

	<p>Technical Specification</p> <p><b>Data Logger System - User Guide</b></p>	<p>Rev. 1.2</p>
	<p>MLP-242 <b>GT3</b> class</p>	<p>13/12/2024</p>



## TELEMETRY SYSTEM

### User Guide



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	MLP-242 <b>GT3</b> class	13/12/2024

Document Revision History			
Revision	Date	Author	Modifications
1.1	28/02/2021	EA	First release
1.2	13/12/2024	RL	General update

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## 1. CONTACTS LIST ORDER

Please send **orders and account information** to:


Orders Mailbox	<a href="mailto:GTACI@MARELLI.COM">GTACI@MARELLI.COM</a>	Subject: GT ACI
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For any **commercial issue** please contact:

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## 2. STANDARD ITEMS SUPPLIED IN THE KITS

### GT3 MLP-242 Atmospheric Kit: (8 items)

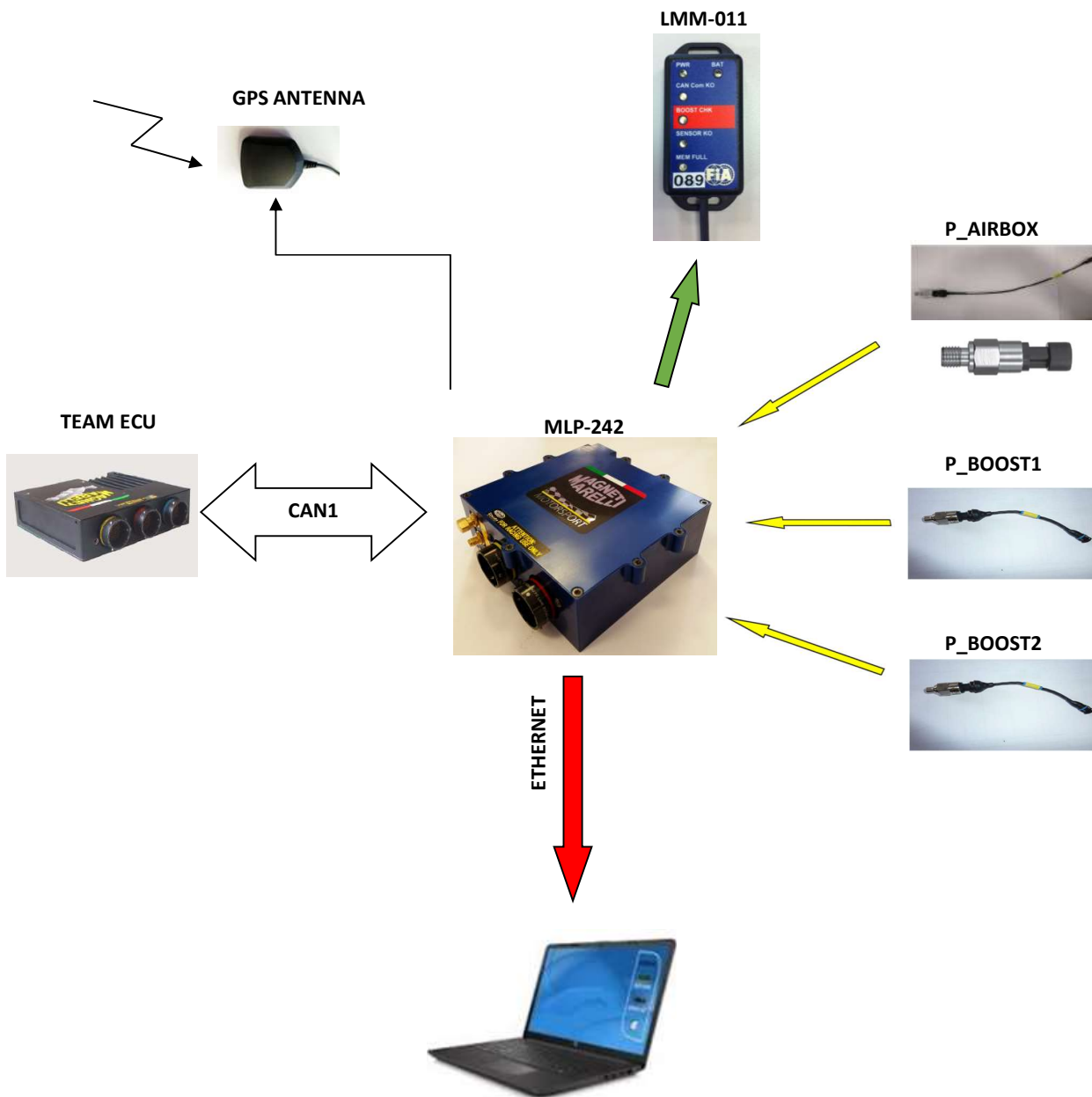
1. 083816456300 - MLP242\_DATA\_LOGGER
2. 083823395500 - MLP MOUNTING TRAY
3. 083823343900 - LMM-011\_LED\_MODULE
4. 083820277500 - GPS ACTIVE ANTENNA
5. 083821470300 - MLP-242\_wiring-loom\_2016 [Rev.2](#)
6. 083821466000 - SENSOR-A\_EXTENTION\_Reworked\_FIAGT3-2016
7. 083813343200 - ABSOLUT.PRESS.SENSOR PSA02 CONNECTOR PLU
8. 083821344300 - FIAGT3 SENSORS EXTENDS KIT PAIR-BOX

