

	<p>Technical Specification</p> <p>Data Logger System - User Guide</p>	<p>Rev. 1.0</p>
	<p>MLP-242 GTCUP class</p>	<p>13/12/2024</p>



TELEMETRY SYSTEM

User Guide



	Technical Specification Data Logger System - User Guide	Rev. 1.0
	MLP-242 GTCUP class	13/12/2024

Document Revision History			
Revision	Date	Author	Modifications
1.0	13/12/2024	RL	First release

	<p style="text-align: center;">Technical Specification</p> <p style="text-align: center;">Data Logger System - User Guide</p>	<p style="text-align: center;">Rev. 1.0</p>
	<p style="text-align: center;">MLP-242 GTCUP class</p>	<p style="text-align: center;">13/12/2024</p>

Table Of Contents

1. CONTACTS LIST ORDER.....	4
2. STANDARD ITEMS SUPPLIED IN THE KIT	5
3. ON-BOARD CONNECTIONS	6
4. MLP-242 (DATA LOGGER).....	7
4.1 Characteristics	7-8
4.2 Installation Requirements	9
5. MLP Tray	10
6. GPS ANTENNA.....	11-12
7. LMM-011 (Leds Module).....	13
8. PRESSURE SENSORS	14
9. CAR LOOM CONNECTION	15
10. ETHERNET LOOM FIXING.....	15
11. CAN LINE	16
12. LOOM DESIGN	17
12.1 MAIN LOOM	17
12.2 SENSORS-A LOOM	18
12.3 SENSORS + EXTENTIONs spec	19
12.3.1 Airbox	19
12.3.2 Boost	20

	Technical Specification <h2 style="text-align: center;">Data Logger System - User Guide</h2>	Rev. 1.0
	MLP-242 GTCUP class	13/12/2024

1. CONTACTS LIST ORDER

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

Orders Mailbox	GTACI@MARELLI.COM	Subject: GT ACI
----------------	--	-----------------

For any **commercial issue** please contact:

Renata Rolla	renata.rolla@marelli.com	Office: +39 02 9722 7478 Mobile: +39 337 1313733

For any **technical information/request** please refer to:

Rosario Libertella	rosario.libertella@marelli.com	Office: +39 051 6157365 Mobile: +39 331 6300159
Emily Andreoli	emily.andreoli@marelli.com	Office: +39 051 6157557 Mobile: +39 335 7876752
Carlo Tagliaferri	carlo.tagliaferri@marelli.com	Office: +39 02 97227241 Mobile: +39 335 7703892

	Technical Specification Data Logger System - User Guide	Rev. 1.0
	MLP-242 GTCUP class	13/12/2024

2. STANDARD ITEMS SUPPLIED IN THE KITS

GTCUP MLP-242 Atmospheric Kit: (5 items)

