ITR-3810
Data Sheet

Version 1.0 - 2023-12-11

PRODUCT FAMILY

InnoSenT Traffic Radar

- Movement
- Velocity
- Direction
- Presence
- Distance
- Angle
- Optics

APPLICATIONS

- Intersection Management
- Traffic Monitoring
- Arterial Management

FEATURES:

- Monitor one whole intersection with only 2 sensors
- 4D MIMO FMCW RADAR operating in the 24 GHz ISM band
- Worldwide certification
- Incorporates software enabled tracking and classification
- Lane separation up to 240m
- Maximum detection range up to 300m
- 4 classes detectable up to 183m
- Velocity range from -233km/h to +233km/h

DESCRIPTION

The ITR-3810 Traffic Radar covers intersection management and traffic monitoring applications and provides the output of events.

CERTIFICATES

InnoSenT GmbH has established and implements a quality system for development, production and sales of radar sensors for industrial and automotive sensors.

See more information on our quality standards at:
https://www.innosent.de/en/company/certifications/

ADDITIONAL INFORMATION

InnoSenT Standard Product. Changes will not be notified as long as there is no impact on form, fit or specified function of the product described within this data sheet.

www.innosent.de – Leading in Radar

PARAMETERS

PARAMETER	TYPICAL VALUE[1]	UNIT
Regulatory		
Operating Frequency	24.05 .. 24.25	GHz
Bandwidth	200	MHz
Output Power (EIRP)	< 20dBm PK // < 108dBµV/m AVG	
Output Power (EIRP AVG)	< 12.7 dBm	
Range		
Min. Detection Range	5 | 16.4	m | ft
Max. Detection // Classification: Pedestrian[2]	130 | 427 // 83 | 272	m | ft
Max. Detection // Classification: Bike[2]	130 | 427 // 83 | 272	m | ft
Max. Detection // Classification: Car[2]	300 | 984 // 183 | 600	m | ft
Max. Detection // Classification: Truck[2]	300 | 984 // 183 | 600	m | ft
Range Accuracy	0.47 | 1.5	m | ft
Lane Separation[9]: Approaching // Receding	220 | 722 // 240 | 787	m | ft
Speed		
Radial Speed Resolution	0.46 | 0.29	km/h | mph
Speed Range	-233 .. +233 | -144.8 .. +144.8	km/h | mph
Speed Accuracy	0.23 | 0.14	km/h | mph
Angle		
Field of View: Azimuth	110	°
Field of View: Elevation	30	°
Separation: Azimuth	5	°
Angular Accuracy: Azimuth	0.5	°
Operational		
Update Rate	< 60	ms
Processing Latency	1	cycle
Initialization Time: DHCP // Static IP	< 52 // < 49	s
Interfaces		
Configuration A	External Power Supply | Ethernet 1GBit/s | RS485 full duplex	
Configuration B[8]	PoE | Ethernet 1GBit/s | RS485 full duplex	
Connectors	M12 industrial	

[1] typical specifications are for general understanding and may vary

[2] the classification parameter is defined as the max. distance up to which an object can be classified

PARAMETERS

PARAMETER	TYPICAL VALUE[1]	UNIT
Power supply		
Operating Voltage: DC	24 .. 48 | ±5%	V
Supply Current[3, 7]	< 0.75	A
Power Consumption: Power Supply[3, 7]	< 18	W
Power Consumption: PoE[3, 7]	20	W
Environment		
Operating Temperature Radar	-40 .. +80	°C
Storage Temperature	-40 .. +85	°C
Protection Class[5, 6]	IP67	
Mechanical		
Dimensions (with connectors): H/W/D	102 x 270 x 37 (47) | 4 x 10.6 x 1.5 (1.8)	mm | in
Weight	< 1 | < 2.2	kg | lb
Mounting[4]	VESA MIS-D 75 | 1.25Nm	Nm
Detection		
Max. amount of monitorable lanes[9]	16	
Max. amount of zones (loops)	64	
Max. amount of ignore zones[10]	10	
Max. amount of objects[11]	128	
Max. amount of targets	512	
Amount of sensors to cover intersection[12]	2	

[3] the typical value is given at 19°C; 24V for external power supply

[4] recommended tightening torque for M4 screws: 1.25Nm; valid only, if screw locking measures like safety washers are taken

[5] tested in independent laboratory

[6] only IP67 protected, if cables and/or gaskets are plugged into connectors and screw-fastened with a torque of 0.4 Nm