### GT3 MLP-242 Turbo Kit: (10 items - 12 items)

1. 083816456300 - MLP242\_DATA\_LOGGER
2. 083823395500 - MLP MOUNTING TRAY
3. 083823343900 - LMM-011\_LED\_MODULE
4. 083820277500 - GPS ACTIVE ANTENNA
5. 083821470300 - MLP-242\_wiring-loom\_2016 [Rev.3](#)
6. 083821567300 - 2021\_SENSORS-A\_EXTENTION
7. 083821471200 - PSensor Extention\_FIAGT3-2016
8. 083813433700 - SENSOR\_PS\_A02\_+ CONNECTOR
9. 083821570400 - 2021\_PBOOST\_SENSOR\_EXTENTION
10. 083821394900 - PBOOST SENSOR WITH EXT

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### 3. ON-BOARD CONNECTIONS



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## 4. MLP-242 (DATA LOGGER)

### 4.1. Characteristics

#### On-board FIA-Data Logger

##### Characteristics

Power supply .....	8 to 16 V
Power .....	4 W
Operating temperature range (internal) .....	-20 to 75 °C
Damaging temperature .....	90 °C
Protection class .....	IP 65
Dimensions	
without connector .....	110.5 x 134.5 x 28 mm
Weight (approx.) .....	350 g

##### Connections

Antenna connector .....	SMA female
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##### Inputs

Analogue Single-ended (@ 12 bit resolution) .....	16
Differential (@ 12 bit resolution) .....	2
K-type thermocouple (*) .....	1
NTC/PT1000 temperature sensor (selectable) .....	4
NTC internal temperature sensor .....	2
4 wires LVDT (@ 12 bit resolution) .....	1
VR Pick-ups or Hall effect .....	4
Hall effect .....	4
Lap trigger (**) .....	1
ON/OFF Digital input .....	2
"Code Load" enable pin .....	1
(*) configurable gain 1 to 64 on request	
(**) Configurable on request	

##### Outputs

Voltage references (70mA) .....	5
VBprot (100mA) .....	2
Led output (30mA) .....	5
High Side (1A) .....	2
Low Side (2A) .....	2

#### Connector CT1

8STA21635PA625

PIN	SIGNAL
46	CAN2_H
52	CAN2_L

#### Connector CT2

8STA21635PN625

PIN	SIGNAL
42	CAN1_H
45	ETH1_RXP
46	ETH1_TXN
48	VBATTP
49	CAN1_L
52	ETH1_RXN
53	VBATTN

Dimensions in millimetres:

DataLogger\_MLP\_GT3\_User-Guide\_Rev1.22

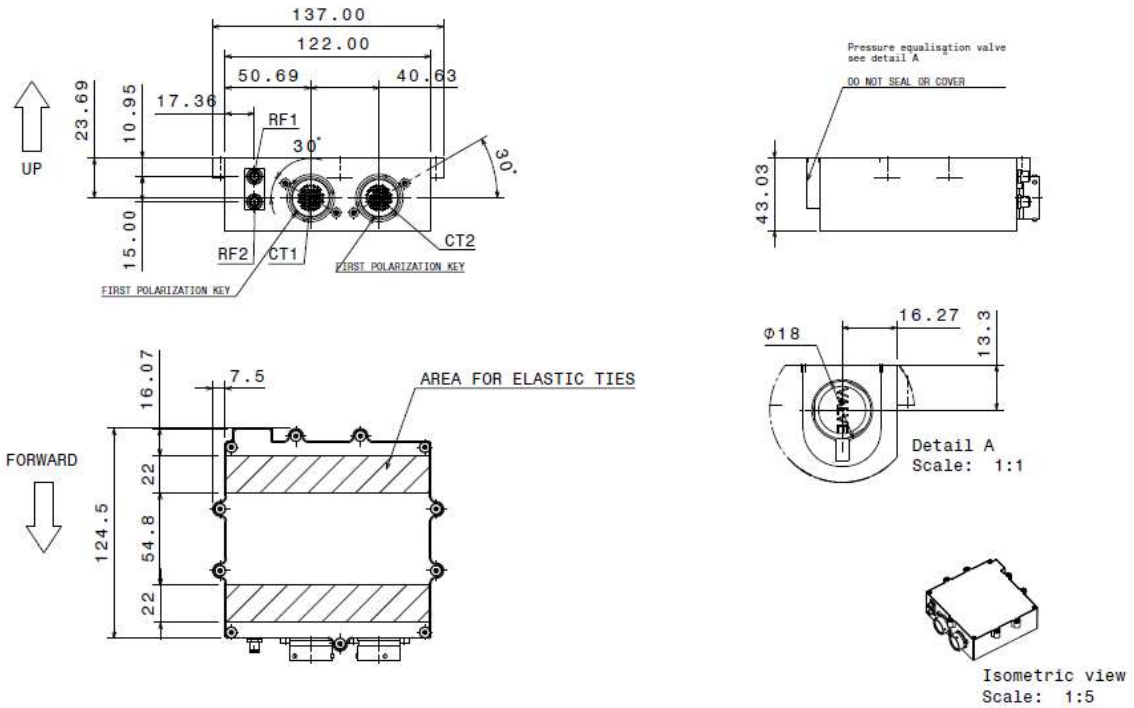
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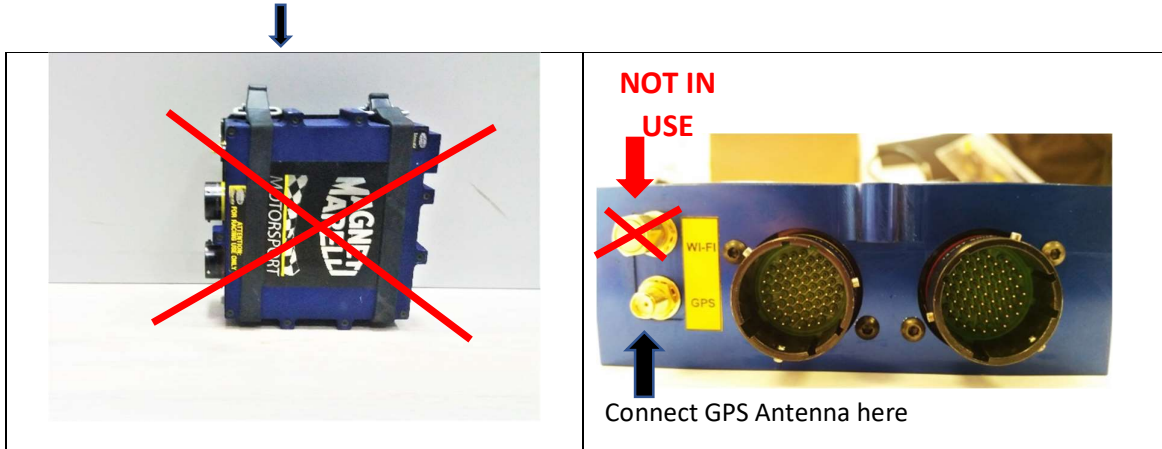
## 4.2. Installation requirements




The datalogger must be installed inside the survival cell.

Be careful positioning ECU to respect following indications. Forward and up indications are related to car's direction of travel.

