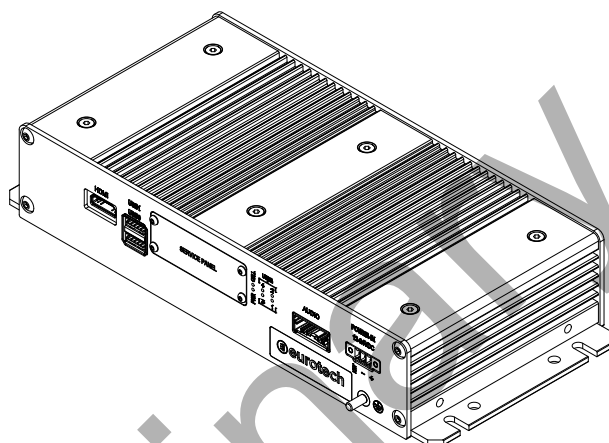




DynaGATE 10-14

**Multi-service IoT Gateway
ITxPT, AI Accelerated, LTE 5G Ready**

EN

Hardware Manual

Original instructions

Document code: DYGATE-10-14_HWM_EN_0-8

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**FOR SAFE AND PROPER USE,
FOLLOW THESE INSTRUCTIONS.
KEEP THEM FOR FUTURE REFERENCE.**

Intended audience of this document

This document is intended for **system integrators**. System integrator is a term applied to skilled persons who are specialized in linking together, physically or functionally, different computing systems and software applications to operate as a coordinated whole in compliance with the applicable regulations.

Skilled person is a term applied to persons who have training or experience in the equipment technology, particularly in knowing the various energies and energy magnitudes used in the equipment. Skilled persons are expected to use their training and experience to recognize energy sources capable of causing pain or injury and to take action for protection from injury from those energies. Skilled persons should also be protected against unintentional contact or exposure to energy sources capable of causing injury.

How to get technical support

To get technical support, refer to: <https://www.eurotech.com/support>

The following resources are available:

- Support Portal: <https://support.eurotech.com>
- Download Area: <https://www.eurotech.com/download>
- RMA (Return Merchandise Authorization): <https://www.eurotech.com/support/rma>

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Revision history

Revision	Description	Date of Issue
0-8	Preliminary release for certification	2023.06.15



GETTING STARTED

To get started with the DynaGATE 10-14:

1. Obey the instructions and warnings contained in this Hardware Manual

To lower the risk of personal injury, electric shock, fire, or damage to the equipment, obey the instructions and warnings contained in this manual.

For more information, refer to: ["Safety-related information" on page 7](#).

If you have questions about these instructions, refer to: <https://www.eurotech.com/support>.

2. Know the DynaGATE 10-14 and its interfaces

For more information, refer to:

- ["Product overview" on page 16](#)
- ["Technical specifications" on page 19](#)
- ["Interfaces overview" on page 31](#)

3. Install the DynaGATE 10-14

For more information, refer to:

- ["Mechanical specifications" on page 68](#)
- ["Product installation" on page 70](#)

4. Supply power to the DynaGATE 10-14

For more information, refer to: ["Product power requirements" on page 72](#)

5. For more information

For more information, refer to: "DynaGATE 10-14 EL Software Manual".

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1 SAFETY-RELATED INFORMATION

This chapter gives the following information:

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1.2 Explanation of messages	8
1.3 Safety instructions	9

Preliminary



1.1 Important information

For safe and proper use, obey these instructions. Keep them for future reference.

Failure to obey these instructions, violates the standards of safety, design, manufacture, and intended use of the product.

Eurotech assume no liability for damages caused by failure to obey these instructions.

If you have questions about these instructions, refer to: <https://www.eurotech.com/support>.

Additional safety-related information is given in the following chapters.

1.2 Explanation of messages

This Hardware Manual uses these messages:

	DANGER Indicates a hazardous situation that, if not avoided, will result in death or serious injury. Indicates how to avoid the hazardous situation.
	WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious injury. Indicates how to avoid the hazardous situation.
	CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. Indicates how to avoid the hazardous situation.
	NOTICE Used to address practices not related to physical injury.

1.3 Safety instructions

1.3.1 Power supply safety instructions



WARNING

Risk of electric shock. Failure to supply power correctly could result in death or serious injury, and could damage the equipment or other property.

Refer to **"What to do before you supply power to the product"** below.

1.3.1.1 *What to do before you supply power to the product*

Before you supply power to the product, obey the following safety instructions:

- Make sure that you have understood any instructions for safety, installation, and for operation
- Make sure that your hands are dry
- Make sure that all the cables to use:
 - meet the product requirements and comply with the relevant standards and regulations
 - are in good condition
 - are placed with care
 - are not placed where they may be trampled or compressed
- Make sure that all power-points and plugs:
 - are in good condition
 - are not overloaded
- Make sure that the product has a proper grounding connection
- Make sure that the power supply source meets the product requirements and complies with the relevant standards and regulations
- Make sure that the product installation is made correctly and in compliance with the relevant standards and regulations
- Make sure that you supply power only after the product installation is completed.

