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1 GENERAL INFORMATION

1.1 Abbreviations

Abbreviation	Description
A/D	Analog/Digital
ANT	Antenna
BT	Bluetooth
CAM	Camera
CAN	Controller Are Network
CC	Configuration channel
D+/D-	Data+/Data-
DC	Direct Current
DOUT	Data Out
EMI	Electromagnetic interference
GND	Ground
GNSS	Global Navigation Satellite System
I/O	Input / Output
ICU	Infotainment control unit
IVI	In-Vehicle infotainment
LTE	Long Term Evolution
MDI	Media Dependent Interface
MIC	Microphone
MPN	Manufacturer Part Number

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NC	Not Connected
PBSW	Parking Brake Switch
PPTC	Polymeric Positive Temperature Coefficient Device
PWR	Power
RX(D)	Receive
SIM	Subscriber Identification Module
SBU	Sideband use
TX(D)	Transmit
USB	Universal Serial Bus
USB SS	Universal Serial Bus Super Speed
VBAT	Battery Voltage

1.2 ICU_301 naming

ICU_301 is available in multiple variants listed in the table below. This document is valid for all the variants listed.

Device	Product Name	Model	Part Number
ICU_301_RIM_03_E	Infotainment Control Unit	RIM_03_E	002012632-6.1
ICU_301_RIM_03_N	Infotainment Control Unit	RIM_03_N	002073871-8.1
ICU_301_RIM_03_J	Infotainment Control Unit	RIM_03_J	002066201-6.1
ICU_301_APF_03_E	Infotainment Control Unit	APF_03_E	002066203-4.1
ICU_301_APF_03_N	Infotainment Control Unit	APF_03_N	002066204-5.1
ICU_301_APF_03_J	Infotainment Control Unit	APF_03_J	002066205-4.1

2 Overview

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Rimac Nevera ICU and its peripherals:

- Infotainment Control Unit (ICU_301) - Figure 1
- Cluster Display Assembly - Figure 2
- Central Display Assembly – Figure 3
- Passenger Display Assembly – Figure 4
- Ethernet Switch - Figure 5
- LTE antennas (2x) –Figure 23
- BT-WiFi antennas (2x) – Figure 27Figure 4
- GNSS antenna – Figure 26
- Radio antennas (3x)
- Necessary harnesses

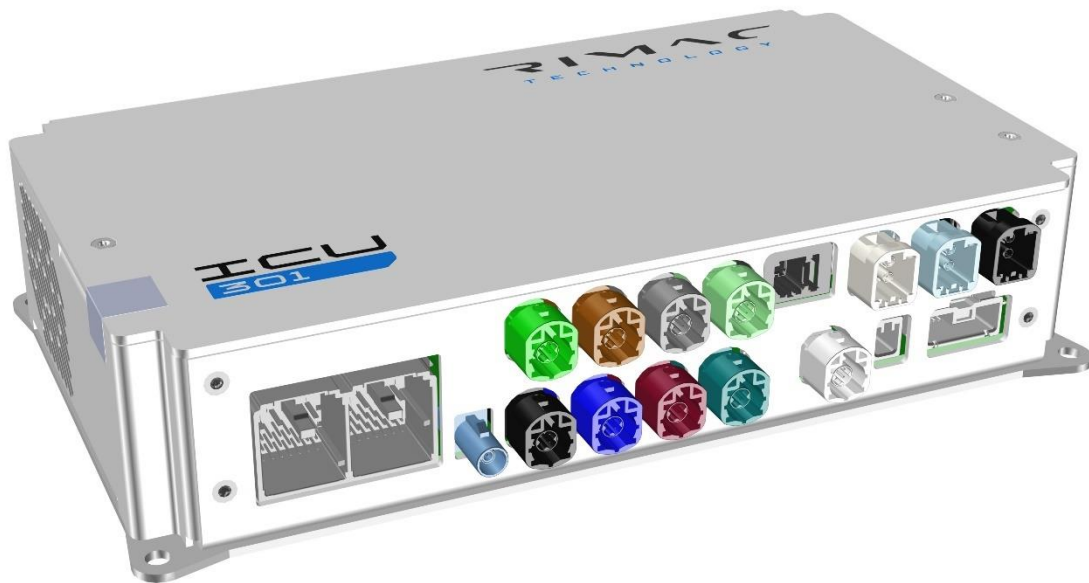


Figure 1 - Infotainment Control Unit (ICU_301)

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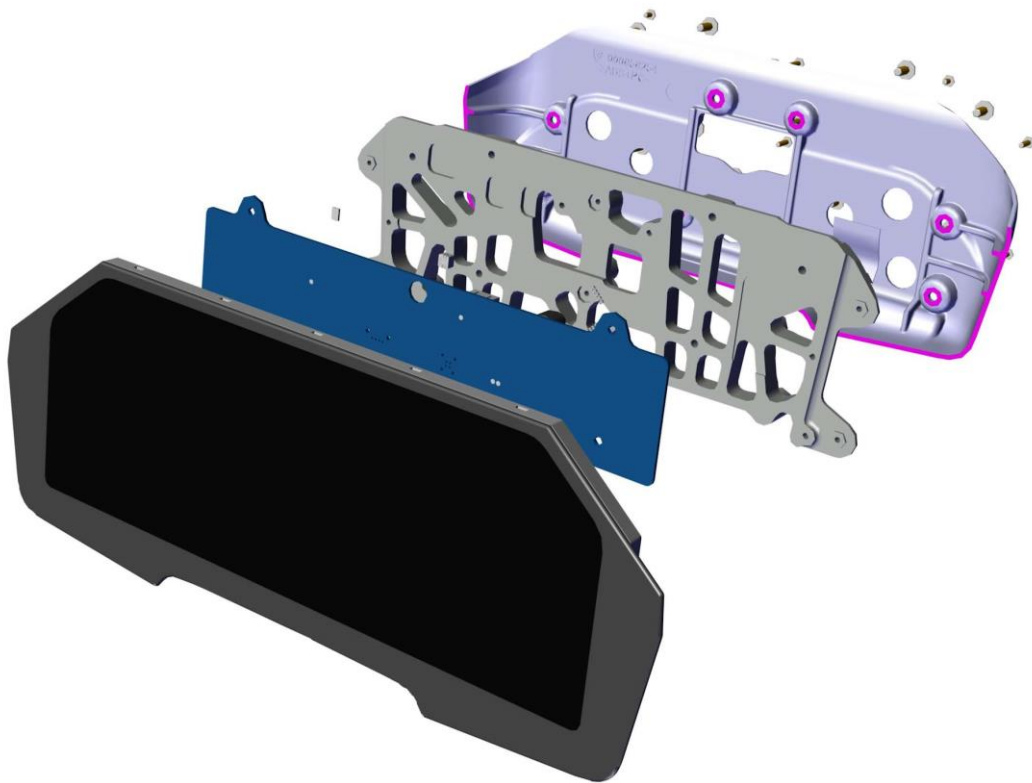


Figure 2 – Cluster Display Assembly

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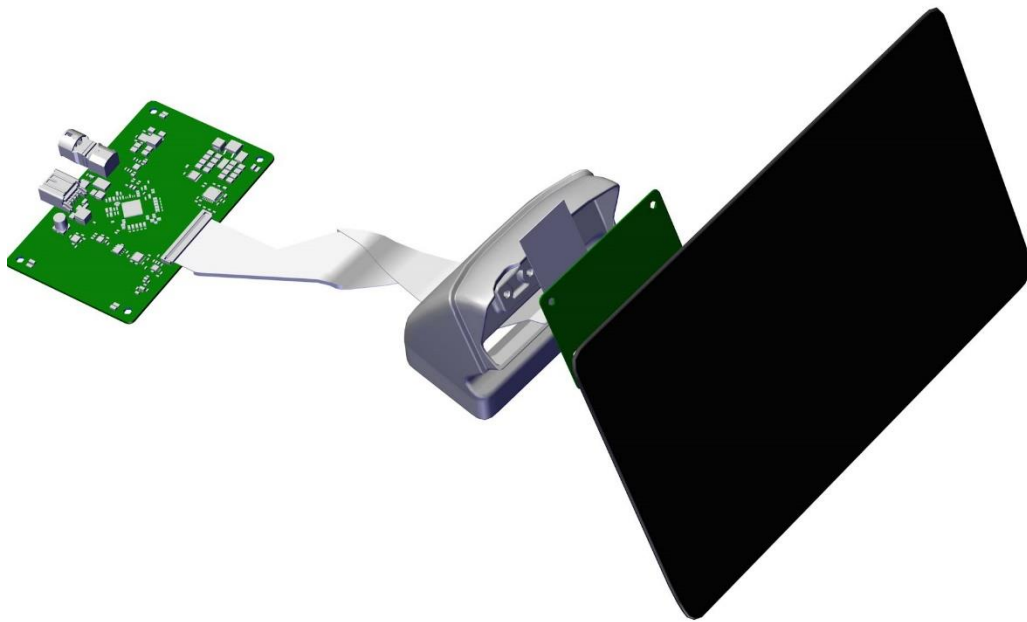


Figure 3 - Central Display Assembly

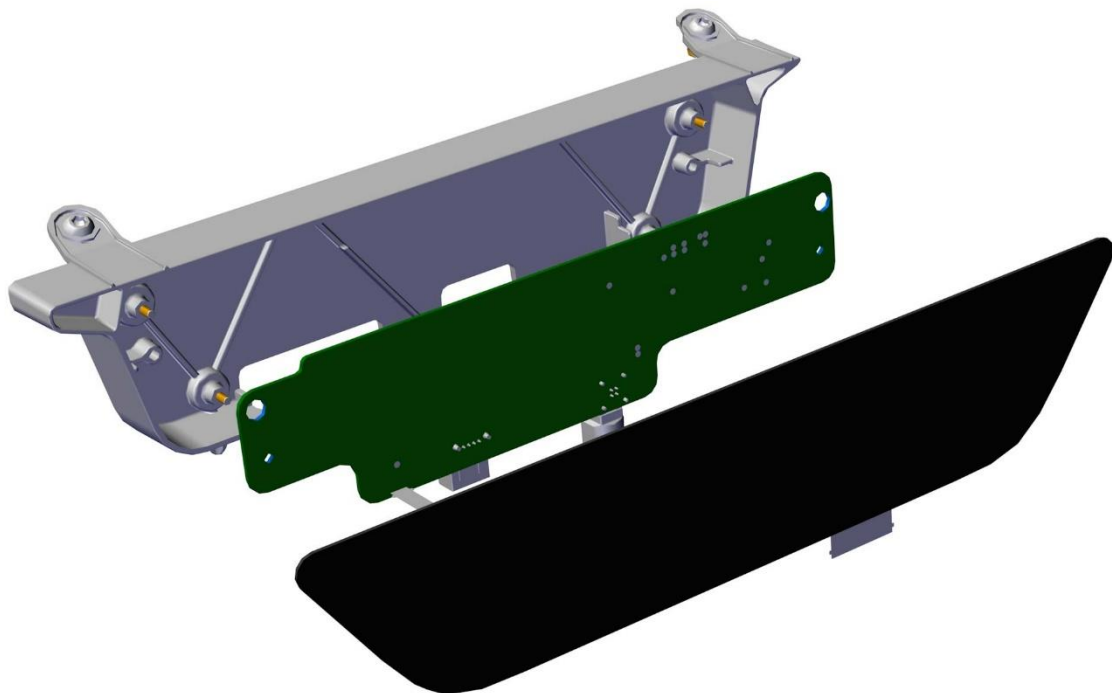


Figure 4 - Passenger Display Assembly

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Figure 5 - TTConnect 616 Ethernet Switch

