



IMSA GT Class Scrutineering System

Manual

V1.4.7 12/21/2020

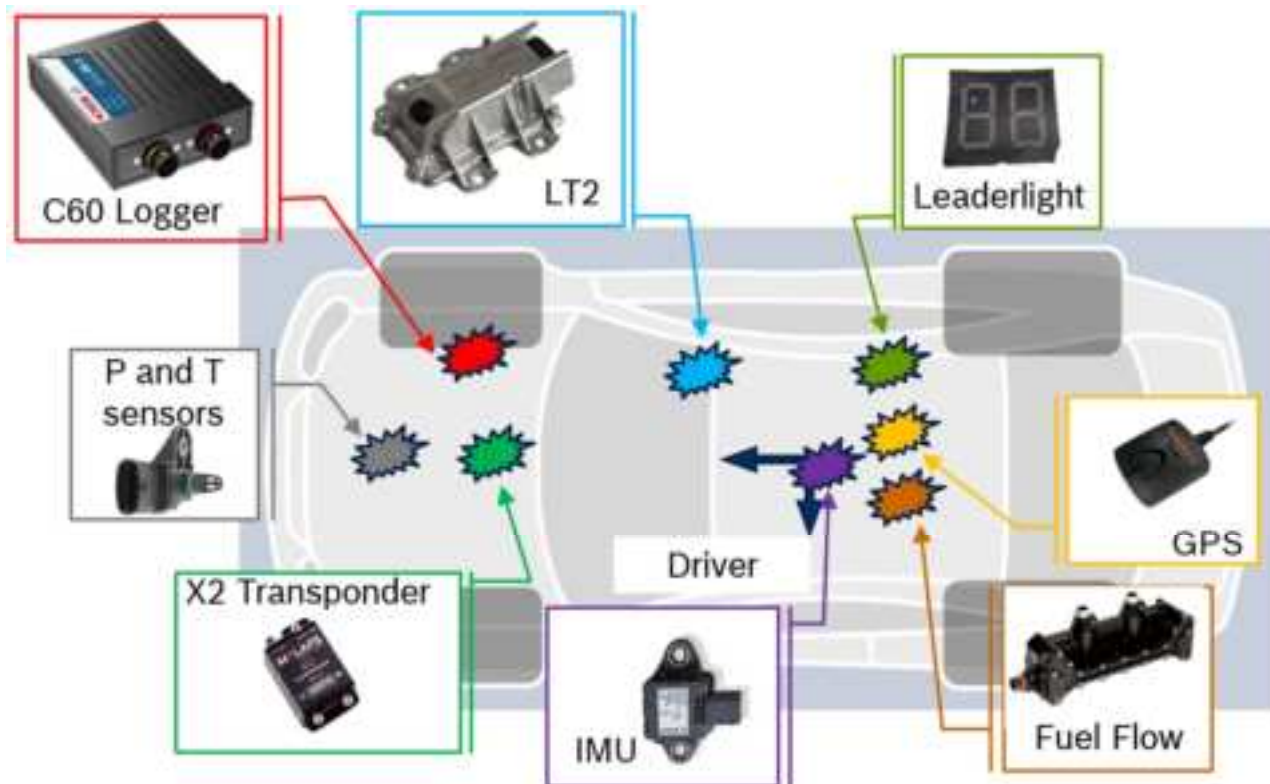
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1 Scope

This document contains application notes on the installation and operation of the IMSA GT Class Scrutineering System.



2 Contact

For technical information please contact:

MAXWELL.HOUCK@us.bosch.com

Tel: +1-248-308-7689

OR

AARON.PFEIFER@us.bosch.com

Tel: +1-248-533-8157

For sales information please contact an approved dealer:

Mech-Tronic

Owner / Contact: Bill Roth

Address: 323 Coolidge Drive
Centerport, NY 11721

Phone : 631-423-0523

Fax : 631-423-7769

Email : mech-tronic@verizon.net

Sakata Motorsports Electronics, Inc.

Owner / Contact: Brian Sakata

Address: 1241 N. Patt ST.
Anaheim, CA 92801

Phone : 714-446-9473

Fax : 714-446-9247

Email : brian@sakatamotorsport.com

Creative Motorsport Solutions

Owner / Contact: Colin Harmer

Address: 222 Oakridge Blvd Suite 120
Daytona Beach, FL 32118

Phone : 386-333-9543

Email : colin@gomuchfaster.com

2.1 Sales

Sales can be performed through the above dealers, OEM customers may purchase directly through Bosch Motorsport North America.

2.1.1 Track Sales

Customers requiring spare parts purchased and delivered at the racetrack are subject to a 10% service fee.

3 Components

3.1 Electronic Hardware

Component List:

Part Number	Mating Connector	Name	Description
F02U.V0U.207-01	ASDD612-41SN ASDD612-41SA	C60	GT Scrutineering Logger
F02U.V01.511-02	F02U.B00.435-01	IMU	5 axis IMU
1271.032.390			IMU mounting plate
F02U.V0U.152-01	F02U.V0U.150-01	LT2 Sport	Lambda controller
F02U.V0U.203-01	ASU603-03SN	GPS	10 Hz GPS unit
F02U.V0U.204-01	ASL106-05SA	1 Bar Pressure TMAP	Air pressure sensor
F02U.V0U.267-01	ASL106-05SD	1 Bar Pressure PSA-N	Air pressure sensor
F02U.V0U.205-01	ASL106-05SB	3.5 Bar Pressure	Boost pressure sensor
F02U.V0U.206-01	ASL106-05SN	Temperature Sensor M12	Air temperature sensor
F02U.V02.356-01	ASL106-05SN	Temperature Sensor M6	Air temperature sensor
0258.988.001	D261.205.356-01	LSU 4.9	Lambda sensor
	ASU603-05SN	X2 Transponder*	Timing Transponder
	ASL106-05SA-HE	Engine Speed**	RPM sensor
	AS108-35SN	Leaderlight*	Leaderlights
	ASDD606-09SD-HE	Fuel Flow*	Fuel flow sensor
	ASL106-05SB	ACO Oil Level*	Catch tank oil level sensor

Max current consumption for all devices: 19 amps.

Nominal current consumption for all devices: 12 amps.

* Denotes component available from IMSA

** Denotes component supplied by team

3.1.1 C60

Functional Description: Logger for IMSA GT Spec Scrutineering System

Mounting Note:

- ~~Refer to Scrutineering Homologation Forms for mounting location. This device must be fitted in the cockpit on the passenger side floor in an easily accessible IMSA approved location.~~
- This device must be mounted away from heat sources. Note maximum temperature range below.
- This device should be mounted so that the status LED's on top of the device can be easily seen.
- This device should be mounted to sustain vibrations within the Vibration Profile 1 defined in the appendix.

Part Number: F02U.V0U.207-01

Temperature Range: -20 to 65 °C

Maximum Current Consumption: 2 amps

Pinout: See "Wiring Diagram" for C60 pinout

Recommended Inspection: 2 years or 220 hours

3.1.2 IMU – MM5.10

Functional Description: 5 axis inertial measurement unit

Mounting Note:

- ~~Refer to Scrutineering Homologation Forms for mounting location. This device must be fitted in the cockpit on the centerline of the longitudinal axis of the vehicle in an easily accessible IMSA approved location.~~ Use of the mounting bracket listed below is required.
- Device to be mounted with connector receptacle facing to the back of the vehicle as shown in Section 0 "Scope" and product sticker facing vertically 'up'. Mounting plate to be aligned within +/-0.5° of vehicle axes.

Part Number: F02U.V01.511-02

Electrical Connector Part Number: F02U.B00.435-01

Mounting Bracket Part Number: 1271.032.390

Temperature Range: -20 to 85 °C

Maximum Current Consumption: 0.4 amps

Pinout:

Connector	F02U.B00.435.01
Pin	Description
1	Gnd (KL.31)
2	CAN Low
3	CAN High
4	12V+ (KL.30)

3.1.3 LT2 Sport

Functional Description: 2 channel lambda sensor controller

Mounting Note:

- ~~Refer to Scrutineering Homologation Forms for mounting location. This device must be fitted in the cockpit on the passenger side foot well in an easily accessible IMSA approved location.~~
- Device MUST be installed on anti-vibration mounts (supplied)

Part Number: F02U.V0U.152-01

Electrical Connector Part Number: F02U.V0U.150-01

Temperature Range: -20 to 85 °C

Maximum Current Consumption: 10 amps

Pinout:

Connector	F02U.V0U.150-01
Pin	Description
1	VS 1
2	VS 2
3	CAN 2 High
4	UN 2
5	IP 2
6	UN 1
7	IP 1
8	RH 2
9	12V+ (KL.30)
10	GND (KL.31)
11	CAN 2 Low
12	VM 2
13	IA 2
14	VM 1
15	IA 1
16	RH 1

3.1.4 GPS

Functional Description: 10 Hz GPS unit

Mounting Note:

- Refer to Scrutineering Homologation Forms for mounting location.
- This device must be fitted ~~to the top surface of the vehicle roof with 200mm of the roof centerline and~~ with at least 250mm separation from all other antennas.

Part Number: F02U.V0U.203-01

Pinout:

Connector	ASU603-03SN
Pin	Description
1	5V+
2	Gnd
3	RS-232 Tx

3.1.5 X2 Transponder

Functional Description: CAN based transponder for IMSA GT Spec Scrutineering System

Mounting Note:

- ~~Refer to Scrutineering Homologation Forms for mounting location. This device in an IMSA approved location. See IMSA tech bulletin for mounting information.~~

Temperature Range: 0 to 60 °C

Maximum Current Consumption: 200 mA

Pinout:

Connector	ASU603-05SN
Pin	Description
1	12V+ KL.30
2	Gnd KL.31
3	CAN Low
4	CAN High
5	

3.1.6 Fuel Flow Meter

Functional Description: CAN based fuel flow meter for IMSA GT Spec Scrutineering System

Mounting Note:

- ~~Refer to Scrutineering Homologation Forms for mounting location. This device in an IMSA approved location. See IMSA tech bulletin for mounting information.~~

Temperature Range: 0 to 85 °C

Maximum Current Consumption: 150 mA

Pinout:

Connector	ASDD606-09SD-HE
Pin	Description
1	12V+
2	CAN_H
3	CAN_L
4	
5	
6	
7	
8	
9	GND

3.1.7 Leaderlight System

Functional Description: CAN based leaderlight panel system for IMSA GT Spec Scrutineering System

Mounting Note:

- ~~Refer to Scrutineering Homologation Forms for mounting location. This device in an IMSA approved location. See IMSA tech bulletin for mounting information.~~

Maximum Current Consumption: 6 A

Pinout:

Connector	AS108-35SN
Pin	Description
1	12V+
2	GND
3	CAN_L
4	CAN_H

3.2 Sensors

This section declares sensors that must be directly connected to the C60. These signals will be fed back to the teams via CAN.

For all sensors refer to IMSA Scrutineering System homologation documentation for installation and mounting location with numbering referring to the fed engine bank.

All GT cars must run:

- Airbox pressure(s)
- Airbox temperature(s)
- Manifold/Boost pressure(s)
- Manifold/Boost temperature(s)
- Lambda(s)
- Fuel flow meter

In addition to the above sensors, all GTLM cars must run:

- Restrictor throat pressure(s) (Where applicable)
- Cockpit temperature
- Engine speed sensor
- Oil catch tank level (See IMSA tech bulletin for sensor information)
- ~~Sensors must be installed in an IMSA approved location as identified in Scrutineering System homologation documentation with numbering referring to the fed engine bank.~~

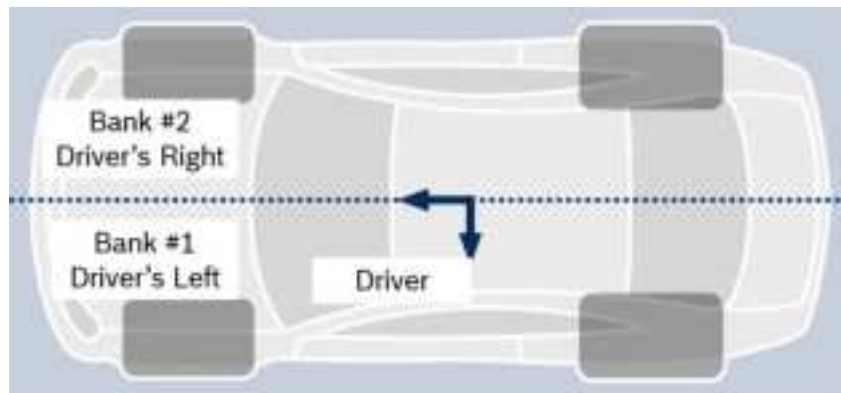


Figure 1 - Diagram displaying sensor mounting

Cars may run either 1 bar pressure sensor depending on the homologated sensor package. Only one 1 bar sensor type may be used. i.e. Either all 1 bar TMAP or 1 bar PSA-N sensor may be used. Using 1 bar TMAP for airbox and 1 bar PSA-N for intake manifold is not allowed. Loom drawings for both options are included in the wiring diagram section.