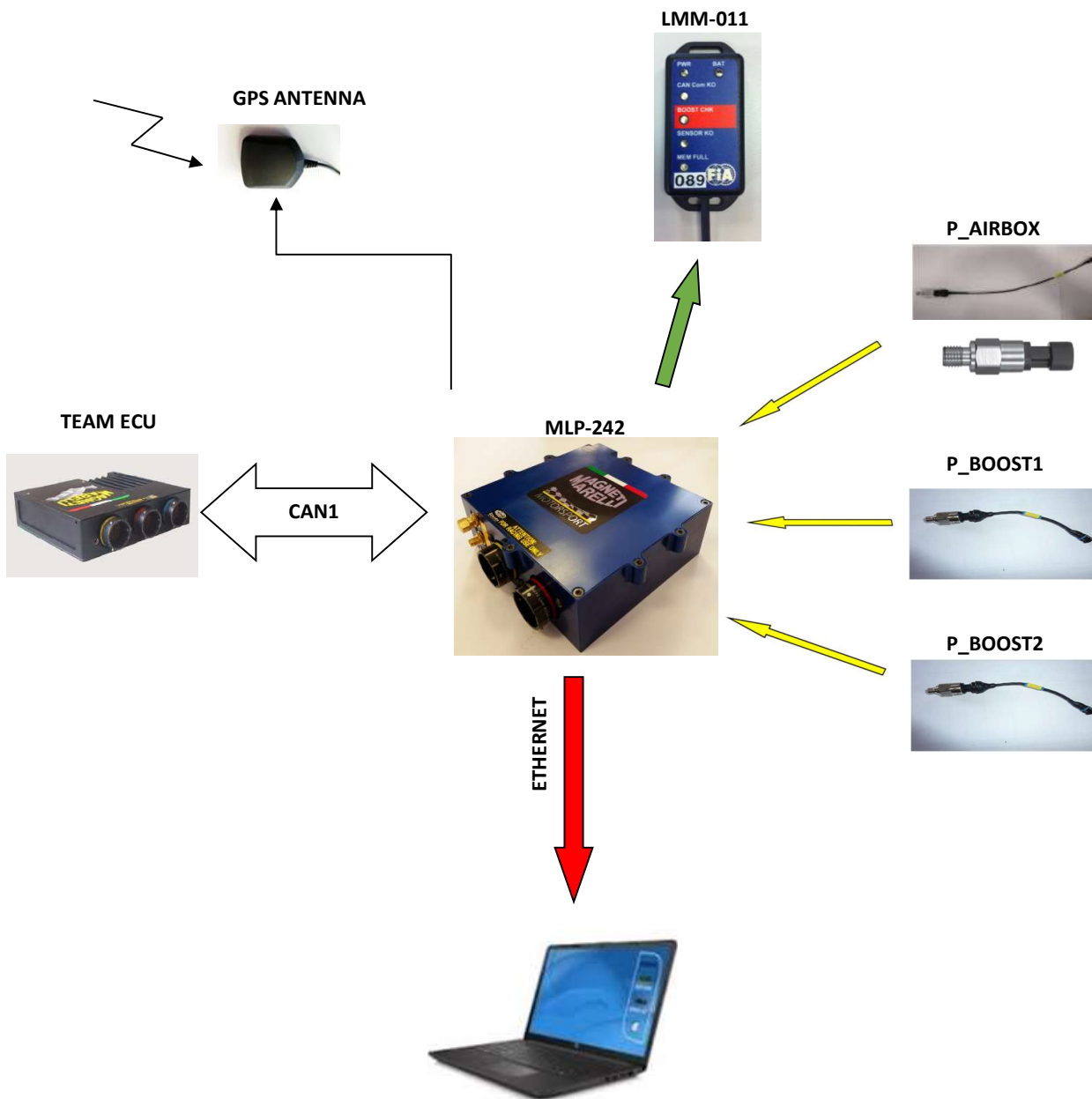
1. 083816456300 - MLP242_DATA_LOGGER
2. 083823395500 - MLP MOUNTING TRAY
3. 083823343900 - LMM-011_LED_MODULE
4. 083820277500 - GPS ACTIVE ANTENNA
5. 083821470300 - MLP-242_wiring-loom_2016 [Rev.2](#)

GTCUP MLP-242 Turbo Kit: (10 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

	<p style="text-align: center;">Technical Specification</p> <h2 style="text-align: center;">Data Logger System - User Guide</h2>	<p style="text-align: right;">Rev. 1.0</p>
MLP-242 GTCUP class		13/12/2024

3. ON-BOARD CONNECTIONS



	Technical Specification Data Logger System - User Guide	Rev. 1.0
	MLP-242 GTCUP class	13/12/2024

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
-------------------------	------------



