



# IMSA GTDX Scrutineering System

Manual

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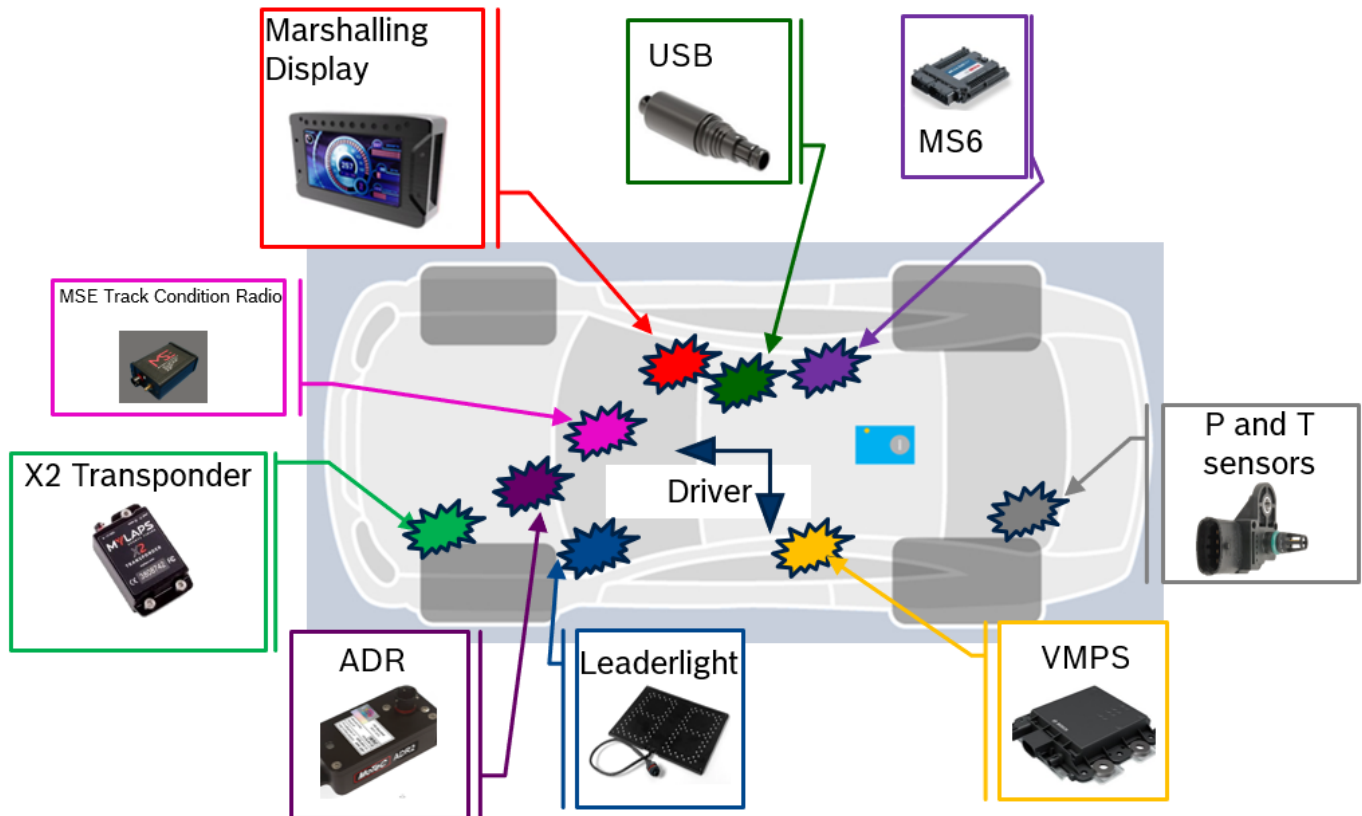
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# 1 Scope

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



## 2 Contact

For technical information please contact:

[SUPPORT.IMSA@US.BOSCH.COM](mailto:SUPPORT.IMSA@US.BOSCH.COM)

### 2.1 Sales

Contact Bosch Motorsport for purchasing information via the contacts above.  
For non-Bosch third-party parts order information, refer to IMSA documentation.

#### 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	Name	Description
F02U.V03.353-01	Data Logger	Bosch MS6-SCR with USB
F02U.V0U.267-02	1 Bar Pressure	Air Pressure Sensor
F02U.V0U.204-01	1 Bar Pressure	Air Pressure Sensor (Automotive connector)
F02U.V0U.205-01	3.5 Bar Pressure	Boost Pressure Sensor
F02U.V02.356-01	Temperature Sensor	Air Temperature Sensor
F02U.V0U.445-01	VMPS	IMU with GPS Sensor
F02U.V01.342-01	USB Stick	Scrutineering Data USB
0258.988.001	LSU 4.9	Lambda Sensor
F02U.00U.081-01	VMPS Antenna	VMPS Antenna kit
	Leaderlight Panel*	Position Display
	X2 Transponder*	Timing Transponder
	MSE System*	Track Condition Radio Yellow Light System
	XAP NTX*	Marshalling Display
	ADR*	Accident Data Recorder

\* Denotes component available from other IMSA suppliers. Please refer to IMSA documentation for ordering information

### 3.1.1 Logger - MS6 SCR

**Functional Description:** Logger for GTDX Class Scrutineering System

**Homologation Mounting Note:**

- Device should be mounted in an easily accessible area that allows access to all main connectors. This device must be mounted away from heat sources. Note maximum temperature range below.
- This device should be mounted to sustain vibrations within the Vibration Profile 1 defined in the appendix.

**Part Number:** F02U.V03.353-01

**Temperature Range:** -20 to 80 °C

**Recommended Inspection:** 2 years or 220 hours

### 3.1.2 Display - XAP NTX

**Functional Description:** Marshalling Display for IMSA GTDX Class Scrutineering System

**Homologation Mounting Note:**

- This device should be mounted so that the display can be easily seen by the driver while on course, and away from any heat sources.

**Brightness Control:** Brightness **must** be commanded via CAN by a dimming value of 0-255 (0 is full bright and 255 is off) for both LED and Screen brightness. The SCR then interpolates the 0-255 value to a 0-7 value sent to the NTX Display on CAN Foxtrot. Message details found in the DBC.

### 3.1.3 Accident Data Recorder

**Functional Description:** Accident Data Recorder for IMSA GTDX Class Scrutineering System

**Homologation Mounting Note:**

- Device should be mounted in an easily accessible area that allows access to all main connectors. This device must be mounted away from heat sources.
- Refer to GTDX Scrutineering Homologation regarding installation requirements.

### 3.1.4 IMU/GNSS – VMPS

**Functional Description:** 6 axis inertial measurement unit with GNSS.

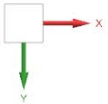
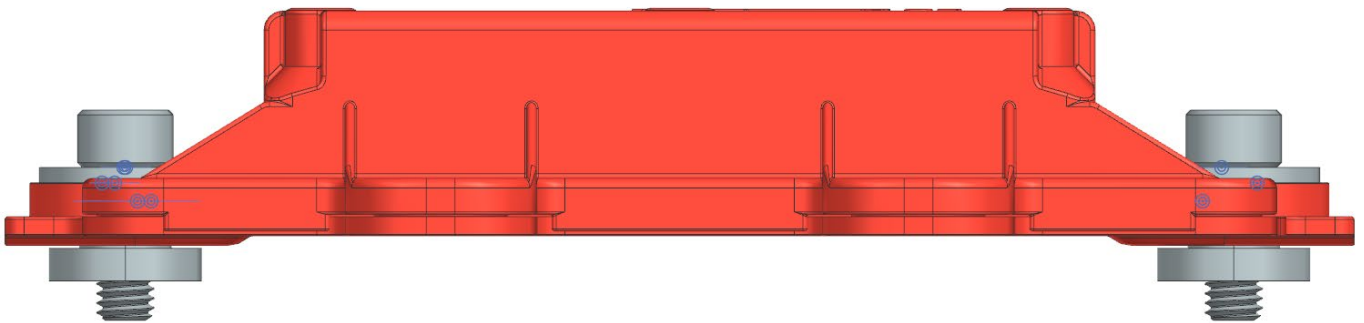
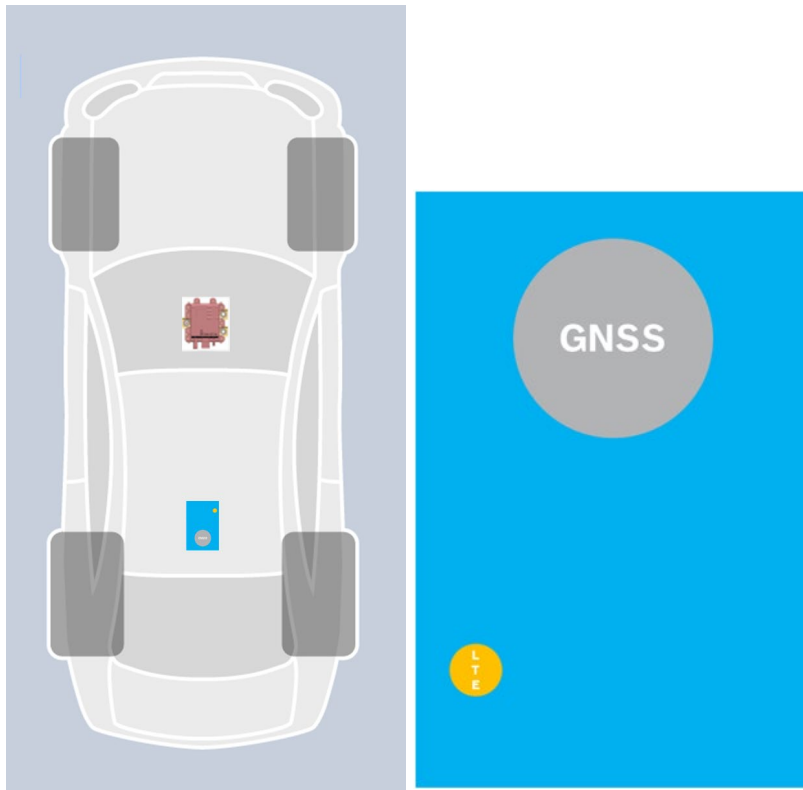
**Homologation Mounting Note:**