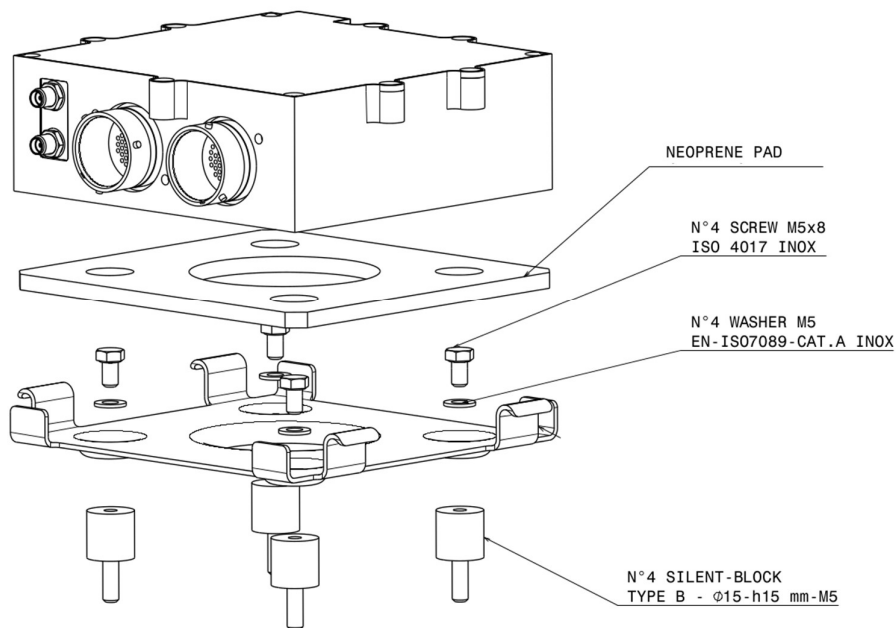
**Unit should be mounted flat with largest face horizontal (to ensure gyro measures vehicle z-axis rotation).**



**To BE A/V MOUNTED on a tray with min. 5mm clearance to other objects.**

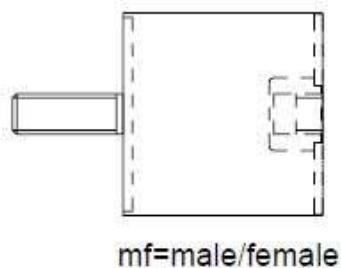
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## 5. MLP Tray



**This Tray must be fixed with 4 Silent Blocs M5**

The unit shall be fixed to the tray via two elastic straps.



Example of male/female AV.

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## 6. GPS ANTENNA

### Magnet Mount GPS Antenna (MGA)

#### Patch antenna characteristics

Frequency  $1575 \pm 3$  MHz  
 VSWR Max. 2  
 Bandwidth Min. 10 MHz  
 Impedance 50  
 Peak gain Min. 4 dBic  
 (over 7 x 7 cm ground plane)  
 Gain coverage ,  
 (over 75% volume)  
 Polarization RHCP (Right-handed circular polarization)

GNSS active antenna for real-time telemetry system



#### Amplifier characteristics

Gain without cable Typ. 27 dB  
 Noise figure Max. 1.8 dB  
 Output VWSR Max. 2.0  
 DC Voltage 2.7 V – 6V  
 DC Current typ 8.5 mA,  $\pm 4.5$  mA

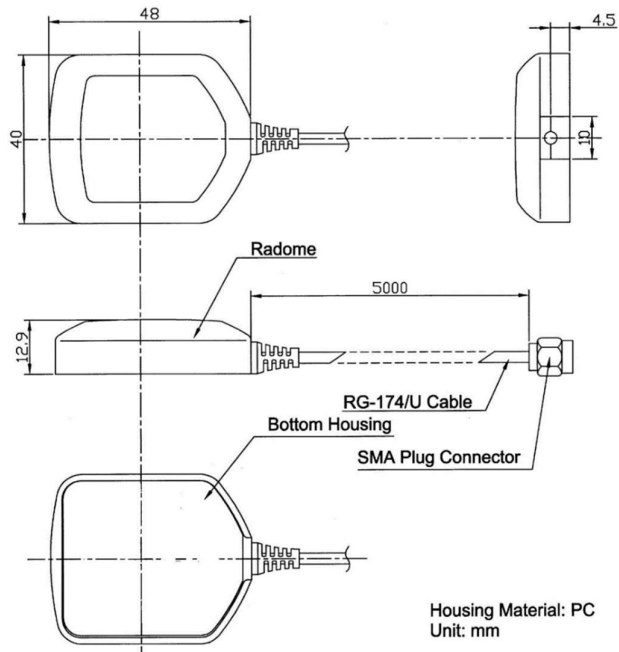
#### Mechanical data

Weight 42 g (without cable)  
 Size 48 x 40 x13 mm  
 Cable 5 m RG174 standard  
 Connectors (choice) SMA, SMB, MCX, FAKRA  
 Mounting Magnetic base  
 Housing color Black

#### Environmental data

Operating temperature  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$   
 Storage temperature  $-50^{\circ}\text{C}$  to  $85^{\circ}\text{C}$   
 Humidity 95% ~ 100% RH  
 Vibration Sine sweep 1G (0-Peak),  
 10–150–10 Hz each axis

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### GPS ANTENNA Installation recommendations:

The GNSS signal is very weak and can be easily obscured by a wrong installation or by interference from other radio devices. For these reasons:

- **Do not place the GPS antenna in the shadow of obstacles.**
- **Do not place any radio device or aerial under the GPS antenna.**
- **Do not place it close (> 1m) other radio antennas especially the ones using frequencies between 1.3 – 1.7GHz.**
- **Must be fitted at least at 700 mm from any antennas**
- **Do not place any metallic object above the GPS antenna. Even the narrow Pitot Tube could reduce the amount of the received signal. Avoid placing the GPS antenna under the Pitot Tube.**
- **Must be installed in such a way to have direct visibility of the sky**
- **Must be mounted at a maximum angle of 5 degrees from the horizontal plane.**
- **Needs good electrical connection to a conducting ground plane of 10 cm radius for best operation**
- **Observe the minimum bending radius of 16mm (static) and be careful not to trap or squeeze the cable**
- **The maximum allowed ambient operating temperature of the GPS cable is 60°C**
- **Pay attention to the cable routing: avoid passing near ignition coil looms, pulsed high power cables, ...**

As it is considered as safety device, FIA will check the quality of the signal during sessions and can ask at anytime to change the position in case the reception is not optimum.

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### 7. LMM-011 (Leds Module)

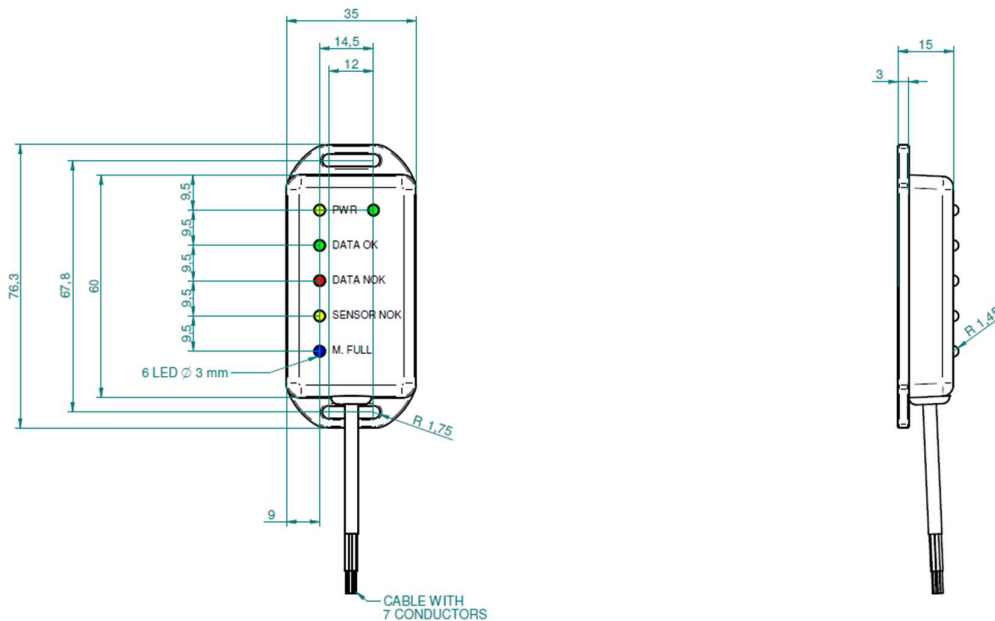


This module contains 6 leds:

- PWR = POWER
- BAT = MLP INTERNAL BATTERY
- CAN Com KO = CAN communication KO
- BOOST CHK = Boost Check
- SENSOR KO = Sensor KO
- MEM FULL = Memory FULL

- IP64

- Fixation with Velcro.



**This module must be fixed with Velcro on the top of the datalogger.**



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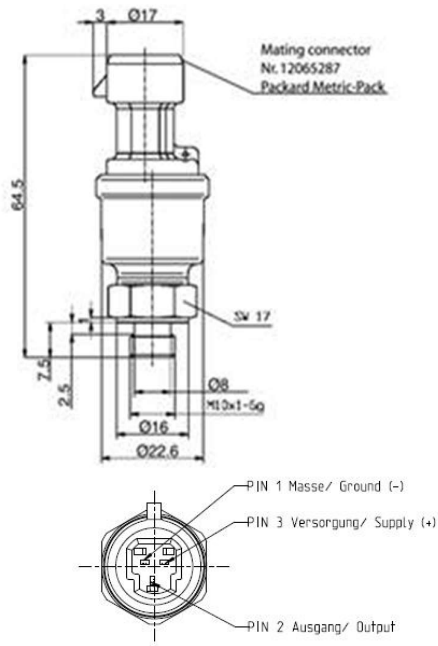
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## 8. PRESSURE SENSORs