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

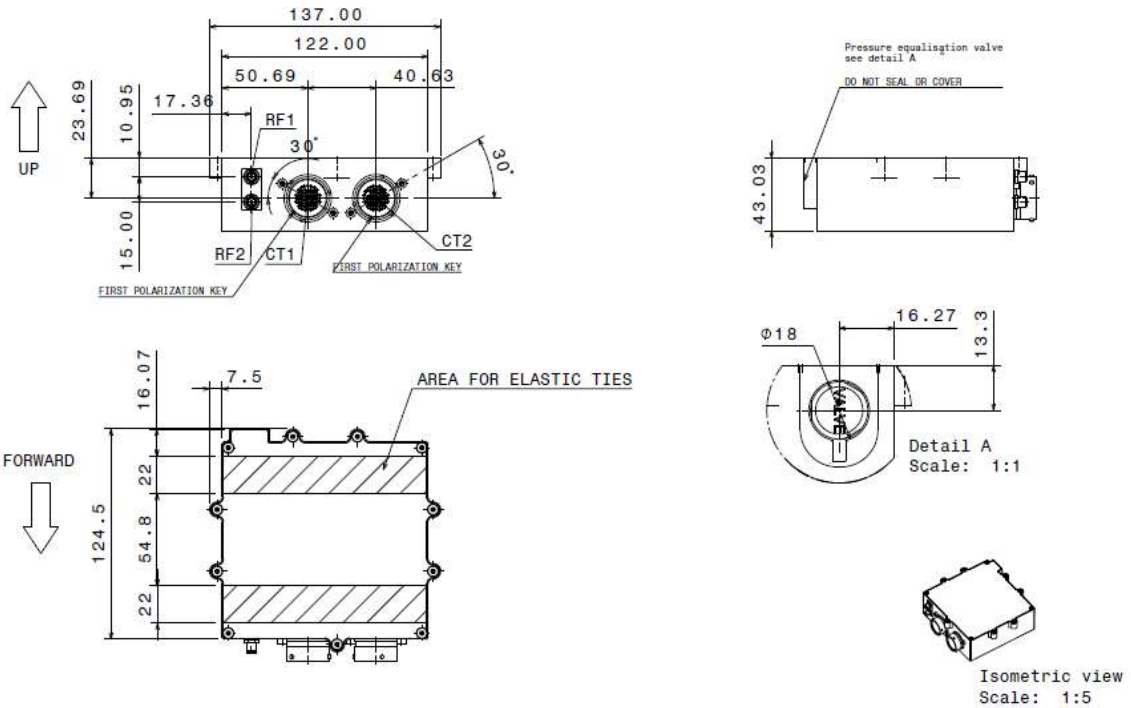


Data Logger System - User Guide

MLP-242 **GTCUP** class

13/12/2024

Dimensions in millimetres:



	<p style="text-align: center;">Technical Specification</p> <h2 style="text-align: center;">Data Logger System - User Guide</h2>	<p style="text-align: right;">Rev. 1.0</p>
	MLP-242 GTCUP class	13/12/2024

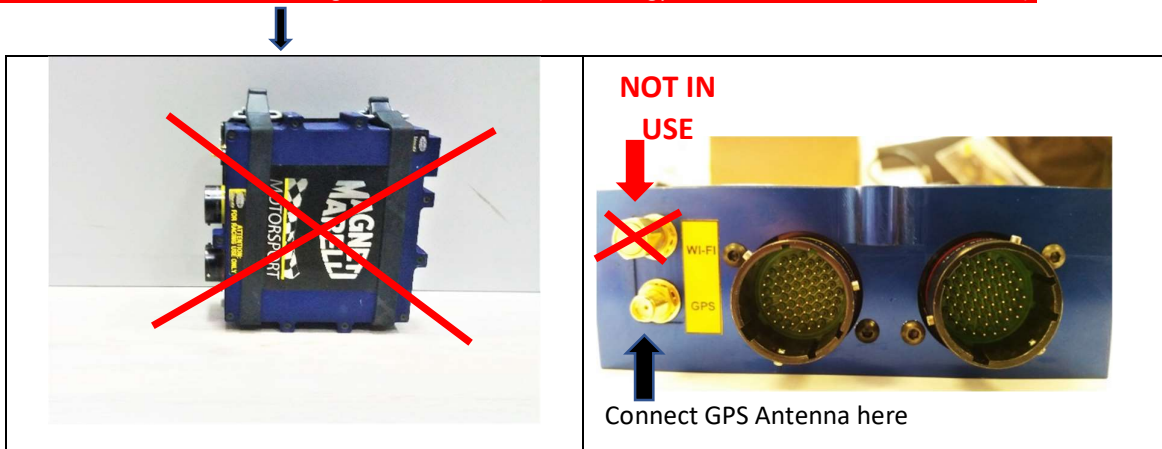
4.2. Installation requirements



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.