- Device should be mounted in an easily accessible area that allows access to all main connectors. This device must be mounted away from heat sources.
- Device must be installed with supplied mounting hardware.
  - Using provided grommets as shown below.
  - Vibration isolating mounts are preferred but not required.
  - The metal housing should not be allowed to contact any part of the chassis during normal operating conditions.
  - Using 3x M6 bolts or studs, competitors to provide.
- Device to be mounted:
  - With connector interfaces facing towards the rear of the car
  - Aligned within 1 degree of vehicle centerline.
  - Within 0.5 degrees of horizontal
  - Nearest to vehicle center of gravity as possible
- Use of the specified antenna is required.
  - Antenna must be mounted as depicted in the GTDX Scrutineering Homologation.
  - An SMA cable is provided in the kit.
    - Competitors can supply their own cables that have an impedance of 50Ω and meet or exceed the standards of LMR-100A.
    - The length of the cable is not to exceed 3 meters.
    - All reasonable efforts should be made to run the antenna cable away from strong sources of electrical noise, including but not limited to:
      - TV cameras and cables
      - Ignition cables
      - Radio transmitters and cables
      - High voltage sources

**Part Number:** F02U.V0U.445-01

**Antenna Part Number:** F02U.00U.081-01

**Temperature Range:** -40 to 65 °C



### 3.1.5 USB Stick/Diagnostic Port

**Functional Description:** IMSA Scrutineering USB Stick and Diagnostic Port

**Homologation Mounting Note:**

- Device and diagnostic connectors must be mounted in an area easily accessible via the passenger side door opening.
- IMSA Scrutineering, Safety, and USB ports must be **clearly labeled as SCRUT, SAFETY, and IMSA USB** respectively, as shown in the example below. These labels must be in the line of sight of the open door, not hidden behind or under other components.
- These ports must be mounted securely, so that the USB stick and diagnostic connector can be inserted and removed with one hand.
- USB Wiring must be shielded. See wiring schematic for more details.
- Mounting example:



**Temperature Range:** -40 to 85 °C

**Removal Note:** 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. Do not pull on the main body to remove.



**USB Stick Possession:** IMSA will distribute and collect USB Sticks at every race; teams will not receive sticks with scrutineering components, nor are they required to purchase these separately.

## 3.1.6 X2 Transponder

**Functional Description:** CAN based transponder for IMSA GTDX Class Scrutineering System

**Homologation Mounting Note:**

- Each car will carry one X2 Transponder.
- Refer to Scrutineering Homologation for mounting location.

**Temperature Range:** 0 to 60 °C

## 3.1.7 Leaderlight Panels

**Functional Description:** Leaderlight panels

**Homologation Mounting Note:**

- This device(s) must be fitted securely.
- Refer to Scrutineering Homologation for mounting location.

The pinout of the leaderlight power connector/s is shown in the table. No changes are allowed to this arrangement. This connector is for providing power to the leaderlights from the team harness.

**Team Harness Connector:** AS(0/1)10-98SN

**Scrutineering Harness Connector:**

Connector	AS610-98PN
Pin #	Signal
1	LeaderLight-12V
2	LeaderLight-12V
3	LeaderLight-12V
4	LeaderLight-GND
5	LeaderLight-GND
6	LeaderLight-GND

## 3.1.8 Track Condition Radio

**Functional Description:** Track condition radio system for FCY notification

**Homologation Mounting Note:**

- This device(s) must be fitted securely.
- Refer to Scrutineering Homologation for mounting location.

## 3.2 Sensors

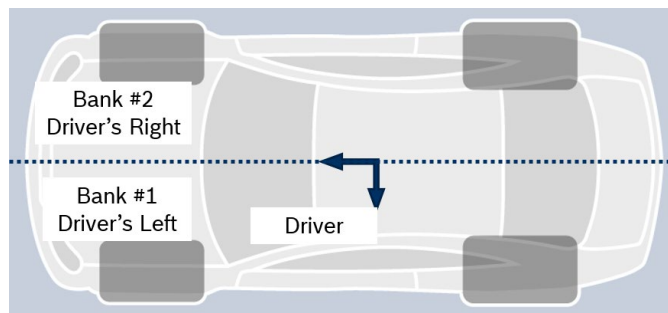
This section declares sensors that must be directly connected to the IMSA scrutineering system. IMSA will define required engine sensors and locations for each engine application. These signals will be fed back to the teams via CAN.

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

As a reference to scrutineering homologation, depending on Engine configuration and class, GTDX cars may be required to run:

- Engine Sensors
  - Manifold pressure(s) (NA only)
  - Manifold temperature(s)
  - Airbox Pressure Sensor(s)
  - Boost pressure(s) (Turbo only)
  - Lambda(s)

Sensors must be installed in an IMSA approved location as identified in Scrutineering System homologation documentation with numbering referring to the fed engine bank.



## 3.2.1 1 Bar Pressure

**Functional Description:** Air pressure sensor

**Use Case:**

- **Manifold Pressure (NA engines):** The sensor must be fitted in each intake manifold downstream of the throttle valve—for example, in the intake runners or intake ports—in an IMSA approved location.
- **Airbox Pressure Sensor:** The sensor must be fitted in each Airbox upstream of the throttle valve in an IMSA approved location.

**Part Number:** F02U.V0U.267-02 (A/S terminated) or F02U.V0U.204-01 (Automotive Connector)

**Pressure Range:** 0.1 – 1.15 bar

**Temperature Range:** -40 to 125°C

## 3.2.2 3.5 Bar Boost Pressure

**Functional Description:** Boost pressure sensor

**Use Case:**

- **Boost Pressure (Turbo engines):** The sensor must be fitted to measure pressure in each intake manifold downstream the throttle valve in an IMSA approved location.

**Part Number:** F02U.V0U.205-01

**Pressure Range:** 0.5 – 3.5 bar

## 3.2.3 Temp Sensor

**Functional Description:** Temperature sensor

**Use Case:**

- **Manifold Temperature:** On each independent intake manifold in an IMSA approved location close to the Boost/Manifold pressure sensor.
- **Intake Temperature:** A single sensor must be installed in an IMSA approved location.

**Part Number:** F02U.V02.356-01

**Temperature Range:** -55 to 300 °C

**Thread:** M6 x 1

**Installation Torque:** 8 Nm

## 3.2.4 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.
- IMSA Sensor should be mounted as close to Team Sensor as possible

**Part Number:** 0258.988.001

**Thread:** M18 x 1.5

**Installation Torque:** 40 to 60 Nm

## 3.3 Sensor Declaration Form

Prior to each event, a **Sensor Declaration Form** must be submitted via the VPRC regulations. This document must be submitted **prior to the car arriving to pre-event inspection**. Failure to do so may result in the tech sticker not being issued until the form is submitted.

## 3.4 Public CAN Bus Message Declaration

Manufacturers must submit a Public CAN Message Declaration Form that includes all the messages that the manufacturer is sending on scrutineering CAN bus Delta and Echo, minus the required messages defined in IMSA CAN Public 1 and 2 DBC's.

- If there are team-specific messages being sent on the public CAN busses, these must also be declared. **The manufacturer is responsible for submitting the Public CAN Message Declaration Form for each team.**
- If the messages change between events **the Public CAN Message Declaration Form must be resubmitted.**

## 3.5 Component Seals

All Scrutineering system primary components (MS6, VMPS) must have no evidence of tampering with the device.

## 3.6 Recommended Mating Connectors

Please see the table below for a summary of recommended mating connectors for scrutineering system sensors.

<b>GTDX Recommended Mating Connectors</b>		
<b>Sensor Part Number</b>	<b>Sensor Description</b>	<b>Mating Connector</b>
F02U.V03.353-01	Bosch MS6-SCR with USB	
	91-pin	F02U.B00.711-01
	105-pin	F02U.B00.712-01
F02U.V0U.445-01	VMPS IMU with GPS Sensor	
	Housing	2-967616-1
	Contacts	5-962885-1 or 5-962885-5
	Seals	967067-1
	Cavity Plug	967056-1
F02U.V01.342-01	Scrutineering Data USB	F02U.002.996-01
0258.988.001	Lambda Sensor	D261.205.356-01
F02U.V00.564-02 or F02U.V00.500-01	Engine Speed Sensor (Hall Effect)	ASL106-05SC-HE
F02U.V0U.267-01	Air Pressure Sensor	ASL 6 06-05 PD-HE
F02U.V0U.204-01	Air Pressure Sensor (Automotive connector)	ASL106-05SA
F02U.V0U.205-01	Boost Pressure Sensor	ASL106-5SB
F02U.V02.356-01	Temp Sensor (Air)	ASL 6-06-05 PN-HE

## 4 System Architecture

### 4.1 Team Connector – Scrutineering Harness

The pinout of the Team Connector is shown in the table. No changes are allowed to this arrangement. Termination of the CAN busses must be done in the car's loom as depicted in 4.1.3, 4.1.4, 4.1.5 and 4.1.6.