3 Disclaimer

- Do not disassemble or alter any of the assembly's
 - Doing so may result in an accident, fire, or electrical shock
- Before wiring disconnect the negative battery terminal
 - Failure to do so may result in electric shock or injury due to electrical shorts
- Make the correct connections
 - Failure to make proper connections may result in fire or product damage
- Keep audio lines away from all other communication and power lines
 - Otherwise interference could deteriorate audio quality
- All the products are designed for operation within specified operating voltage
 - Use for other than its designed application may result in fire, electric shock or other injury
- Do not place hands, finger or foreign objects in insertion slots or gaps
 - Doing so may result in personal injury or damage to the product
- Units may become hot during use
- Information on Disposal of Old Electric and Electronic Equipment (applicable for countries that have adopted separate waste collection systems)
 - Do not mix it with general household waste
 - There is a separate collection system for used electronic products in accordance with legislation that requires proper treatment, recovery and recycling
 - Contact your local authority for details

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4 System Technical Description

4.1 Infotainment Control Unit (ICU_301)

4.2 Electrical

Power supply

- Nominal input voltage: 14.4V DC
- Full operational voltage range: 8V – 16V DC
- Transient over-voltage protection
- Reverse polarity protection

Inputs/Outputs

- 2 x Microphone inputs (with 8V phantom power)
- 2 x Analog Line Out (Audio interface)
- 3 x FPD-Link III
- 1 x Fault
- 1 x Enable

Communication

- 5 x CAN
- 1 x RS232 (standard RS232 logic levels)
- 1 x USB 2.0 with 5V power supply
- 1 x USB 3.0 with 5V power supply
- 1 x 1000BASE-T1 Ethernet
- 1 x 10GBASE-T1 Ethernet

Wireless Communication

- **Cellular Network** - LTE/HSPA+/GSM module
- **Navigation** - GPS/QZSS, GLONASS, BeiDou, Galileo with dead reckoning
- **Bluetooth** - Bluetooth v4.2 with BR/EDR, integrated antenna
- **WIFI** - Dual band Wi-Fi with 2x2 MIMO 802.11a/b/g/n/ac

Thermal specification

- Temperature operating range: -40°C to +70°C
- Temperature storage range: -40°C to +70°C

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Connector definition and pinout

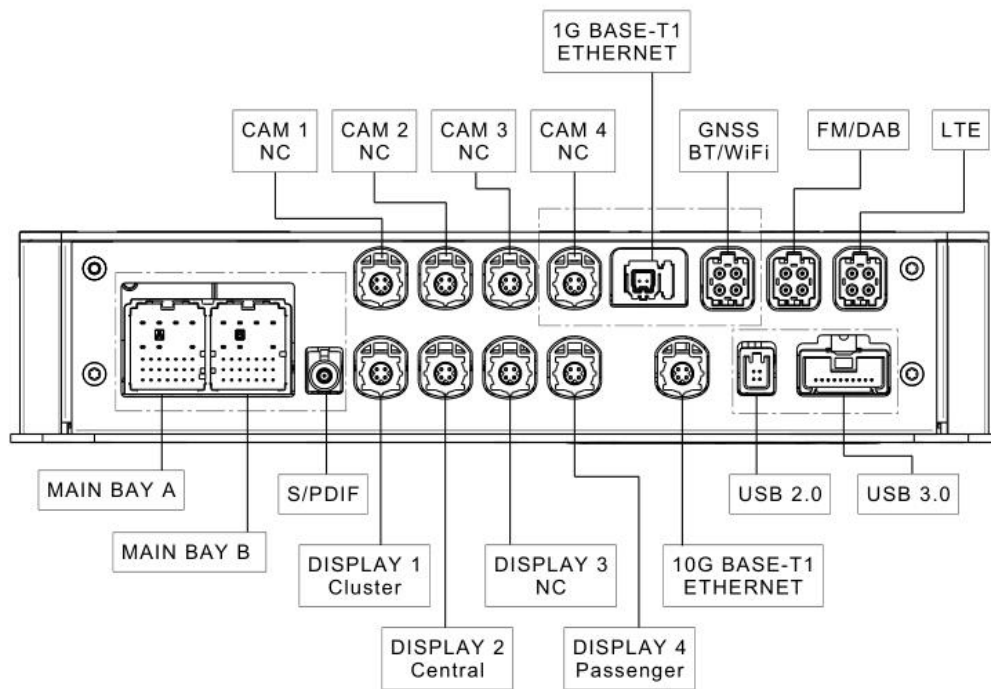


Figure 6 - ICU_301 Connector Definition

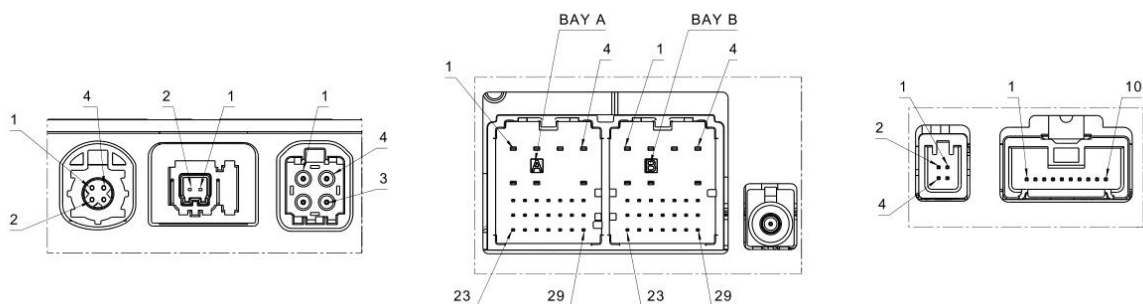


Figure 7 - Pin 1 position on ICU_301 connectors

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Table 1 - Connector pinouts – Base board – Displays, 10G Ethernet

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Rosenberger D4S20G-400A5-A	A, Black	Cluster Display	1	DOUT_A_N	- 0.3 – 1.7
			2	DOUT_B_N	- 0.3 – 1.7
			3	DOUT_A_P	- 0.3 – 1.7
			4	DOUT_B_P	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
Rosenberger D4S20G-400A5-C	C, Blue	Central Display	1	DOUT_A_N	- 0.3 – 1.7
			2	DOUT_B_N	- 0.3 – 1.7
			3	DOUT_A_P	- 0.3 – 1.7
			4	DOUT_B_P	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
Rosenberger D4S20G-400A5-D	D	Not used	1	GND	- 0.3 – 1.7
			2	GND	- 0.3 – 1.7
			3	GND	- 0.3 – 1.7
			4	GND	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
Rosenberger D4S20G-400A5-Z	Z, Green	Passenger Display	1	DOUT_A_N	- 0.3 – 1.7
			2	DOUT_B_N	- 0.3 – 1.7
			3	DOUT_A_P	- 0.3 – 1.7
			4	DOUT_B_P	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
Rosenberger D4S20G-400A5-B	B, White	10G Ethernet	1	PHY_A	-1 – 1
			2	PHY_D	-1 – 1
			3	PHY_C	-1 – 1
			4	PHY_B	-1 – 1
			SHLD	SHIELD (GND)	0

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Table 2 - Connector pinouts – Base board – USB 2.0, USB 3.0

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Hirose GT32-4DP-1.5H(10)	N/A	USB 2.0	1	GND	0
			2	VBUS	5
			3	DATA_N	0 – 3.6
			4	DATA_P	0 – 3.6
			SHLD	SHIELD (GND)	0
Hirose GT32-10P-1.5H	N/A	USB 3.0	1	GND	0
			2	USB SS RX-	-0.3 – 1.32
			3	USB SS RX+	-0.3 – 1.32
			4	VBUS	5
			5	DATA_N	0 – 3.6
			6	DATA_P	0 – 3.6
			7	Drain wire	0
			8	USB SS TX-	-0.3 – 1.32
			9	USB SS TX+	-0.3 – 1.32
			10	GND	0
			SHLD	SHIELD (GND)	0

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Table 3 - Connector pinouts – Base board - Main connector (Bay A)

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Molex stAK50h - 56 pins (1600130641)	Bay A - Key 4	Main ICU connector	A1	PWR 12V_KL30	8 - 16
			A2	PWR GND	0
			A3	PWR GND	0
			A4	PWR 12V_KL15	8 - 16
			A5	GND	0
			A6	GND	0
			A8	GND	0
			A9	CAN1_P	-0.1 – 4.5
			A10	CAN1_N	-0.1 – 4.5
			A11	CAN2_P	-0.1 – 4.5
			A12	CAN2_N	-0.1 – 4.5
			A13	CAN3_P	-0.1 – 4.5
			A14	CAN3_N	-0.1 – 4.5
			A15	CAN5_P	-0.1 – 4.5
			A16	CAN1_P_Pass_Through	-0.1 – 4.5
			A17	CAN1_N_Pass_Through	-0.1 – 4.5
			A18	CAN2_P_Pass_Through	-0.1 – 4.5
			A19	CAN2_N_Pass_Through	-0.1 – 4.5
			A20	CAN3_P_Pass_Through	-0.1 – 4.5
			A21	CAN3_N_Pass_Through	-0.1 – 4.5
			A22	CAN5_N	-0.1 – 4.5
			A23	CAN4_P	-0.1 – 4.5
			A24	CAN4_N	-0.1 – 4.5
			A25	CAN4_P_Pass_Through	-0.1 – 4.5
			A26	CAN4_N_Pass_Through	-0.1 – 4.5
			A27	GND	0
			A28	Enable	0 – 12V_KL15
			A29	Fault	0 – 12V_KL15

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Table 4 - Connector pinouts – Base board - Main connector (Bay B)

