



iPEM

INNOVIZ PERCEPTION EDGE MODULE

The Innoviz Perception Edge Module (iPEM) enables evaluation of InnovizOne and InnovizTwo in your system over an Automotive Ethernet connection. iPEM receives raw point cloud data from the LiDAR's MIPI interface and transmits it over 1000BASE-T1 (Automotive Ethernet).

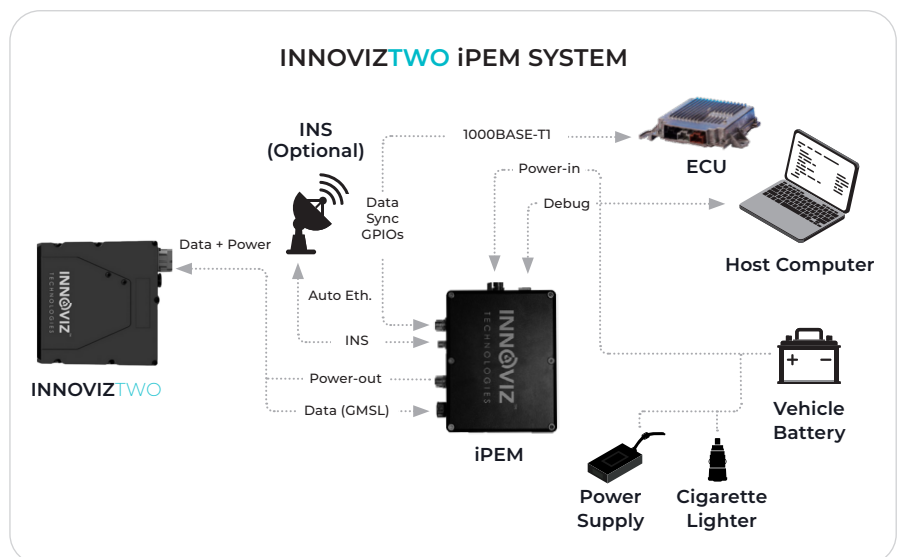
In a future version, iPEM will execute Innoviz's proprietary perception software on the point cloud data when the LiDAR is connected. It will output object detection, tracking and classification data, and pixel collision classification for each pixel. Innoviz point cloud data and additional perception software outputs can be viewed over 3D visualization applications such as the InnovizPlayer utility. It also will receive INS signals from an external INS device and convert them to vehicle position and speed.

The following illustration shows iPEM connected to InnovizTwo and a vehicle's Electronic Control Unit over Automotive Ethernet. An optional 1000BASE-T1 to 1000BASE-T converter is available for a standard Gigabit Ethernet connection.

UNIQUE FEATURES

- Controls all Innoviz LiDAR functions
- Converts point cloud data between MIPI and Ethernet formats
- Will convert INS signals to vehicle location and speed*
- Embedded perception software will process raw point cloud data*
- Automotive Ethernet (1000BASE-T1) interface
- Optional media converter to connect to Gigabit Ethernet networks

*Future implementation





SPECIFICATIONS

CONTROL INTERFACE

Command and control	Automotive Ethernet
Protocol conversion	MIPI and SPI to Automotive Gigabit Ethernet (1000BASE-T1)

PERFORMANCE

Boot time	~30 seconds
Latency	INNOVIZONE raw point cloud and perception data: <ul style="list-style-type: none">Eagle: 100ms (counted from emitting laser until pixel arrives on the Ethernet port)Falcon: 180ms (counted from emitting laser until pixel arrives on the Ethernet port)Perception software: ~300ms (counting from emitting laser until object list arrives on the Ethernet port)
	INNOVIZTWO point cloud: <ul style="list-style-type: none">100ms (counted from emitting laser until pixel arrives on the Ethernet port)
Bandwidth	INNOVIZONE: <ul style="list-style-type: none">Eagle: 370Mbps maximum bandwidth when all pixels are populatedFalcon: 390Mbps maximum bandwidth with single reflection. Up to 780Mbps with two reflections.
	INNOVIZTWO: <ul style="list-style-type: none">800Mbps maximum bandwidth when all pixels are populated

MECHANICAL

Dimensions (WxHxD)	157x47.5x129.3mm	
Connectors	Data	Rosenberger H-MTD® E6S147-40MT5-A
	Power-out	M12 female
	Power-In	M12 female
	INS	M8 female
	Automotive Ethernet	M12 female (X-Code)
	Debug Ethernet	RJ45
Weight	767g	
Temperature (Operating)	0°~40°C	

ELECTRICAL

Power consumption	≤9W
Power connector input voltage	9-32VDC
Input power	≤40W maximum
Input current	≤5A
Network interface	1Gbps Automotive Ethernet – 1000BASE-T1 (IEEE 802.3bp-2016)