



Ainstein 77 GHz Automotive Short Range Radar T79

Technical User Documentation



Proprietary information
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Ainstein Inc | 2029 Becker Drive | Lawrence, Kansas 66047



IMPORTANT NOTICE

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 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.

NOTE:

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

Commented [1]: confirm with lab

Commented [2R1]: This is pasted from the what the lab sent. I didn't change anything

Commented [3]: @faiz@ainstein.ai Part 95?

Commented [4]: part 95?



IMPORTANT NOTICE

This device complies with Industry Canada's licence-exempt RSSs. 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;
- 2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

NOTE:

- CAN ICES-3 (B)/NMB-3(B)
- In order to comply with FCC / ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.
- "Afin de se conformer aux exigences d'exposition RF FCC / ISED, cet appareil doit être installé pour fournir au moins 20 cm de séparation du corps humain en tout temps."

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1. Overview

In this document, a description of Ainstein's 77GHz Automotive Short Range Radar, T-79, is given.

2. Technical Specifications

Table 1 shows the technical specifications of the T-79.

Table 1: Technical Specifications

Frequency Range	76 ~ 77 GHz
Power Consumption	3 W
Quiescent Current	< 1 mA
Radar Operating Voltage	6 ~ 32 V DC
Detection Range	0.5 ~ 80 m
Range Resolution	0.65 m
Range Accuracy	0.3 m
Maximum Detection Velocity	±200 km/h
Velocity Resolution	0.4 m/s
Velocity Accuracy	0.13 m/s
Field of View (Elevation)	±4°
Field of View (Azimuth)	±60°
Angle Accuracy	0.4°

Commented [5]: @faiz@ainstein.ai start from 6V or 12V

Commented [6R5]: Yilun's document said 6v



Update Rate	20Hz
Protection Rafting	IP67
Operating Temperature	-40° ~ 85° C
Maximum Tracked Targets	64
Output Date Interface	CAN

3. Hardware Information

3.1 Interface connector

Figure 2 shows the order of the pins in both orientations. Table 12 lists the interface connector pinout.

- Interface Part Manufacturer: Molex
- Molex Part Number:
 - Cable Interface 34967-1001(Terminal 34905-2447)

Figure 2: Connector Pin Orientation

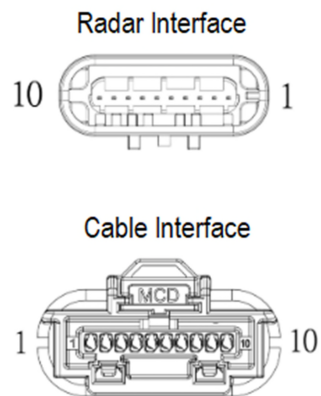


Table 12: Counter Connector Pin Definition

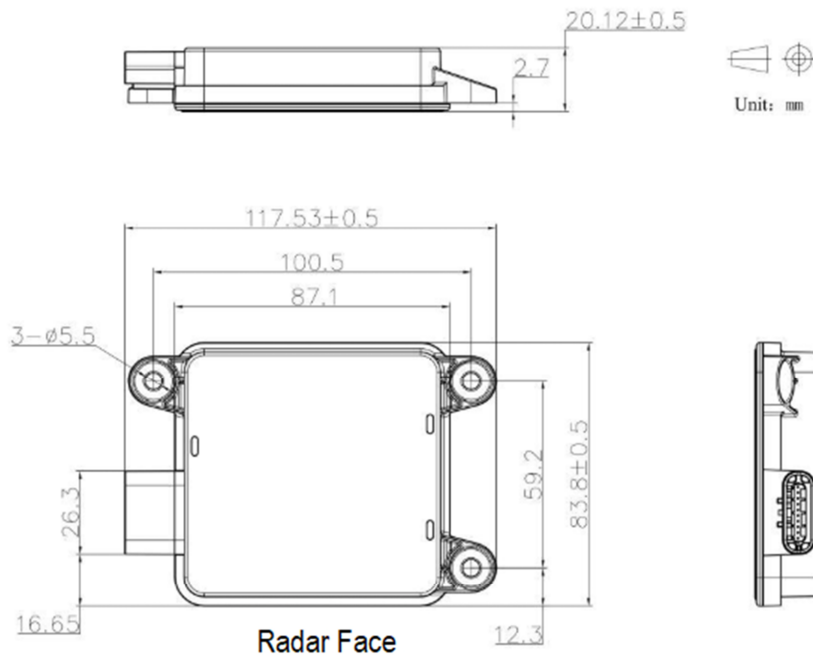
Pin	Line Color	Definition
1	Orange	IGNITION
2	Grey	RESERVED
3	Purple	RESERVED
4	White	DATA_CAN_L
5	Green	DATA_CAN_H
6	Blue	VEH_CAN_L
7	Yellow	VEH_CAN_H
8	Black	GND_IN
9	Brown	RESERVED
10	Red	DC_IN



3.2 Hardware Dimensions

Figure 3 shows the physical dimensions of the T-79 in millimeters.

Figure 2: Physical Dimensions



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4. Software Operation

T79 enters its operational mode once 12 V is applied to the DC_IN and IGNITION pins and 0V is applied to the GND_IN pin. No CAN message protocol or diagnostic handshake protocol is necessary in this special mode.

Commented [7]: Above table says 6V to 32V

Commented [8R7]: I think the nominal voltage is 12V. Do you think that matters?



5. Version History

Version	Modification	Modified by	Date
1.0	Initial release	Dave Ochs	7-30-19
1.1	Fix message descriptions	Nick Rotella	10-24-19
1.2	Updated for Production Version	Andrew Megaris	10-25-19
1.3	Remove unnecessary content. Update the pin definition. Add software operation description.	Yilun Su	8-30-20