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Molex stAK50h - 56 pins (1600130641)	Bay B - Key 1	Main ICU connector	B1	GND	0
			B2	AUDIO_LINE_OUT Left	-1,56 – 1,56
			B3	MIC1_IN	0 – 8
			B4	GND	0
			B5	AUDIO_LINE_OUT Right	-1,56 – 1,56
			B6	GND	0
			B8	MIC2_IN	0 – 8
			B9	1GBASE-T_DC_CONN_P	-1 – 1
			B10	1GBASE-T_DD_CONN_P	-1 – 1
			B11	100BASE-T_TX+	-1 – 1
			B12	100BASE-T_TX-	-1 – 1
			B13	NC	N/A
			B14	RS232_RXD	-25 – 25
			B15	NC	N/A
			B16	1GBASE-T_DC_CONN_N	-1 – 1
			B17	1GBASE-T_DD_CONN_N	-1 – 1
			B18	100BASE-T_RX+	-1 – 1
			B19	100BASE-T_RX-	-1 – 1
			B20	NC	N/A
			B21	RS232_TXD	-25 – 25
			B22	NC	N/A
			B23	NC	N/A
			B24	GND	0
			B25	GND	0
			B26	GND	0
			B27	GND	0
			B28	GND	0
			B29	GND	0

Table 5 - Connector pinouts - Extension board – 1G Ethernet, BT-WiFi, GNSS, LTE, Radio antennas

Connector	Keying	Purpose	Pin	Function	Voltage [V]
1-Port MATENet (9-2304372-1)	A, Black	1GBASE-T1 Ethernet	1	MDI_P	-1 – 1
			2	MDI_N	-1 – 1
			SHLD	SHIELD (GND)	0
TE MATE-AX 2304168-2	B	BT, WiFi, GNSS Antennas	1	GNSS_ANT	-
			2	BT/WiFi_ANT1	-
			3	BT/WiFi_ANT2	-
			4	NC	N/A
TE MATE-AX 2304168-1	A	LTE Antennas	1	LTE_ANT1	-
			2	LTE_ANT2	-
			3	NC	N/A
			4	NC	N/A
TE MATE-AX 2304168-3	C	Radio Antennas	1	RADIO_ANT1	-
			2	RADIO_ANT2	-
			3	NC	N/A
			4	RADIO_ANT3*	-

*NOT used on ICU_301_RIM_03_N and ICU_301_APF_03_N variants

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4.2.1 Mechanical

- Mechanical dimensions of the ICU

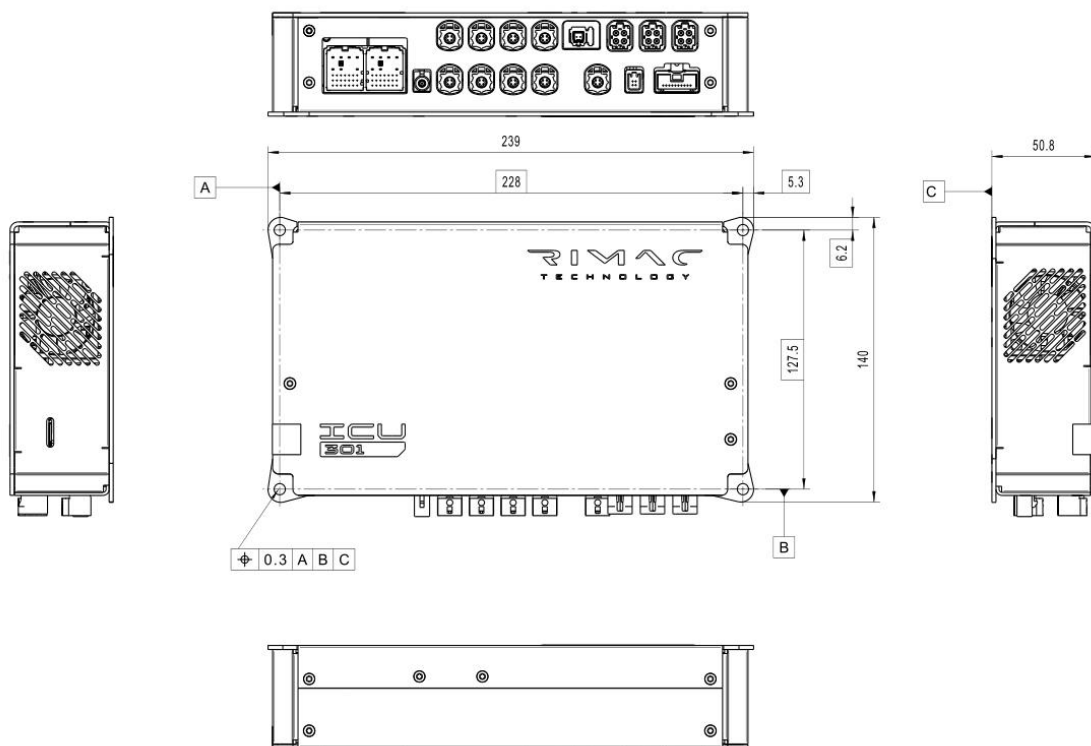


Figure 8 – Mechanical dimensions of the ICU

- Calculated weight of the ICU: 1180 g
- Mounting requirements:
 - Flat head countersunk screws M5; for position and orientation see picture below
 - Maximum torque applied: 3 Nm

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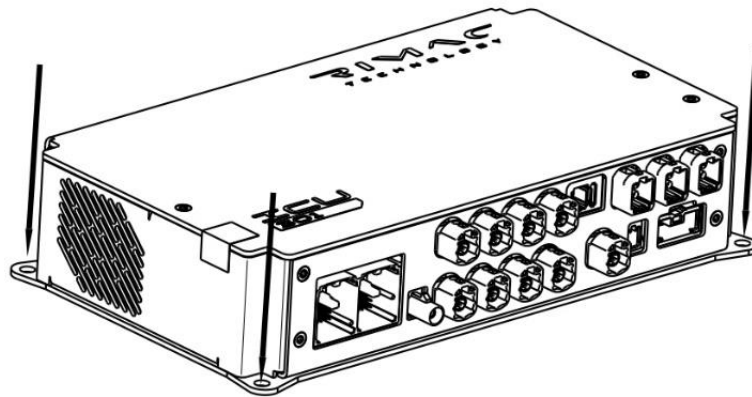


Figure 9 - ICU Mounting points.

ICU Cooling requirements

- Do not cover input/output of air

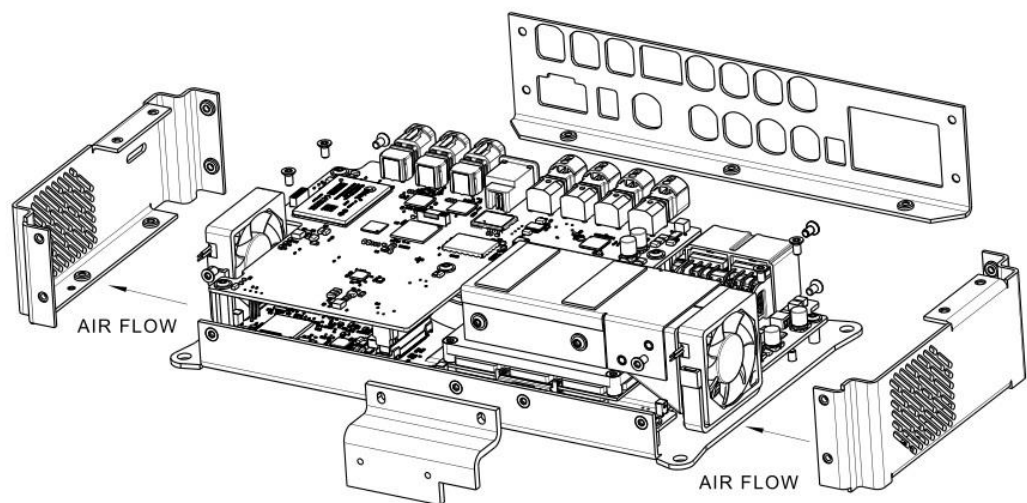


Figure 10 - ICU Cooling diagram

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4.3 Cluster Display assembly

4.3.1 Electrical

Power supply

- Nominal input voltage: 14.4V DC
- Full operational voltage range: 8V – 16V DC
- PPTC Resettable Fuse 2.5 A (5.2 A max)
- Transient over-voltage protection
- Reverse polarity protection
- EMI filter

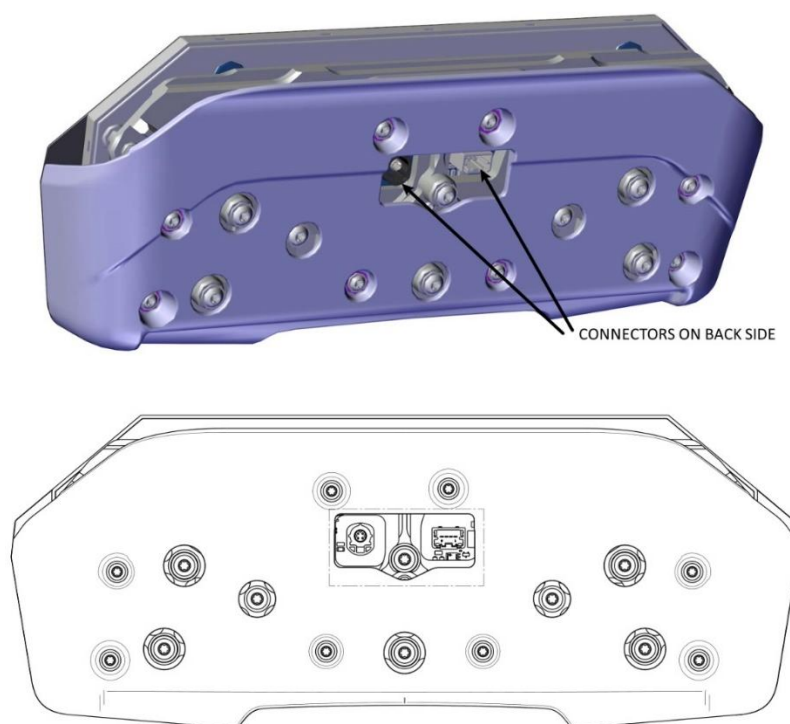
Inputs/Outputs

- 1 x FPD-Link III Video interface

Thermal specification

- Temperature storage range: -40°C to +70°C
- Temperature storage range: -40°C to +70°C

Connector definition and pinout



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Figure 11 – Cluster Display Assembly Connector Definition

