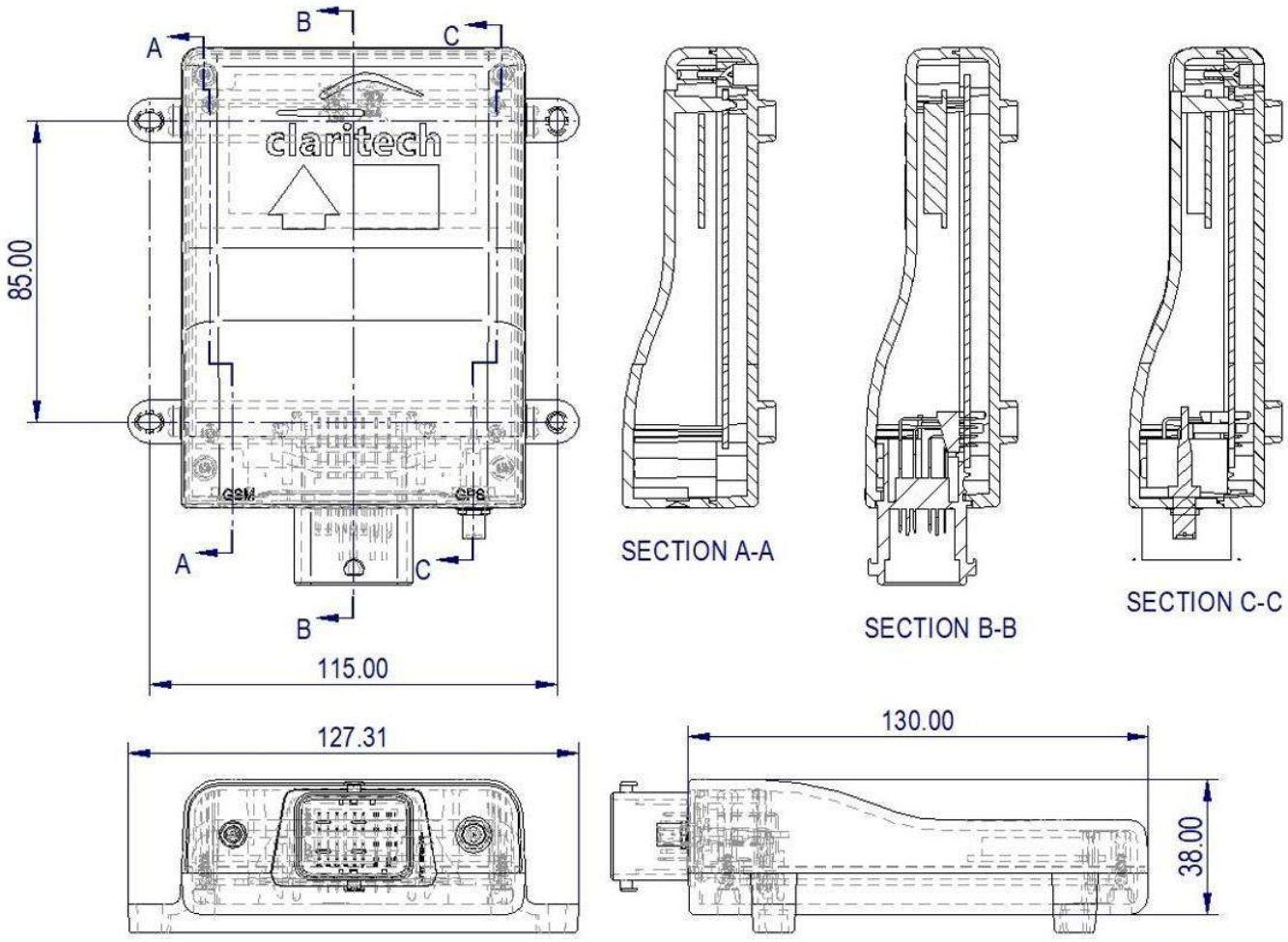
The vehicle is now ready to Road Test. Using the Calibration Manual as a guide, reconnect the Laptop and perform a full Calibration Set up. The RPM and Speed should be checked thoroughly at different speeds. If the frequency drops out or the vehicle speed cannot be calibrated because of a logarithmic error, Consult Standby RSG for guidance.

Europa Data Recorder Specification

Summary

- High Speed Incident Data Recording for in-depth accident analysis
- Economic Journey Data Recording for every day Fleet Management
- Statistical Data for quick view reports
- 8 x Digital (On/Off) Inputs and up to 32 from CANbus
- 2 x Analogue (Variable) Inputs
- 3-Axis Accelerometer for longitudinal, lateral and vertical movement measurement
- Speed/rpm fron CANbus
- 3-Axis Gyros
- 6MB Memory
- 2MB Incident Data
- 4MB Journey Data
- Dual CAN Interface
- 1Hz GPS Data on every journey data point and 10Hz GPS data for incidents
- Battery Backed-up memory
- USB Connectivity for Laptop PC
- Manual Incident (Catch Event) Switch
- Interface to drivers status module
- Internal auto reset fuses
- Internal transient protection
- Automotive robust enclosure
- 2 x CAN Bus Interfaces Can be programmed to read vehicle CAN Bus data and/or hazard warning controller
- GPS See Position Monitoring

Physical Enclosure



Connection Details

The main connector is a Molex 64334-0100

Connection	Purpose	
A1	Analog 1	Yellow / Blue
A2	Analog 2	Blue
A3	Digital A	Brown
A4	Digital B	Orange
B1	Digital C	White / Black
B2	Digital D	Yellow / Black
B3	Digital E	Purple
B4	Digital F	Orange / White
C1	Digital G	Red / White
C2	Digital H	Blue / White
C3	CAN1 Hi	Green
C4	CAN1 Lo	Yellow
D1	CAN2 Hi	Purple / Green
D2	CAN2 Lo	Purple / Yellow
D3	Driver ID 1	Red
D4	Driver ID 2	Black
E1	Driver ID 3	White
E2	Driver ID 4	Green
E3	Driver ID 5	Blue
E4	Driver ID 6	Yellow
F1	USB V+	Red
F2	USB D-	White
F3	USB D+	Green
F4	USB Ground	Black
G1	Not used – do not connect	
G2	Not used – do not connect	
G3	Driver ID output	Brown / White
G4	Output 1	Green / Red
H1	Output 2	Yellow / Red
H2	Permanent Positive	Red
H3	Ignition Positive	Red / Black
H4	Ground	Black