3.2.1 1 Bar Pressure TMAP

Functional Description: Air pressure sensor

Use Case:

- **Airbox Pressure:**
- **Manifold Pressure:**
- **Restrictor Throat Pressure:**

Callout: Driver's left bank will be Sensor #1

Part Number: F02U.V0U.204-01

Pressure Range: 0.1 – 1.15 bar

Pinout:

Connector	ASL106-05SA-HE
Pin	Description
1	5V+
2	Sensor Gnd
3	Signal
4	
5	

3.2.2 1 Bar Pressure PSA-N

Functional Description: Air pressure sensor

Use Case:

- **Airbox Pressure:**
- **Manifold Pressure:**
- **Restrictor Throat Pressure:**

Callout: Driver's left bank will be Sensor #1

Part Number: F02U.V0U.267-01

Pressure Range: 0.1 – 1.15 bar

Pinout:

Connector	ASL106-05SD-HE
Pin	Description
1	12V+
2	Sensor Gnd
3	Signal
4	
5	

3.2.3 3.5 Bar Boost Pressure

Functional Description: Boost pressure sensor

Use Case:

- **Boost Pressure:**

Callout: Driver's left bank will be Sensor #1

Part Number: F02U.V0U.205-01

Pressure Range: 0.5 – 3.5 bar

Pinout:

Connector	ASL106-05SB
Pin	Description
1	5V+
2	Sensor Gnd
3	Signal
4	
5	

3.2.4 Temp Sensor – M12

Functional Description: Temperature sensor

Use Case:

- **Intake Temperature:**
- **Manifold/Boost Temperature:**
- **Cockpit Temperature:**

Callout: Driver's left bank will be Sensor #1

Part Number: F02U.V0U.206-01

Temperature Range: -40 to 140 °C

Thread: M12 x 1.5

Installation Torque: 15 Nm

Pinout:

Connector	ASL106-05SN
Pin	Description
1	
2	Sensor Gnd
3	Signal
4	
5	

3.2.5 Temp Sensor – M6

Functional Description: Temperature sensor

Use Case:

- **Intake Temperature:**
- **Manifold/Boost Temperature:**
- **Cockpit Temperature:**

Callout: Driver's left bank will be Sensor #1

Part Number: F02U.V02.356-01

Temperature Range: -55 to 300 °C

Thread: M6 x 1

Installation Torque: 8 Nm

Pinout:

Connector	ASL106-05SN
Pin	Description
1	
2	Sensor Gnd
3	Signal
4	
5	

3.2.6 LSU 4.9 Lambda Sensor

Functional Description: Exhaust gas lambda sensor

Use Case:

- See Appendix for required sensor mounting information.
- One sensor per cylinder bank is required.

Callout: Driver's left bank will be Sensor #1

Part Number: 0258.988.001

Thread: M18 x 1.5

Installation Torque: 40 to 60 Nm

Pinout:

Connector	D261.205.356-01
Pin	Description
1	IP
2	VM
3	RH
4	VS
5	IA
6	UN

3.2.7 Engine Speed Sensor

Functional Description: Hall effect style speed sensor

Use Case:

- Each manufacturer may select a sensor to be approved by IMSA.

Recommendation:

- Bosch P/N: HA-N **F.02U.V0U.714-01**
- 20 tooth symmetrical wheel, no missing teeth

Trigger Wheel Requirements (for HA-N above):

- Diameter \geq 80mm
- Slot Width \geq 10mm
- Tooth Width \geq 5mm
- Height of tooth \geq 5mm
- Thickness \geq 8mm

Pinout:

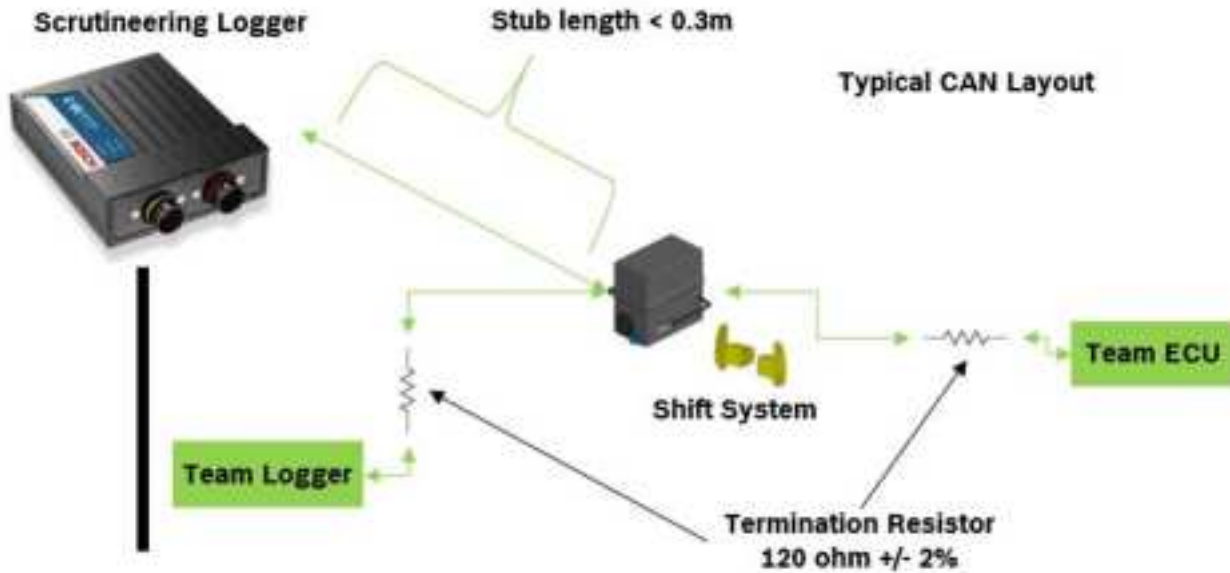
Connector	ASL606-05PA-HE
Pin	Description
1	12V+ KL.30
2	GND
3	Signal
4	
5	

3.3 Sensor Declaration Form

Sensor declaration forms must be submitted prior to every IWSC event. Sensor declaration forms are submitted ~~via the TIMS system~~ per the IWSC Technical Regulations.

4 System Architecture

4.1 Team CAN (C60 CAN #1)



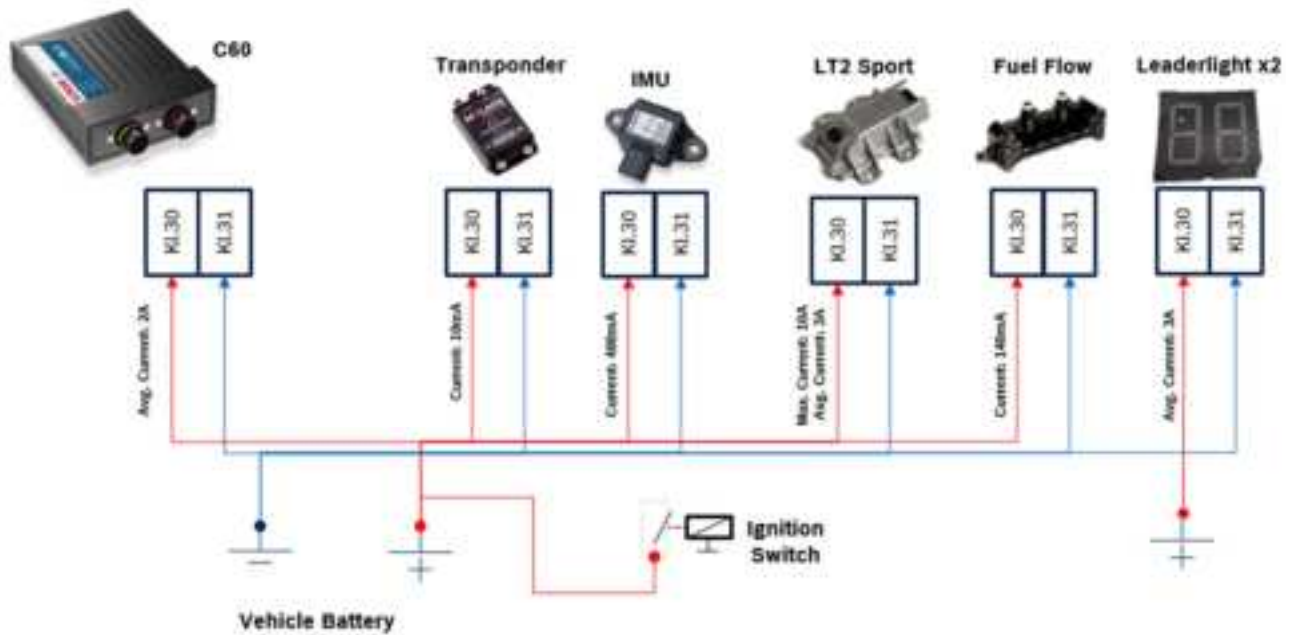
4.2 Scrutineering CAN (C60 CAN #2)



NOTE:

Order of components on the CAN bus may be changed to suit vehicle layout, however, CAN bus wiring **MUST** remain linear between components and CAN termination resistors **MUST** remain at either physical end of the bus.

4.3 Power Supply



The following notations for power signals are used:

- **KL 30** is a switched battery rail controlled by the main power relay
- **KL 31** is an un-switched ground rail (same as battery negative terminal)

All power supplied should be at least 11.0V and below 15.0V.

4.4 USB



The USB stick is property of and will be provided by IMSA for the scrutineering system. This must be mounted in a plainly visible bulkhead type mount and marked with "IMSA" location nearest the rearward side of the passenger door opening and at an equivalent height to the lower edge of the passenger door window.

The length of the USB wiring from the C60 to the USB connector should be less than 1.5 meters. All USB wiring must be screened and drained per the diagram. To remove the USB stick from the connector the collar at the connector end of the USB stick must be pulled away from the connector.



4.5 Driver ID

The Driver ID will be an input on the same connector as the team CAN connections and power. The Driver ID signal will be controlled by a different resistance value for each driver. The resistor will go between the two pins for Driver ID with nothing else in the circuit. The Driver ID and resistor value pairings are in the table below:

ID	Resistor Value (Ohm)
1	0
2	820
3	2.2K
4	4.7K
5	12K

5 Loom Certification

Bosch will provide certification of all scrutineering looms consisting of the following:

- HiPot testing
- Loom serialization

This service will be provided with the following cost structure:

- First time certification (per car) will be provided by Bosch
- Subsequent certifications, of additional looms or a failed test, will be provided at a cost of \$200 / test.

All pieces of the scrutineering loom must be present in order to certify any single piece.

For example team XYZ would like to certify a spare 'engine' section of the scrutineering loom, the car has three scrutineering looms pieces (cockpit, engine, rear section). All three pieces must be submitted in order to certify the spare 'engine' loom.

All looms will be checked to the wiring diagram in Section 7. Any deviation from this diagram must be approved by IMSA and Bosch.

IMSA reserves the right to require a loom certification between events.

6 CAN Specification

There are two CAN interfaces on the C60 logger. C60 CAN 1 will be used for "Team" communication, on this bus the team is required to send the "Team Transmitted Channels". The other bus (C60 CAN 2) will be used solely for scrutineering components, no components other than those listed on the wiring diagram are allowed on the Scrutineering bus.

Team CAN Bus:

The team CAN bus will be used to transfer vital information between the team and the Scrutineering System. The team CAN bus must be laid out in a linear fashion, with a termination resistor (120 ohm) at each end of the bus. The team bus is required to be 1 Mbit and conform to CAN 2.0B specifications.

Scrutineering CAN Bus:

The scrutineering CAN bus will link all of the IMSA GT Spec Scrutineering System components. This bus must be laid out linearly with a termination resistor (120 ohm) on each end of the bus. **Only those components listed in this document may exist on the scrutineering CAN bus!**

6.1 Team Transmitted Channels

Channel Name	Short Name	Raster (ms)	Notes
Engine Revs	nmot	5	Engine revolutions per minute
Ignition Timing	ign_out	5	Crank angle of ignition event
Fuel Injector Mass	fuel_mass	5	Fuel mass injected per 2 engine revolutions
Fuel Rail Pressure	prail	5	Pressure measured in the high pressure fuel rail
Gearbox Drum Position	gear_drum	20	Voltage of gearbox drum angle sensor
Gearbox Flag	shift_*	20	Flag denoting, up/down shift, shift error, and shift strategy active
Gear	gear	20	Engaged gear in transmission
FL Wheelspeed	vwheel_fl	20	Speed of FL wheel
FR Wheelspeed	vwheel_fr	20	Speed of FR wheel
RL Wheelspeed	vwheel_rl	20	Speed of RL wheel
RR Wheelspeed	vwheel_rr	20	Speed of RR wheel
Throttle Pedal	aps	50	Throttle pedal percentage
Engine Throttle(s)	ath(2)	50	Throttle blade open percentage
FL Brake Pressure	pbrake_fl	20	If only axle pressure is available, send on both L & R
FR Brake Pressure	pbrake_fr	20	If only axle pressure is available, send on both L & R
RL Brake Pressure	pbrake_rl	20	If only axle pressure is available, send on both L & R
RR Brake Pressure	pbrake_rl	20	If only axle pressure is available, send on both L & R
Mixture Map	mappos	100	Value of engine mixture map selection switch
Fuel Consumption Calculation	fuelcons	100	Counter starts from 0 each session Does NOT reset during session/race
Steering Angle	steer	20	Angle of steering wheel from center
Clutch Pressure	pclutch	20	Pressure in the clutch disengagement system
Cam Angle Left Bank Intake	Cam1Int	100	Angle of the drivers left bank intake CAM from park
Cam Angle Left Bank Exhaust	Cam1Exh	100	Angle of the drivers left bank exhaust CAM from park
Cam Angle Right Bank Intake	Cam2Int	100	Angle of the drivers right bank intake CAM from park
Cam Angle Right Bank Exhaust	Cam2Exh	100	Angle of the drivers right bank exhaust CAM from park
Tire Pressure FL	TireFL	1000	TPMS system reported absolute air pressure in FL tire
Tire Pressure FR	TireFR	1000	TPMS system reported absolute air pressure in FR tire
Tire Pressure RL	TireRL	1000	TPMS system reported absolute air pressure in RL tire
Tire Pressure RR	TireRR	1000	TPMS system reported absolute air pressure in RR tire
Fuel Probe Flag - GTLM Only	b_fuelprobe	20	Fuel Probe sensor, 0 = not connected, 1 = connected