[7] current and power consumption increase with temperature and supply voltage

[8] applied PoE standard: IEEE 802.3bt Type 3 „4PPoE“

[9] measured on highway with standard lane width of 3.75m

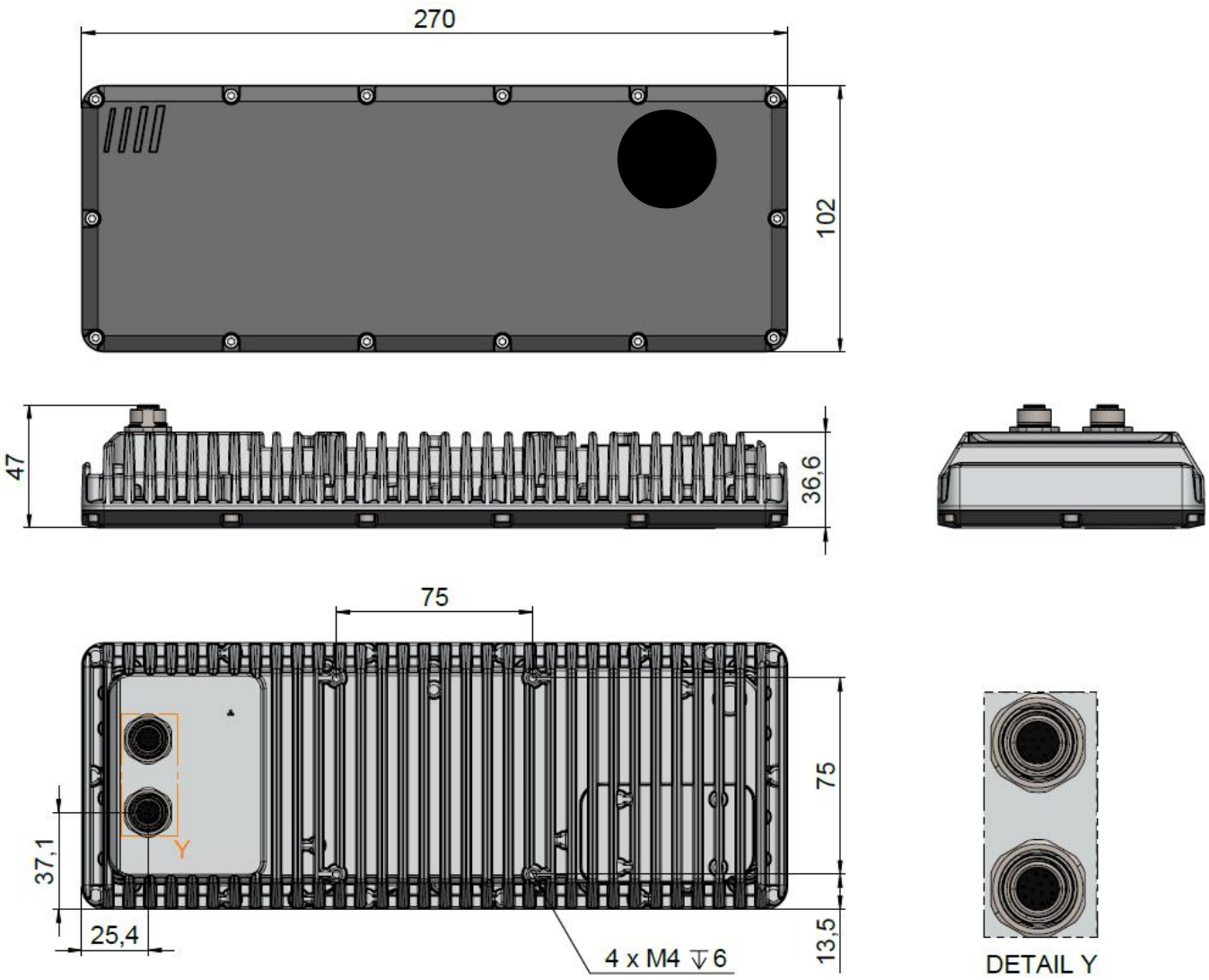
[10] ignore zones improve detection quality in harsh environments, e.g urban areas with dense building