If you have questions about these instructions, refer to: <https://www.eurotech.com/support>.

1.3.2 Wireless safety instructions

Install the product's antennas with care:

1. **Make sure that the antennas are at least 20 cm away from nearby persons**
2. Make sure that the equipment (product with antennas installed) do not cause interferences with other electronic devices.

If you cannot obey these instructions, make sure that the equipment is assessed to be compliant with the SAR (Specific Absorption Rate) regulations.

1.3.3 Product handling safety instructions: product's surfaces may be hot



CAUTION

If the product is used at high temperatures, its surfaces become hot. Burn hazard.
Before you touch the product's surfaces, make sure that they are cold.

2 CONSIGNES DE SÉCURITÉ

Ce chapitre fournit les informations suivantes:

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Preliminary



2.1 Informations importantes

Pour une utilisation sûre et correcte, suivre ces instructions. Les conserver pour référence ultérieure.

Le non-respect de ces instructions constitue une violation des normes de sécurité, de conception, de fabrication et d'utilisation prévue du produit.

Eurotech rejette toute responsabilité pour les dommages causés en cas de non-respect de ces instructions.

En cas de doutes sur ces instructions, consultez le site: <https://www.eurotech.com/support>.

Des informations supplémentaires liées à la sécurité sont fournies dans les chapitres suivantes.

2.2 Explication des messages

Ce manuel utilise les messages suivants:

	DANGER Indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort ou un préjudice grave. Indique comment éviter la situation dangereuse.
	AVERTISSEMENT Indique une situation dangereuse qui, si elle n'est pas évitée, pourrait entraîner la mort ou un préjudice grave. Indique comment éviter la situation dangereuse.
	ATTENTION Indique une situation dangereuse qui, si elle n'est pas évitée, pourrait entraîner un préjudice mineur ou modéré. Indique comment éviter la situation dangereuse.
	AVIS Utilisé pour traiter les pratiques non liées à des blessures physiques.

2.3 Instructions de sécurité

2.3.1 Précautions de sécurité pour l'alimentation électrique



AVERTISSEMENT

Risque de choc électrique. Une alimentation électrique incorrecte peut causer la mort ou des blessures graves, et peut endommager l'équipement ou d'autres biens.
Voir "Que faire avant d'alimenter le produit en électricité" en dessous.

2.3.1.1 Que faire avant d'alimenter le produit en électricité

Avant d'alimenter le produit, respectez les consignes de sécurité suivantes:

- S'assurer que vous avez compris toutes les instructions relatives à la sécurité, à l'installation et au fonctionnement.
- S'assurer que vos mains sont sèches
- S'assurer que tous les câbles à utiliser:
 - sont conformes aux exigences du produit et aux normes et réglementations en vigueur
 - sont en bon état
 - sont placés avec soin
 - ne sont pas placés dans des endroits où ils peuvent être piétinés ou compressés
- S'assurer que toutes les prises de courant et les connecteurs d'alimentation :
 - sont en bon état
 - ne sont pas surchargés
- S'assurer que le produit est correctement relié à la terre
- S'assurer que la source d'alimentation électrique répond aux exigences du produit et est conforme aux normes et réglementations en vigueur.
- Branchez l'alimentation uniquement après avoir terminé l'installation du système
- S'assurer que l'installation du produit est effectuée correctement et en conformité avec les normes et réglementations en vigueur
- S'assurer de ne fournir l'alimentation qu'une fois l'installation du produit terminée.

En cas de doutes sur ces instructions, consultez le site: <https://www.eurotech.com/support>.

2.3.2 Instructions de sécurité pour les communications sans fil

Installez les antennes du produit avec soin :

1. **Assurez-vous que les antennes sont éloignées d'au moins 20 cm des personnes à proximité**
2. Assurez-vous que l'équipement (produit avec antennes installées) ne provoque pas d'interférences avec d'autres appareils électroniques.

Si vous ne pouvez pas respecter ces instructions, assurez-vous que l'équipement est évalué pour être conforme aux réglementations SAR (Specific Absorption Rate).

2.3.3 Instructions de sécurité pour la manipulation du produit: les surfaces du produit peuvent devenir chaudes



ATTENTION

Si le produit est utilisé à des températures élevées, ses surfaces deviennent chaudes.
Risque de brûlure.

Avant de toucher les surfaces du produit, assurez-vous qu'elles sont froides.