6.2 Team Received Channels

Channel Name	Short Name	Raster (ms)	Notes
Low Boost Counter**	low_overboost_counter	20	Low overboost counter
High Overboost Counter**	high_overboost_integral	20	High overboost counter
Overboost Integral**	Integral	20	Live overboost integral value
Beacon	beacon_imsa	20	Beacon for S/f, Pit In, Pit Out
Position in Class	class_position	50	Position of car in class
Track Condition	track_condition	50	Track condition
Rainlight On	Rainlight	50	Rainlight activation status
Driver ID	DriverID	50	Driver ID from Timing and Scoring
Lap Number	LapNum	50	Current lap number
Cockpit Temp*	tcockpit	1000	Car cockpit temperature
C60 Temp	tlogger	1000	Scrutineering system C60 core temperature
Oil Level*	oillevel	1000	Catch tank oil level
GPS Latitude	gpsLatitude	50	GPS latitude
GPS Longitude	gpsLongitude	50	GPS longitude
GPS Speed	gpsSpeed	50	GPS speed
GPS Altitude	gpsAltitude	50	GPS altitude
GPS Time	gpsTime	50	GPS time
Airbox Pressure 1	pairbox	50	Driver's left bank airbox pressure
Airbox Pressure 2	pairbox_2	50	Driver's right bank airbox pressure
Airbox Temperature 1	tairbox	50	Driver's left bank airbox temperature
Airbox Temperature 2	tairbox_2	50	Driver's right bank airbox temperature
Manifold Pressure 1	pmanifold	50	Driver's left bank manifold pressure
Manifold Pressure 2	pmanifold_2	50	Driver's right bank manifold pressure
Manifold Temperature 1	tmanifold	50	Driver's left bank manifold temperature
Manifold Temperature 2	tmanifold_2	50	Driver's right bank manifold temperature
Restrictor Pressure 1*	prestricor	100	Driver's left restrictor throat pressure
Restrictor Pressure 2*	prestricor_2	100	Driver's right restrictor throat pressure
Logger Status	logger_status	100	C60 logger status
USB Status	usb_status	100	USB stick recording status
Lambda 1	lambda1	100	Driver's left lambda value
Lambda 2	lambda2	100	Driver's right lambda value
Volumetric Flow Rate	q_fuelflow	20	Instantaneous volumetric fuel flow rate
Total Volume	V_fuelflow	20	Total volumetric fuel flow
Mass Flow Rate	dm_fuelflow	20	Instantaneous fuel mass flow rate
Total Mass	m_fuelflow	20	Total mass fuel flow
Engine Speed*	nmot_sens	50	Sensor measured engine speed
Fuel Temperature	tfuel	200	Fuel flow meter reported fuel temperature
Flow meter service time	FFM_ServiceTime	200	Hours until service required for fuel flow meter
Flow meter calibration	b_FFMService	200	Flow meter calibration required
Ambient Pressure*	pambient	1000	IMSA declared live ambient pressure
Private CAN Error	b_privateCANerror	50	Scrutineering only CAN bus errors exist
Shared CAN Error	b_sharedCANerror	50	Shared chassis and scrutineering bus errors exist

<u>Filtered Boost Pressure</u>	<u>pboost_filt</u>	<u>20</u>	<u>Filtered boost pressure</u>
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* Denotes GTLM Only

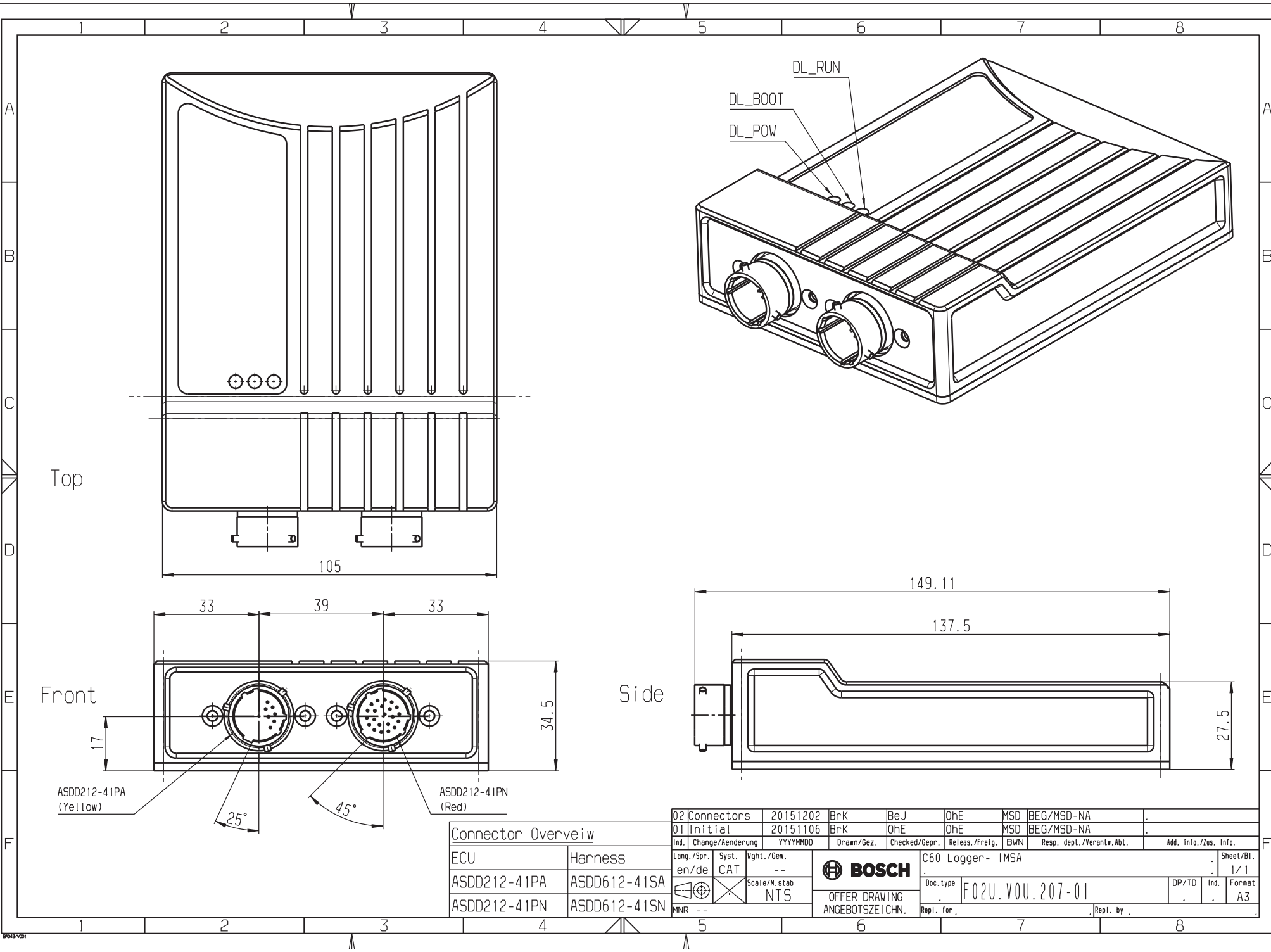
6.3 DBC file

A DBC file for the transmitted and received channels is available at IMSA.com and bosch-motorsport.com.

8 Appendix

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Connector Overview			
ECU	Harness		
ASDD212-41PA	ASDD612-41SA		
ASDD212-41PN	ASDD612-41SN		

02 Connectors	20151202	BrK	BeJ	OhE	MSD	BEG/MSD-NA	
01 Initial	20151106	BrK	OhE	OhE	MSD	BEG/MSD-NA	
Ind. Change/Änderung	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Released/freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.
Lang./Spr.	Syst.	Ught./Gew.	C60 Logger- IMSA				
en/de	CAT	--					
		Scale/M.stab					
		NTS					
MNR	--						
				Doc. type	F02U.V0U.207-01	DP/TO	Ind. Format
				Repl. for		Repl. by	

- Sensor is to be mounted at a location close to the center of gravity of the vehicle. Correct mounting position of the sensor is required for its proper function.
- Tightening torque for M6 screws mounting the sensor to the damping plate: 6Nm \pm 1Nm.
- Correct vehicle mounting orientation of the sensor is shown in drawing(s) below

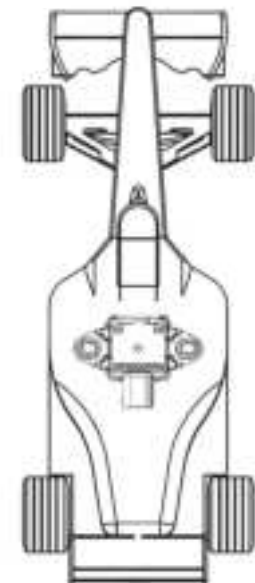
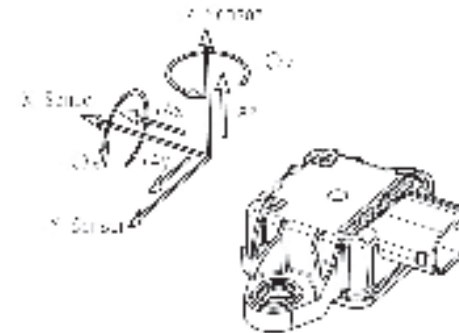
Top

Side

Front




Front

Isometric



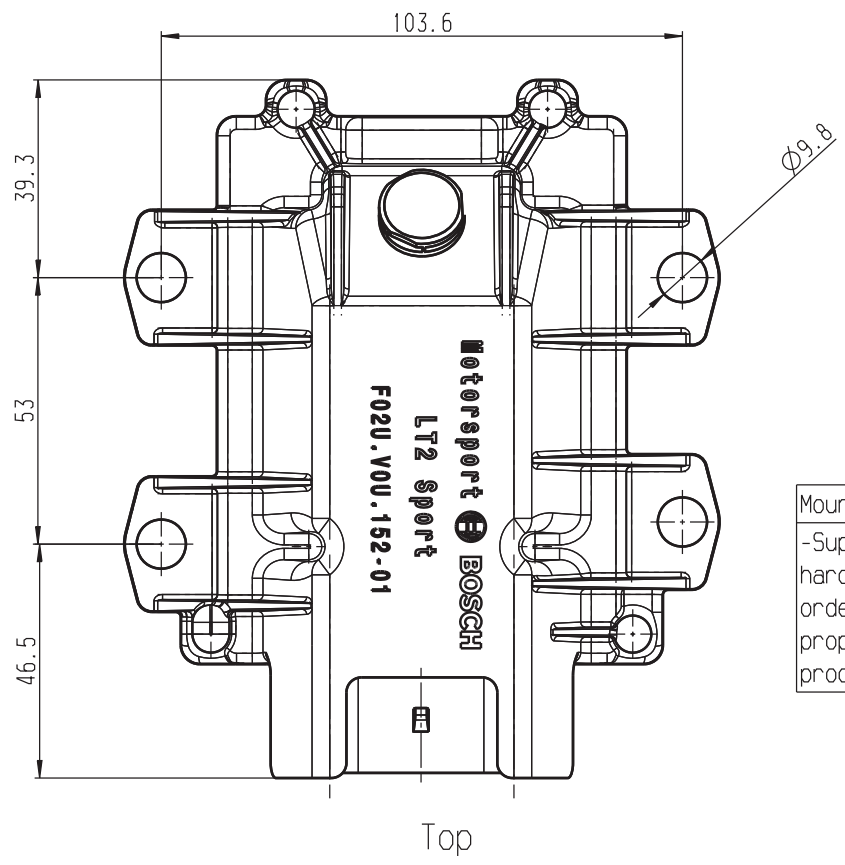
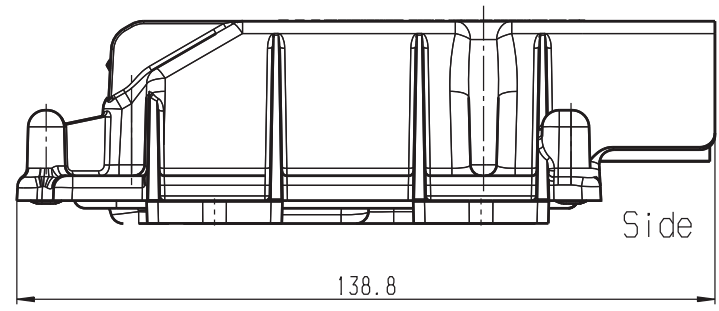
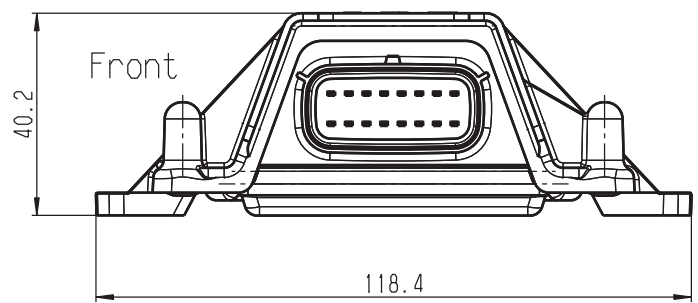
Top

Side

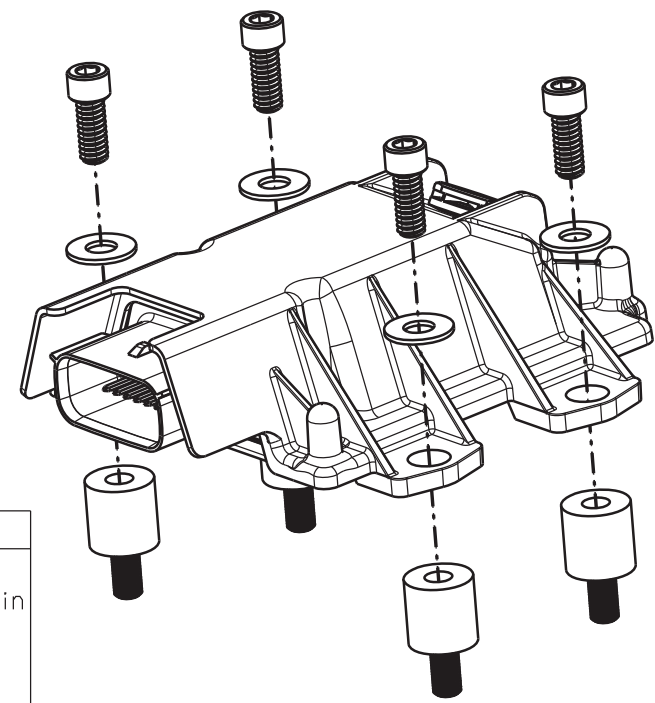
02 Mounting	20151202	Brk	BeJ	ONE	MSD	BEG/MSD-NA	.
01 Initial	20151106	Brk	ONE	ONE	MSD	BEG/MSD-NA	.
Changer/endering	YYYYMM	Drawn/Ges.	Checked/Ges.	Released/Rel.	BW	Revis. resp. Verants. Abt.	
Lamp. / en/de	Syst. CAT	Wght./ Gew.					1MU5.10 IMSA Date: _____ Plate: _____ F02U.V01: 511.012 Sheet/B1 1 271 032 390 1/1
 	Scale/M.stab	NTS	OFFER DRAWING ANGEBOTSZEICHN.				DP/DT Ind. A2
MNR			Repl. for		Repl. by		