**Team Harness Connector:** AS(0/1)14-35SN

**Scrutineering Harness Connector:**

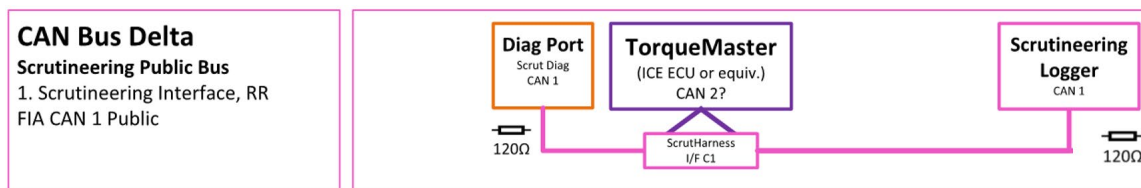
Connector	AS614-35PN
Pin #	Signal
1	CAN_Delta-SHD-IN
2	CAN_Delta-Hi-IN
3	CAN_Delta-Lo-IN
4	CAN_Delta-SHD-OUT
5	CAN_Delta-Hi-OUT
6	CAN_Delta-Lo-OUT
7	CAN_Echo-SHD-IN
8	CAN_Echo-Hi-IN
9	CAN_Echo-Lo-In
10	CAN_Echo-SHD-OUT
11	CAN_Echo-Hi-OUT
12	CAN_Echo-Lo-OUT
13	
14	RS232-GND
15	
16	
17	FIA CAN4
18	FIA CAN4
19	FIA CAN4
20	FIA CAN4
21	
22	
23	
24	
25	
26	KL.30
27	KL.30
28	KL.30
29	KL.30
30	KL.30
31	KL.30
32	KL-31
33	KL-31
34	KL.31
35	KL.31
36	KL.31
37	KL.31

## 4.1.1 Dual Public Bus Option

### 4.1.2 CAN Bus Delta

CAN Bus Delta is the same layout as FIA CAN 1 Public.

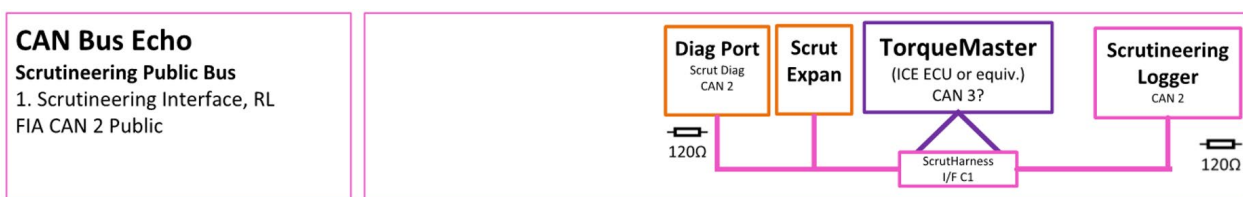
- The order of components and compartment interfaces is open to constructors.
- CAN buses must be laid out in a linear fashion, with  $120\Omega$  termination resistors required at both ends of each bus.
- The interface for the Scrutineering Harness to Team (contains Torque Master) must follow the specified pinout.
- Bus load must be kept at or below 70%. IMSA may install a CAN logging device to test bus load as required.



### 4.1.3 CAN Bus Echo

CAN Bus Echo is the same layout as FIA CAN 2 Public.

- The order of components and compartment interfaces is open to constructors.
- CAN buses must be laid out in a linear fashion, with  $120\Omega$  termination resistors required at both ends of each bus.
- The interface for the Scrutineering Harness to Team (contains Torque Master) must follow the specified pinout.
- Bus load must be kept at or below 70%. IMSA may install a CAN logging device to test bus load as required.

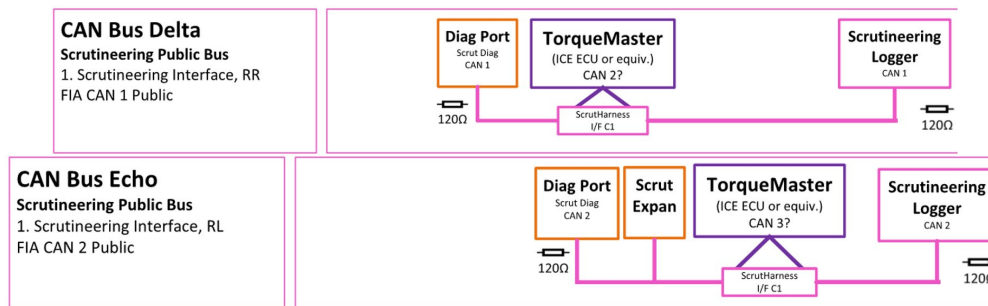


### 4.1.4 Single Public Bus Option

CAN Bus Echo is the same layout as FIA CAN 2 Public and if using a single public bus must use CAN Bus Echo.

- The order of components and compartment interfaces is open to constructors.
- CAN buses must be laid out in a linear fashion, with 120Ω termination resistors required at both ends of each bus.
- The interface for the Scrutineering Harness to Team (contains Torque Master) must follow the specified pinout.
- Bus load must be kept at or below 70%. IMSA may install a CAN logging device to test bus load as required.
- The public messages from CAN Bus Delta and Echo on the Dual Public Bus option between the scrutineering logger and torque master will all be sent and received on CAN Bus Echo.
- For CAN configuration reference, please see the single CAN DBC provided at <https://www.imsa.com/competitors/>
- CAN Bus Echo is not to be used for Team device communications. Only Scrutineering messages allowed.

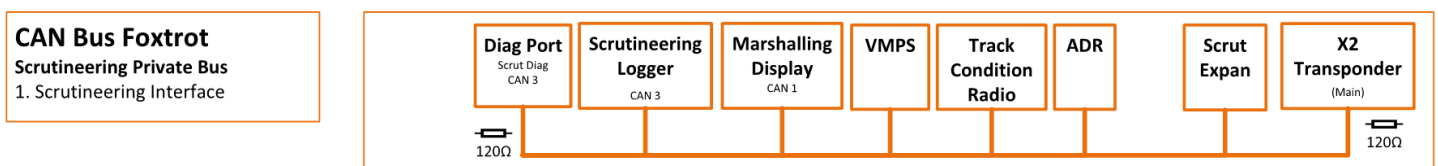
CAN Bus Delta between the Scrutineering Logger, Diag Port and Expansion Connector must be included in the scrutineering harness.



### 4.1.5 CAN Bus Foxtrot

CAN Bus Foxtrot is a private CAN bus for the scrutineering system.

- The order of components and compartment interfaces is open to constructors.
- CAN buses must be laid out in a linear fashion, with 120Ω termination resistors required at both ends of each bus.

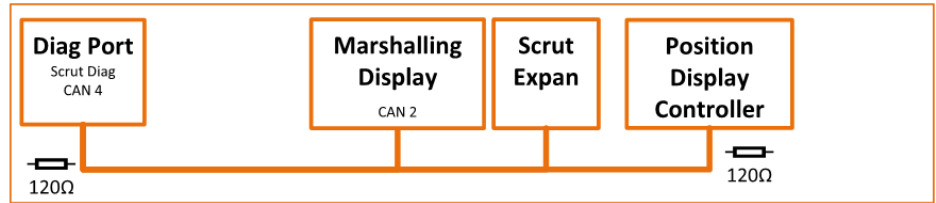


## 4.1.6 CAN Bus Golf

CAN Bus Golf is a private CAN bus for the scrutineering system.

- The order of components and compartment interfaces is open to constructors.
- CAN buses must be laid out in a linear fashion, with  $120\Omega$  termination resistors required at both ends of each bus.

**CAN Bus Golf**  
Scrutineering Private Bus  
1. Scrutineering Interface



## 4.2 Power Supply

All power supplied should be at least 11.0V and below 15.0V. Power must remain supplied at all times when the car is in pit-lane or on-track. Interruptions of specified scrutineering power may result in IMSA applied penalties.

It is recommended to supply a minimum of 10Amps to the system.

## 5 Loom Certification

All scrutineering harnesses must be certified for use in 2025 by a Bosch Motorsport approved loom fabricator.

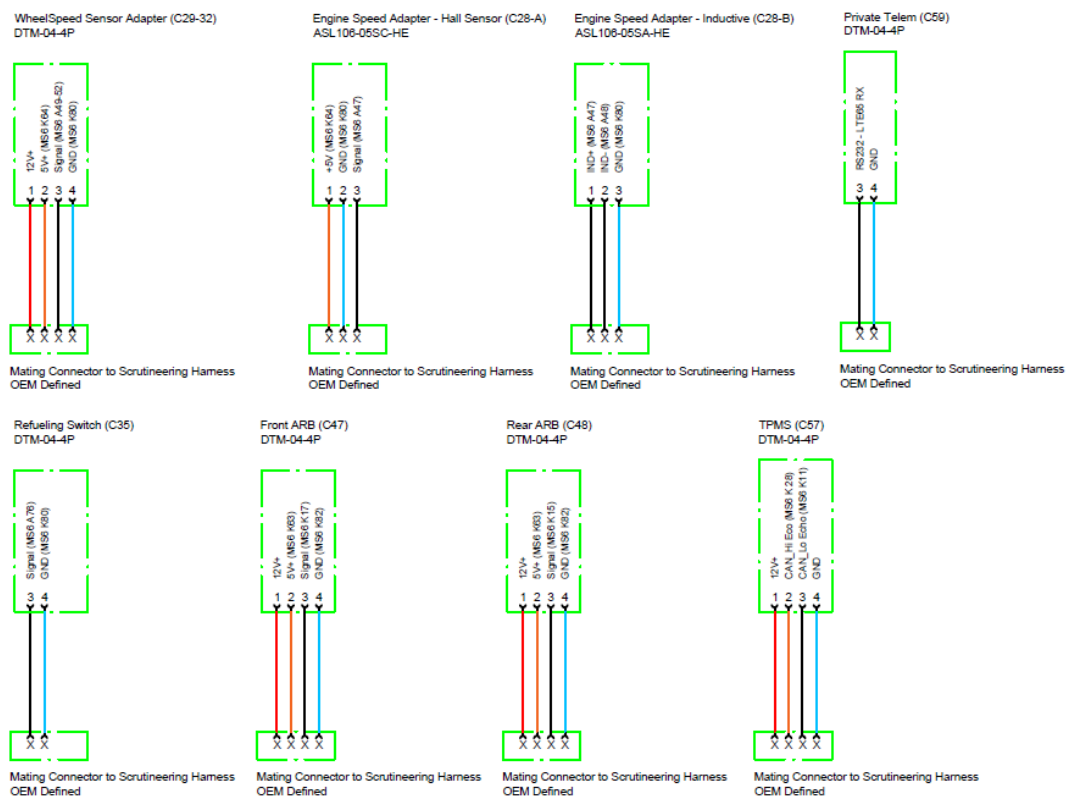
All pieces of the scrutineering loom must be present in order to certify any single piece. For example: team XYZ would like to certify a spare 'engine' section of the scrutineering loom; the car has three scrutineering looms pieces (cockpit, engine, rear section). All three pieces must be submitted in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

IMSA reserves the right to require an additional HiPot inspection at any time. Once certified, looms must be available for re-certification every year; teams must be able to demonstrate annual inspection with passing results.