Preliminary



3 TECHNICAL TERMS AND GRAPHICAL SYMBOLS

This chapter gives the following information:

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3.2 Graphical symbols	15

Preliminary



3.1 Technical terms (acronyms, abbreviations)

The following technical terms (acronyms, abbreviations) can be used in this manual:

Les termes techniques suivants (acronymes, abréviations) peuvent être utilisés dans ce manuel:

Term Terme	Meaning Signification
GND	Ground <i>Terre</i>
#	Active low signal <i>Signal bas actif</i>
+	Positive signal; Positive signal in differential pair <i>Signal positif ; signal positif dans la paire différentielle</i>
-	Negative signal; Negative signal in differential pair <i>Signal négatif ; Signal négatif dans la paire différentielle</i>
3.3	3.3 V signal level <i>Niveau de signal 3,3 V</i>
5	5 V signal level <i>Niveau de signal de 5 V</i>
I	Signal is an input to the system <i>Le signal est une entrée du système</i>
O	Signal is an output from the system <i>Le signal est une sortie du système</i>
IO	Signal may be input or output <i>Le signal peut être une entrée ou une sortie</i>
P	Power and Ground <i>Alimentation et terre</i>
A	Analog signal <i>Signal analogique</i>
NC	No Connection <i>Absence de connexion</i>
R	Use is reserved to Eurotech <i>L'utilisation est réservée à Eurotech</i>
Reserved	

3.2 Graphical symbols

The following graphical symbols can be used in this manual:

Les symboles graphiques suivants peuvent être utilisés dans ce manuel:

Symbol Symbole	Meaning Signification
	Alternating current (AC) <i>Courant alternatif (CA)</i>
	Direct current (DC) <i>Courant continu (CC)</i>
	Earth; ground <i>Mise à la terre</i>
	Functional earthing; functional grounding (US) <i>Mise à la terre fonctionnelle</i>
	Protective earth; protective ground <i>Mise à la terre de protection (PE)</i>
	Dangerous voltage <i>Tension dangereuse</i>

4 PRODUCT OVERVIEW

This chapter gives the following information:

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Preliminary



4.1 Product description

The DynaGATE 10-14 is an E-Mark certified Edge Gateway for Public Transport and Road Vehicles that enables a fast transition to ITxPT both in existing and new deployments.

Fully compliant with the ITxPT installation requirements (with accessory cables), the DynaGATE 10-14 also provides legacy interfaces (e.g., serial RS-232/485/422) to support the integration in fleets that are still depending on them.

The DynaGATE 10-14 consolidates multiple devices in one, with significant savings while dramatically simplifying the installation and the interoperability challenges; DynaGATE 10-14 packs all the functions that would require dedicated GNSS units, Wi-Fi/BT to LTE/5G routers, IP and GSML II camera processors, CAN-FD controllers.

The DynaGATE 10-14 combines a rugged IoT Gateway with an AI and Computer vision platform: for instance, IP and GSML II (factory option) video feeds from vehicle cameras can be processed by the integrated 2.3TOPS AI accelerator.

The DynaGATE 10-14 is a global product, certified by major LTE carriers and ready to deploy in North America, Europe and Japan; it is also 5G ready and additional cellular operator and country certifications are available as a professional service.

Cutting-edge cybersecurity is often a critical requirement: the DynaGATE 10-14 is PSA certified and can even be certified according to IEC 62443-4-1/-4-2 cybersecurity (Professional Service). System integrity and authenticity against unauthorized manipulations is layered across hardware and software: at the hardware level TPM 2.0 and an innovative, always-on, power-independent hardware antitamper monitor assure that the system has not been manipulated and that its sensitive data are safe. At a higher level, technologies such as Secure Boot and ARM Trust Zone expand the protection perimeter to the whole system.

The DynaGATE 10-14 comes with **Everyware Software Framework (ESF)**, a commercial, enterprise-ready edition of Eclipse Kura, the open source Java/OSGi middleware for IoT Edge Gateways. Distributed and supported by Eurotech, ESF supports ready-to-use field protocols (including Modbus, OPC-UA, S7), MQTT connectivity, web-based visual data flow programming and deep configuration. ESF is also integrated with **Everyware Cloud (EC)**, Eurotech IoT Integration Platform (separately available), enabling advanced diagnostics, provisioning, and full remote device access and management.

For more information visit www.eurotech.com.

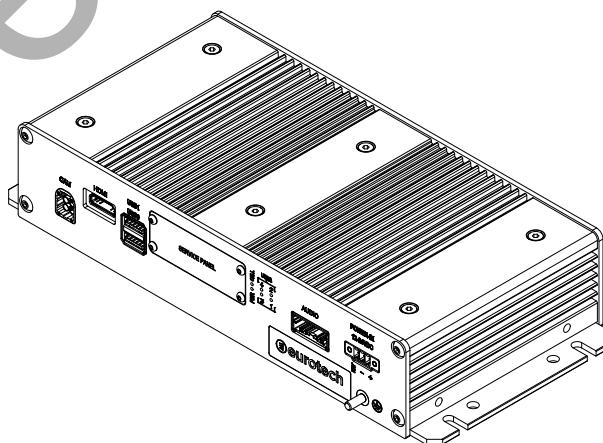


Fig. 1 - The DynaGATE 10-14

4.2 Intended use and not allowed uses of the product

The product is intended for professional use and must be installed by qualified personnel only.