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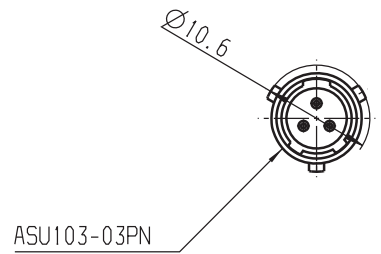
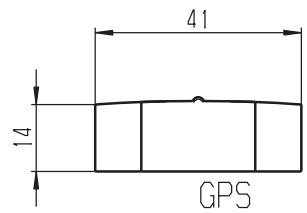
Mounting:
-Supplied mounting hardware must be used in order to ensure the proper function of the product



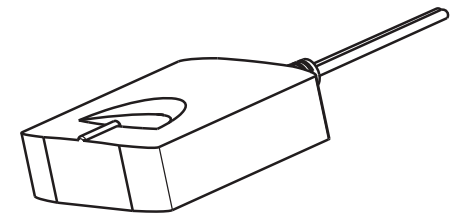
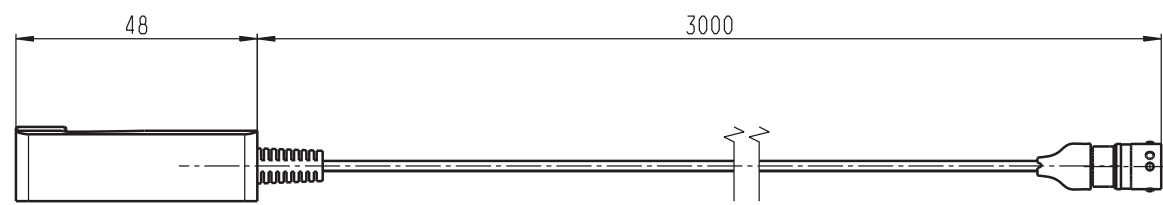
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01 Initial	20151106	BrK	OnE	OnE	MSD	BEG/MSD-NA	
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Lang./Spr.	Syst.	Ught./Gew.	 BOSCH				
en/de	CAT	--					
		Scale/M.stab	OFFER DRAWING ANGEBOTSZEICHN.				
MNR	--	NTS					
				LT2 Sport- IMSA			Sheet/Bl.
				F02U.V0U.152-01			1/1
				Doc. type	DP/TO		Ind.
				Repl. for	Repl. by		Format
						A3	



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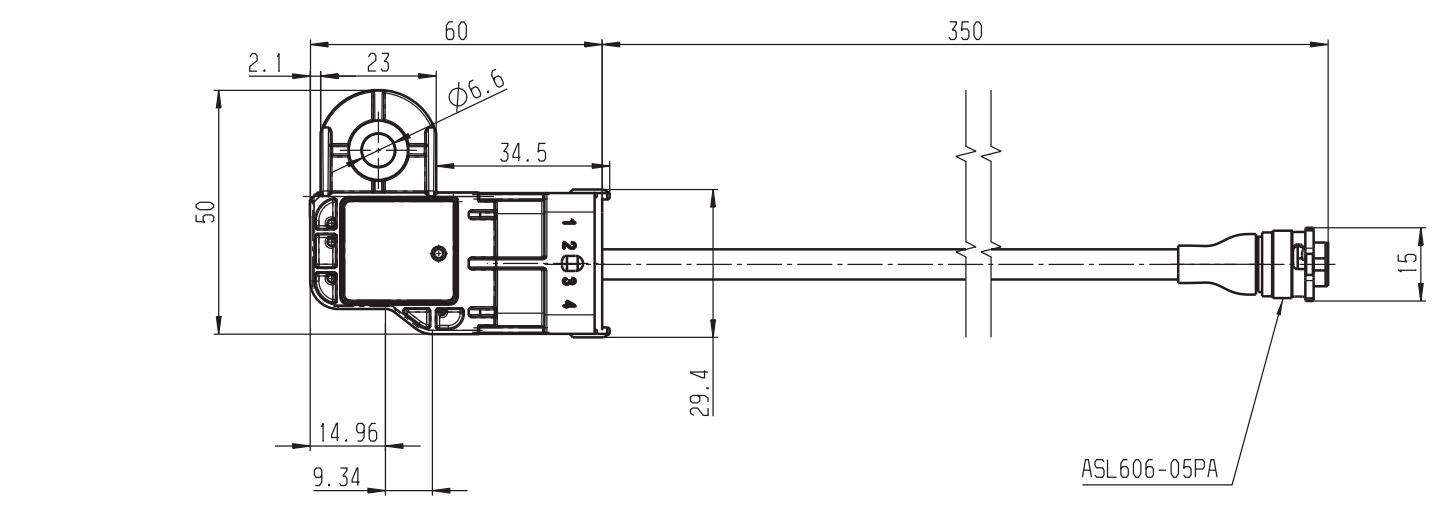
Pin Out	
1	Sens 5v
2	RS232 GND
3	RS232 TX
Mating Connector: ASU603-03SN	



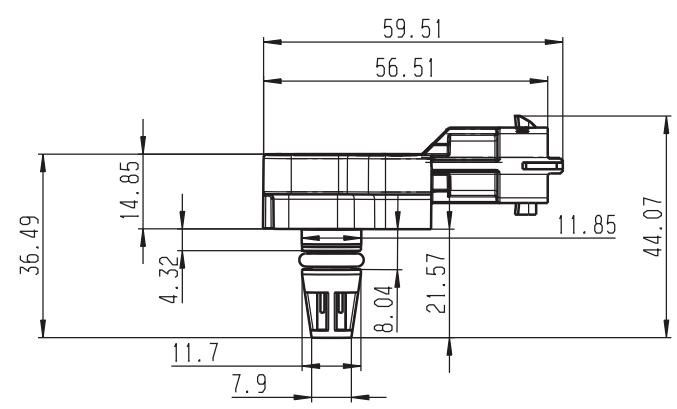
01	Initial	20151109	Brk	OnE	OnE	MSD	BEG/MSD-NA	
Ind.	Change/Änderung	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Released/Freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.
Lang./Spr.	Syst.	Wght./Gew.				GPS Module- IMSA		Sheet/Bl.
en/de	CAT	--				1/1		
	Scale/M.stab	1:1	OFFER DRAWING ANGEBOTSZEICHN.			Doc. type	F02U.VOU.203-01	DP/TO
MNR	--					Repl. for		Repl. by

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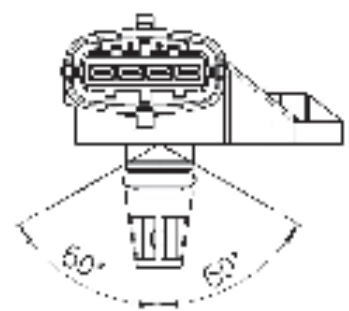
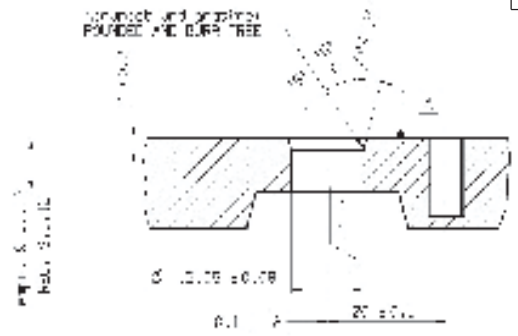
Pin Out	
1	Sens 5v
2	Sens GND
3	Signal
4	N-C
5	N-C
Mating Connector: ASL 106-05SA	





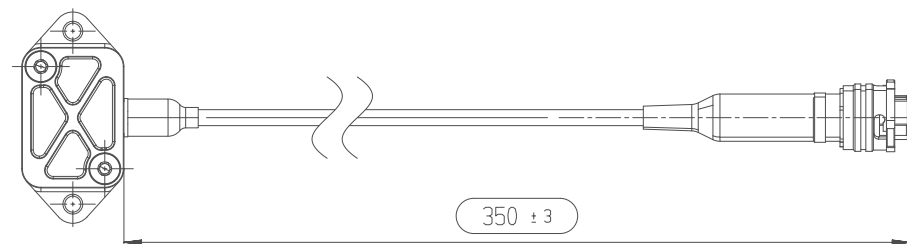
Sensor

Mounting Instructions:

- Recommended position: 0...±60° in all directions from vertical; orifice facing downwards
- Sensor should be mounted on a flat surface, with the base of the sensor sufficiently supported
- Mounting screw: M6x1
- Installation torque: 3.3 Nm



02 Mounting	20151203	BrK	BeJ	OhE	MSD	BEG/MSD-NA	.	.
01 Initial	20151106	BrK	OhE	OhE	MSD	BEG/MSD-NA	.	.
Ind. Change/Änderung	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Released./freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.	
Lang./Spr.	Syst.	Ught./Gew.	 BOSCH			Pressure Sensor: 1 Bar- IMSA		Sheet/Bl.
en/de	CAT	--						1/1
	Scale/M. stab		OFFER DRAWING ANGEBOTSZEICHN.			Doc. type	F02U.VOU.204-01	DP/TO
NTS						Ind.	Format	
MNR --							A3	
Repl. for				Repl. by				



Sensor Pin Assignment			
Pin	AWG	Color	Description
1	24	Wht/Org	12V Sensor Supply
2	24	Wht/Blu	Sensor Ground
3	24	Wht	Sensor Signal
4	24	Unused	Unused
5	24	Unused	Unused

Connector	Pressure Range
ASL 6 06-05 PD-HE	10 - 115 kPa

Size acc. to / Masse nach	ISO 14405-1:2010-12
---------------------------	---------------------

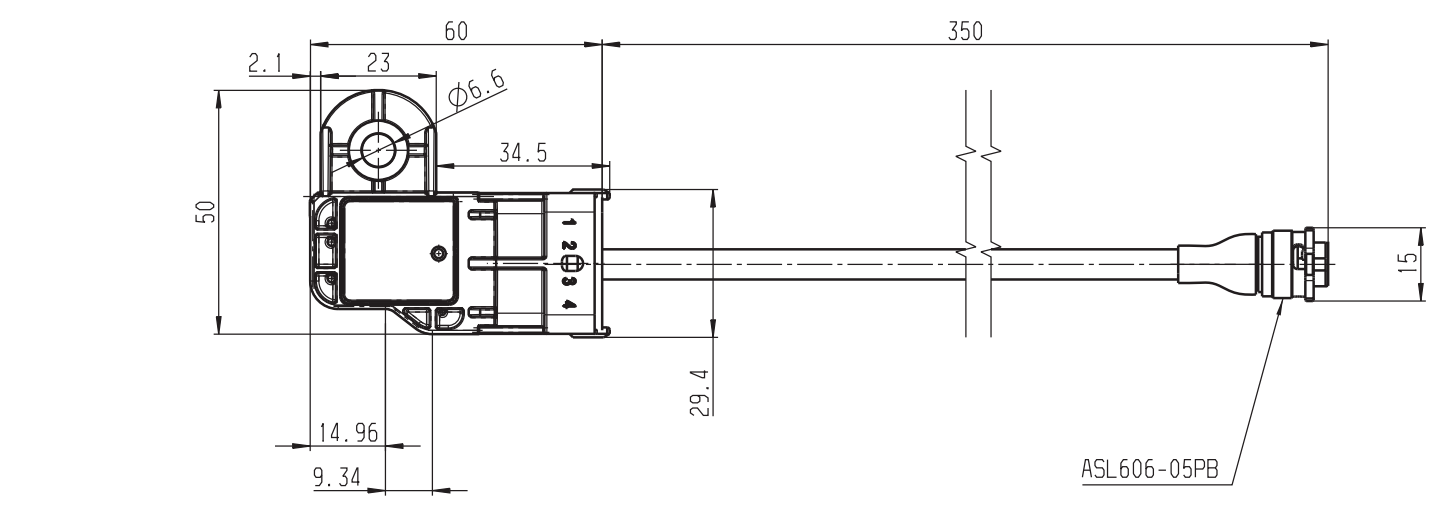
envelope principle/ Huellprinzip	150 1.150 1
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©

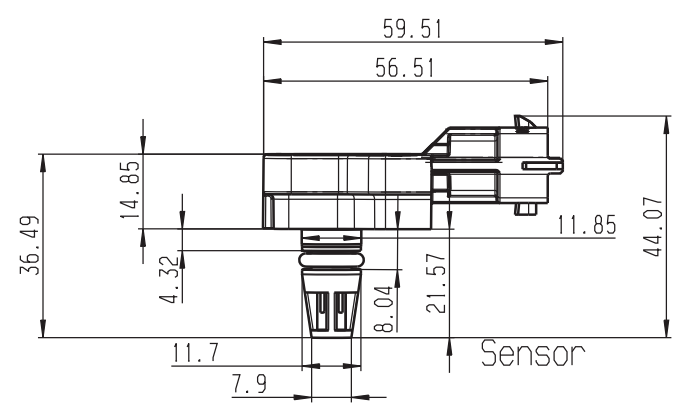
	*	*	*	*	*	*	*
	*	*	*	*	*	*	*
01	Update	20160909	hup2mtp	MuJ	MuJ	6720	BEG/MSD
Ind.	Change/Aend.	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Releas./Freig.	BWN	Resp. dept./Verantw. Abt.
						Add. info./Zus. Info.	
Treatment/ Behandlung						Missed Details/Fehlende Angaben	
Mat./Stoff						Size/Gst	
From/Aus							
Lang./Spr. en/de	Crit. P.	Scale/W.stab 1 : 1	PRESSURE SENSOR DRUCKFUEHLER				Sheet/Bil 1 / 1
		Mat.meets/Stoße s.	Doc. type DRW	F 02U VOU 267-01	DP/TD 000	Ind. 01	Format A3
MNR		N 2580 - I	Syst. UG	Repl. for . Repl. by .			