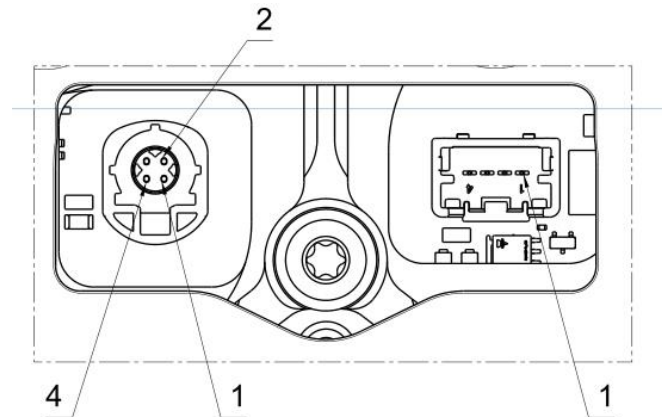


Figure 12- Pin 1 position on Cluster Display Assembly connectors

Table 6 - Cluster Display Assembly connectors pinout

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Rosenberger D4S20G-400A5-A	A, Black	Cluster Display	1	DOUT_B_P	- 0.3 – 1.7
			2	DOUT_A_P	- 0.3 – 1.7
			3	DOUT_B_N	- 0.3 – 1.7
			4	DOUT_A_N	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
34792-0040 Molex 4P Header Vertical Black	A, Black	Power	1	VBAT	8 – 16
			2	VBAT	
			3	GND	0
			4	GND	

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4.3.2 Mechanical

- Mechanical dimensions of the Cluster Display Assembly

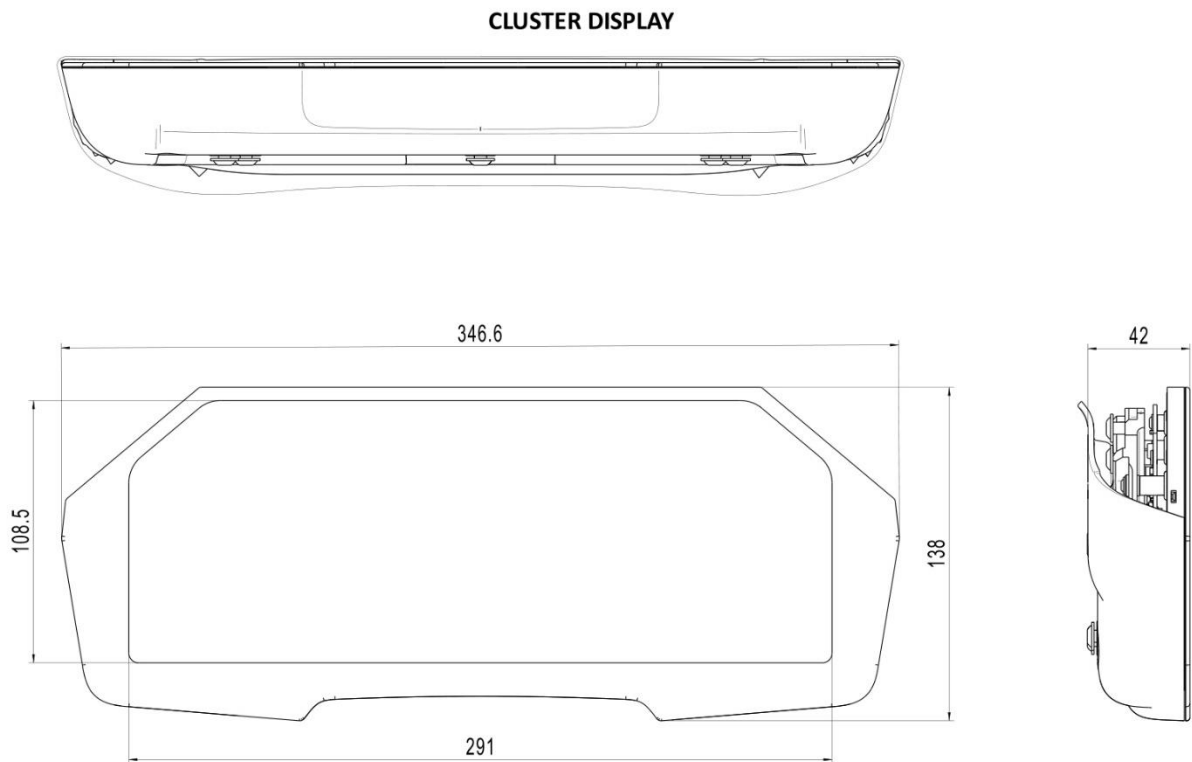


Figure 13 – Mechanical dimensions of the Cluster Display Assembly

4.4 Central Display assembly

4.4.1 Electrical

Power supply

- Nominal input voltage: 14.4V DC
- Full operational voltage range: 8V – 16V DC
- PPTC Resettable Fuse 2.5 A (5.2 A max)
- Transient over-voltage protection
- Reverse polarity protection
- EMI filter

Inputs/Outputs

- 1 x FPD-Link III Video interface

Thermal specification

- Temperature storage range: -40°C to +70°C
- Temperature storage range: -40°C to +70°C

Connector definition and pinout

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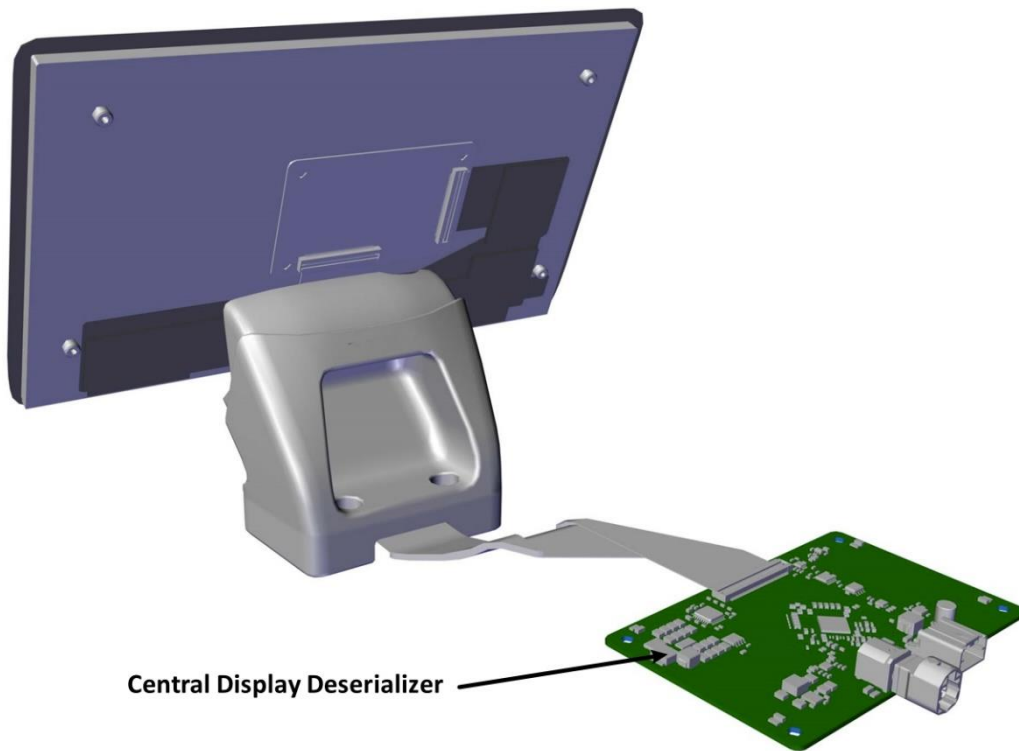


Figure 14 – Central Display Assembly Connector Definition

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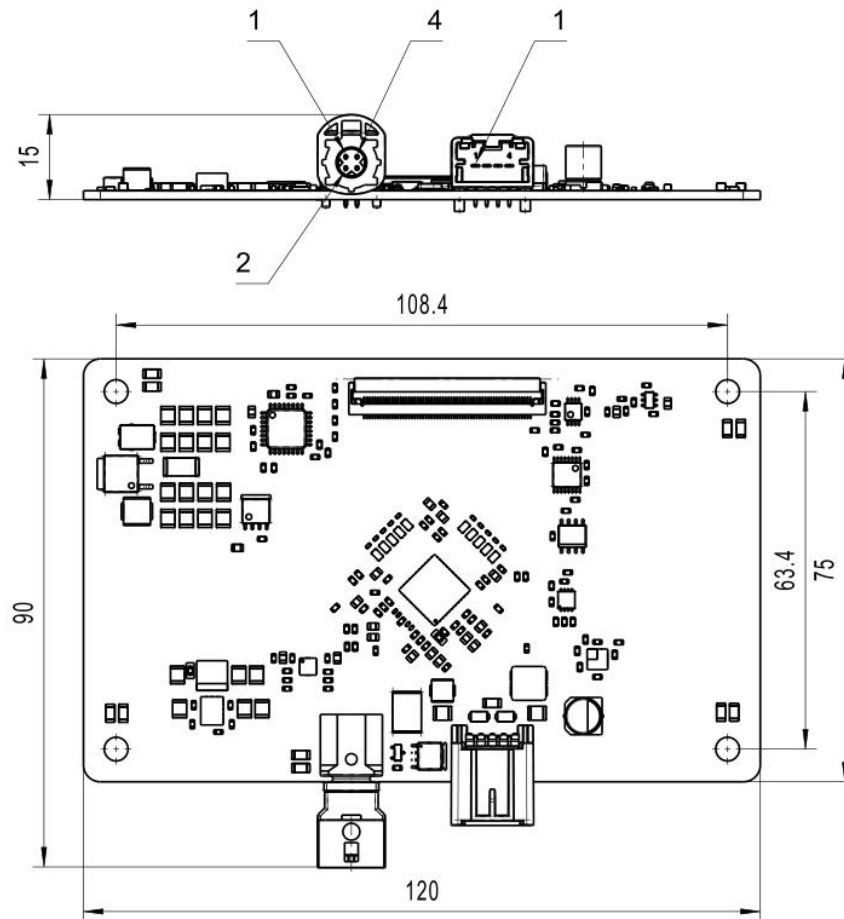


Figure 15 - Pin 1 position on Central Display Assembly connectors

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Table 7 - Central Display Assembly connectors pinout

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Rosenberger D4S20G-400A5-C	C, Blue	Central Display	1	DOUT_B_P	- 0.3 – 1.7
			2	DOUT_A_P	- 0.3 – 1.7
			3	DOUT_B_N	- 0.3 – 1.7
			4	DOUT_A_N	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
34793-0040 Molex 4P Header Right Angle Black	A, Black	Power	1	VBAT	8 – 16
			2	VBAT	
			3	GND	0
			4	GND	