The product must be installed in a secured location, accessible to authorized personnel only (for example in a cabinet / technical compartment).

The product is intended to be installed horizontally on a plane surface.

4.2.1 Deterministic output notice



NOTICE

This product is not intended to be physically or logically connected to an automation process.

4.2.2 Intended use

The DynaGATE 10-14 is an E-Mark certified Edge Gateway for Public Transport and Road Vehicles that enables a fast transition to ITxPT both in existing and new deployments.

The DynaGATE 10-14 must:

- Be installed in a secured location, only accessible to authorized personnel (for example in a cabinet/ technical compartment), and not exposed to atmospheric agents
- Be used indoors or in automotive applications. Before you use the DynaGATE 10-14 in automotive applications:
 - in the EU, switch-OFF the Wi-Fi frequency band ¹ 5150 MHz – 5250 MHz
 - in the US and Canada, switch-OFF the Wi-Fi frequency bands 15150 MHz – 5250 MHz and 5745 MHz – 5825 MHz
- Be used with appropriate interconnecting and power cables
- Be used with an external DC power supply source that:
 - must meet the requirements stated on the identification label of the product
 - must deliver a minimum power of 65 W
 - must include an external Type F fuse on the line coming from the negative terminal (a 3 A Type F fuse is appropriate for 24 V DC operation).

4.2.3 Not allowed uses

Do not use the DynaGATE 10-14:

- in railway applications
- in defense applications
- outdoors
- in safety-critical applications
- in environments with potentially explosive atmospheres
- if not installed according to the instructions and warnings contained in this document.

When used in automotive applications in any EU Member State, do not use the DynaGATE 10-14 with the following Wi-Fi bands enabled: 5150 MHz – 5250 MHz and 5745 MHz – 5825 MHz.

¹For more information, refer to: "DynaGATE 10-14 EL Software Manual"

4.3 Technical specifications

The DynaGATE 10-14 family has the following technical specifications:

Ordering Code: DYGATE-10-14-xx							
Ordering Code: HW ⁽¹⁾ Only		-01	-03	-04	-05	-07	-09
Ordering Code: HW + EL ⁽²⁾		-21	-23	-24	-25	-27	-29
Ordering Code: HW + EL + ESF ⁽³⁾		-31	-33	-34	-35	-37	-39
PROCESSOR	CPU	NXP i.MX 8M Plus, 4 Core ARM Cortex A53 1.8 GHz + 1 Core ARM Cortex M7 800 MHz					
ACCELERATORS	Neural Processor	Integrated, 2.3 TOPS					
	2D/3D GPU	Integrated, Shader, Vivante GC520L, Vivante GC7000UL					
MEMORY	RAM	4 GB LPDDR4 (Up to 8 GB); Inline ECC (Contact Eurotech for more information)					
STORAGE	Embedded	32 GB eMMC (Up to 128 GB)					
	Other	1x microSD Slot (User Accessible)					
I/O INTERFACES	Ethernet	2x GbE; M12 X-Coded				4x GbE; M12 X-Coded	2x GbE; M12 X-Coded
	USB	2x Host 3.0 (Noise and Surge Protected); Type A					
	CAN	2x CAN-FD bus, Protected and Isolated with Termination Resistors					
	Serial	2x RS-232/422/485					4x RS-232/422/485
	Serial Protection	Isolated, Surge Protected, with Termination Resistors and Fail-safe Receivers					
	Debug Console	1x USB Serial Console					
	Camera Input	Ethernet (IP Camera)		Ethernet (IP Camera) and 4x GMSL 3.12 Gbps Coax Input; FAKRA		Ethernet (IP Camera)	
	Digital I/O	11x Digital Input 36 V, 1.5 kV Isolated; 4x Digital Outputs (36 V AC/DC), 500 mA sink, 1 kHz Max Switching, 1.5 kV Isolated; 3x Digital Outputs (24 V DC, Log-level, Non-isolated)					
	Analog I/O	2x Analog Inputs 36 V, 11-bit, Isolated					
	Video Out	1x HDMI with 2D/3D Acceleration					
	Audio	Stereo Line-level Audio Output					
	RADIO INTERFACES	Internal Cellular	No	LTE Cat 4 (Global) - Factory Options: Cat 6, 12, 18; 5G Ready			
SIM Slot		No	2x microSIM (User Accessible; LTE CAT 4 only supports 1x)				
GNSS		GPS, Galileo, GLONASS, BeiDou, QZSS					
GNSS type		UDR ⁽⁴⁾	UDR	RTK ⁽⁵⁾ (sub-meter)	UDR	UDR	UDR
Wi-Fi		No	802.11 a/b/g/n/ac (2.4 GHz, 5 GHz)				
Bluetooth		No	BT/BLE5.0 (2.4 GHz)				
Ext. Antennas		No	2x Cellular, 1x Wi-Fi/BT, 1x GNSS; FAKRA (Factory Option: SMA/RP-SMA)				
CYBERSECURITY (HARDWARE)		TPM	TPM 2.0				
	Hardware	Yes (Enclosure and Service Panel - Always-on Monitoring and Event Logging with Time Stamping)					