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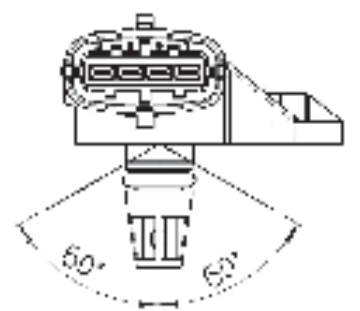
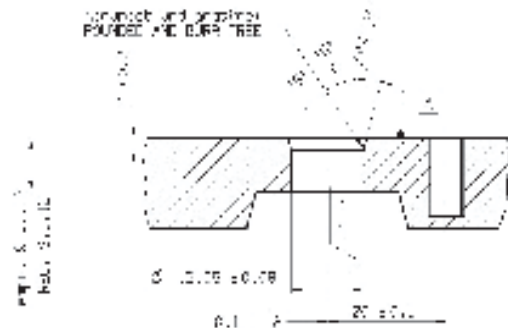





Pin Out	
1	Sens 5v
2	Sens GND
3	Signal
4	N-C
5	N-C
Mating Connector:	
ASL106-05SB	



Mounting Instructions:

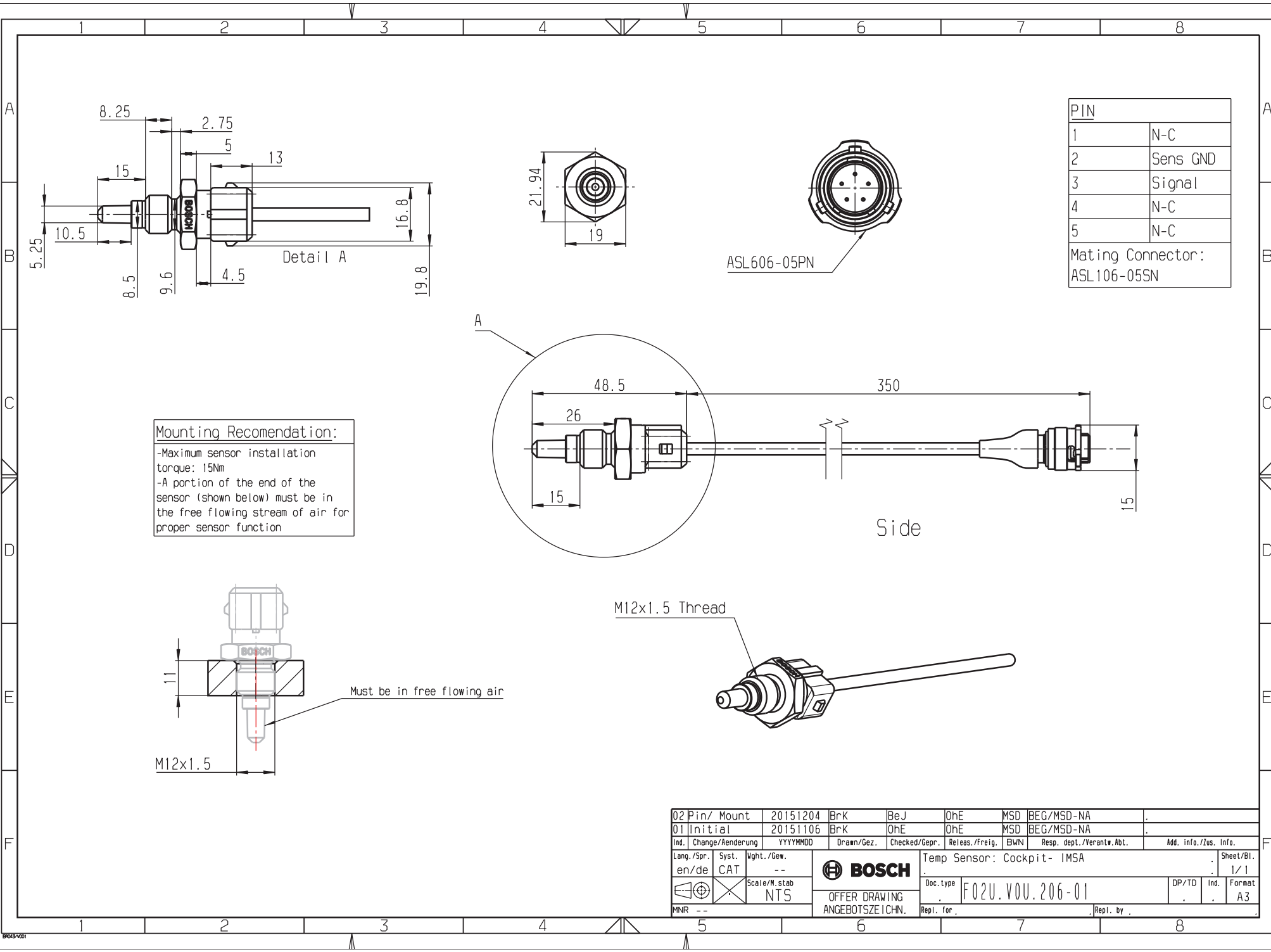
- Recommended position: 0...±60° in all directions from vertical; orifice facing downwards
- Sensor should be mounted on a flat surface, with the base of the sensor sufficiently supported
- Mounting screw: M6x1
- Installation torque: 3.3 Nm



02	Mounting	20151203	BrK	BeJ	OhE	MSD	BEG/MSD-NA	
01	Initial	20151106	BrK	OhE	OhE	MSD	BEG/MSD-NA	
Ind.	Change/Änderung	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Released/freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.
Lang./Spr.	Syst.	Ught./Gew.				Pressure Sensor: Boost- IMSA		
en/de	CAT	--				Sheet/Bl.		
		Scale/M. stab	OFFER DRAWING			Doc. type	F02U.V0U.205-01	DP/TO
MNR	--	NTS	ANGEBOTSZEICHN.			Repl. for		Repl. by

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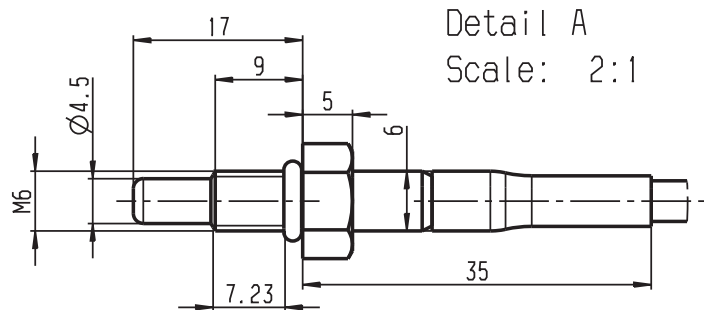
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Mounting Recommendation:
-Maximum sensor installation
torque: 15Nm
-A portion of the end of the
sensor (shown below) must be in
the free flowing stream of air for
proper sensor function

PIN	
1	N-C
2	Sens GND
3	Signal
4	N-C
5	N-C
Mating Connector: ASL106-05SN	

02 Pin/ Mount	20151204	Brk	BeJ	OhE	MSD	BEG/MSD-NA	.
01 Initial	20151106	Brk	OhE	OhE	MSD	BEG/MSD-NA	.
Ind. Change/Änderung	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Released/freig.	BWN	Resp. dept./Verante. Abt.	Add. info./Zus. Info.
Lang./Spr.	Syst.	Ught./Gew.	BOSCH				Temp Sensor: Cockpit- IMSA
en/de	CAT	--					Sheet/Bl.
Scale/M. stab	NTS	OFFER DRAWING ANGEBOTSZEICHN.				Doc. type	F02U.VOU.206-01
MNR	--	Repl. for				Repl. by	DP/TO Ind. Format
							A3

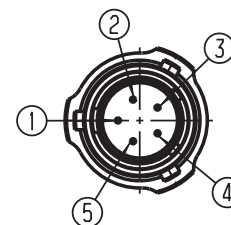


Detail A
Scale: 2:1

View A
Scale: 2:1



View B
Scale: 2:1



1: n.c.

2: Signal -

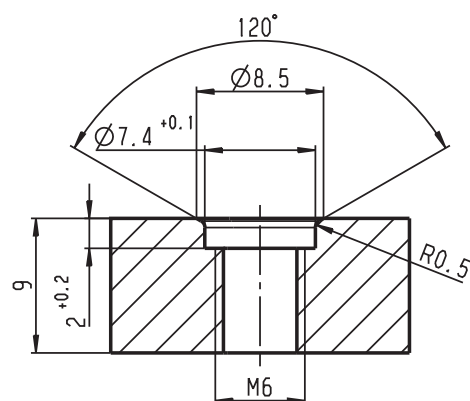
3: Signal +

4: n.c.

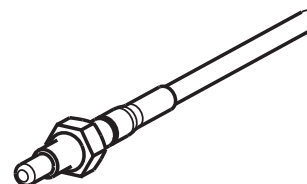
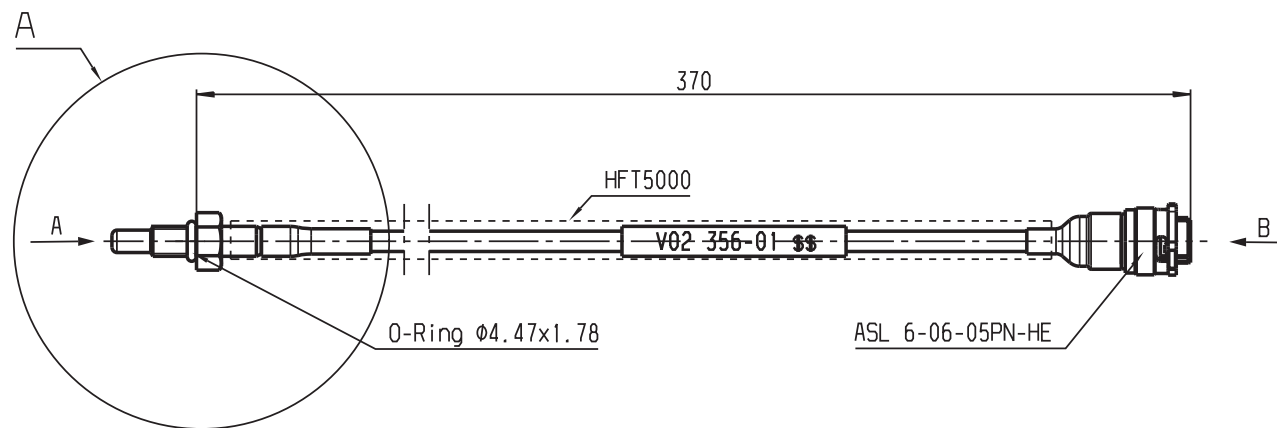
5: n.c.

ASL 6-06-05PN-HE

Installation
Recommendation
Scale: 3:1



Tightening Torque: 8Nm



lin. dim./L.masse	radii/Radien	angles/Winkel
± 1	± 0.5	± 2°

size acc. to/Masse nach
ISO 14405-1:2010-12

envelope principle / Huellprinzip	(E)
--------------------------------------	-----

F 02U V02 356-01 DH	-55...300
Order Number	Temperature Range [°C]
Bestellnummer	Temperaturbereich [°C]

01 Erstellung		20151126		SKR		672		BEG/MSD-P Behrens			
Ind. Change/End.		YYYYMMDD		Drawn/Gez.		Released/Freig.		BWN		Resp. dept./Verante.Abl.	
Lang./Spr.		Syst.		Mht./Ges.		<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> 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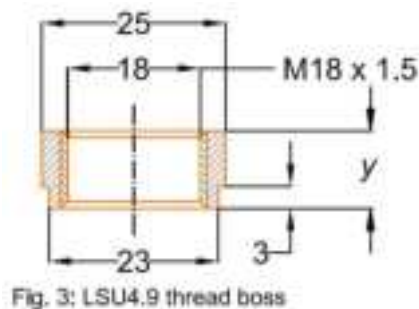


Fig. 3: LSU4.9 thread boss

Operating Temperatures (°C)	
Fiberglass pipe	830 °C
Fastening 22 mm hex	600 °C
PTFE formed hose (barrier side)	250 °C
PTFE formed hose (perforated side)	300 °C
Cable / protective sleeve	250 °C
Connector (OEM)	140 °C
Maximum Temperatures (°C)	
Exhaust Gas	1100 °C
Fastening 22 mm hex	680 °C

02 Mounting	20151203	BrK	BeJ	OhE	MSD	BEG/MSD-NA	.
01 Initial	20151106	BrK	OhE	OhE	MSD	BEG/MSD-NA	.
Ind. Change/Aenderung	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Releases./Freig.	BWN	Resp. dept./Verantw.Abt.	Add. info./Zus. Info.
Leng./Spr. en/de	Syst. CAT	Wght./Gew. --	LSU 4.9 - IMSA				Sheet/Bli 1/1
	Scale/M.stab	BOSCH				Dwg. type	DP/TD
	NTS	OFFER DRAWING ANGEBOTSZEICHN.				0 258.988.001	ind.
MNR --				Repl. for		Repl. by	Format A3

Vibration Profile 1

Broadband noise: 8h/direction

Frequency (Hz)	Acceleration density (m/s ²) ² /Hz
20	50.4
55	26.0
180	1.0
300	1.0
360	0.56
1,000	0.6
2,000	0.6
Effective value a_{eff}	55.4 m/s ²

Sine: 8h/direction

Frequency (Hz)	Acceleration peak (m/s ²)
100	50
180	200
250	200
350	60
2,000	60



Customer Information		Dealer Contact Information		CMS	Email
				Florida	colin@gomuchfaster.com
Team Name Here		Sakata Motorsport Electronics		California	Phone
Car Make and Competition Class					brian@sakatamotorsport.com
Contact Name		Mech-Tronic		New York	Phone / Fax
Contact Email / Phone Number					mech-tronic@verizon.net
					Phone / Fax
					+1 (631) 423-0523 / +1 (631) 423-7769

Product Description	Part Number	Qty.	Use Case	Price	Comments
Spec Kit					
IMSA GT Spec Scrutineering Kit	F02U.V0U.202-01			\$ 9,253.87	Includes: C60 logger with USB Stick, GPS Module, LT2 Sport Lambda Controller, MM5.10 IMU with mounting plate.
Spec Sensors					
Pressure Sensor - 1 Bar	F02U.V0U.204-01		Airbox, Manifold, Restrictor	\$ 260.00	
Pressure Sensor - 1.15 Bar	F02U.V0U.267-02		Airbox, Manifold, Restrictor	\$ 437.50	
Pressure Sensor - 3.5 Bar	F02U.V0U.205-01		Turbo Boost	\$ 260.00	
Temperature Sensor - M12	F02U.V0U.206-01		Intake, Cockpit	\$ 209.00	
Temperature Sensor - M6	F02U.V02.356-01		Intake, Cockpit	\$ 424.36	
Lambda Sensor	0258.988.001		Lambda	\$ 149.35	
Individual Spare Parts					
IMSA C60 - Data Logger	F02U.V0U.207-01			\$ 7,501.46	IMSA C60 logger
LT2 Sport - Lambda Controller	F02U.V0U.152-01			\$ 678.77	
MM5.10 - IMU	F02U.V01.511-02			\$ 805.94	
GPS Module	F02U.V0U.203-01			\$ 365.00	
IMU Mounting Plate	1271.032.390			\$ 73.00	Mounting plate for MM5.10 sensor
Matting Connectors (Wiring Harness Side)					
LT2 Sport - Lambda Controller - Connector Kit	F02U.V0U.150-01			\$ 10.04	Includes housing, pins, and seals
MM5.10 - IMU - Connector Kit	F02U.B00.435-01			\$ 12.44	Includes housing, pins, and seals
Lambda Sensor Connector Kit	D261.205.356-01			\$ 14.15	Includes housing, pins, and seals
USB Stick Matting Connector Kit	F02U.002.996-01			\$ 65.54	For C60 data logger USB interface

Notes

To order parts please fill out this orderform with requested quantities of each part and send it back to one of the approved distributors.