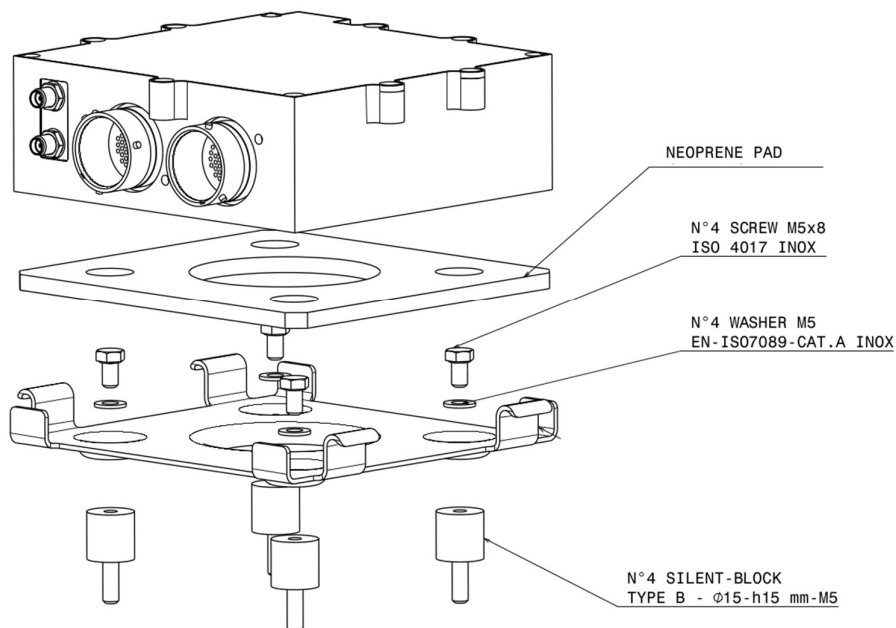
Unit should be mounted flat with largest face horizontal (to ensure gyro measures vehicle z-axis rotation).



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

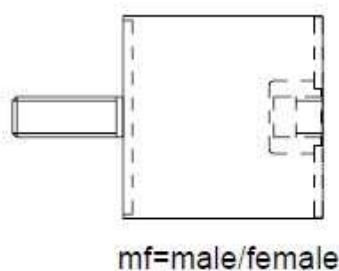
	Technical Specification Data Logger System - User Guide	Rev. 1.0
	MLP-242 GTCUP class	13/12/2024

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.

	Technical Specification	Rev. 1.0
	Data Logger System - User Guide	
	MLP-242 GTCUP class	13/12/2024

6. GPS ANTENNA

Magnet Mount GPS Antenna (MGA)

Patch antenna characteristics

Frequency 1575 ± 3 MHz
 VSWR Max. 2
 Bandwidth Min. 10 MHz
 Impedance 50
 Peak gain Min. 4 dBic
 (over 7×7 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, ± 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

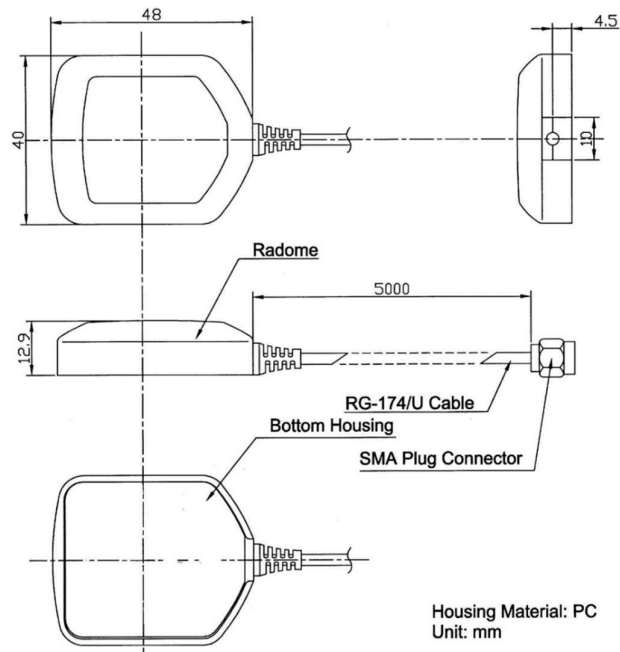
Environmental data

Operating temperature -40°C to 85°C
 Storage temperature -50°C to 85°C
 Humidity 95% ~ 100% RH
 Vibration Sine sweep 1G (0-Peak),
 10–150–10 Hz each axis

Data Logger System - User Guide

MLP-242 **GTCUP** class

13/12/2024



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.