Ordering Code: DYGATE-10-14-xx			
OTHER	RTC	Yes (supercap backup)	
	Watchdog	Yes - CPU built-in	
	EEPROM	256 Kbit	
	Temp. Sensor	Yes	
	Accelerometer	3D Accelerometer / 3D Gyroscope	
	LEDs	1x Power Blue, 1x Cellular Activity Green, 4x User Configurable (2x Green/Yellow, 2x Green/Red)	
	Buttons	1x Reset Button 1x Programmable Button	
EXPANSIONS	Internal Expansions	Internal, M.2, Internal Bay #1, Internal Bay #2 (Contact Factory for Expansion Options)	
POWER	Input	Nominal: 12 and 24 V DC; Range: 9 to 35 V DC with Transient Protection and Vehicle Ignition Sense	
	Power Backup	Safe-shutdown; Configurable Sleep Timer, to Manage Shutdown	
	Consumption	Typical: 10 W; Sleep < 2.5 W	
ENVIRONMENT	Operating Temp.	-40 to +70 °C	
	Storage Temp.	-40 to +70 °C	
	Humidity	5 to 95% Relative Humidity (Non-condensing) at +40°C	
CERTIFICATIONS	Cybersecurity	Secure Boot, TrustZone Architecture, PSA Level 1, California SB-327, Always-on Antitamper Monitor, TPM 2.0; IEC 62443-4-1/-4-2 - For Hardened Production-only Images	
	IoT Platform	AWS IoT Core Qualified; Microsoft Azure Certified; Everyware Cloud Native	
	Regulatory	EU/UK: CE(*), UKCA(*); North America: FCC(*), ISED(*); Japan: TELEC(*), JATE(*); Other Countries: Factory Option	
	Cellular	No	EU/UK: RED(*), Any Carriers; North America: PTCRB(*), AT&T(*), Verizon(*); Japan: Any Carriers; Other Countries: Factory Option
	Safety	EN 62368-1(*), UL 62368-1(\$)	
	Road	E-Mark, ITxPT	
	Environmental	RoHS3, REACH	
	Ingress	IP40	
	MECHANICAL		
	Enclosure	Material: Aluminum; Color: Black Anodized	
	Dimensions	270 x 123 x 51mm (WxDxH) - Excluded Connectors	

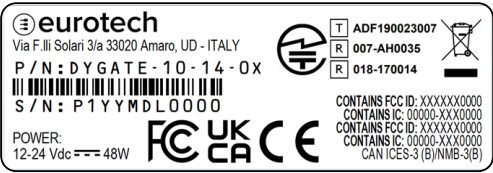
- (1) HW = Hardware
 (2) EL = Eurotech Everyware Linux
 (3) ESF = Everyware Software Framework
 (4) UDR = Untethered Dead Reckoning
 (5) RTK = Real Time Kinematics
 (\$) UL, NRTL listing Factory Option
 (*) Ongoing

SOFTWARE		
SOFTWARE	OS	Eurotech Everyware Linux
	SDK	Yocto-based Eclipse Tooling, Azul Java
	IoT Framework	Everyware Software Framework (Java/OSGi)



4.4 Product label

The following label is placed on the product:

Label example	Label type and content	Label position
	Product Label* - Eurotech logo - Manufacturer address - Product number (example) - Serial number - Regulatory marks* - Power supply specifications** - Contains FCC ID: XXXXXXXXXX - Contains IC: XXXXXXXXXXXXXXX - Contains FCC ID: XXXXXXXXXX - Contains IC: XXXXXXXXXXXXXXX - CAN ICES-3 (B)/NMB-3(B)	Front side of the product

* Information included in the label depends on the product variant

** The symbol  stands for direct current

4.5 Optional accessories

The DynaGATE 10-14 can include the following optional accessories:

Accessory Order Code	Accessory Description
E16-50-11-01	AC/DC Power Supply Adapter 60 W; IN: 90-264 V AC; OUT: 24 V DC, 2.7 A IEC320 C14 to Screw Strip Conn 3P
99ACC-70000-A0001	Audio ITxPT Cable*
99ACC-70000-A0002	Auxiliary (I/O) ITxPT Cable*
99ACC-70000-A0003	CAN ITxPT Cable*
99ACC-70000-A0004	Power ITxPT Cable*
99ACC-70000-A0005	USB Type-C to USB 2.0 Standard-A Cable Assembly; L = 1 m
99ACC-70000-A0006	Analog IN Cable (Mini50 Code A 24P to Open ended); L = 250 mm
99ACC-70000-A0007	Auxiliary (I/O) Cable (Mini50 Code A 8P to Open ended); L = 250 mm
99ACC-70000-A0008	Cable Power Supply 250 V AC IEC 320 C13 (3P) 10 A Straight to Schuko; L = 2 m
99ACC-70000-A0009	Cable Power Supply 125 V AC IEC 320 C13 (3P) 15 A to USA/ Japan; L = 2 m
99ACC-70000-A0010	Cable Power Supply 250 V AC IEC 320 C13 (3P) 13 A to UK; L = 2 m
99ACC-70000-A0011	Cable Circ M 8P M12 X-Coded to RJ45 M (Cat 6A); L = 1 m
99ACC-60750-C0016	2-in-1 LTE 4G/5G Magnetic/Adhesive-mount Antenna**: 2J Antennas 2J6983MPa-300D302-C861_C861; L = 3 m
99ACC-60750-C0017	2.4/5.0/7 GHz Wi-Fi/BT Adhesive-mount Antenna**: 2J Antennas 2J4802P-300LL100-C638; L = 3 m
99ACC-60750-C0018	GNSS Magnetic/Adhesive-mount Antenna**: 2J Antennas 2J4301MPGF-300LL100-C95; L = 3 m

* Required to meet ITxPT installation requirements

** For more information, refer to: "[Antennas list](#)" on page 30



5 CERTIFICATIONS

Note about the Declaration of Conformity
Upon request, Eurotech can provide the product Declaration of Conformity.
For more information, refer to: <https://www.eurotech.com/support>.

This chapter gives the following information:

5.1 CE marking	23
5.2 REACH compliance	24
5.3 UKCA marking	24
5.4 FCC compliance	25
5.5 ISED Canada compliance	27
5.6 MIC Japan	29
5.7 Antennas list	30

5.1 CE marking

This product is CE marked and complies with the essential requirements and other relevant requirements of the directives reported in the following sections.

Eurotech does not approve the use of this product with equipment (for example: power supplies, personal computers, etc.) that is not CE marked and that is not compliant with the requirements specified in this Hardware Manual.



5.1.1 Safety

This product complies with the standard IEC EN 62368-1 on the safety requirements in information and communication technology equipment.

5.1.2 RoHS 3 compliance

This product complies with the following Directives:

- Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment
- Commission Delegated Directive (EU) 2015/863 as regards the list of restricted substances.

5.1.3 Packaging and packaging waste

This product complies with the Directive 94/62/EC on packaging and packaging waste.

5.1.4 Product disposal and recycling

This product, at the end of its life cycle, must be collected separately and managed in accordance with the provisions of the Directive 2012/19/EU on waste of electrical and electronic equipment (WEEE).

For more information, refer to: "The WEEE label" below.

5.1.4.1 The WEEE label

This symbol, placed on the product, indicates that the product at the end of its life cycle must be sent to separate collection facilities for recovery and recycling. Because of the substances present in the product, improper disposal can cause damage to human health and to the environment.

For collecting and recycling information, refer to: <https://www.eurotech.com/support>.



5.1.5 RED compliance (all product variants but: -x1)

This product complies with the Directive 2014/53/EU on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment.

Modification statement

Eurotech does not approve any changes or modifications to this product by the user. Any changes or modifications could void the user’s authority to operate this product.

5.1.5.1 Class II product and EU restrictions on 5 GHz Wi-Fi usage

According to Commission Decision 2000/299/EC, establishing the initial classification of radio equipment and telecommunications terminal equipment and associated identifiers, the product falls within the scope of Class II.

The WiFi frequency band 5150-5350 MHz is restricted to indoor use only.

Dynamic Frequency selection (DFS) as master or subordinate is not supported by the product.

	AT	BE	BG	CH	CY	CZ	DE
	DK	EE	EL	ES	FI	FR	HR
	HU	IE	IT	IS	LI	LT	LU
	LV	MT	NL	NO	PL	PT	RO
	SE	SI	SK	TR	UK(NI)		

5.2 REACH compliance

This product is assessed to be compliant with the regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), with the exceptions allowed by the EU Technical Committee.

Eurotech has set in place a monitoring process to assess compliance to REACH regulation. For details and more information, refer to: <https://www.eurotech.com/support>.

5.3 UKCA marking

This product is UKCA marked and complies with the relevant UK Statutory Instruments and their amendments:

- 2017 No 1206 The Radio Equipment Regulations 2017
- 2012 No 3032 The Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Eurotech does not approve the use of this product with equipment (for example: power supplies, personal computers, etc.) that is not UKCA marked and that is not compliant with the requirements specified in this Hardware Manual.



5.4 FCC compliance

5.4.1 FCC marking

This product is FCC marked and complies with the regulatory information reported in the following sections.