1.1.1 Mechanical

- Mechanical dimensions of the Central Display Assembly

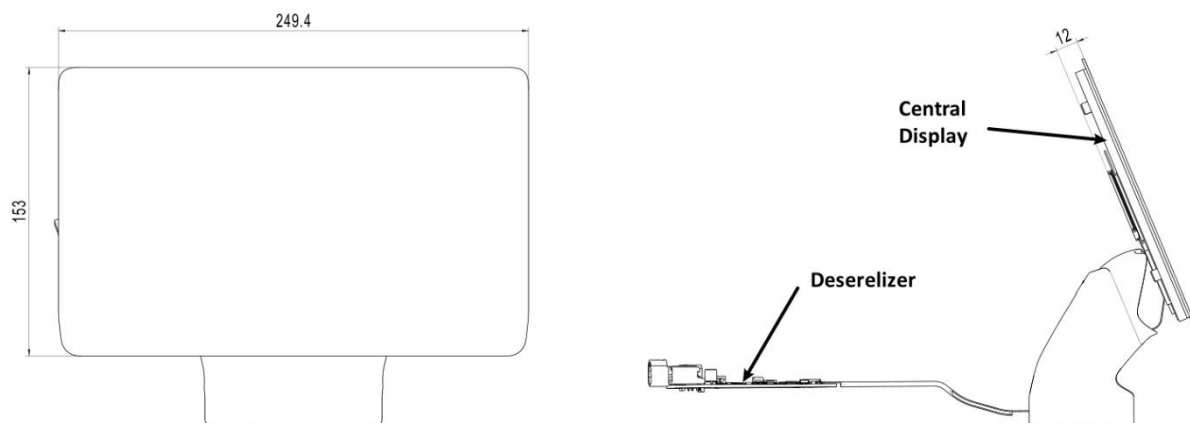


Figure 16 – Mechanical dimensions of the Central Display Assembly

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4.5 Passenger Display assembly

4.5.1 Electrical

Power supply

- Nominal input voltage: 14.4V DC
- Full operational voltage range: 8V – 16V DC
- PPTC Resettable Fuse 2.5 A (5.2 A max)
- Transient over-voltage protection
- Reverse polarity protection
- EMI filter

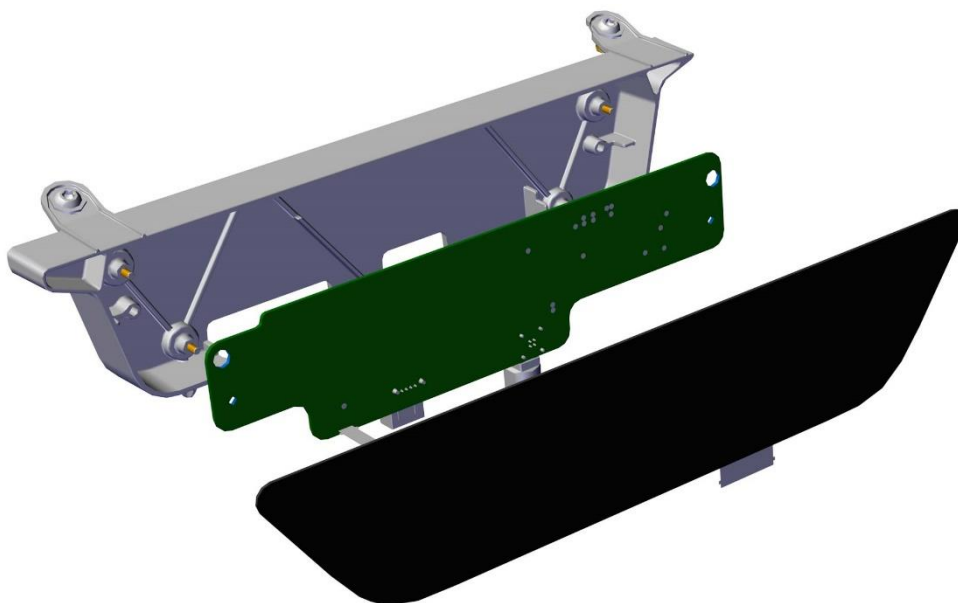
Inputs/Outputs

- 1 x FPD-Link III Video interface

Thermal specification

- Temperature storage range: -40°C to +70°C
- Temperature storage range: -40°C to +70°C

Connector definition and pinout



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Figure 17 – Passenger Display Assembly Connector Definition

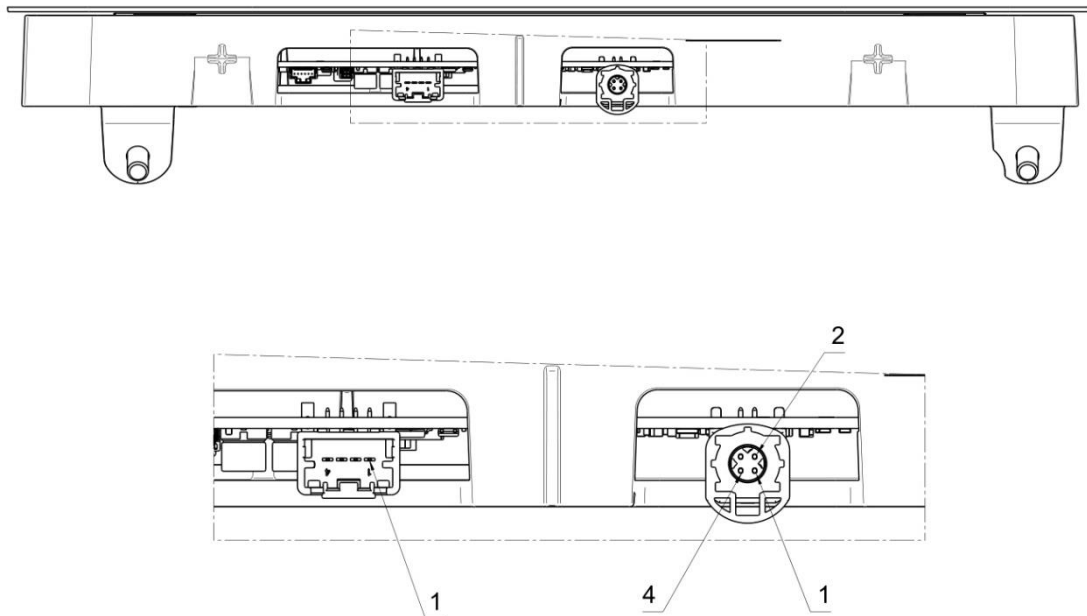


Figure 18 - Pin 1 position on Passenger Display Assembly connectors

Table 8 - Central Display Assembly connectors pinout

Connector	Keying	Purpose	Pin	Function	Voltage [V]
Rosenberger D4S20G-400A5-Z	Z, Navy Blue	Passenger Display	1	DOUT_B_P	- 0.3 – 1.7
			2	DOUT_A_P	- 0.3 – 1.7
			3	DOUT_B_N	- 0.3 – 1.7
			4	DOUT_A_N	- 0.3 – 1.7
			SHLD	SHIELD (GND)	0
34793-0040 Molex 4P Header Right Angle Black	A, Black	Power	1	VBAT	8 – 16
			2	VBAT	
			3	GND	0
			4	GND	

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4.5.2 Mechanical

- Mechanical dimensions of the Passenger Display Assembly

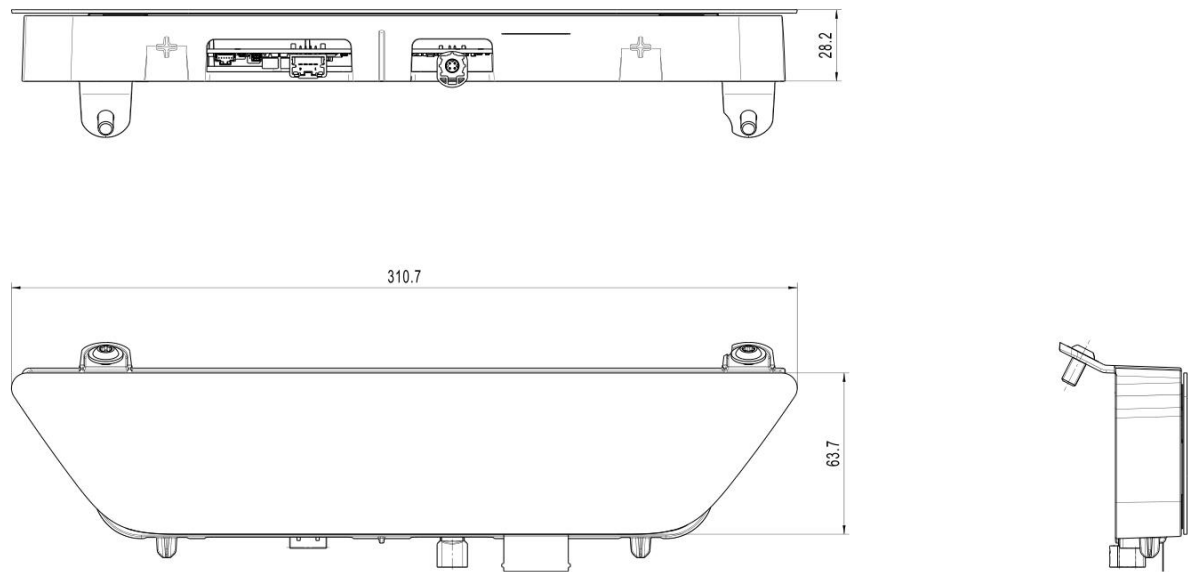


Figure 19 – Mechanical dimensions of the Passenger Display Assembly

4.6 Ethernet switch

4.6.1 Electrical

Power supply

- Nominal input voltage: 14.4V DC
- Full operational voltage range: 8V – 16V DC

Connection

- 6 x 100BASE-T1 BroadR-Reach® 100 Mbit/full-duplex
- 1 x 100BASE-TX Ethernet for diagnostics and flashing
- 6 x CAN

Thermal specification

- Temperature operating range: -40°C to +85°C
- Temperature storage range: -40°C to +85°C