Data Logger System - User Guide

MLP-242 **GTCUP** class

13/12/2024

7. LMM-011 (Leds Module)

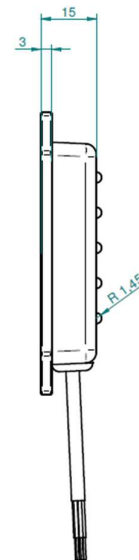
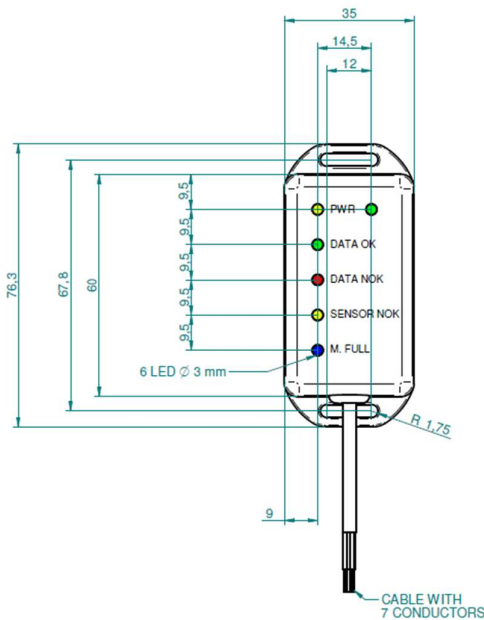


This module contains 6 leds:

- 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.




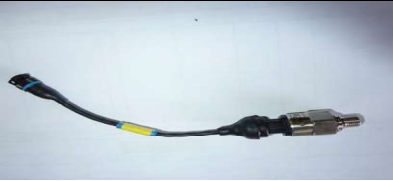

Data Logger System - User Guide

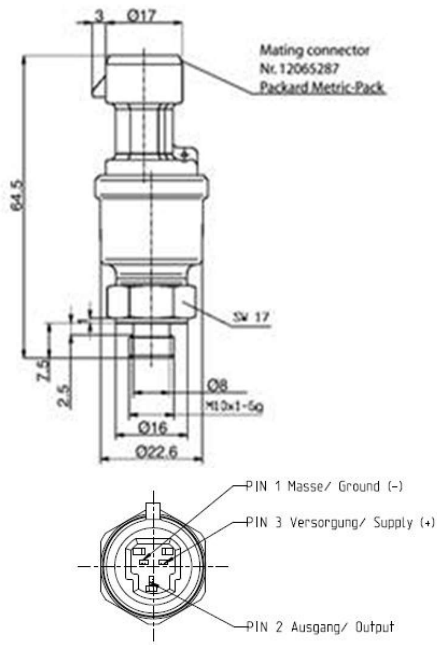
MLP-242 **GTCUP** class

13/12/2024

8. PRESSURE SENSORs

Atmospheric spec	
	
	P_Airbox – 2 bar

Turbo spec	
	
P_Boost - 4 bar (1r2 pc)	P_Airbox – 2 bar



NOTE:

On the Packard loom connector:

PIN 1 = A

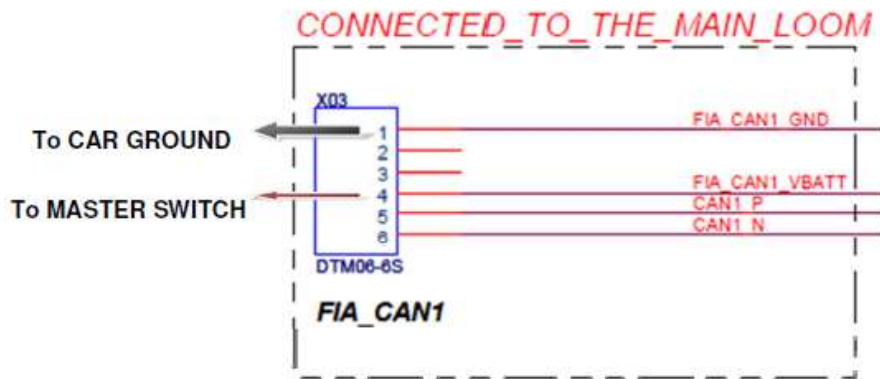
PIN 2 = C

PIN 3 = B

	Technical Specification	Rev. 1.0
	<h2>Data Logger System - User Guide</h2>	
	MLP-242 GTCUP class	13/12/2024

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



	<p style="text-align: center;">Technical Specification</p> <h2 style="text-align: center;">Data Logger System - User Guide</h2>	<p style="text-align: right;">Rev. 1.0</p>
	<p style="text-align: center;">MLP-242 GTCUP class</p>	<p style="text-align: right;">13/12/2024</p>