Atmospheric spec	
	P_Airbox – 2 bar

Turbo spec	
P_Boost - 4 bar (1or2 pc)	P_Airbox – 2 bar



**NOTE:**

On the Packard loom connector:

PIN 1 = A

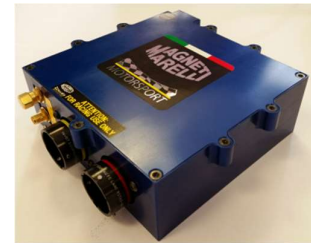
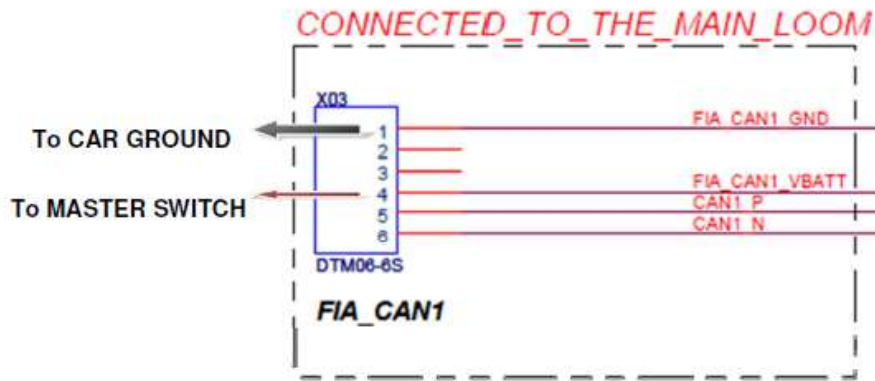
PIN 2 = C

PIN 3 = B

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## 9. CAR LOOM CONNECTION

- Power : 12v. 2 Amp. through Car Main-Loom connector
- Data from ECU to MLP through CAN1
- All connectors plastic DTM except the one to MLP: type military Souriau



## 10. ETHERNET LOOM FIXING

- Ethernet loom must be easily accessible (no strap to cut)
- Ethernet loom must be fixed with Velcro on 80 cm length



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## 11. CAN LINE

Via CAN BUS the MLP Datalogger records the following data from Ecu:

- Pedal Accelerator
- Throttle
- RPM (Crank)
- Lambda (R and L)
- PBrake FR/FL/RL/RR or only Front and Rear
- Water Temp
- Pfuel
- Fuel Temp
- Fuel Consumption
- Airbox Temp
- Gear position
- WheelSpeed FR/FL/RL/RR
- Fuel Qty injected (ms or mg)
- Ignition advance
- Pboost (only for turbo cars)
- Patmo
- Steering Angle

The Team / Manufacturer has to supply the CAN protocol information





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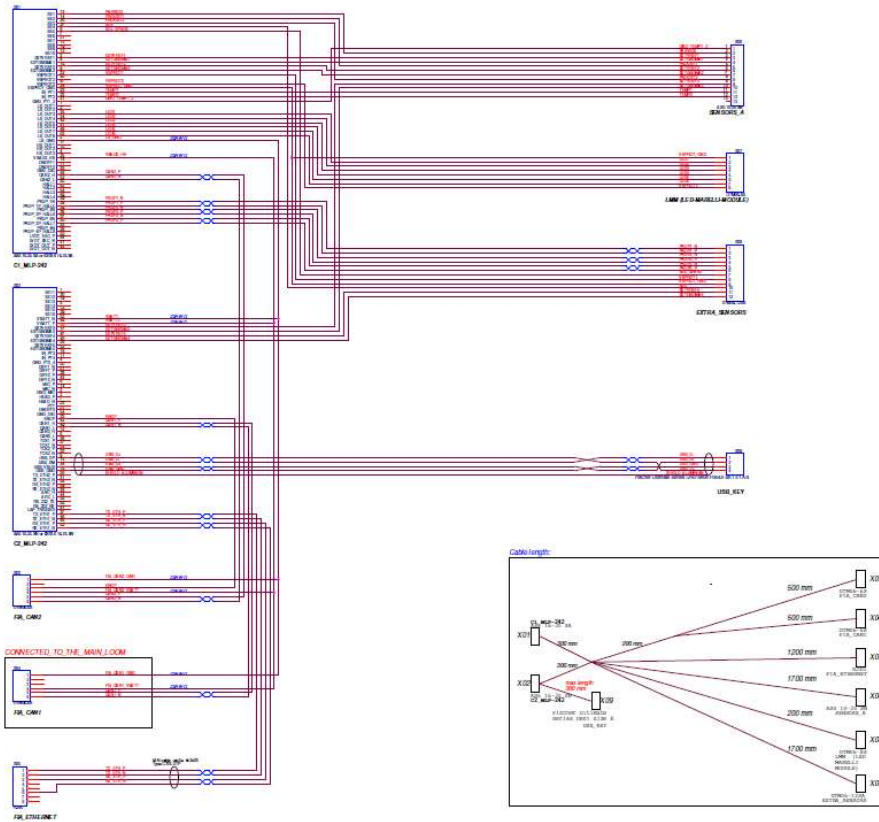
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## 12. LOOM DESIGN