**All looms will be checked to the wiring diagram in Section 8. Any deviation from this diagram must be approved by IMSA and Bosch.**

Approved Loom Fabricators	
<b>CMS</b> Florida	Email: <a href="mailto:colin@gomuchfaster.com">colin@gomuchfaster.com</a>
	Phone: +1(813) 482-2178
<b>DCE Inc.</b> North Carolina	Email: <a href="mailto:tom@dcemotorsport.com">tom@dcemotorsport.com</a>
	Phone: +1(704) 230-4649
<b>Sakata Motorsport Electronics</b> California	Email: <a href="mailto:brian@sakatamotorsport.com">brian@sakatamotorsport.com</a>
	Phone / Fax: +1(714) 446-9473 / +1(714) 446-9247

Test bench adapter looms will be required if connectors deviate from the following spec:



Manufacturers may supply the adapters, or they may work with loom certifiers to have them manufactured.

## 6 CAN Specification

There are two IMSA CAN interfaces that may be used for communication; on these buses, the team is required to send all messages specified in the provided DBC.

GTDX Manufacturers will be responsible for informing IMSA and Bosch which buses will be used for ECU and team communications as per Section 3.4 of this manual. These messages may be on the same bus.

### **CAN Buses:**

The CAN buses will be used to transfer vital information between the team and the Scrutineering System. The buses are required to be 1 Mbit and conform to CAN 2.0B specifications.

For the single bus option, Public CAN 2 will be utilized.

The DBC file for the transmitted and received channels is available at <https://www.imsa.com/competitors/>.

## 7 Display Pages

There are two pages on the display. A mechanic page, used for IMSA safety checks and sensor installation verification, is displayed when the vehicle is stationary. A driver page with alarms and information for the driver is shown while the vehicle is moving.

### 7.1 Driver Page

#### 7.1.1 Standard

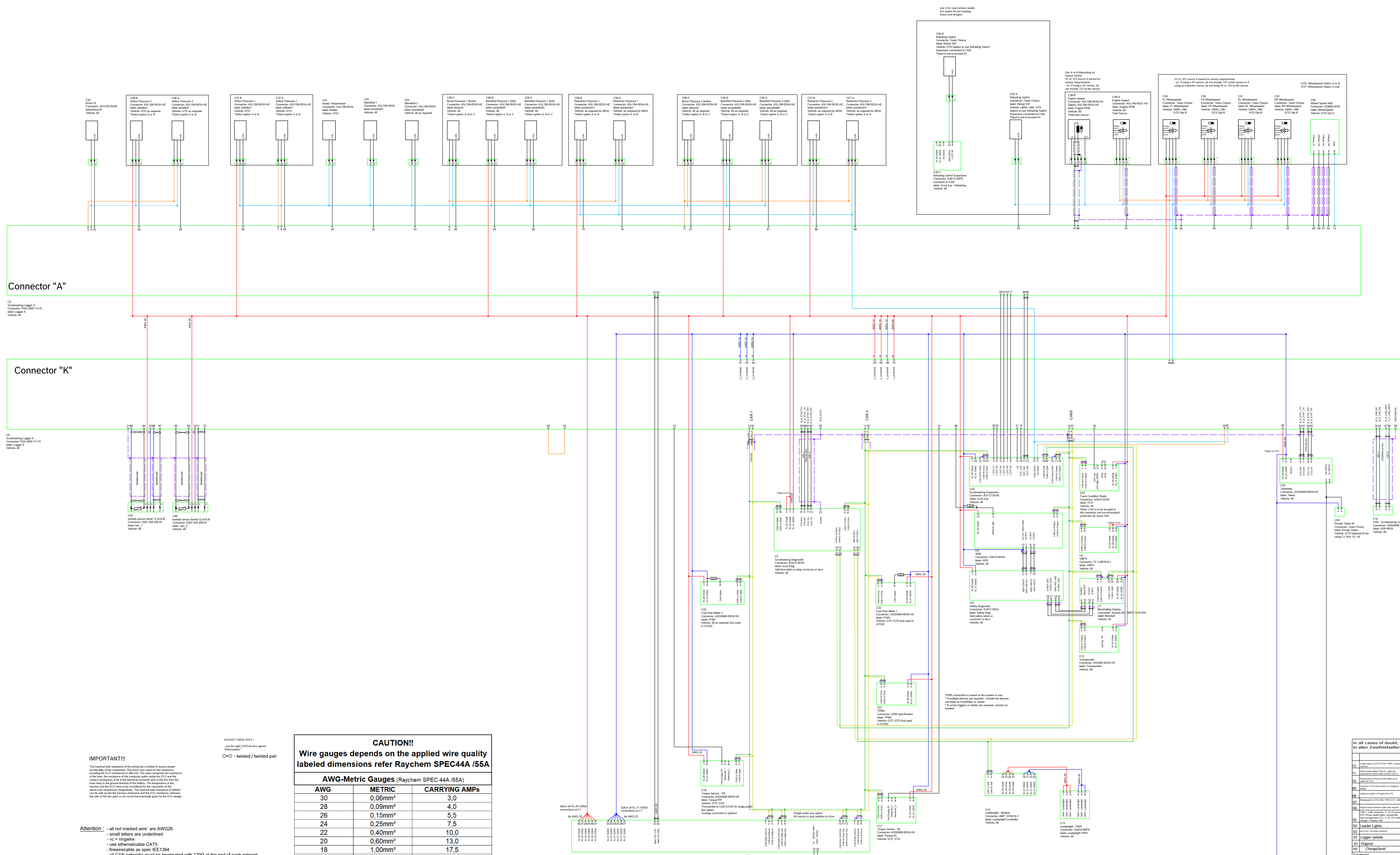
While on track the display will show:

- Current Driver ID
- Current Laptime
- Last Laptime

Note: The laptimes shown are calculated internally and are not the timing and scoring laptimes.

# 8 Loom Layout

# IMSA Scrutineering



**CAUTION!**  
Wire gauges depends on the applied wire quality  
labeled dimensions refer Raychem SPEC44A /55A

AWG	METRIC	CARRYING AMPS
30	0,06mm <sup>2</sup>	3,0
28	0,09mm <sup>2</sup>	4,0
26	0,15mm <sup>2</sup>	5,5
24	0,25mm <sup>2</sup>	7,5
22	0,40mm <sup>2</sup>	10,0
20	0,60mm <sup>2</sup>	13,0
18	1,00mm <sup>2</sup>	17,5
16	1,20mm <sup>2</sup>	20,0
14	2,00mm <sup>2</sup>	28,0
12	3,00mm <sup>2</sup>	37,0
10	4,50mm <sup>2</sup>	53,0
8	9,00mm <sup>2</sup>	78,0

**IMPORTANT!!**

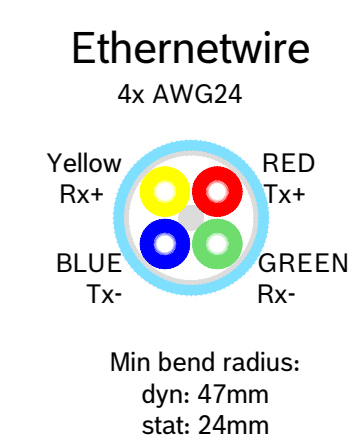
The minimal wire resistance of the wiring has to be taken into account for the correct functionality of the system. The wire resistance is dependent on the length of the wire and the cross-section of the wire. The value of the resistance is given in the table below. The length of the wire is given in meters. The cross-section of the wire is given in mm<sup>2</sup>. The value of the resistance is given in Ohm/m.