Eurotech is not responsible for the use of the product together with equipment (for example: power supplies, personal computers, etc.) that are not FCC marked and not compliant with the requirements specified in this instructions for use.

Cet appareil est certifié FCC et est conforme aux exigences réglementaires décrites dans les sections suivantes.

Eurotech n'est pas responsable de l'utilisation du appareil avec des équipements (par exemple : alimentations, ordinateurs personnels, etc.) non certifiés FCC et qui ne sont pas conformes aux exigences spécifiées dans ce instructions d'utilisation.

Modification statement

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

Les changements ou modifications qui ne sont pas expressément approuvés par la partie responsable de la conformité peuvent annuler l'autorité de l'utilisateur à utiliser l'équipement.



5.4.2 FCC compliance: Class B Digital Device

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.

Note: 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 product 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 product and the receiver
- Connect the product 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

Cet appareil est conforme à la partie 15 des règlements de la FCC. L'utilisation est soumise aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Remarque: Cet appareil a été testé et déclaré conforme aux limites d'un appareil numérique de classe B, conformément à la partie 15 des règlements de la FCC. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle.

Cet appareil génère, utilise et peut émettre des ondes radio qui peuvent causer des interférences nuisibles s'il n'est pas installé et utilisé conformément aux instructions.



Si néanmoins cet appareil cause des interférences nuisibles à la réception de la radio ou de la télévision, ce qui peut être déterminé en éteignant et en rallumant l'appareil, l'utilisateur est encouragé à essayer de corriger l'interférence par une ou plusieurs des mesures suivantes:

- *Réorienter ou déplacer l'antenne de réception*
- *Augmenter la distance entre le produit et le récepteur*
- *Brancher l'appareil sur une prise de courant différente de celle à laquelle le récepteur est raccordé*
- *Consulter le revendeur ou un technicien radio/TV expérimenté pour obtenir de l'aide.*

5.4.3 RF radiation exposure statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

Cet appareil est conforme aux limites d'exposition aux rayonnements de la FCC pour un environnement non contrôlé. L'antenne doit être installée de façon à garder une distance minimale de 20 cm entre la source de rayonnements et votre corps.

Cet appareil et son (ses) antenne(s) ne doivent pas être co-localisés ou utilisés en conjonction avec une autre antenne ou un autre émetteur, sauf en conformité avec les procédures du produit multi-émetteur de la FCC.

5.4.4 FCC restrictions on 5 GHz Wi-Fi usage

The product is limited to indoor operation and can only be operated in the frequency bands: 5150 MHz – 5250 MHz and 5745 MHz – 5825 MHz.

Le produit est limité à un fonctionnement en intérieur et ne peut être utilisé que dans les bandes de fréquences 5150 MHz – 5250 MHz et 5745 MHz – 5825 MHz.

5.4.5 FCC labeling information

For the FCC information stated on the product label, see: ["Product label" on page 21](#).

Pour les informations de la FCC indiquées sur l'étiquette du produit, voir: ["Product label" page 21](#).

5.5 ISED Canada compliance

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). 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 of the device.

This device has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this 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'utilisation est soumise aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement du dispositif.

Le présent appareil a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

5.5.1 ISED compliance: Class B Digital Device

ICES-003 Class B Notice - Avis NMB-003, Classe B.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

5.5.2 RF radiation exposure statement

This product complies with ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with ISED multi-transmitter product procedures.

This device complies with Health Canada's Safety Code. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement

Cet appareil est conforme aux limites d'exposition aux rayonnements de la ISED pour un environnement non contrôlé. L'antenne doit être installée de façon à garder une distance minimale de 20 cm entre la source de rayonnements et votre corps.

Cet appareil et son (ses) antenne(s) ne doivent pas être co-localisés ou utilisés en conjonction avec une autre antenne ou un autre émetteur, sauf en conformité avec les procédures du produit multi-émetteur de la ISED.

Cet appareil est conforme avec Santé Canada Code de sécurité 6. Le programme d'installation de cet appareil doit s'assurer que les rayonnements RF n'est pas émis au-delà de l'exigence de Santé Canada

5.5.3 ISED restrictions on 5 GHz Wi-Fi usage

The product is limited to indoor operation and can only be operated in the frequency bands: 5150 MHz – 5250 MHz and 5745 MHz – 5825 MHz.

Le produit est limité à un fonctionnement en intérieur et ne peut être utilisé que dans les bandes de fréquences 5150 MHz – 5250 MHz et 5745 MHz – 5825 MHz.

5.5.4 ISED labeling information

For the ISED information stated on the product label, see: ["Product label" on page 21](#).

Pour les informations de la ISED indiquées sur l'étiquette du produit, voir: ["Product label" page 21](#).