### 12.1. MAIN LOOM

MLP-242\_wiring-loom\_2016



<p>CCC Cable part wire          All wire 20amp unless specified</p>	
<p>Part No: MLP-242 WIRING LOOM 2016</p>	
<p>Rev: 1.2</p>	<p>Company: MARELLI</p>



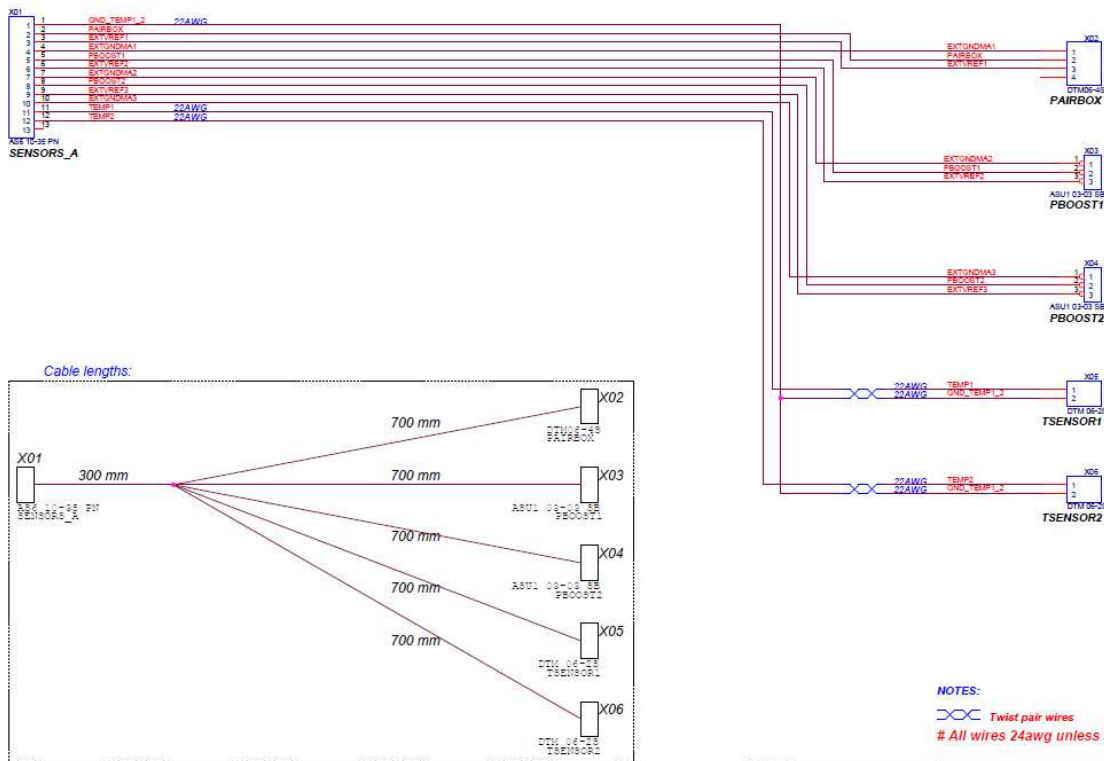
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## 12.2. SENSORS-A LOOM

### 2021\_SENSORS-A\_EXTENTION



REVISION:	Marelli Europe S.p.A. MOTORSPORT Via Timavo,33 40131 Bologna - Italy	
File:	2021_SENSORS-A_EXTENTION	
Size:	MARELLI MOTORSPORT CODE	Designer: RL
A3:	063821 5673 00	
Date:	Thursday, January 21, 2021	Page: 1 of 1