Connector pinout

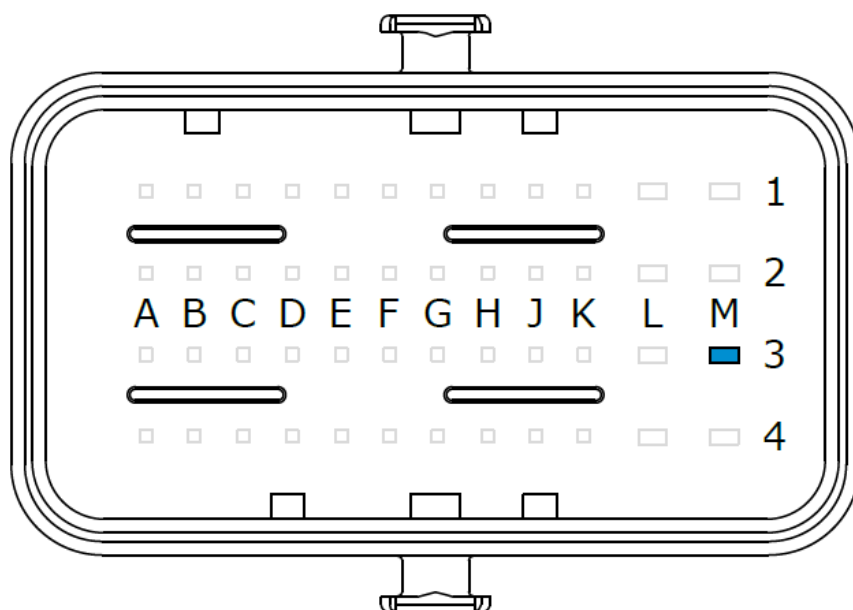


Figure 20 – Ethernet Switch Connector Definition

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Table 9 – Ethernet Switch connectors pinout

Pin No.	Signal name	Description
A1	Ethernet RX+	100BASE-TX Ethernet Receive RX+
A2	Ethernet TX+	100BASE-TX Ethernet Transmit TX+
A3	100BASE-T1 1 P	100BASE-T1 Interface 1
A4	100BASE-T1 0 P	100BASE-T1 Interface 0
B1	Ethernet RX -	100BASE-TX Ethernet Receive RX–
B2	Ethernet TX -	100BASE-TX Ethernet Transmit TX–
B3	100BASE-T1 1 M	100BASE-T1 Interface 1
B4	100BASE-T1 0 M	100BASE-T1 Interface 0
C1	FlexRay BP	FlexRay
C2	Digital Input	Digital Input 1
C3	NC	Not connected
C4	NC	Not connected
D1	FlexRay BM	FlexRay
D2	Digital Input	Digital Input 2
D3	NC	Not connected
D4	NC	Not connected
E1	CAN 0 High	CAN Interface 0
E2	CAN 1 High	CAN Interface 1
E3	100BASE-T1 3 P	100BASE-T1 Interface 3
E4	100BASE-T1 2 P	100BASE-T1 Interface 2
F1	CAN 0 Low	CAN Interface 0
F2	CAN 1 Low	CAN Interface 1
F3	100BASE-T1 3 M	100BASE-T1 Interface 3
F4	100BASE-T1 2 M	100BASE-T1 Interface 2
G1	CAN 2 High	CAN Interface 2
G2	CAN 3 High	CAN Interface 3
G3	NC	Not connected
G4	NC	Not connected
H1	CAN 2 Low	CAN Interface 2
H2	CAN 3 Low	CAN Interface 3
H3	NC	Not connected
H4	NC	Not connected
J1	CAN 4 High	CAN Interface 4
J2	CAN 5 High	CAN Interface 5
J3	100BASE-T1 5 P	100BASE-T1 Interface 5

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J4	100BASE-T1 4 P	100BASE-T1 Interface 4
K1	CAN 4 Low	CAN Interface 4
K2	CAN 5 Low	CAN Interface 5
K3	100BASE-T1 5 M	100BASE-T1 Interface 5
K4	100BASE-T1 4 M	100BASE-T1 Interface 4
L1	High-Side Output 0	High-Side Output
L2	LIN	LIN
L3	NC	Not connected
L4	NC	Not connected
M1	High-Side Output 1	High-Side Output
M2	Terminal 15 / Digital Input 0	Terminal 15 / Wake-up capability
M3	BAT+	Positive Power Supply / Terminal 30
M4	BAT-	Negative Power

4.6.2 Mechanical

- Mechanical dimensions of the Ethernet Switch

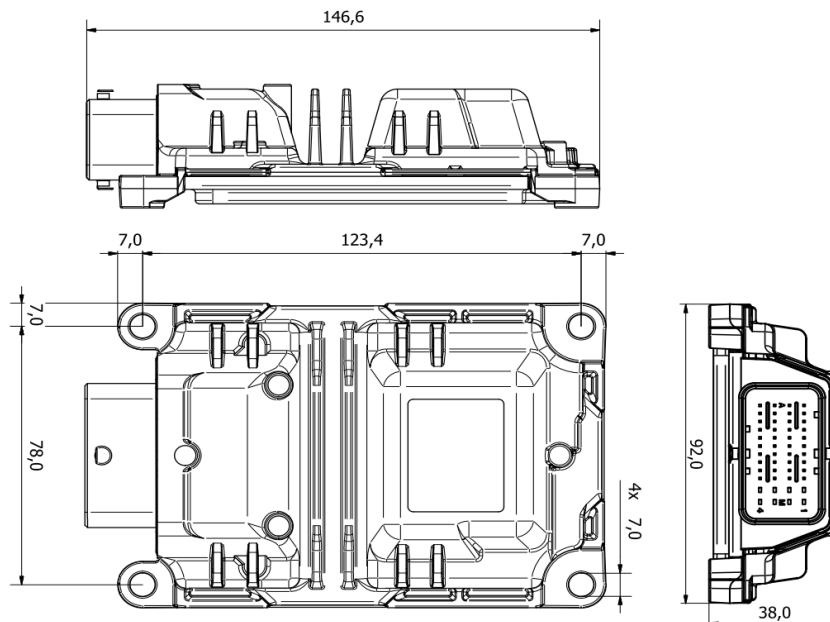


Figure 21 – Mechanical dimensions of the Ethernet Switch

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Connector	Keying	Purpose	Pin	Function	Voltage [V]
34793-0040	A (Black)	Power	1	VBAT	8 – 16
			2	VBAT	8 – 16
			3	GND	0
			4	GND	0
CX90B1-24P	N/A	USB 3.0	A1	GND	0
			A2	TX1+	-0.3 – 1.32
			A3	TX1-	-0.3 – 1.32
			A4	VBUS	0 – 5.25
			A5	CC1	-0.3 – 3.6
			A6	D+	-0.3 – 5.5
			A7	D-	-0.3 – 5.5
			A8	NC	-
			A9	VBUS	0 – 5.25
			A10	RX2+	-0.3 – 1.32
			A11	RX2-	-0.3 – 1.32
			A12	GND	0
			B1	GND	0
			B2	TX2-	-0.3 – 1.32
			B3	TX2+	-0.3 – 1.32
			B4	VBUS	0 – 5.25
			B5	CC2	-0.3 – 3.6
			B6	D+	-0.3 – 5.5
			B7	D-	-0.3 – 5.5
			B8	SBU2	
			B9	VBUS	0 – 5.25
			B10	RX1-	-0.3 to +1.32
			B11	RX1+	-0.3 to +1.32
			B12	GND	0
			25 - 26	SHIELD	0
CX90B1-24P	N/A	USB 3.0	A1	GND	0
			A2	TX1+	-0.3 to +1.32
			A3	TX1-	-0.3 to +1.32
			A4	VBUS	0 – 5.25
			A5	CC1	-0.3 to +3.6
			A6	D+	-0.3 – 5.5
			A7	D-	-0.3 – 5.5
			A8	NC	-

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			A9	VBUS	0 – 5.25
			A10	RX2+	-0.3 to +1.32
			A11	RX2-	-0.3 to +1.32
			A12	GND	0V
			B1	GND	0V
			B2	TX2-	-0.3 V to +1.32 V
			B3	TX2+	-0.3 V to +1.32 V
			B4	VBUS	0 – 5.25 V
			B5	CC2	-0.3 V to +3.6 V
			B6	D+	-0.3 – 5.5 V
			B7	D-	-0.3 – 5.5 V
			B8	SBU2	
			B9	VBUS	0 – 5.25 V
			B10	RX1-	-0.3 V to +1.32 V
			B11	RX1+	-0.3 V to +1.32 V
			B12	GND	0V
GT32-4DP-1.5H(10)	N/A	USB 2.0 (J1300)	25 - 26	SHIELD	0V
			1	GND	0V
			2	VBUS4	0 – 5.25 V
			3	USB2DN	-0.3 V to +3.6 V
			4	USB2DP	-0.3 V to +3.6 V
GT32-4DP-1.5H(10)	N/A	USB 2.0 (J1200)	5-12	SH1	0V
			1	GND	0V
			2	VBUS4	0 – 5.25 V
			3	USB2DN	-0.3 V to +3.6 V
			4	USB2DP	-0.3 V to +3.6 V
GT32-10P-1.5H	N/A	USB C Upstream	5-12	SH1	0V
			1	GND	0V
			2	C_USB3UP_RXA_N	-0.3 V to +1.32 V
			3	C_USB3UP_RXA_P	-0.3 V to +1.32 V
			4	USB_H_PWR	0 – 5.25 V
			5	C_USB2UP_N	-0.3 V to +5.5V
			6	C_USB2UP_P	-0.3 V to +5.5V
			7	GND	0V
			8	C_USB3UP_TXA_P	-0.3 V to +1.32 V
			9	C_USB3UP_TXA_N	-0.3 V to +1.32 V
			10	GND	0V