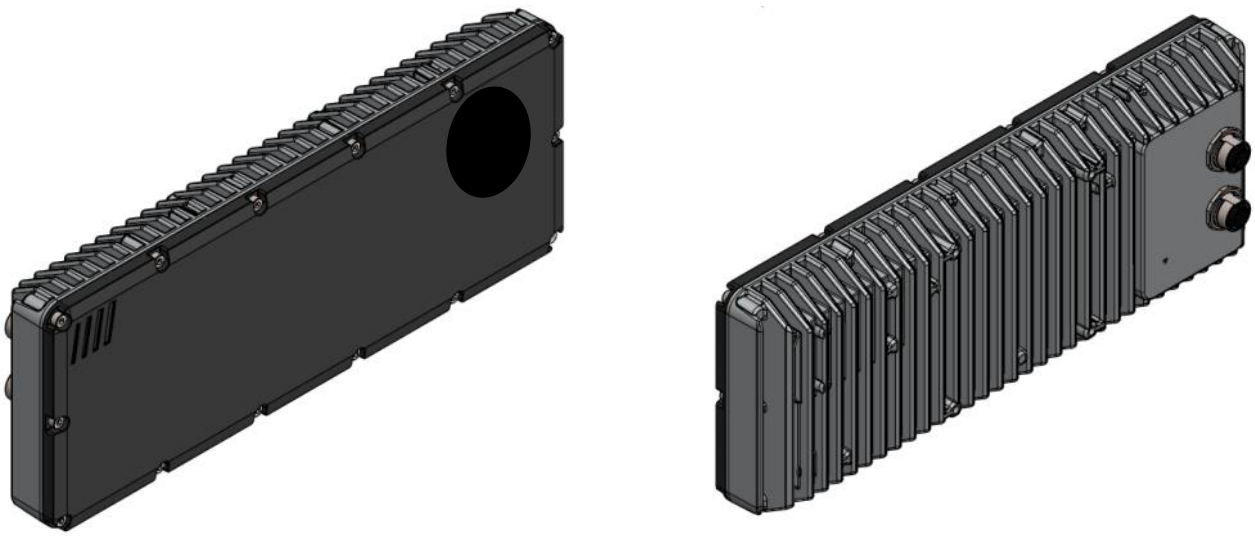
[11] objects are humans and all types of vehicles, which are provided as output

[12] standard intersection with 4 directions

MECHANICAL DRAWING

Note: All dimensions in mm



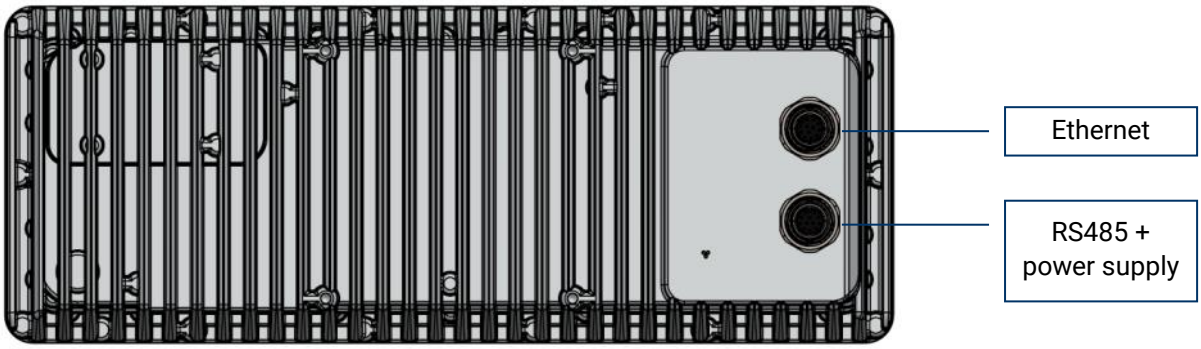


INTERFACES

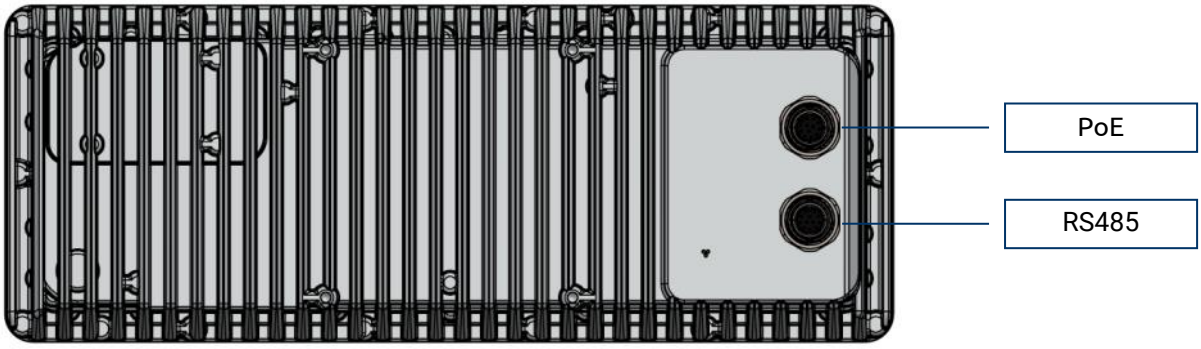
The module provides two different interfacing possibilities. The user may choose which one to use.