11. CAN LINE (if connected)

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

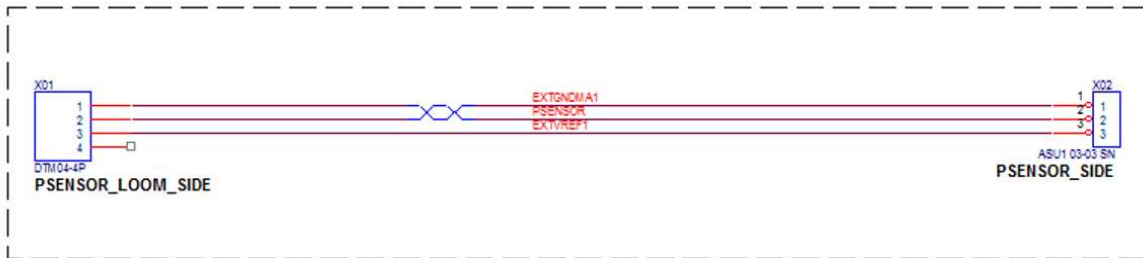
The Team / Manufacturer has to supply the CAN protocol information

	Technical Specification	Rev. 1.0
	<h2>Data Logger System - User Guide</h2>	
	MLP-242 GTCUP class	13/12/2024

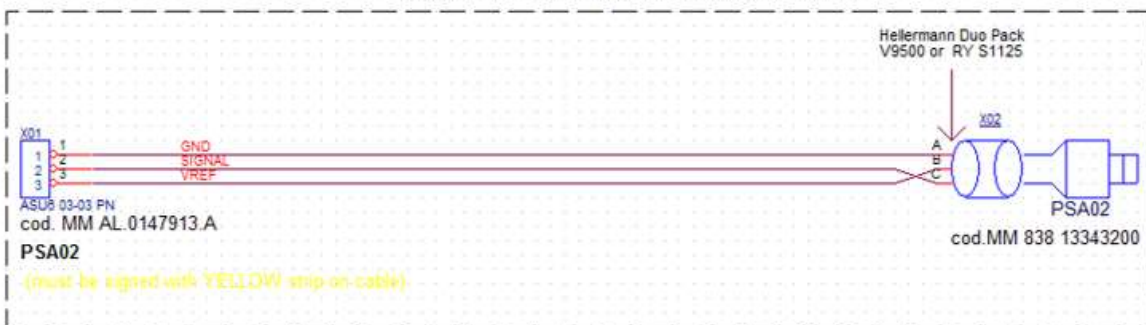
12.3. SENSORS + EXTENTIONS spec

12.3.1. Airbox

083821471200 PSensor Extention_FIAGT3-2016



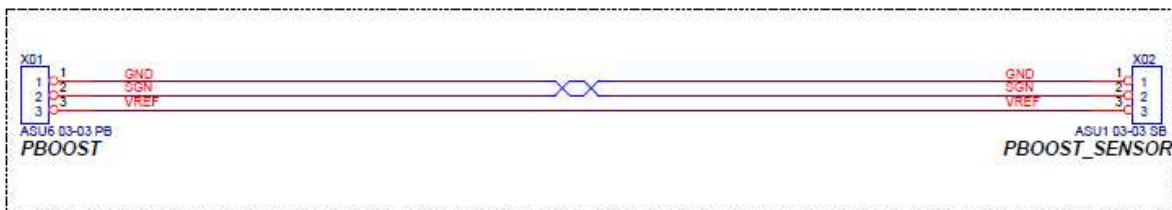
cod.MM reworked 838 13433700



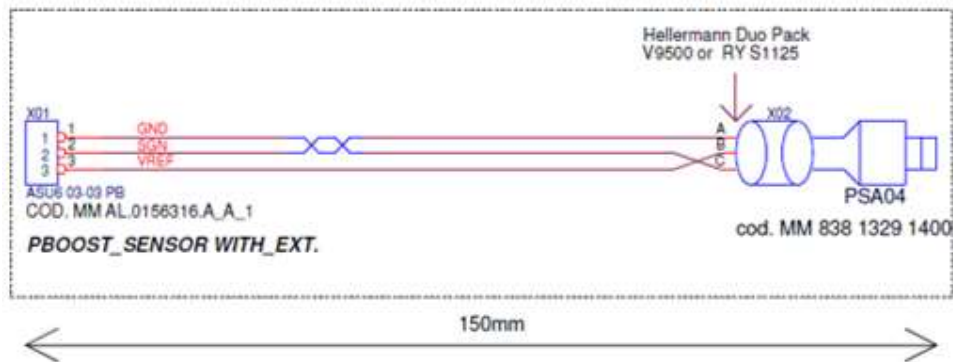
	Technical Specification	Rev. 1.0
	<h2 style="color: #0070C0;">Data Logger System - User Guide</h2>	
	MLP-242 GTCUP class	13/12/2024

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.