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4.6.3 Mechanical

- Mechanical dimensions of the USB Hub

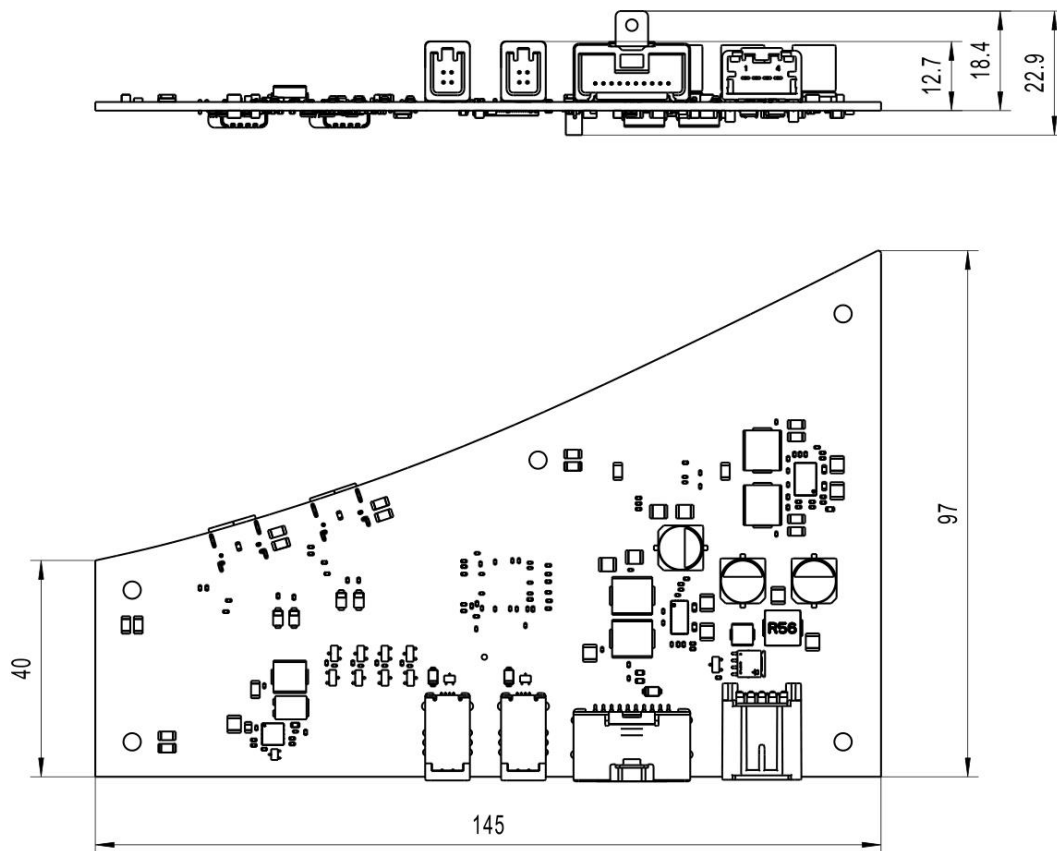


Figure 22 – Mechanical dimensions of the USB Hub

4.7 Antennas

4.7.1 LTE

Part numbers

- **LTE 1**
 - **RA_PN:** ARBCP23-000047
 - **MPN:** 2J5224P-012,5RG174HF-C96
- **LTE 2**
 - **RA_PN:** ARBCP23-000048
 - **MPN:** 2J5224P-012,5RG174HF-C99

Electrical and mechanical specifications

- **Connector**
 - **LTE 1:** Fakra, D keying (bordeaux), female (jack) – MPN: 59Z063-000D
 - **LTE 2:** Fakra, B keying (white), female (jack) – MPN: 59Z063-000B
- **Polarisation:** Linear
- **Radiation Pattern:** Omni-Directional
- **Impedance:** 50 Ohm
- **Max. Input Power (W):** 25
- **Mounting Type:** Adhesive Mount
- **Dimensions (mm):** 117.4 x 12.5 x 6.5
- **Operating Temperature (°C):** -40 to +85
- **Storage Temperature (°C):** -40 to +85
- **Cable Type:** 50 Ohm Coaxial cable
- **Cable Length:** max. 2 m

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Figure 23 – LTE Antenna

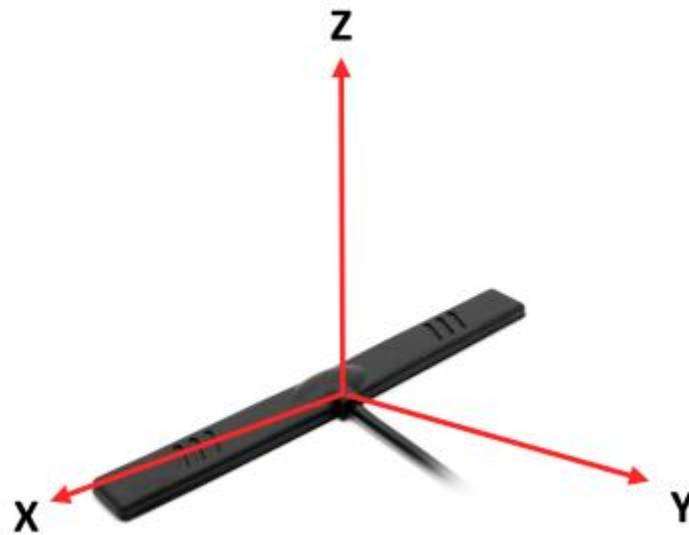


Figure 24 – LTE Antenna - Radiation pattern reference

Placement instructions

- Mount the antennas with a 45 to 90 degree angle between them (cross polarisation – Figure 34)
- Mount the antennas 10+ cm apart
- Assure direct exposure to outside world (not covered with conductive or RF blocking material)

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- Failure to do so may degrade signal strength and LTE performance

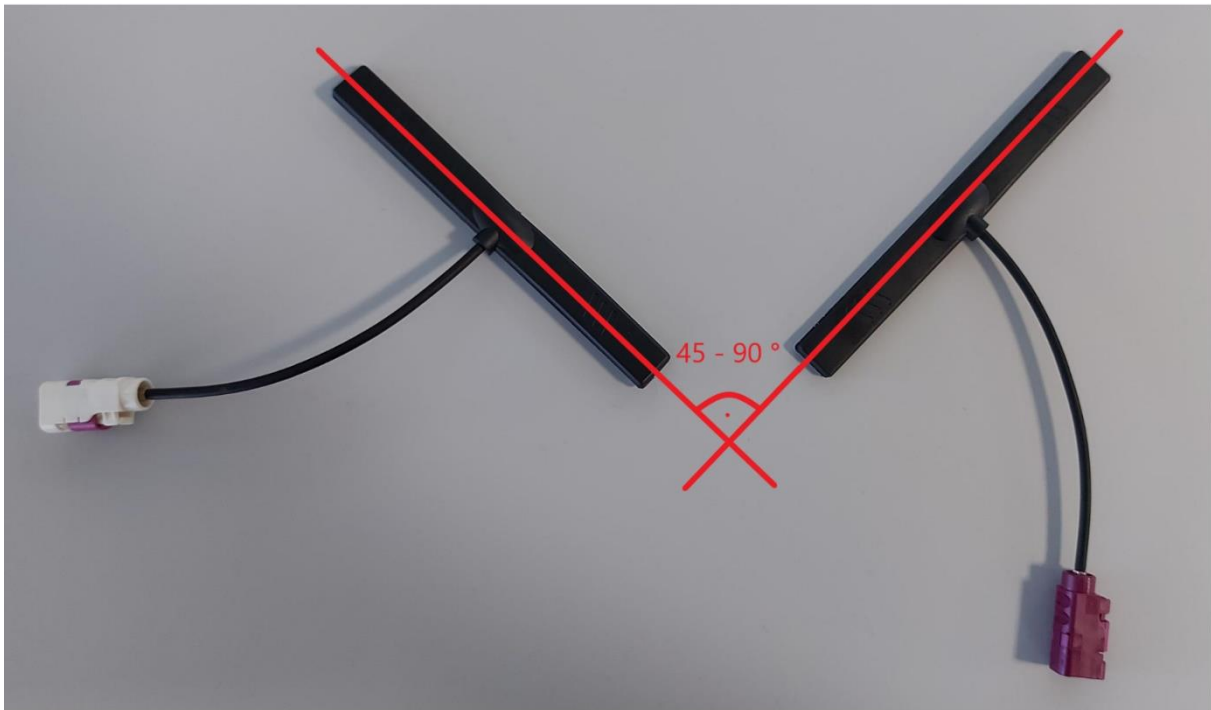


Figure 25 - LTE Antenna positioning - cross polarisation

4.7.2 GNSS

Part numbers

- **RA_PN:** ARBCP23-000049
- **MPN:** 2JM0801CF-012,5RG174HF

Electrical and mechanical specifications

- **Type:** Ceramic Active Antenna
- **Standards:** Bei/Dou, GPS/QZSS/Gallileo, GLONASS
- **Connector:** Fakra, C keying (blue), female (jack) - MPN: 59Z063-000C
- **Radiation Pattern:** Hemispherical
- **Impedance:** 50 Ohm
- **Voltage Range (V):** 1.5 – 3.6
- **Passive Gain (dBi):** 4.2 – 5.0
- **Power Consumption (mW):** 24.3 @ 2.7 V
- **Dimensions (mm):** 25 x 25 x 7.6
- **Operating Temperature (°C):** -40 to +85
- **Storage Temperature (°C):** -40 to +85

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- **Cable Type:** 50 Ohm Coaxial cable
- **Cable Length:** max. 2 m

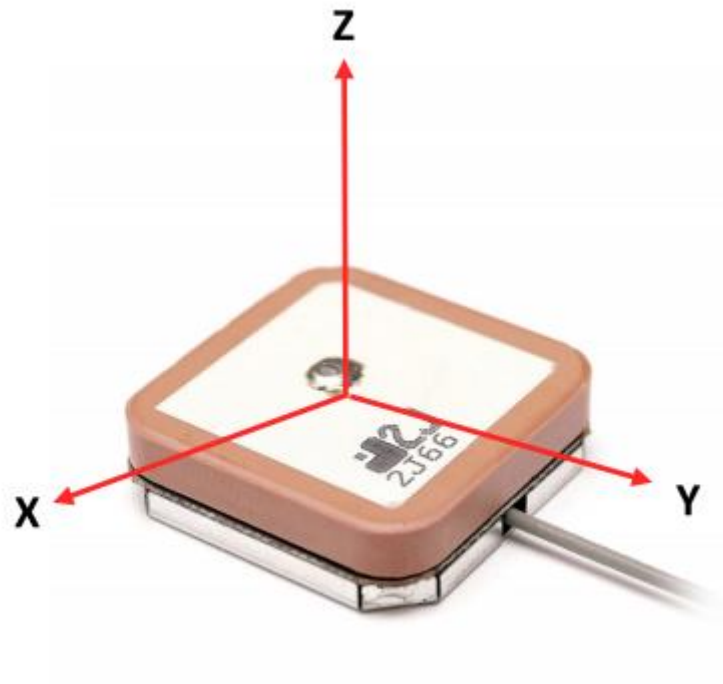


Figure 26 - GNSS Antenna - Radiation pattern reference

Placement instructions

- Mount the antenna with active side (top side visible on **Error! Reference source not found.**35) facing the sky (ideally 0 degree offset)
- Assure direct exposure to outside world (not covered with conductive or RF blocking material)
- Avoid placing the antenna in close proximity to broadcast antennas
- Failure to do so may degrade signal strength and GNSS performance

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4.7.3 BT-WiFi

Part numbers

- **RA_PN:** RIMCP23-000276
- **MPN:** 2JF0102P-012,5RG174HF_C152

Electrical and mechanical specifications

- **Standards:** WiFi 6E, BT, ZigBee, ISM, SigFox, LoRa
- **Connector:** Fakra, B keying (white), female (jack) - MPN: 2298721-2
- **Radiation Pattern:** Omni-Directional
- **Impedance:** 50 Ohm
- **Passive Gain (dBi):** -0.8 – -2.2
- **Power (W):** 25
- **Dimensions (mm):** 39.6x 8.4 x 0.1
- **Operating Temperature (°C):** -40 to +85
- **Storage Temperature (°C):** -40 to +85
- **Cable Type:** 50 Ohm Coaxial cable
- **Cable Length:** max. 0.1m

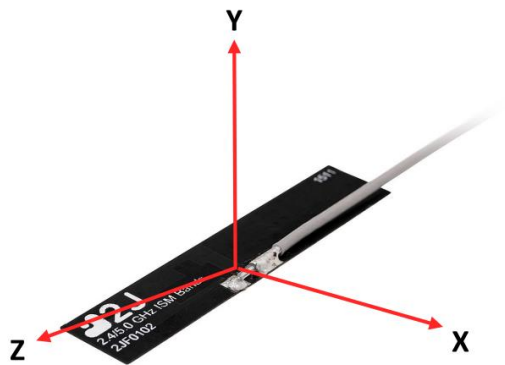


Figure 27 – BT-WIFI Antenna - Radiation pattern reference

Placement instructions

- Mount the antenna with active side (top side visible on **Error! Reference source not found.**) facing the sky (ideally 0 degree offset)
- Assure direct exposure to outside world (not covered with conductive or RF blocking material)
- Avoid placing the antenna near broadcast antennas
- Failure to do so may degrade signal strength and BT-WIFI performance

5 Install Guide

5.1 System connections

Represents a connection block diagram of the Nevera IVI system.