**Attention:**

- all not marked wire are AWG28
- small letters are underlined
- TC = ring wire
- use ethernetable CAT5
- fireproofable as spec. IEC 1394
- all CAN networks must be terminated with 120Ω at the end of each network
- the CAN networks may extend to another harness, respect that the ends of the network have the termination resistor and that there are only 2 termination resistors for the entire network - resulting in a 60Ω network
- order of devices within the CAN networks can be determined by the customer
- please respect strictly the pairs while using datalines like USB or Ethernet
- ethernet wires must be wired separately
- wire diameter must be adapted depending on usage

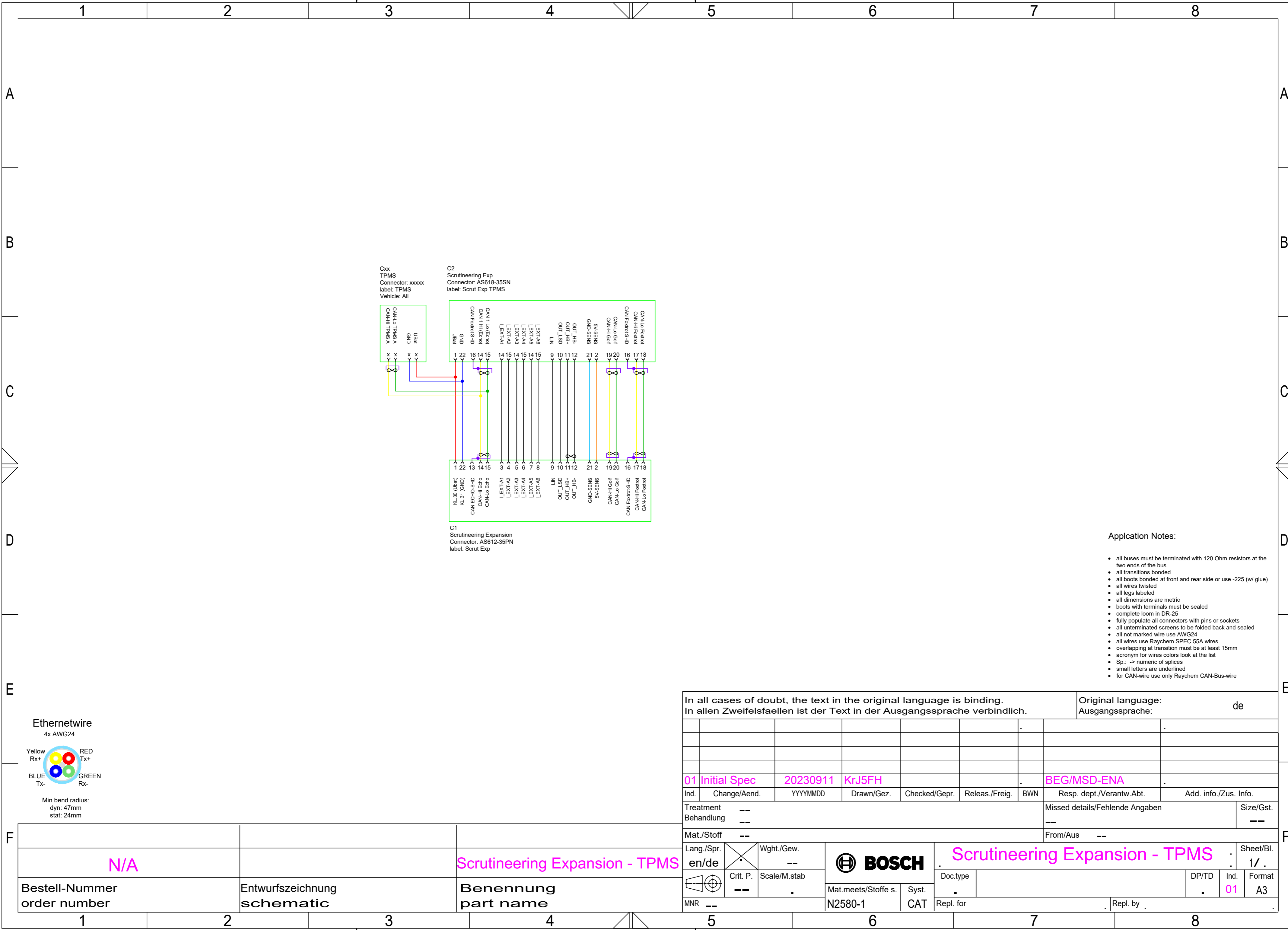
In all cases of doubt, the text in the original language is binding.  
In allen Zweifelsfällen ist der Text in der Ausgangssprache verbindlich.

Rev.	Change/Änd.	11/11/2011	Draw/Zeich.	Check/Überpr.	Released/Freige.	AWG Info/Zeich. Info.	Sheet No./Blatt
01	Original	20220813	Ku.BFH	PAASH	BEGMSD-NA		1/1
02	Logger update	20220821	Ku.BFH	PAASH	BEGMSD-NA		1/1
03	Leader Lights	20220825	Ku.BFH	PAASH	BEGMSD-NA		1/1
04	...	...	...	...	...		...



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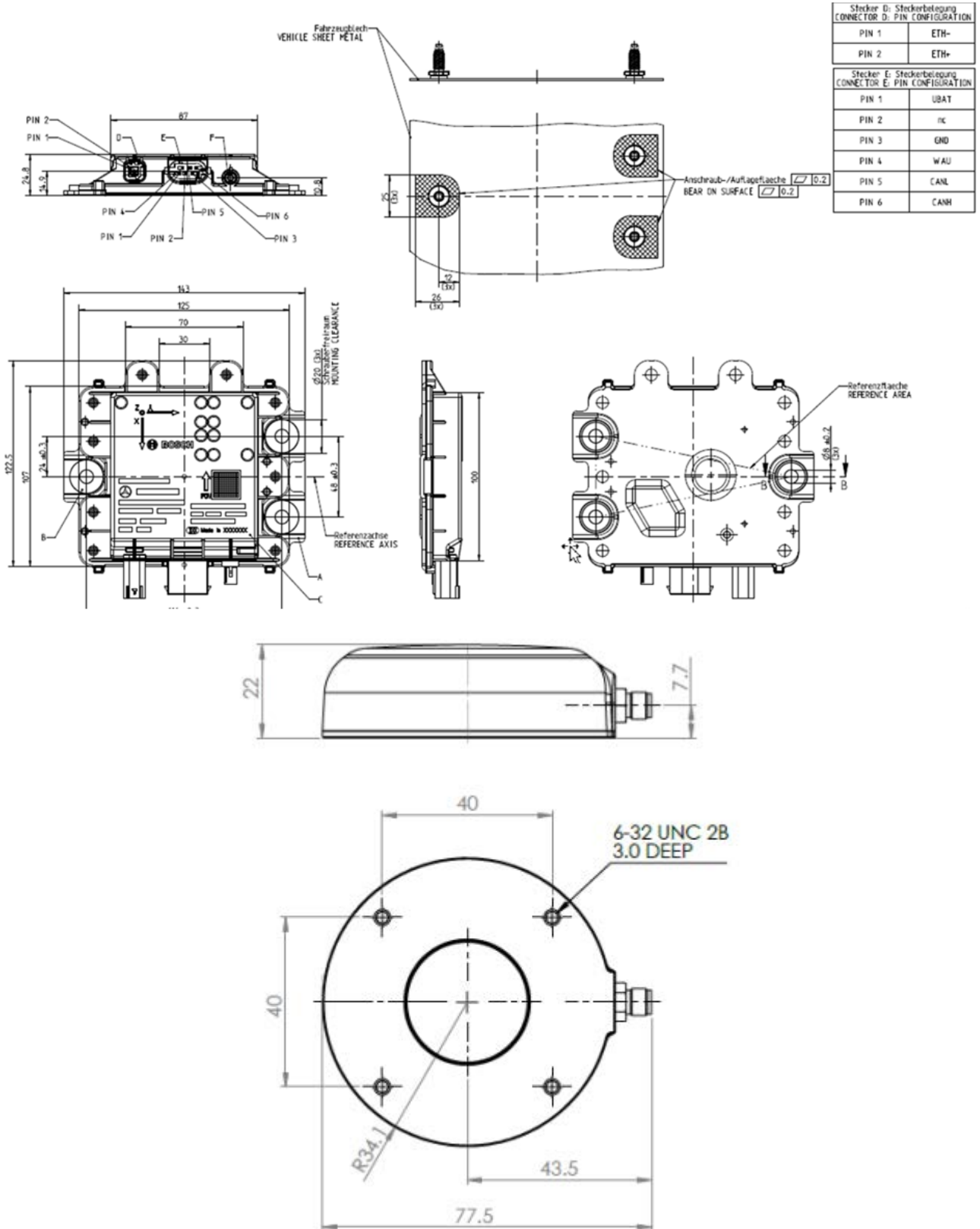


In all cases of doubt, the text in the original language is binding. In allen Zweifelsfaellen ist der Text in der Ausgangssprache verbindlich.						Original language: de					
01 Initial Spec						20230911		KrJ5FH		BEG/MSD-ENA	
Ind.	Change/Aend.	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Releas./Freig.	BWN	Resp. dept./Verantw.Abt.	Add. info./Zus. Info.			
Treatment -- Behandlung --							Missed details/Fehlende Angaben			Size/Gst. --	
Mat./Stoff --							From/Aus --				
Lang./Spr. en/de		Wght./Gew. --		Crit. P. --		Scale/M.stab .				Scrutineering Expansion - TPMS	
MNR --		Mat.meets/Stoffe s. N2580-1		Syst. CAT		Doc.type .		DP/TD .		Ind. 01	
Bestell-Nummer order number		Entwurfszeichnung schematic		Benennung part name		Repl. for .		Repl. by .		Format A3	