All prices are in USD and are valid until 12/31/2021.
Parts are only able to be dispatched after payment has been verified.

Shipping charges are additional to kit/piece prices.

For sales/deliveries at the track, there is a 10% service charge

Robert Bosch LLC – Bosch Engineering North America Motorsport Sales Terms & Conditions

Version: January 20, 2020

1. GENERAL. THE SALE OF COMPONENTS, PARTS, OR A SYSTEM INTENDED FOR SERIES PRODUCTION (“**SERIAL PRODUCTION PRODUCTS**” OR “**PRODUCTS**”), ALL SAMPLES, PROTOTYPES, NON-PRODUCTION PRODUCTS, AND COMPONENTS (INCLUDING SOFTWARE CONTAINED THEREIN) NOT APPROVED FOR SERIES PRODUCTION OR THAT ARE INTENDED FOR EVALUATION PURPOSES ONLY (“**PROTOTYPES**”), AND/OR DESIGN AND ENGINEERING OR SIMILAR SERVICES (“**SERVICES**”) PROVIDED BY ROBERT BOSCH LLC, THROUGH ITS BOSCH ENGINEERING NORTH AMERICA DIVISION (“**BOSCH**”) TO THE CUSTOMER (“**CUSTOMER**”) (EACH A “**PARTY**” AND COLLECTIVELY REFERRED TO AS “**PARTIES**”) IS EXPRESSLY LIMITED TO CUSTOMER’S ACCEPTANCE OF THE TERMS OF BOSCH’S OFFER (ALSO REFERRED TO AS THE “**QUOTATION**”) AND THESE BOSCH TERMS, EXCLUDING MODIFICATIONS TO THESE BOSCH TERMS SET FORTH IN THE APPLICABLE BOSCH QUOTATION. NO MODIFICATION OR WAIVER OF ANY OF THESE BOSCH TERMS AND NO ADDITIONAL OR DIFFERENT TERMS OR CONDITIONS WILL BE EFFECTIVE UNLESS EXPRESSLY SET FORTH IN BOSCH’S QUOTATION OR AGREED TO IN WRITING SIGNED BY BOSCH. NO ORAL AGREEMENT, COURSE OF PERFORMANCE, OR OTHER MEANS WILL BE DEEMED TO WAIVE THESE BOSCH TERMS OR ANY OF THE TERMS OF THE QUOTATION. CUSTOMER’S ACCEPTANCE OF THE PRODUCTS, PROTOTYPES, AND/OR SERVICES SOLD HEREUNDER WILL CONSTITUTE CUSTOMER’S ACCEPTANCE OF THE BOSCH QUOTATION AND BOSCH TERMS.

2. SCOPE. CUSTOMER acknowledges that Serial Production Products, whether or not modified, are not designed to meet the requirements and demands of motorsport racing.

CUSTOMER acknowledges that modified Serial Production Products and CUSTOMER specified Products cannot be tested to the same degree as Serial Production Products and that production of such modified Serial Production Products or CUSTOMER specified Products does not follow the testing and validation standards applicable to Serial Production Products. CUSTOMER acknowledges that the use of the Products in motorsport racing applications will lead to early wear, and that modified Serial Production Products or CUSTOMER specified products are produced with a focus on race performance and not on endurance. The terms of Sections 1 to 2 above apply irrespective of the CUSTOMER’s application of the Products.

3. USE OF THE PRODUCTS. The Products are provided solely for use by (i) racing professionals and CUSTOMER warrants and represents that it possesses the appropriate engineering and professional racing experience to use the Products for motorsport racing and (ii) research institutions trained by professionals. CUSTOMER acknowledges that the use of the Products may be dangerous and that the Products shall not be used in any consumer application. CUSTOMER shall use the Products: (i) only for motorsport racing purposes; (ii) only through engineers and mechanics who are trained and experienced in motorsport racing; (iii) only in vehicles, which are suitable for use in motorsport racing; (iv) only in such suitable vehicles that are operated by trained, professional motorsport race drivers; and (iv) research purposes by trained professionals. CUSTOMER shall not use, nor permit any other party to use, the Products in any vehicle operated on the public roads, or in connection with any consumer application. BOSCH shall not be liable for any use of the Products on the public roads. Should a Product be used on the public roads or in connection with any consumer application, all Product warranties are void.

4. PRICES; TAXES; CURRENCY. All prices are subject to the shipping terms defined in Section 6 below. Bosch reserves the right to adjust prices due to cost increases resulting from variations in labor rates, material costs, or other costs (including but not limited to variations

related to tariffs). To the extent the Products contain raw materials, raw material fluctuations will be reviewed on a quarterly basis. Actual material price increases of 5% or more will be paid in lump sum by CUSTOMER. The prices are exclusive of any applicable Federal, State, Provincial, or local sales, use, and other similar taxes or assessments. Such taxes and assessments will be included in Bosch’s invoice and paid by CUSTOMER. CUSTOMER shall be solely responsible for its tax administration and tax liability based upon governing Federal, State, and local laws that relate to these BOSCH Terms. All prices are subject to adjustment, at any time, by Bosch for changes in volume forecasts, economics, or exchange rates as applicable. To the extent CUSTOMER’s actual purchases fall short of the volume forecasts upon which the prices were based, any price adjustments by Bosch will be retroactive. Prices are per piece in U.S. Dollars or EUR. All North American CUSTOMER facilities will be invoiced in U.S. Dollars. Each payment by CUSTOMER is subject to the terms of Section 8 below and will be made without withholding any taxes, unless required by law. CUSTOMER shall inform Bosch of any withholding tax obligation on payments due to Bosch under an invoice as soon as CUSTOMER becomes aware of such withholding tax obligation. If Bosch believes that it is eligible for exemption from, or reduction of, any U.S. withholding tax (or other withholding or similar tax of one or more other jurisdictions), Bosch will deliver to CUSTOMER a completed, duly executed IRS Form W-9 or Form W-8 (or other appropriate form of such other jurisdiction(s) as required under the laws of such other jurisdiction) valid through the date of payment. In such event, CUSTOMER shall promptly deliver to Bosch a certificate evidencing the payment of any tax actually withheld.

5. CANCELLATIONS AND CHANGES. No cancellations of or changes ordered by CUSTOMER to the Products, Prototypes, and/or Services or any delivery or pickup terms related thereto will be effective without Bosch’s written consent and in the event of any such cancellation or change, Bosch will be entitled to all remedies available by law or equity, including without limitation cancellation costs, warehousing fees, and/or increased prices. At a minimum, CUSTOMER will be liable for the following items, or any applicable combination thereof: (a) Products, Prototypes delivered, and/or Services performed prior to cancellation or change that comply with the specifications and other requirements of the Quotation; (b) the reasonable cost of raw materials and components that were purchased by Bosch to meet the requirements of the Quotation and that cannot be returned for refund or credit or immediately used for or sold to any of Bosch’s other CUSTOMERS; (c) the reasonable costs to settle all claims by subcontractors for actual costs that are rendered unrecoverable due to cancellation or change; and (d) the reasonable costs of reassignment of Bosch’s employees specifically dedicated to the satisfaction of Bosch’s obligations under the Quotation, provided Bosch uses reasonable efforts to reassign each such employee.

6. SHIPMENT AND DELIVERY. All delivery dates are estimates only. Bosch’s only obligation with respect to delivery dates will be to use reasonable efforts to meet such delivery dates. Unless specified otherwise in the Quotation, the delivery terms will be FCA (as defined in Incoterms® 2010) at the designated Bosch facility. Title and risk of loss to the Products and Prototypes will transfer upon completion of delivery of the Products and Prototypes per the applicable delivery term specified above. Unless otherwise instructed, Bosch will ship via industry standard means for the applicable Products and Prototypes. Bosch will not be liable for any delays, breakage, loss, or damage after having made delivery in good order to the first transportation carrier. All claims for loss or damage in transit are to be made by CUSTOMER directly to the transportation carrier and the appropriate insurance carrier retained by CUSTOMER. CUSTOMER shall not make any deductions of any kind from the invoice amount. Unless otherwise specified in the Quotation, standard packing for domestic shipment is included in the quoted price. When special domestic or export packing is requested, CUSTOMER will be charged for any additional expenses. Shipments will be deemed accepted by CUSTOMER unless written

notice of rejection is received by Bosch within ten (10) days after receipt of the Products and Prototypes by CUSTOMER. For rejected shipments, CUSTOMER will bear the risk of loss or damage to the Products and/or Prototypes in transit. If Bosch reasonably determines that the rejection was improper, CUSTOMER will be responsible for all expenses incurred by Bosch arising from the improper rejection.

7. FORCE MAJEURE. In the event either Bosch or CUSTOMER is unable to fully perform its obligations hereunder (except for CUSTOMER's obligation to pay invoices for Products, Prototypes, and/or Services) due to events beyond its reasonable control, including without limitation, acts of God, action by any governmental authority (whether valid or invalid), fires, floods, windstorms, explosions, riots, natural disasters, wars, sabotage, labor problems (including lockouts, strikes, or slowdowns), inability to obtain power, material, labor, equipment or transportation, or court injunction or order (collectively referred to herein as a "Force Majeure Event"), that party shall be relieved of its obligations to the extent it is unable to perform such obligations. A Party experiencing a Force Majeure Event shall provide reasonable notice of such Force Majeure Event to the other Party. In the event of Bosch's inability to perform due to a Force Majeure Event, Bosch may allocate available goods and materials among its CUSTOMERs and CUSTOMER will be entitled to reduce its purchase obligations toward Bosch by the quantities purchased from other sources, but shall not have the right to terminate these BOSCH Terms.

8. PAYMENT TERMS. Unless specified otherwise in the Quotation, terms of payment are net thirty (30) days from the earlier of the date of shipment or the date of an invoice, with no discount allowed for early payment. Bosch reserves the right to reclaim any Products, Prototypes, and/or Services that have not been paid for in full and Bosch reserves the right to alter or suspend credit terms or require C.O.D. or advance payment whenever Bosch has reasonable doubt as to CUSTOMER's credit worthiness or the ability of CUSTOMER to pay in a timely manner. If CUSTOMER becomes delinquent in payment or refuses to accept C.O.D. shipments, Bosch will have the right to, in addition to all other available rights and remedies, cancel any or all CUSTOMER orders, withhold further deliveries, and declare all unpaid amounts for Products, Services, and/or Prototypes previously delivered immediately due and payable. Amounts past due will be subject to an interest charge of 1.5% per month or the maximum rate allowed by law, whichever is less. CUSTOMER shall pay all costs and expenses incurred by Bosch as a result of non-payment or delinquent payment by CUSTOMER, including without limitation collection costs, interest, and reasonable attorneys' fees.

9. WARRANTY

9.1 Unless specified otherwise in BOSCH's quotation BOSCH warrants that, upon delivery, the Products will be free of defects in material and workmanship. BOSCH's warranty covers only defects, that existed at the time of delivery. The foregoing warranty: (i) is personal to CUSTOMER and does not extend to any subsequent owner of the Products; and (ii) does not cover defects which occur due to the use in a motorsport environment.

9.2 CUSTOMER acknowledges that the Products are designed for race performance, with reduced durability and stability, and that the extreme wear inherent in a racing environment may result in Product malfunction which will not be covered by the limited warranty set forth above.

9.3 BOSCH does not warrant that modified Serial Production Products or CUSTOMER specified Products will display the features or operational performance requested or expected by CUSTOMER.

9.4 BOSCH will provide free of charge to CUSTOMER, replacement Products or, at BOSCH's option, credit in a fair amount not to exceed the purchase price for Products which prove to be defective under the limited warranty set forth above, provided, however, that CUSTOMER has returned to BOSCH 100% or a statistically relevant share, as mutually agreed upon, of any Products claimed to be defective. BOSCH shall have the right to request reasonable evidence of, and impose reasonable requirements for, submission of a warranty claim including, by way of example and not limitation, printouts of diagnostic test results performed at the CUSTOMER's dealer level or by CUSTOMER.

9.5 In the event of (a) improper installation or misuse of the Products, (b) use of Products outside of BOSCH approved applications, specified environments or installation conditions, (c) use of Products for racing or testing applications, (d) failure to maintain Products in accordance with applicable maintenance instructions, or (e) alteration or damage caused to the Product, or similar circumstances, no warranty shall apply and BOSCH shall not be liable for such Products or any damage caused by such products.

9.6 THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING WARRANTY DOES NOT APPLY TO ANY ISSUES STEMMING FROM CUSTOMER'S USE OF THE PRODUCT IN ANY APPLICATION. THE REMEDIES SET FORTH IN THIS SECTION REPRESENT CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES FOR ANY BOSCH BREACH OF WARRANTY.