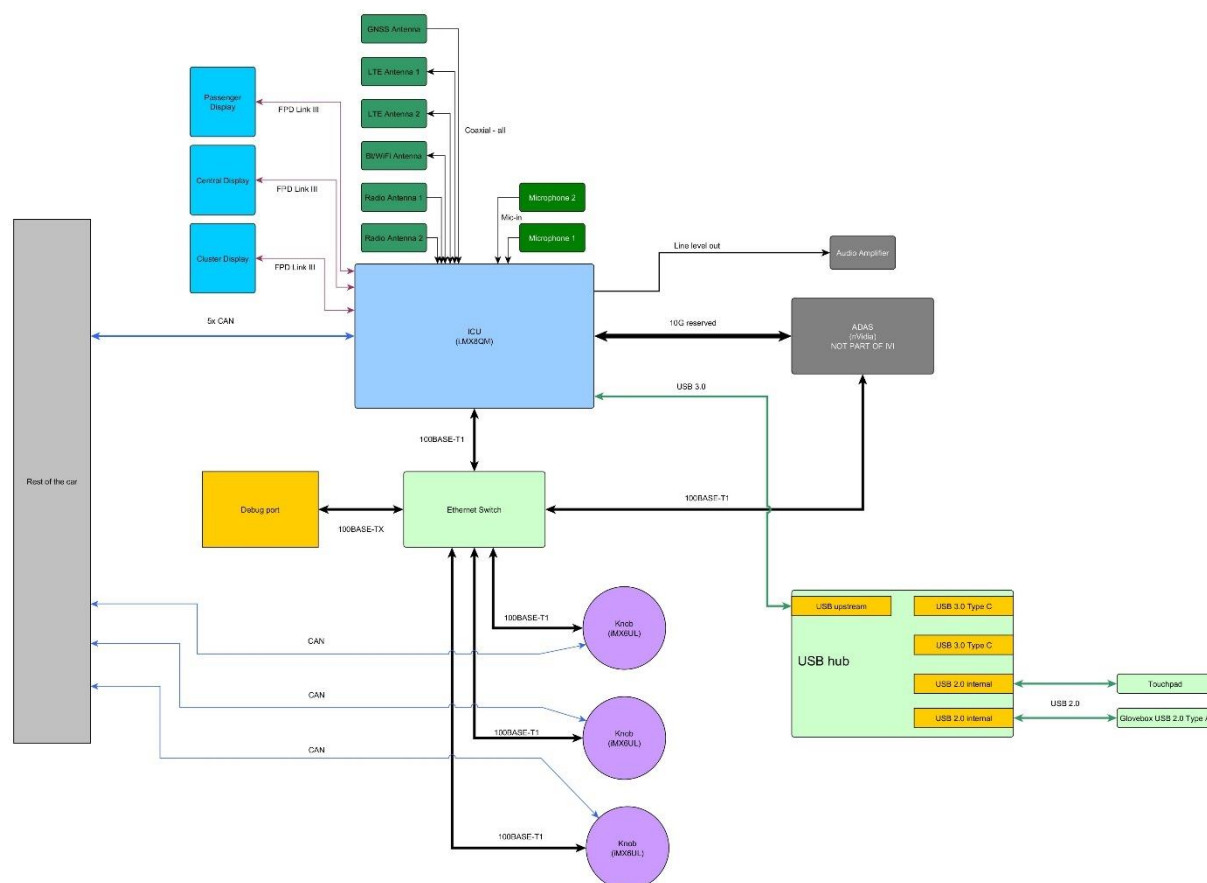


Figure 28 - Nevera IVI Connection Block Diagram

To have a fully functional Nevera IVI system, following connections need to be made:

Cluster Display Assembly connections:

- **HSD Display cable** (connected to Rosenberger D4S20G-400A5-A **black connector** on ICU, and to Rosenberger D4S12H-40MA5-A **black connector** on the **Cluster Display Assembly**)
- **Power Cable** (connected to Molex Mini50 4way Header connector on the **Cluster Display Assembly** and to **Power Distribution Unit** with nominal voltage of 14.4V)

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Central Display Assembly:

- **HSD Display cable** (connected to Rosenberger D4S20G-400A5-C **blue connector on ICU**, and to Rosenberger D4S20G-400A5-C **blue connector** on the **Central Display Assembly**)
- **Power Cable** (connected to Molex Mini50 4way Header connector on the **Central Display Assembly** and to **Power Distribution Unit** with nominal voltage of 14.4V)

Passenger Display Assembly:

- **HSD Display cable** (connected to Rosenberger D4S20G-400A5-Z **Water blue connector on ICU**, and to Rosenberger D4S20G-400A5-Z **Water blue connector** on the **Cluster Display Assembly**)
- **Power Cable** (connected to Molex Mini50 4way Header connector on the **Passenger Display Assembly** and to **Power Distribution Unit** with nominal voltage of 14.4V)

Knob Display Assembly:

- **Ethernet Cable** (connected to connector 1-PORT MATENET (2 pin) 9-2304372-1 **Knob Display Assembly** and **Ethernet Switch**)
- **Main Harness** (connected to Molex Mini50 12way 34897-8121 on **Knob Display Assembly**
 - Wires that provide CAN should be connected to rest of the car depending on the architecture
 - Connect power wires to **Power Distribution Unit** with nominal voltage of 14.4V
 - Parking Break Switch wires should be connected to corresponding switch

USB Hub:

- **Power Cable** (connected to Molex Mini50 4way Header connector on the **USB Hub** and to **Power Distribution Unit** with nominal voltage of 14.4V)
- **USB Upstream Cable** (connected to Hirose GT32 connector on the **USB Hub** and to Hirose GT32 connector on the **ICU**)
- **USB 2.0 Cable** (connected to Hirose GT32-4DP-1.5H(10) connector on the **USB Hub** and to cars touch pad)

Ethernet Switch:

Along with connections already mentioned, following connections should be made:

- **Power Cable** (connected to connector of the **Ethernet Switch** and to **Power Distribution Unit** with nominal voltage of 14.4V)
- **Ethernet cable** (connected to connector of the **Ethernet Switch** and to 1-Port MATENet on the **ICU**)

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Infotainment Control Unit (ICU_301):

Along with connections already mentioned, following connections should be made:

- **Main harness** (with CAN, PS input and I/Os wires) connected to stAK50h 2 Bay Connector
 - Power Cable (connected to **Power Distribution Unit** with nominal voltage of 14.4V)
 - other connections like CAN interface and I/Os depend on the wiring architecture of the vehicle in which the system is installed
- **10G cable** (connected to Rosenberger D4S20G-400A5-B **white connector** on the **ICU** and to ADAS ECU)
- **USB 2.0 Cable** (connected to Hirose GT32-4DP-1.5H(10) connector on the **ICU** and to cars glovebox)
- **LTE Antenna 1** (2J5224P-012,5RG174HF-C96) connected to Amphenol MATE-AX Key A **black connector** on the ICU
 - 50 Ohm coaxial extension cable can be used (recommended max length - 2 m)
- **LTE Antenna 2** (2J5224P-012,5RG174HF-C99) connected to Amphenol MATE-AX Key A **black connector** on the ICU
 - 50 Ohm coaxial extension cable can be used (recommended max length - 2 m)
- **GNSS Antenna** (2JM0801CF-012,5RG174HF) connected to Amphenol MATE-AX Key B **white connector** on the ICU
 - 50 Ohm coaxial extension cable can be used (recommended max length - 2 m)
- **BT-WiFi** (2JF0102P-012,5RG174HF_C152) connected to Amphenol MATE-AX Key B **white connector** on the ICU
 - 50 Ohm coaxial extension cable can be used (recommended max length - 2 m)
- Radio antennas connected to Amphenol MATE-AX Key C **blue connector** on the ICU
 - 50 Ohm coaxial extension cable can be used (recommended max length - 2 m)

5.2 ICU_301 fuse mounting

On the ICU_301 power supply line **external 3 A fuse must be installed.**

6 Certification

6.1 ICU_301

6.1.1 EU

The notified body TÜV Rheinland LGA Products GmbH, NB No.: 0197 performed an EU-type examination and issued the EU-type examination certificate: RT 60175810 0001

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6.1.2 UK

The notified body TÜV Rheinland UK Ltd, Notified Body number.: 2571 performed an UKCA examination and issued the UKCA type examination certificate: A9 50624499 0001

6.1.3 FCC (SDoC)

1. FCC Caution - §15.21:

"Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

2. FCC Statement - §15.105(b):

"This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help."

3. FCC statement - §15.19(a)3:

" This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

4. Responsible party information - §2.909:

Go Global Compliance, Inc.
4454 Crabapple Ct., Tracy, CA 95377, USA
Peter S. Merguerian | President & CEO
P 408 416-3772 x 1 | C 408 931-3303 | E peter@goglobalcompliance.com

6.1.4 FCC Certification (Part 15)

1. FCC Caution:

"Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

2. FCC Statement:

"This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

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measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help."

3. RF Exposure: §2.1091

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. The minimum distance of 20 cm is used for FCC/ISED MPE assessment.

6.1.5 ISED (SDoC)

1. ISED notice - Clause 8, ISEDES-003 Issue 5:
"CAN ISEDES-3 B/NMB-3 B"

6.1.6 ISED Certification

RSS-Gen statement:

"This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

RSS-102 Statement:

"This equipment complies with Industry Canada radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme à l'exposition aux rayonnements Industry Canada limites établies pour un environnement non contrôlé."