# 9 Appendix



## VMPS Dimensions



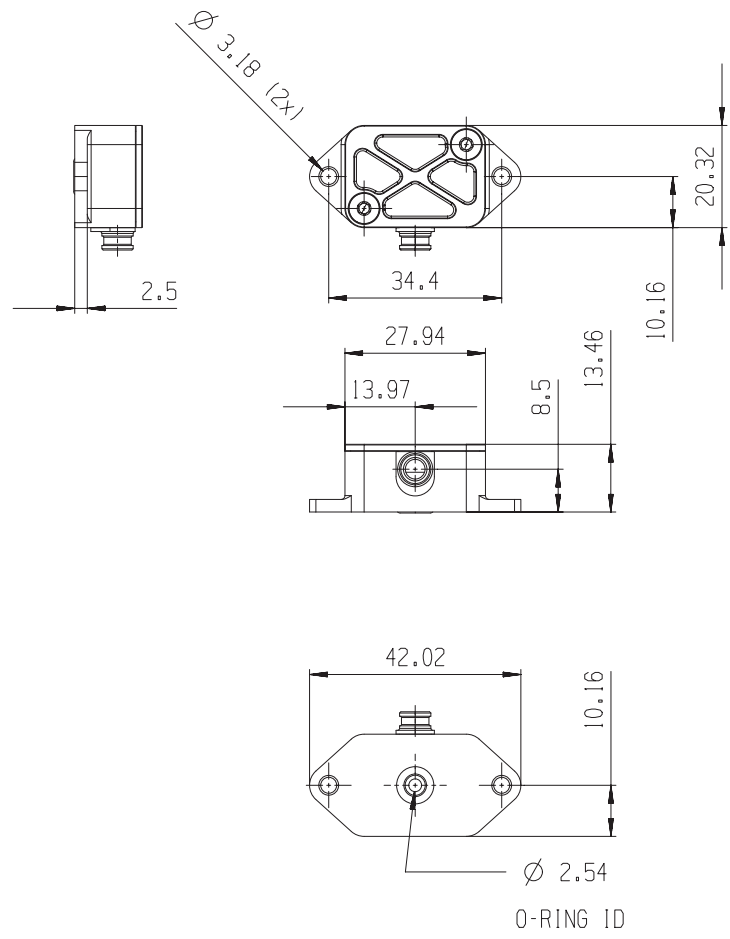
Stecker D: Steckerbelegung CONNECTOR D: PIN CONFIGURATION	
PIN 1	ETH-
PIN 2	ETH+

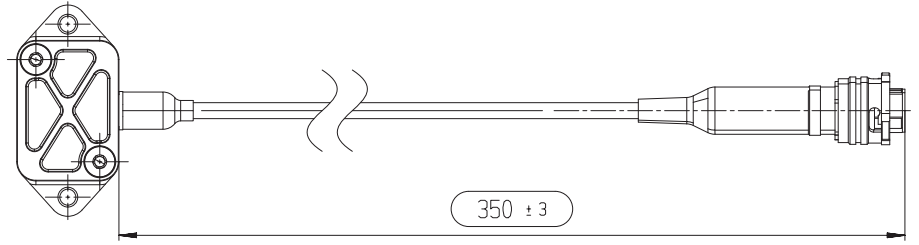
Stecker E: Steckerbelegung CONNECTOR E: PIN CONFIGURATION	
PIN 1	UBAT
PIN 2	ic
PIN 3	GND
PIN 4	WAU
PIN 5	CANL
PIN 6	CANH

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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



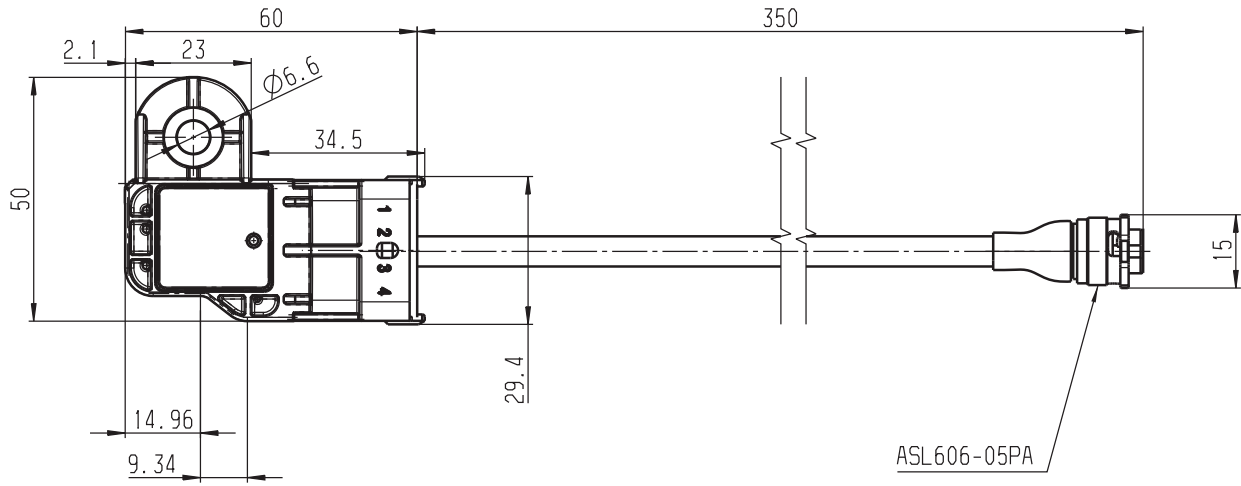
Connector	Pressure Range
ASL 6 06-05 PD-HE	10 - 115 kPa

Size acc. to / Masse nach ISO 14405-1:2010-12	
envelope principle/ Huellprinzip	E

01 Update	20160909	hup2mtp	MjJ	MjJ	6720	BEG/MSD		
Ind. Change/Änd.	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Released/Freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.	
Treatment/ Behandlung						Missed Details/Fehlende Angaben		Size/Gst.
Mat./Stoff						From/Aus		
Lang./Spr. en/de	Wght./Gew.	<b>BOSCH</b>		PRESSURE SENSOR DRUCKFUEHLER			Sheet/Bl.	
							1 / 1	
MNR	Crit. P.	Scale/M.stab	Mat.meets/Stoffe s.	Syst.	Doc. type	Repl. for		Repl. by
		1 : 1	N 2580-1	UG	DRW	F 02U VOU 267-01		
					DP/TO	Ind.	Format	
					000	01	A3	

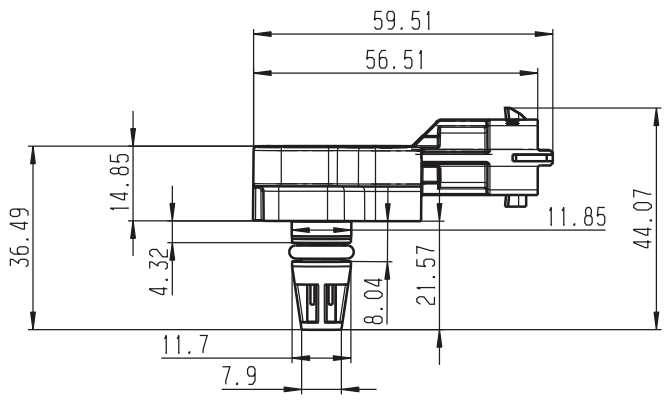
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Pin Out	
1	Sens 5v
2	Sens GND
3	Signal
4	N-C
5	N-C

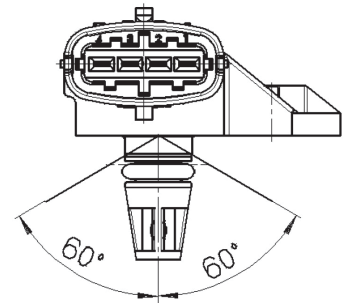
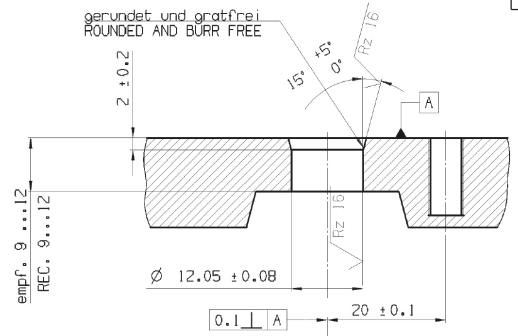
Mating Connector:  
ASL106-05SA



Sensor

**Mounting Instructions:**

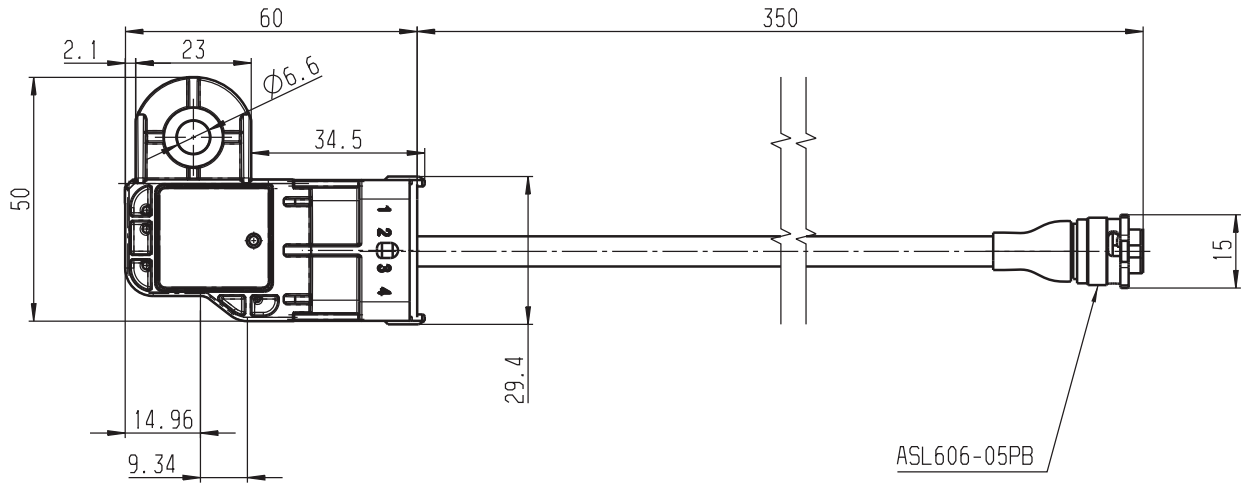
- Recommended position: 0...±60° in all directions from vertical; orifice facing downwards
- Sensor should be mounted on a flat surface, with the base of the sensor sufficiently supported
- Mounting screw: M6x1
- Installation torque: 3.3 Nm