10. PROTOTYPE WARRANTY AND USE.

10.1 PROTOTYPES ARE PROVIDED "AS IS" AND ALL WARRANTIES, EXPRESSED OR IMPLIED, ARE DISCLAIMED AND EXCLUDED, INCLUDING WITHOUT LIMITATION WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR FREEDOM FROM THIRD PARTY RIGHTS, WHETHER ARISING BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, OR OTHERWISE. BOSCH DOES NOT WARRANT THAT THE PROTOTYPES WILL BE ERROR FREE OR SECURE. PROTOTYPES ARE NOT DESIGNED FOR AND SHOULD NOT BE USED IN ANY FAIL-SAFE APPLICATIONS.

10.2 CUSTOMER acknowledges that Prototypes are intended only for use in evaluation and testing in a suitable and safe evaluation and testing environment and by suitably trained and qualified persons. CUSTOMER shall ensure safe operating conditions for all evaluation and testing purposes at all times during the evaluation and testing. CUSTOMER warrants that no vehicles containing any Prototypes will be driven on public roads, unless and until CUSTOMER and Bosch agree in writing. CUSTOMER shall only use the Prototypes in accordance with written instructions from Bosch. Any use or application of Prototypes, which deviates from written instructions from Bosch, will be considered an impermissible use in breach of these BOSCH Terms. Any use, testing or evaluation of the Prototypes outside the scope of this Section 10.2 or as agreed in writing between the parties shall be at CUSTOMER's sole risk.

11. TERMINATION/CANCELLATION.

11.1 Bosch may terminate the CUSTOMER's purchase order/acceptance of the Quotation: (a) upon written communication to CUSTOMER in the event CUSTOMER breaches any material term of the Quotation or these BOSCH Terms, provided CUSTOMER has not remedied the breach within 30 days of Bosch providing notice to CUSTOMER of such breach; or (b) if CUSTOMER becomes insolvent or makes an assignment for the benefit of creditors, or CUSTOMER institutes any voluntary proceeding under bankruptcy, reorganization, arrangement, readjustment of debt, or insolvency law of any jurisdiction or for the appointment of a receiver or trustee in respect to any of CUSTOMER's property, then termination shall be automatic and immediate; however, in the event any such proceeding is initiated by a third party against CUSTOMER, termination will be automatic if the such proceeding is not dismissed or cured by CUSTOMER within thirty (30) days after the filing thereof. Bosch shall not be liable to CUSTOMER for any claims arising out of or based on termination in accordance with this Section 11.1.

11.2 In the event that CUSTOMER cancels the program after business award but before the agreed upon end of program duration, CUSTOMER shall reimburse Bosch for reasonable cancellation charges for unrecoverable costs and investments, including without limitation capital equipment, finished Products, cost of all work in process, Bosch paid tooling or licenses (including software licenses and maintenance agreements), engineering costs, application costs, development services, samples, and material obsolescence. CUSTOMER shall pay such cancellation charges in accordance with Section 8.

12. INTELLECTUAL PROPERTY/SOFTWARE.

12.1 INTELLECTUAL PROPERTY RIGHTS. As between Bosch and CUSTOMER, Bosch exclusively owns and shall retain exclusive

ownership of all right, title, and interest, including all worldwide patent, trademark, copyright, trade secret, and other intellectual property and proprietary rights (collectively, “**Intellectual Property Rights**”) in and related to (a) the Products; (b) the Prototypes; (c) the Services; and (d) all other ideas, inventions (whether patentable or not), concepts, designs, methods, processes, software (including source code and object code), data, and works of authorship authored, developed, or conceived by Bosch in connection with the Products, Prototypes, or Services, along with all software, functions, and related documentation provided by Bosch or any division or affiliate thereof. Bosch reserves the right to brand, mark, or label the Products, Services, and Prototypes and accompanying packaging with Bosch trademarks. Products or Services delivered from Bosch to the independent aftermarket will bear the Bosch trademarks only.

12.2 THIRD PARTY INTELLECTUAL PROPERTY RIGHTS INDEMNIFICATION. Bosch shall indemnify, defend, and hold harmless CUSTOMER against all final judgments of infringement in the United States of the Intellectual Property Rights of any third party registered and published in the United States (specifically excluding claims of infringement of any affiliate of CUSTOMER) and resulting direct damages and expenses (including reasonable attorney’s fees) arising out of use of any Product or Service as delivered by Bosch, provided Bosch shall have no liability and shall not indemnify, defend, or hold harmless CUSTOMER for or against any claim arising from (i) CUSTOMER’s gross negligence or willful or intentional acts or omissions; or (ii) any modification or alteration of any Products or Services, unless prior written authorization for such modification or alteration is provided by Bosch in writing; or (iii) use of the Products or Services in combination with any other equipment, software, products or services not supplied by Bosch and the use of such combination was not authorized by Bosch; or (iv) CUSTOMER’s designs, specifications, requirements, or instructions; or (v) the application or use of any Products or Services which fails to comply with the specification or other written instruction from Bosch; or (vi) the implementation of Standardized Technologies, to the extent the indemnification obligation stems from the Standardized Technologies or implementation related thereto (as used herein “Standardized Technologies” means technical specifications or functions (x) adopted by a standards organization (e.g., ETSI or IEEE), (y) defined by research institutes, industrial companies, or market participants to ensure technical conformity or compatibility, or (z) established by common practice in a particular field). For the sake of clarity, no indemnification or warranty is provided for Prototypes.

12.3 Bosch shall be entitled, at its discretion, to: (i) obtain a right of use for a Product or Service alleged to infringe an Intellectual Property Right, (ii) to modify the Product or Service so that it no longer infringes the Intellectual Property Right, or (iii) to replace the Product or Service with an equivalent substitute that no longer infringes the Intellectual Property Right. Bosch reserves the right to carry out the actions of (i)-(iii) in the sentence above at its disposal even if the infringement of the Intellectual Property Right has not been ruled on by a court of law with res judicata effect or acknowledged by Bosch. If Bosch determines that options (i), (ii) or (iii) are not reasonably available, Bosch shall be considered to have fulfilled its obligations under this Section 12 by returning the fees paid by CUSTOMER for Products or Services which are subject to the infringement claim.

12.4 INDEMNIFICATION FROM CUSTOMER. To the fullest extent permitted by applicable law, and subject to the conditions applicable to claims by CUSTOMER against Bosch under Section 12.2, CUSTOMER shall indemnify, defend, and hold harmless Bosch, its affiliates, and their respective directors, officers, employees, successors, and assigns for all claims, liabilities, damages, costs, and expenses (including reasonable attorney fees) asserted by a third party (specifically excluding any affiliate of Bosch) and incurred by Bosch in connection with such claims (including lawsuits, administrative claims, regulatory actions, and other proceedings to recover for personal injury or death, property damage, or economic losses) to the extent caused by: (i) CUSTOMER’s or Bosch’s infringement or misappropriation of any Intellectual Property Rights of any third party caused by (a) CUSTOMER’s technology, products, or services, or Bosch’s use thereof in accordance with these BOSCH Terms or any applicable Quotation, or (b) any modification or alteration of any Products or Services by CUSTOMER, unless prior written authorization for such modification or alteration is provided by Bosch in writing; or (ii) bodily injury or property damage resulting from CUSTOMER’s integration of the Products or

Services into vehicle systems or other components within the vehicle system in a manner that is not approved by Bosch or in compliance with all applicable laws; or (iii) any grossly negligent act or omission of CUSTOMER or any of its employees or agents; or (iv) CUSTOMER’s failure to comply with representations, performance, or obligations under these BOSCH Terms or the applicable Quotation; or (v) any design, hardware, software, data, instructions, requirements, or material expressly required or supplied by CUSTOMER.

12.5 The indemnified Party under Sections 12.2 or 12.4 shall give prompt written notice to the indemnifying Party of the claim for which it seeks indemnification (provided that the failure to give such notice will not relieve the indemnifying Party of its obligations under Sections 12.2 or 12.4, except to the extent that such failure materially prejudices the indemnifying Party’s ability to carry out its obligations under Sections 12.2 or 12.4). The indemnifying Party will assume and direct the defense and settlement of any such claim with counsel of the indemnifying Party’s reasonable choosing; the indemnified Party will provide the indemnifying Party, at the indemnifying Party’s expense, with such information and assistance as may be reasonably necessary for the defense and settlement of the claim. CUSTOMER will not settle or resolve any such claim without the advance written approval of Bosch, approval not to be unreasonably withheld or delayed, unless such settlement or resolution includes a full and unconditional release of Bosch with no admission of guilt from Bosch or its affiliates.

12.6 SOFTWARE. Notwithstanding anything to the contrary set forth in an applicable Quotation or these BOSCH Terms, and excluding any OSS (defined below), all Bosch software and firmware that has been loaded onto, incorporated into, or provided by Bosch in connection with the Products, Prototypes, or Services (the “**Software**”) is and remains owned by Bosch, or its affiliates. All Software is provided with only a limited right to use as delivered in connection with hardware and/or in accordance with the applicable software license provided to CUSTOMER. In the event any Software contains a click-through, pop-up, or other end-user license agreement (collectively, “**EULA**”), the terms of such EULA shall control over the terms of the applicable Quotation or these BOSCH Terms to the extent the terms of the EULA conflict with the Quotation or BOSCH Terms. In the event CUSTOMER does not accept the EULA at the time of delivery, (i) CUSTOMER shall not use the applicable Software or hardware incorporating such Software for any purpose and return the Software or corresponding hardware within ten (10) days of receipt thereof, and (ii) any use of the Software will be considered an unauthorized use in breach of these BOSCH Terms and the EULA. Unless expressly agreed otherwise, Bosch has no obligation to provide any updates or upgrades to the Software (including, without limitation correcting any bugs identified by Bosch, CUSTOMER, or any third party). Notwithstanding the foregoing sentence, Bosch reserves the right to make the availability of updates, upgrades, and new releases at its sole discretion or conditional upon the existence of a valid service contract.

12.7 OPEN SOURCE SOFTWARE. Products, Prototypes and Services which incorporate Software may contain free or open source software (“OSS”). Such OSS is always subject to separate third party OSS licensing terms and conditions (“**OSS-Terms and Conditions**”). The OSS-Terms and Conditions come into effect between CUSTOMER and the authors of the respective OSS. Under such OSS-Terms and Conditions, Bosch is required to provide the same to CUSTOMER and CUSTOMER itself has to obey all of the OSS-Terms and Conditions and to fulfill all corresponding obligations in case CUSTOMER further disposes of the Products, Prototypes, or Services through sales or other transfer to third parties. Such obligations may include, for example, documentation obligations or obligations to provide the source code of any software integrated in a product in which the OSS has also been integrated by CUSTOMER. An overview about all OSS components contained in the Products, Prototypes, or Services as well as corresponding license text of the OSS-Terms and Conditions (of all originating OSS authors) are part of Bosch’s delivery of the Product, Prototype, or Service (e.g. as part of the provided documentation, in a display field within a device, etc.). To the extent that new software versions included in Bosch’s Products, Prototypes, and Services may contain other and/or additional OSS, the same terms and conditions apply as stated in this Section 12.7.

12.8 CUSTOMER’S USE OF OPEN SOURCE SOFTWARE. CUSTOMER shall use reasonable commercial efforts to not combine or request or otherwise cause others to combine Bosch Software,

Products, Prototypes, and/or Services with any OSS or other data in any manner that would result in the Bosch Software, Products, Prototypes, and/or Services becoming subject to the terms of an OSS license. For any software provided to Bosch by CUSTOMER or on behalf of CUSTOMER, CUSTOMER shall disclose in writing a list of all applicable OSS-Terms and Conditions and/or third party license terms at the time of delivery of such software to Bosch, and CUSTOMER shall indemnify Bosch for all costs, expenses, and damages caused by CUSTOMER's failure to disclose OSS-Terms and Conditions and/or third party license terms in software provided by CUSTOMER, directed by CUSTOMER, or on behalf of CUSTOMER.

12.9 NO REPRODUCTION. Unless otherwise permissible under law or agreed to by Bosch in writing, CUSTOMER shall not itself and shall not enable or instruct others to copy/reproduce, reverse engineer, decompile, disassemble, translate, or fragment parts of Software or Prototypes provided by Bosch and CUSTOMER shall treat such Software and Prototypes as Confidential Information as defined in Section 12 of these BOSCH Terms.

13. GOVERNMENT CONTRACTS. If Products, Prototypes, and/or Services are purchased under a government contract or sub-contract, CUSTOMER shall promptly notify Bosch of the provisions of any government procurement laws and regulations which are required to be included in the contract covering the Products, Prototypes, and/or Services ordered. If compliance with such provisions increases Bosch's costs or liability, or encumbers any Bosch Intellectual Property Rights, Bosch will be entitled, at its option, to adjust the prices accordingly, request separate payment of the additional costs, or terminate this Agreement. CUSTOMER shall be responsible for all costs incurred by Bosch related to such compliance.

14. CONFIDENTIAL INFORMATION. Any and all non-public information and data concerning the Products, Prototypes, Services, or any other transaction covered hereunder which Bosch discloses to CUSTOMER, is generated by the Products, Prototypes, or Services, or which CUSTOMER otherwise obtains knowledge of hereunder, and any non-public technical, financial, or business information, trade secrets, orders, content, Prototype, or other information provided by Bosch to CUSTOMER (collectively, "**Confidential Information**") remains the exclusive property of Bosch and shall not be disclosed by CUSTOMER to third parties without Bosch's express written consent. Confidential Information shall be held in confidence and shall not be disclosed and shall not be used except to the extent necessary to carry out CUSTOMER's obligations or express rights hereunder, unless otherwise authorized by Bosch in writing. For the sake of clarity, CUSTOMER shall have no right whatsoever to such Confidential Information other than to use it for evaluation for the purpose of the transaction covered hereunder. If the CUSTOMER is compelled by law to disclose Bosch's Confidential Information, and a protective order or other remedy is not obtained, CUSTOMER shall furnish only that portion of the Confidential Information that is legally required and CUSTOMER shall use commercially reasonable efforts to obtain assurance that confidential treatment shall be accorded the Confidential Information. This Section 14 (Confidentiality) shall survive the termination or expiration of any purchase order, accepted Quotation, or other termination of CUSTOMER's use of or CUSTOMER's right to use the Products, Prototypes, and/or Services.