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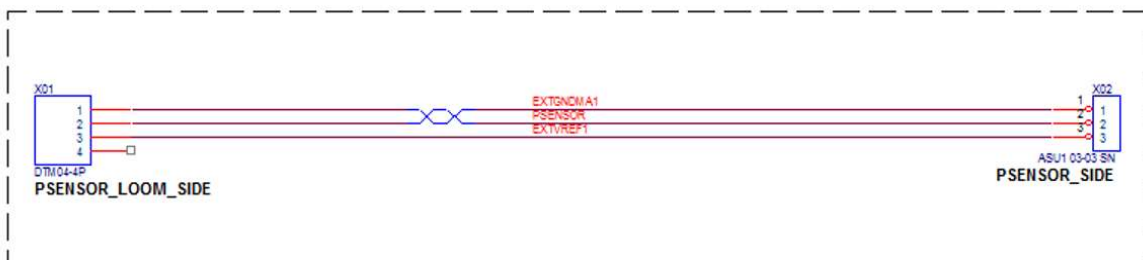
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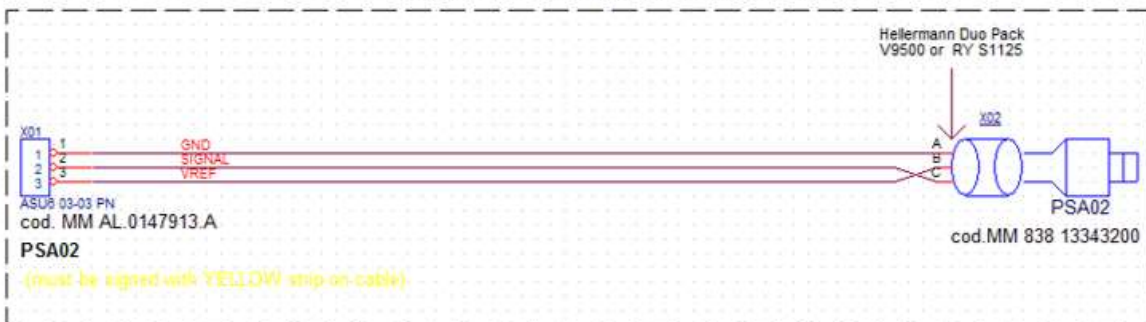
## 12.3. SENSORS + EXTENSIONS spec

### 12.3.1. Airbox

#### 083821471200 PSensor Extention\_FIAGT3-2016



#### cod.MM reworked 838 13433700





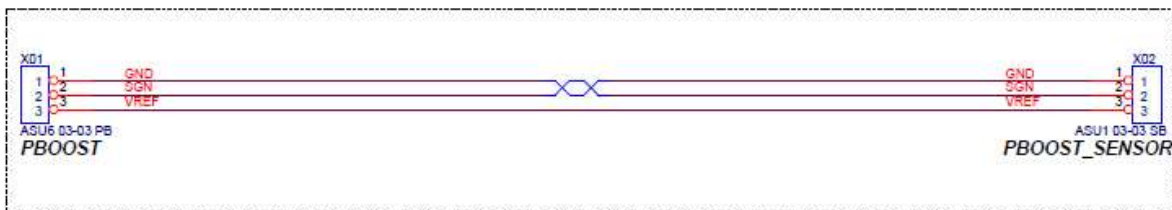
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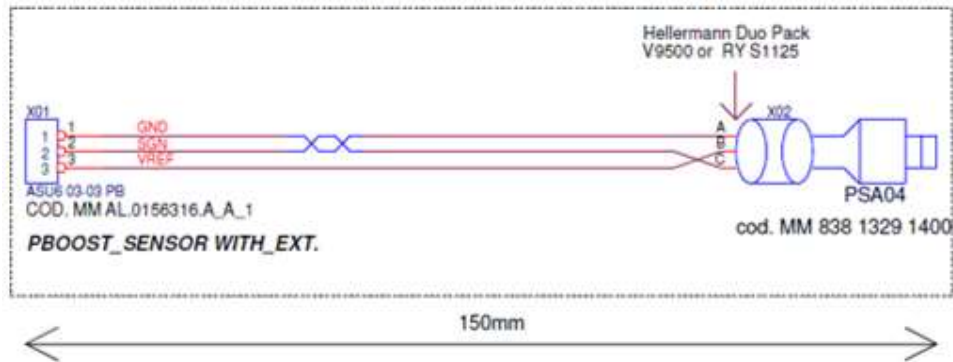
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## 12.3.2. Boost

### 83821570400 2021\_Pboost\_Sensor\_Extention



### cod.Marelli re-worked 838 21 3949 00



**NB:** Please consider both

- 83821570400 2021\_PBoost\_Sensor\_Extention and
- 838213949 PBoost\_Sensor\_with\_Ext

**x2 pcs** if it is supposed to mount one sensor for each cylinder bank.