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.	Wght./Gew.				Pressure Sensor: 1 Bar - IMSA			Sheet/Bl.
en/de	CAT	--				OFFER DRAWING ANGEBOOTSZEICHN.			1/1
en	Scale/M. stab	NTS	Doc. type			F02U.VOU.204-01			DP/TD
MNR	--		Repl. for			Repl. by			Ind. Format
									A3

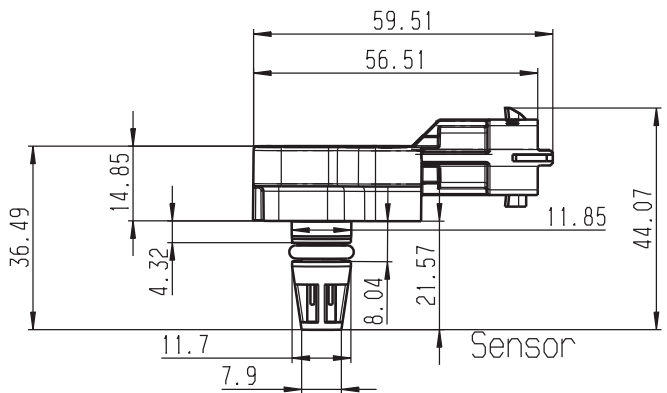
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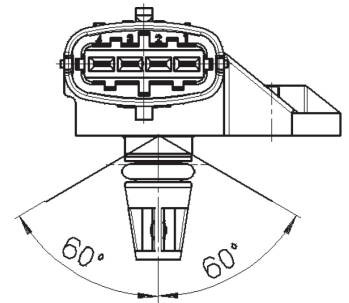
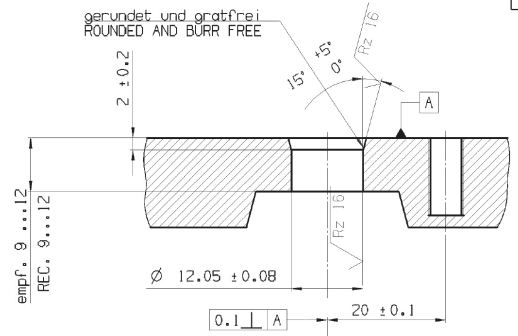
Pin Out	
1	Sens 5v
2	Sens GND
3	Signal
4	N-C
5	N-C

Mating Connector:  
ASL106-05SB



**Mounting Instructions:**

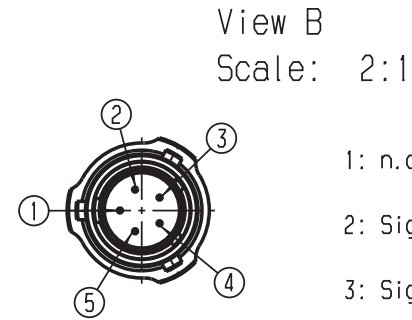
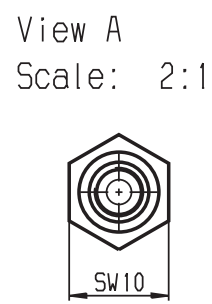
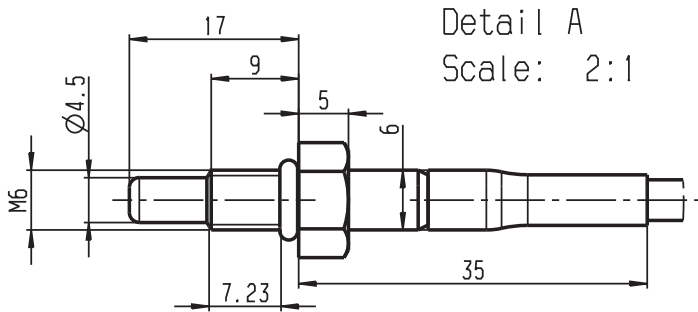
- Recommended position: 0...±60° in all directions from vertical; orifice facing downwards
- Sensor should be mounted on a flat surface, with the base of the sensor sufficiently supported
- Mounting screw: M6x1
- Installation torque: 3.3 Nm



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.	Wght./Gew.					Pressure Sensor: Boost-IMSA		Sheet/Bl.
en/de	CAT	--					OFFER DRAWING ANGBOTSZEICHN.		F02U.V0U.205-01
Scale/M.stab	NTS		Repl. for		Repl. by		DP/TD	Ind.	Format
MNR	--								A3

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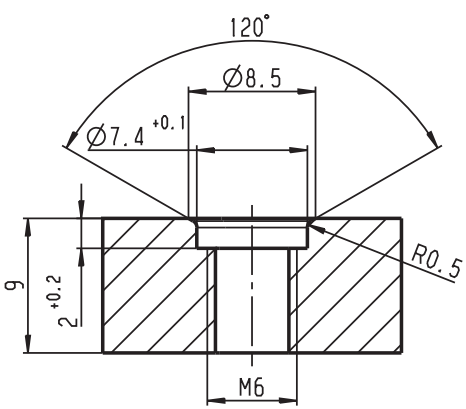
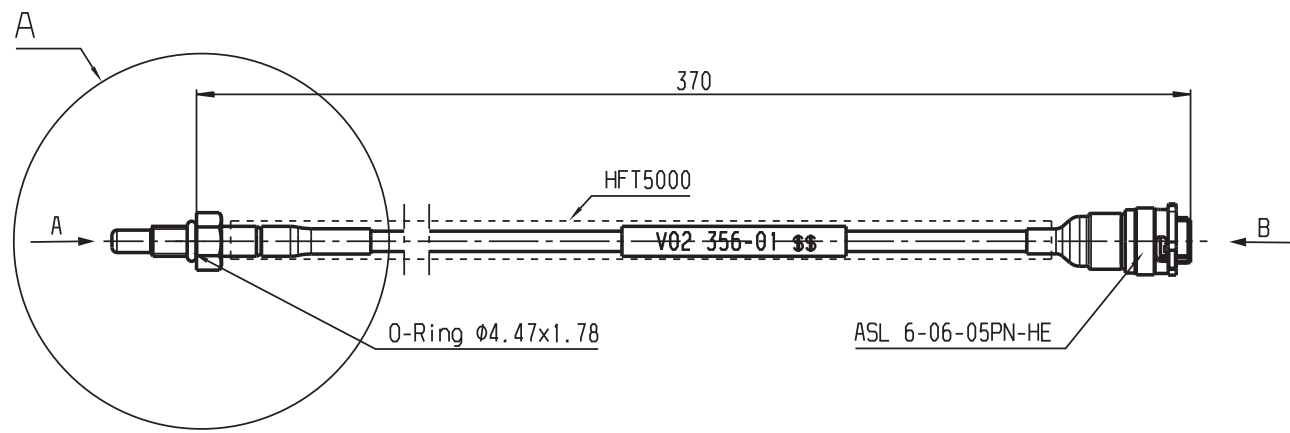
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- 1: n.c.
- 2: Signal -
- 3: Signal +
- 4: n.c.
- 5: n.c.

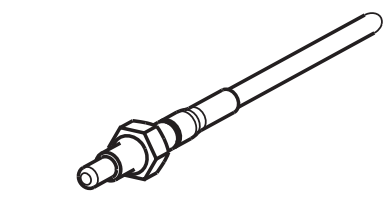
ASL 6-06-05PN-HE

Installation Recommendation  
Scale: 3:1



Tightening Torque: 8Nm

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

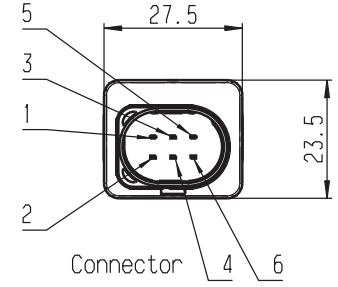
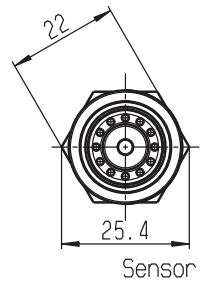
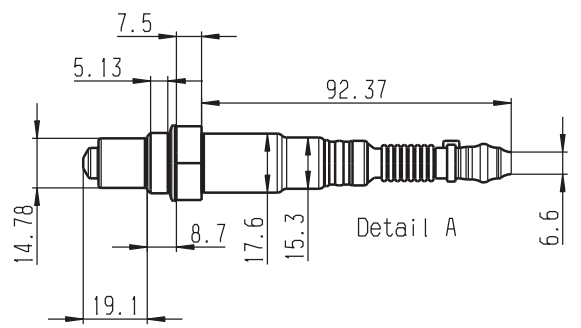


General tolerances for/Allgemeintoleranzen fuer		
lin. dim./L. Masse	radii/Radien	angles/Winkel
± 1	± 0.5	± 2°
Size acc. to/Masse nach ISO 14405-1:2010-12		
envelope principle / Hüllprinzip		Ⓔ

01 Erstellung	20151126	SKR	672	BEG/MSD-P Behrens
Ind. Change/Änd.	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Releas./Freig.
Lang./Spr.	Syst.	Wght./Gew.	Temperature Sensor NTC-M6HS	
en/de	CAT	--	Temperatursensor NTC-M6HS	
Scale/M.stab		1:1	Doc. type	
MNR		--	AGZ F 02U V02 356-01	
OFFER DRAWING ANGEBOTSZEICHN.			DP/TD	Ind. Format
Repl. for			Repl. by	
				A3

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Pin Out	
1	IP
2	VM
3	RH
4	VS
5	IA
6	US
Mating Connector:	
D261 205 356-01	