15. REMEDIES/LIMITATION OF REMEDIES. Bosch's rights and remedies set forth herein shall be in addition to any legal or equitable right or remedy available to Bosch. No waiver of any of Bosch's rights or remedies shall be effective without Bosch's express written consent. CUSTOMER's sole and exclusive remedy after acceptance of the Products or Services shall be the remedy available under the respective warranty provision.

16. LIMITATION OF LIABILITY.

The liability of BOSCH, and its respective affiliates, officers, directors, employees, shareholders, agents, licensors, or representatives (collectively the "BOSCH Parties") for any claim, regardless of the form of action, whether in contract, tort or negligence, for any damages resulting from or in any manner connected with this Agreement and any Products, shall be limited to the lesser of (i) CUSTOMER's actual direct damages related thereto, or (ii) the amount of the fees paid by

CUSTOMER for the portion of the Products which are in error. In no event shall the liability of the BOSCH Parties exceed the fees paid by CUSTOMER during the period such damages were incurred, such period not to exceed three (3) months, for the specific Products that allegedly give rise to the damages.

In no event shall any of the BOSCH Parties be liable for any indirect, incidental, special or consequential damages including, but not limited to, loss of data, lost business, lost profits and other economic damages, whether foreseeable or not, even if advised of the possibility of such damages. Without limiting the generality of the foregoing, the BOSCH Parties shall not be liable to CUSTOMER with respect to the quality or sufficiency of any business results or motorsport racing results to be achieved with the use of the Products.

CUSTOMER agrees, acknowledges and confirms that the limitations of liability set out in this Section are fair and reasonable in the commercial circumstances of this Agreement and that BOSCH would not have entered into this Agreement but for CUSTOMER's agreement to limit the liability of the BOSCH Parties in the manner, and to the extent, provided herein. The limitations of liability set out in this Section shall apply even in the event of a breach of condition, a breach of an essential or fundamental term, or a fundamental breach of this Agreement.

17. EXPORT. CUSTOMER will not sell, distribute, resell, or transfer (hereinafter collectively, "**Transfer**") any Product, Prototype, or Services, including commodities, software and technology/technical data, plans, and specifications relating to the Product, Prototype, or Services (collectively, "**Export Control Products**") or take any actions in relation to or in furtherance of these BOSCH Terms, which are contrary to U.S. Export Regulations, including but not limited to U.S. Department of Commerce Export Administration Regulations ("**EAR**"), the U.S. Treasury Office of Foreign Assets Controls ("**OFAC**"), U.S. Department of State International Traffic in Arms Regulations ("**ITAR**"), or any other applicable export control, import control, and economic sanction laws and regulations of the US or any country or countries (collectively, "**Export/Import Control Laws**"). CUSTOMER further acknowledges that Export/Import Control Laws, include but are not limited to, prohibitions against: (a) Transfer any product to U.S. embargoed countries (currently, Cuba, Iran, North Korea, Syria, and Sudan); (b) Transfer of ITAR product to any country with which the U.S. maintains an Arms Embargo; (c) Transfer of certain EAR controlled product for China, Russia, and Venezuela military end-use; (d) Transfer to certain OFAC sanctioned persons or countries; and (e) other restrictions as defined in the Export/Import Control Laws. CUSTOMER will immediately notify Bosch and cease activities with respect to a sale if CUSTOMER knows or has a reasonable suspicion that an Export Control Product has been or may be exported, re-exported, transferred, or released in violation of Export/Import Control Laws. Unless otherwise mutually agreed in writing, CUSTOMER agrees that it will not use an Export Control Product in connection with any activity involving nuclear fission or fusion, any use or handling of any nuclear material, or any nuclear, chemical or biological weapons. CUSTOMER shall defend, indemnify, and hold Bosch harmless from any and all losses suffered by Bosch as a direct result of CUSTOMER's or its CUSTOMERs' non-compliance with Export/Import Control Laws. Bosch will not be liable to CUSTOMER for failure to provide Products, Prototypes, Services, transfers, or technical data as a result of any government actions that impacts Bosch's ability to perform, including: (a) the failure to provide or the cancellation of export or re-export licenses; or (b) any subsequent interpretation of applicable import, transfer, export, or re-export law or regulation after the date of any order or commitment that has a material adverse effect on Bosch's performance.

18. ELECTRONIC DATA EXCHANGE; VEHICLE DATA; PRIVACY.

18.1 ELECTRONIC DATA EXCHANGE. Bosch supports most electronic data exchange systems. Each party bears responsibility for its data input and for the part of the system for which it is responsible.

18.2 VEHICLE DATA. CUSTOMER hereby grants to Bosch the unlimited right to use and sublicense to Bosch affiliates, agents, consultants, and subcontractors the unlimited right to use Vehicle Data (defined below) or any portion thereof, wherein such use may include, without limitation, copying, aggregating, creating derivatives, and/or

anonymizing such Vehicle Data, for the following purposes: (i) the investigation of any accidents or claims related to a defect, failure, or alleged defect or failure of Bosch's Products, Prototypes, or Services; (ii) research and development related to improvement, analyses, and modification of Bosch's Products, Prototypes, and Services; (iii) the defense of any claim against Bosch brought by CUSTOMER or any third party; and (iv) any other purpose as mutually agreed in writing between the parties. To the extent Bosch does not have direct access to or does not directly receive Vehicle Data, CUSTOMER shall provide access or otherwise deliver to Bosch all Vehicle Data in the possession of CUSTOMER within thirty (30) days after written request from Bosch or on a continual basis, if mutually agreed between the parties. Bosch shall not disclose Vehicle Data to any third party, other than (i) affiliates, and (ii) agents, consultants, and subcontractors contractually required to maintain the confidentiality of Vehicle Data. As used herein, "**Vehicle Data**" means any and all data produced, collected, transmitted, or processed by Bosch's Products, Prototypes, or Services, including without limitation components, systems, modules and electronic control units.

18.3 PROTECTION OF PERSONAL INFORMATION. The terms of the Data Protection Addendum at, available upon request, are hereby incorporated by reference and shall apply to the extent that Vehicle Data includes Personal Data (as defined below) or Bosch processes Personal Data for or on behalf of CUSTOMER as part of the Services. Bosch and CUSTOMER shall complete Bosch's Data Protection Addendum. "**Personal Data**" means any information relating to any identified or identifiable natural person.

19. COMPLIANCE WITH LAWS. Each party represents and warrants to the other party that it and its employees and agents are and will continue to be in compliance with all applicable laws and regulations relating to its performance under the Quotation and these BOSCH Terms, including without limitation laws associated with testing and evaluation of vehicles and Prototypes on a public roadway, and any laws or regulations relating to the processing of Vehicle Data. The applicable laws and regulations that Bosch must comply with are only those jurisdictions set forth in the applicable Quotation.

20. SET-OFF. CUSTOMER is not entitled to and shall not set-off any amounts due or allegedly due from Bosch to CUSTOMER from CUSTOMER's debts towards Bosch.

21. ASSIGNMENT. Neither Party shall assign its rights or obligations hereunder without the other Party's prior written consent. A corporate reorganization, which does not result in a change of control or beneficial owner, will not be deemed an assignment.

22. RELATIONSHIP OF THE PARTIES. CUSTOMER and Bosch are independent contracting parties. Nothing hereunder or in the course of performance under the Quotation or these BOSCH Terms will grant either Party the authority to create or assume an obligation on behalf of or in the name of the other Party or will be deemed to create the relationship of joint venture, partnership, association, or employment between the Parties.

23. SEVERABILITY. In the event that any provision of these BOSCH Terms or the Quotation is declared by a court to be void or unenforceable, the validity of any other provisions and of the entire BOSCH Terms or the Quotation will not be affected thereby.

24. APPLICABLE LAW; ARBITRATION. These BOSCH Terms, the Quotation, and all disputes between the Parties arising out of or related thereto shall be governed by the laws of the State of Michigan except for its choice of law rules; the United Nations Convention on the International Sale of Goods shall not apply. The Parties acknowledge that these BOSCH Terms and the applicable Quotation evidences a transaction involving interstate commerce. The Parties shall first endeavor to resolve through good faith negotiations any dispute arising under or relating to these BOSCH Terms and the applicable Quotation. If a dispute cannot be resolved through good faith negotiations within thirty (30) days either Party may request non-binding mediation by a mediator approved by both Parties. If mediation fails to resolve the dispute within thirty (30) days after the first mediation session, then,

upon notice by either Party to the other, any and all disputes, controversies, differences, or claims arising out of or relating to these BOSCH Terms and the applicable Quotation (including the formation, existence, validity, interpretation (including of this Arbitration clause), breach, or termination thereof) shall be resolved exclusively through binding arbitration, except that either Party shall have the right, at its option, to seek injunctive relief, under seal to maintain confidentiality to the extent permitted by law, (i) in either the Michigan Circuit Court for the County of Oakland or the United States Court for the Eastern District of Michigan, or (ii) pursuant to the American Arbitration Association ("AAA") Optional Rules for Emergency Measures of Protection. A request by a Party to a court of competent jurisdiction for such interim measures shall not be deemed incompatible with, or a waiver of, this agreement to arbitrate. The Parties agree that any ruling by the arbitration tribunal on interim measures shall be deemed to be a final award for purposes of enforcement. The arbitration proceedings shall be conducted in accordance with the Commercial Arbitration Rules of the AAA including application of the Optional Rules for Emergency Measures of Protection as amended from time to time, except as modified by this clause or by mutual agreement of the Parties, and shall be governed by the United States Federal Arbitration Act. Within 14 days after the commencement of arbitration, each Party shall select one person to act as arbitrator and the two selected shall select a third arbitrator within 10 days of their appointment. If the arbitrators selected by the Parties are unable or fail to agree upon the third arbitrator, the third arbitrator shall be selected by the AAA. The arbitration shall be conducted in Detroit, Michigan, and the language of the arbitration shall be English. The arbitrators' award shall be final and binding. The arbitrators shall issue a written opinion setting forth the basis for the arbitrators' decision. The written opinion may be issued separately from the award, in the arbitrators' discretion. Each Party shall bear its own attorney fees and costs, and each Party shall bear one half the cost of the arbitration hearing fees, and the cost of the arbitrators, unless the arbitrators find the claims or defenses to have been frivolous or harassing, in which case the arbitrators may award the party responding to such frivolous or harassing claims/defenses its costs of the arbitration and/or reasonable attorney fees, in the arbitrators' discretion. Either Party may apply to have the arbitration award confirmed and a court judgment entered upon it. Venue for confirmation of or any challenge to the Arbitration Award shall be in either the Michigan Circuit Court for the County of Oakland or the United States Court for the Eastern District of Michigan and shall be done under seal to maintain confidentiality to the maximum extent permitted by law. The arbitrators shall have no authority to award punitive damages or any other damages excluded herein, to the maximum extent permitted by law. Except as may be required by law, neither a Party nor their counsel nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both Parties.

25. SURVIVAL. Any right or obligation of a Party which, by its nature or context is intended to survive termination or expiration of the applicable Quotation or these BOSCH Terms, will survive any such termination or expiration, including without limitation Sections 14-26.

26. VALIDITY OF QUOTATION. Any Quotations issued subject to these BOSCH Terms will be valid for 30 days from the date of issuance unless stated otherwise in the Quotation.

12 Revisions

V1.4.7

- Add C60 recommended service interval
- Updated order form for 2021
- Add supply voltage range
- Add USB stick removal image
- Add CAN errors and filtered boost pressure to CAN sent to team
- Change mounting location instructions to refer to IMSA Scrutineering Homologation Form

V1.4.6

- Clarified USB mount and removal notes
- Add pambient CAN channel to team CAN received
- Update FFM service time to hours until calibration
- Add drawing for 12V 1 bar sensor loom
- Change Bosch contact to Max Houck
- Updated order form
- Add 12V 1 bar pressure sensor option and offer drawing

V1.4.5

- Update Creative Motorsport address
- Add b_FFMService CAN channel
- Update pricing for 2019

V1.4.4

- Removed sensor declaration form
- Updated CAN channels sent to include Fuel Temp and FFM Minutes On
- Add Driver ID
- Clarify connectors on components

V1.4.3:

- Updated device table with recommended speed sensor connector
- Updated schematic
 - o Pinout of recommended engine speed sensor
 - o Power source of fuel flow sensor

V1.4.2:

- Corrected pinout of recommended engine speed sensor

V1.4.1:

- Added additional information about engine speed sensor

V1.4.0:

- Added fuel flow meter, leaderlight, and RPM sensor sections
- Updated loom drawing
- Updated CAN diagram
- Updated power diagram
- Sensor locations all as mandated by IMSA
- Added vibration profile 1

- Remove KL 15
- Declaration sheet updated
- Order form updated

V1.3.5:

- DBC Available Online
- CAN message table removed
- Team received CAN table added
- Rainlight CAN message added
- Example serial number added on declaration form

V1.3.4:

- Driver ID added to 0x251
- Declaration form included

V1.3.3:

- Split CAM and TPMS CAN messages
- Added CMS as dealer
- Updated TPMS quantization
- KL15/KL30 Clarification
- 0x250 Integral added
- 0x245 Fuel Probe status added
- 0x251 Position in Class and Track Condition added

V1.3.0:

- Included LT2 Sport drawing w/ vibration isolation mounts
- Added CAN message descriptions
- Updated Tx rate on 0x240
- Updated 0x244 message details
- Added 0x24B message
- Added 0x25C message
- Highlighted callout for sensor/bank 1 to be Drivers Left
- Added section 3.3
- Wording in USB section
- Loom certification requirements update
- X2 transponder current consumption
- Added section 2.1 and 2.1.1

V1.2.0:

- Included IMU mounting bracket part number
- Added specification to C60 of LED light visibility
- Added mounting requirement to GPS sensor
- Added M6 temperature sensor
- Updated Team received channel CAN specification
- Updated C60 offer drawing to show correct connector clocking
- Updated IMU offer drawing to show fastener spec

- Added section 4.4 USB
- Added section 5 Loom Certification

V1.1.0:

- Clarification on sensor numbering vs. left bank/right bank
- Added restrictor pressure sensor wiring to schematic
- Added notation on USB wiring length to schematic
- Updated section 3.1, mating connectors
- Updated LSU4.9 offer drawing
- Added mounting information on IMU to section 3.1.2
- Added Throttle 2 to TEAM CAN Spec
- Added order form to Appendix

V1.0.0 – Initial Release

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