WARNING: Connect the module only as stated below. Do not interchange these options. Connections other than illustrated below may result in unexpected behaviour!

INTERFACES | Configuration A: Ethernet + RS485 full duplex + power supply



INTERFACES | Configuration B: PoE + Ethernet 1GBit/s + RS485 full duplex

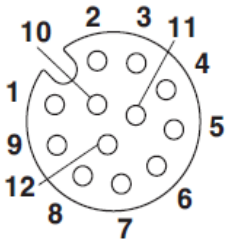


CABLES / ACCESSORIES

TYPE	CONNECTOR	PIN COUNT	InnoSenT ORDERING NUMBER
PoE / Ethernet	M12 <-> RJ45 ETH	8	29.00000283
RS485 / power supply	M12 <-> COM / banana jacks	12	29.00000284
ITR-3810 Starter Kit			80.00000595

INTERFACES | Configuration A: PoE + Ethernet 1GBit/s + RS485 full duplex

Type: PHOENIX CONTACT - Contact insert - SACC-CI-M12FS-12CON-SH TOR 32 - 1457704

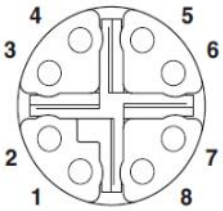


PIN	DESCRIPTION
1	GND
2	GND
3	RS485_FD.A
4	RS485_FD.B
5	RS485_FD.Z
6	RS485_FD.Y
7	VCC
8	VCC
9	*Do not connect*
10	*Do not connect*
11	*Do not connect*
12	*Do not connect*

CONNECTORS | PoE / Ethernet Connector

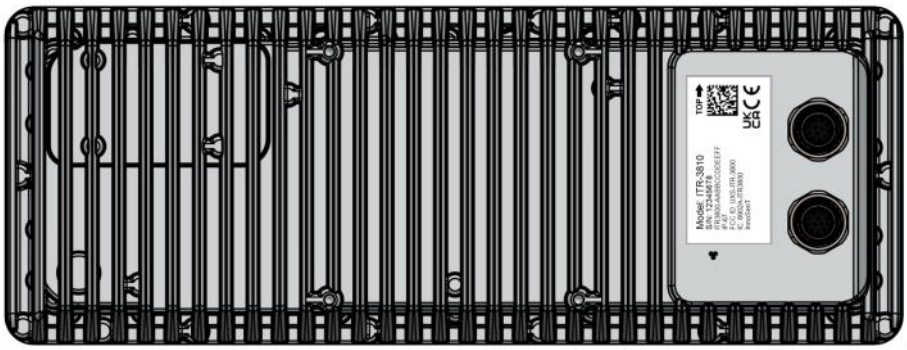
Type: PHOENIX CONTACT - Contact insert - SACC-CI-M12FS-8CON-L180-10G - 1402457

PoE is implemented, according to IEEE 802.3bt standard, see [User Manual, 9.2].

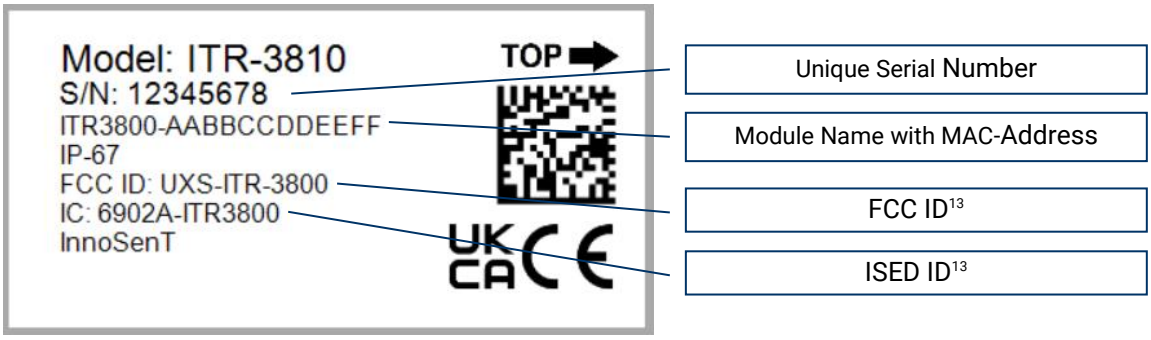


PoE IEEE 802.3bt		
PIN	**DATA**	**PoE**
1	A+	IN1
2	A-	
3	B+	IN1
4	B-	
5	D+	IN2
6	D-	
7	C-	IN2
8	C+	

LABEL LOCATION



LABEL DESCRIPTION



DISPOSAL

The device is to be disposed of according to the European Community Directive 2012/19/EU on waste electrical and electronic equipment.
Devices must not be disposed of with consumer waste.
For environmentally compatible recycling and disposal of the device, please contact a certified waste management company or send the device back to InnoSenT GmbH.