Installation Torque:
40-60 Nm

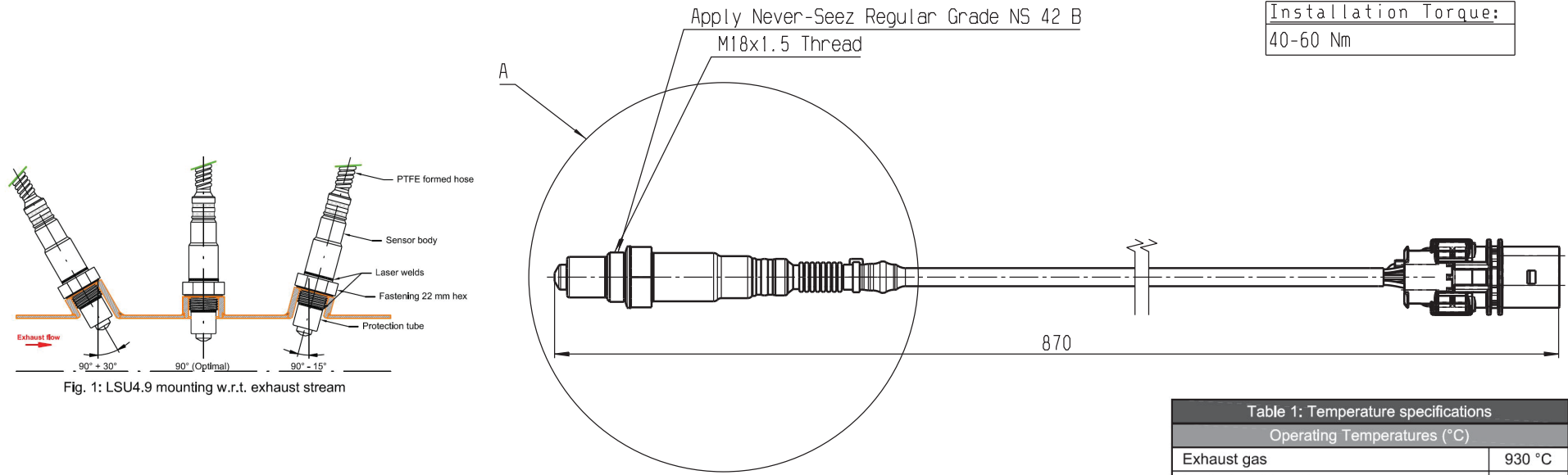


Fig. 1: LSU4.9 mounting w.r.t. exhaust stream

Table 1: Temperature specifications	
Operating Temperatures (°C)	
Exhaust gas	930 °C
Fastening 22 mm hex	600 °C
PTFE formed hose (sensor side)	250 °C
PTFE formed hose (upperhose crimp)	200 °C
Cable / protective sleeve	250 °C
Connector (OEM)	140 °C
Maximum Temperatures (°C)	
Exhaust Gas	1030 °C
Fastening 22 mm hex	680 °C

Table 2: Thread boss depth specifications		
Operating Temperatures (°C)	y (mm)	
Exhaust gas < 930	10.5	
Fastening 22 mm hex < 600	10.5	
Exhaust gas ≥ 930	13.0	
Fastening 22 mm hex ≥ 600	13.0	

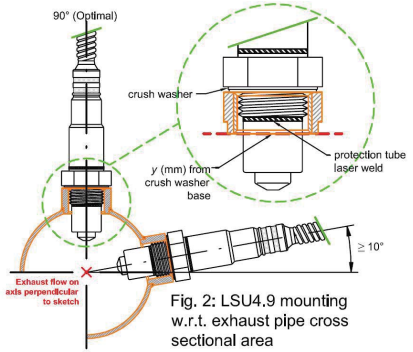


Fig. 2: LSU4.9 mounting w.r.t. exhaust pipe cross sectional area

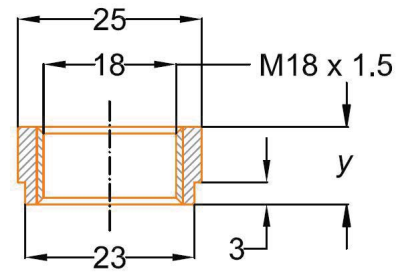


Fig. 3: LSU4.9 thread boss

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.	Releas./freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.
Lang./Spr.	Syst.	Vght./Gew.	LSU 4.9- IMSA				Sheet/Bl.
en/de	CAT	--					1/1
en	Scale/M.stab	NTS	OFFER DRAWING ANGEBOOTSZEICHN.				Format
MNR	--		Repl. for.				A3

# 10 Vibration Profile 1

## Vibration Profile 1

### Broadband noise: 8h/direction

Frequency (Hz)	Acceleration density (m/s <sup>2</sup> ) <sup>2</sup> /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 $a_{\text{eff}}$	55.4 m/s <sup>2</sup>

### Sine: 8h/direction

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



<b>Customer Information</b>		<b>PO Number:</b>	<b>Customer PO# if issued</b>
Team Name		Contact Name	
Car Make and Competition Class		Contact Email / Phone Number	
Shipping Preference (FedEx or UPS)		Shipping Address Line 1	
Shipping Account Number		Shipping Address Line 2	

<b>Dealer Contact Information</b>	CMS Florida	Email	<a href="mailto:colin@gomuchfaster.com">colin@gomuchfaster.com</a>	
	Sakata Motorsport Electronics California	Phone	+1 (813) 482-2178	
		Email	<a href="mailto:brian@sakatamotorsport.com">brian@sakatamotorsport.com</a>	
	Mech-Tronic New York	Phone / Fax	+1 (714) 446-9473 / +1 (714) 446-9247	
		Email	<a href="mailto:mec-tronic@verizon.net">mec-tronic@verizon.net</a>	
		Phone / Fax	+1 (631) 423-0523 / +1 (631) 423-7769	

Product Description	Part Number	Qty.	Use Case	Price	Tariff Charge	Total Price	Comments
<b>Spec Kit</b>							
GTU Kit (MS6-SCR with USB, VMPS+Antenna)	F02U.V0U.444-01			\$ 11,882.00	\$ 968.38	\$ 12,850.38	
<b>Spec Sensors</b>							
Pressure Sensor - 0-1.15 Bar	F02U.V0U.267-02		Plenum, Inlet Port (NA)	\$ 483.00	\$ 39.36	\$ 522.36	
Pressure Sensor - 0-1.15 Bar (Automotive Connector)	F02U.V0U.204-01		Plenum, Inlet Port (NA)	\$ 313.00	\$ 25.51	\$ 338.51	
Pressure Sensor - 0-3.5 Bar	F02U.V0U.205-01		Boost (Turbo)	\$ 313.00	\$ 25.51	\$ 338.51	
Temperature Sensor - M6	F02U.V02.356-01		Engine, Cockpit	\$ 483.00	\$ 39.36	\$ 522.36	
Lambda Sensor	0258.988.001		Lambda	\$ 164.00	\$ -	\$ 164.00	
<b>Individual Spare Parts</b>							
MS6 SCR with USB	F02U.V03.353-01			\$ 9,225.00	\$ 751.84	\$ 9,976.84	
VMPS	F02U.V0U.445-01			\$ 2,647.00	\$ 215.73	\$ 2,862.73	
VMPS Antenna	F02U.00U.091-01			\$ 232.00	\$ 18.91	\$ 250.91	
VMPS Antenna Cable 66"	F02U.00U.092-01			\$ 103.00	\$ 8.39	\$ 111.39	
VMPS Antenna Cable 96"	F02U.00U.092-02			\$ 103.00	\$ 8.39	\$ 111.39	
VMPS Antenna Cable 120"	F02U.00U.092-03			\$ 103.00	\$ 8.39	\$ 111.39	
VMPS Antenna Cable 160"	F02U.00U.092-04			\$ 103.00	\$ 8.39	\$ 111.39	

**Notes**

Credit card/other fees may apply as long as teams have some option to pay the listed price.

Track sales are subject to a 10% surcharge to teams.

Parts are only able to be dispatched after payment has been verified.

Shipping charges are additional to kit/piece prices.

All prices are in USD and are valid until 12/31/2025.

# 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

V0.1	Initial Draft Release.
V0.2	Draft Revision – Removed references to GTP.
V0.3	Draft Revision - GTDX references added. CAN Delta & Echo Pictures updated. Removal of all LTE 65 and Telemetry mentions. Scrutineering Harness Diagram and Bosch Ordering Form updated. FIA CAN4 Pin Out moved to Pin# 17-20.
V0.4	Sensors 3.2 Airbox Pressure Sensor(s) Upgraded image quality for Diagrams in 4.1.2, 4.1.3, 4.4.4, 4.4.5, 4.1.6
V0.5	Removed restrictor throat pressure from 3.2 Added Airbox pressure description to 3.2.1 (1 Bar pressure sensor)
V1.1.0	Engine and wheel speed sensors sections removed (3.2.5 and 3.2.6). Removed section 4.2 – No Driver ID in GTDX. Section 3.1: Removed engine speed from table and unused denotations **, ^ Section 3.1.3, 6, 7, 8: Replaced “Technical Regulations” with Scrutineering Homologation. Section 3.1.6: Added labeling requirement to USB/Diag ports. Section 3.2: Removed engine speed sensor from list. Section 3.3: IWSC Tech Regs replaced as references VPRC Tech regs. Section 3.3: arriving to “pre-event” inspection. Section 4.1.4: removed bullet point which references Fuel Flow Meters. Section 5: change from 2024 to 2025. Section 6: updated IMSA link.
V1.1.1	Formatting of 4.1.6 and 6.0
V1.1.2	3.1.2 XAP brightness control 0-255 interpolation description updated.
V1.1.3	3.1.5 USB/Diag port labeling requirements updated; port picture updated
V1.1.4	Updated Cost Sheet

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**BOSCH**