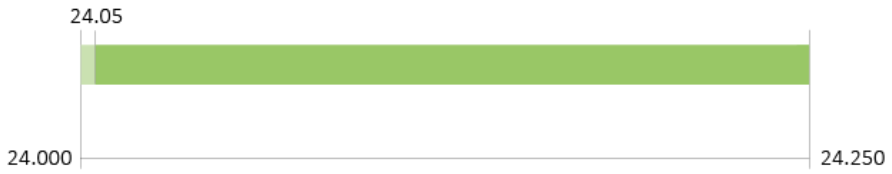
[13] FCC and ISED IDs are the same as ITR-3800

FREQUENCY INFORMATION

The information that will be given below is only a broad overview; for details please contact the regional approval agency. An overview over the frequency bands in Europe can also be found in the REC 70-03 which is available under www.cept.org.

ISM FREQUENCY BAND

In general, the ITR-3810 can be used in EU, USA, Canada and UK, as well as other regions which apply to those regulations.



COMPLIANCES

Declarations of conformity, certificates and test reports can be provided upon request.

STANDARD	COMMENT
Conformity / Certificates	
CE	Declaration of Conformity
UKCA	
FCC Part 15.245	Tested by external TCB and applies to relevant regulatory limitations.
ISED	Tested by external TCB and applies to relevant regulatory limitations.
RF / Electrical / Traffic / Other	
EN 300 440 V2.1.1	
EN 301 489-1 V2.2.3	Tested by external TCB and applies to relevant regulatory limitations.
EN 301 489-3 V2.3.2	Tested by external TCB and applies to relevant regulatory limitations.
NEMA TS 2	Referring to temperature and vibration.
DIN EN 60529	Tested and certified by external laboratory.
DIN EN IEC 62311	
DIN EN IEC 62368-1	

ID

AGENCY	ID
FCC[13]	UXS-ITR-3800
IC[13]	6902A-ITR3800

FCC & ISED COMPLIANCE

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s) and complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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.

FCC §15.21

Changes or modifications made to this equipment not expressly approved by InnoSenT GmbH may void the FCC authorization to operate this equipment.

FCC §15.105

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.

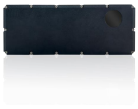
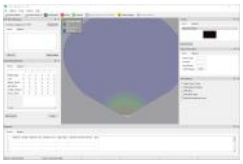
RF Exposure

This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.
Ce transmetteur ne doit pas etre place au meme endroit ou utilise simultanement avec un autre transmetteur ou antenne.

EVALUATION KIT

Order number: 80.00000595, see [3]

ACCESSORY	ORDER NUMBER	PICTURE	DESCRIPTION
ITR-3810	80.00000594		ITR-3810
Power Supply Cable	29.00000284		Connection with power supply Connection with RS485 interface
Ethernet Cable	29.00000283		Connection with PoE or Ethernet
Mounting Bracket	80.00000417		attaches the ITR-3810 to a mast, post or pole [1]
PoE Injector	29.00000297		Digitus PoE Ultra Injector, 60W, see vendor data sheet
Software Package	download at InnoSenT download portal		Software Package: -Traffic Manager - Radar API - Network Browser - Firmware Update Traffic Manager is used for configuring the ITR-3800 and displays the radar data on screen.

CO-APPLICABLE DOCUMENTS

REFERENCE	DOCUMENT
[1]	ITR-3810 User Manual
[2]	ITR-3810 Quick Start Guide
[3]	ITR-3810 Accessories User Manual
[4]	ITR-3810 Interface Protocol

ESD-INFORMATION

This InnoSenT sensor is sensitive to damage from ESD. Normal precautions as usually applied to CMOS devices are sufficient when handling the device. Touching the signal output pins has to be avoided at any time before soldering or plugging the device into a motherboard.

REVISION HISTORY

This Data Sheet contains the technical specifications of the described product. Changes to specifications will be in written form. All previous versions of this Data Sheet are invalid.

VERSION	DATE	COMMENT
1.0	2023-12-11	Initial release