5.5.5 Responsible parties: Canadian Representative contact information

The Canadian Representative has the following contact information:

Le Représentant Canadien dispose des coordonnées suivantes:

Contact Information	
Company Name	Canadian Certification Consulting, Inc.
Company Number ^(*)	10842A
Company Address	2210 Horizon Drive, Suite 17
City	West Kelowna
Province/State	BC
Postal Code	V1Z 3L4
Country	Canada
Contact Name	Jon Hughes
Title	President
Phone Number	1-250-575-1719
Email	info@can-cert.com

(*) Company Number is issued by Innovation, Science and Economic Development Canada (formerly Industry Canada).

Le numéro d'entreprise est délivré par Innovation, Science et Développement économique Canada (anciennement Industrie Canada).

5.6 MIC Japan

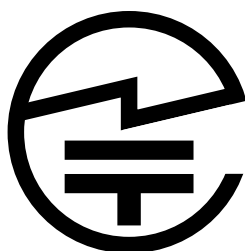
This product contains wireless equipment that comply with the construction design certification based on the Radio Law of MIC (Ministry of Internal Affairs and Communications) Japan.

A radio station license is not required to use this wireless equipment in Japan.

The certification numbers are the following:

Product Wireless Equipment	Certification Numbers
Quectel_EM05-G	[R] 201-190133 [T] AD 19 0040 201
Telit WE866C6-P	[R] 201-210263 [T] D 21 0068 201

The product certification mark is the following:



[R] 201-190133
[R] AD 19 0040 201
[T] 201-210263
[T] D 21 0068 201

Modification statement

Eurotech does not approve any changes or modifications to this product by the user. Any changes or modifications could void the user's authority to operate this product.



5.7 Antennas list

The DynaGATE 10-14 has been certified with the following antennas:

Le DynaGATE 10-14 a été certifié avec les antennes suivantes:

Types Types	Manufacturer and Model Fabricant et Modèle	Frequency (MHz) Fréquence (MHz)	Peak Gain (dBi) Max. Gain (dBi)	VSWR
Cellular	2J Antennas 2J6983MPa-300D302-C861_C861	617 - 960	~2.1	~3.1:1
		1427 - 2690	~6.3	~2.1:1
		3300 - 5000	~3.7	~3.1:1
		5150 - 5925	~2.8	~3.0:1
Wi-Fi/BT	2J Antennas 2J4802P-300LL100-C638	2410 - 2490	~3.5	~2.3:1
		4920 - 5925	~1.7	~1.5:1
		5925 - 7125	~1.5	~1.7:1
GNSS	2J Antennas 2J4301MPGF-300LL100-C95	1561.098 1575.42 1598-1606	-	≤1.4:1

5.7.1 Notice for EU

In the EU, antennas must be used in compliance with the RED requirements.

5.7.2 Notice for UK

In the UK, antennas must be used in compliance with the UK RER requirements.

5.7.3 Notice for US

In the US, antennas must be used in compliance with the FCC requirements.

5.7.4 Notice for Canada/Avis pour le Canada

In the Canada, antennas must be used in compliance with the ISED requirements.

Au Canada, les antennes doivent être utilisées conformément aux exigences de la ISED.

6 INTERFACES OVERVIEW

This chapter gives the following information:

6.1 Front side interfaces overview	32
6.2 LED indicators overview	33
6.3 Service Panel overview	34
6.4 Rear side interfaces overview	40

Preliminary



6.1 Front side interfaces overview

The Front side interfaces are as follows.
Connectors availability depends on product variant. For more information, refer to:"[Technical specifications](#)" on page 19.

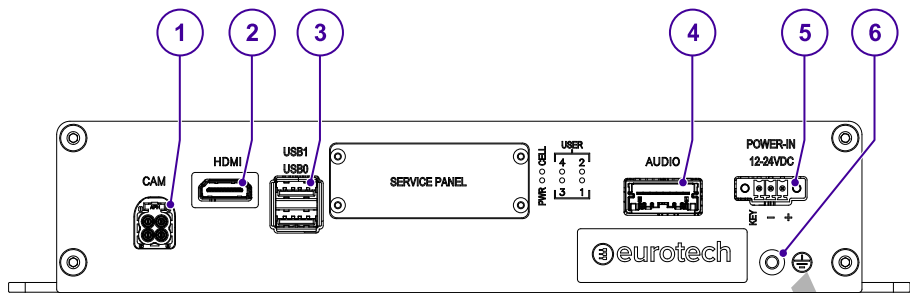


Fig. 2 - Front side interfaces layout

Ref #	Label	Description
1	CAM	4x GMSL Camera IN connector (only for product variant: -x5)
2	HDMI	HDMI OUT connector
3	USB0, USB1	2x Host USB ports (USB 3.0 Type A; USB0 on the bottom; USB1 on the top)
4	AUDIO	Audio Interface
5	POWER IN	Power IN connector
6		Earth connection terminal

Tab. 1 - Front side interfaces description



6.2 LED indicators overview

The LED indicators **A** are as follows:

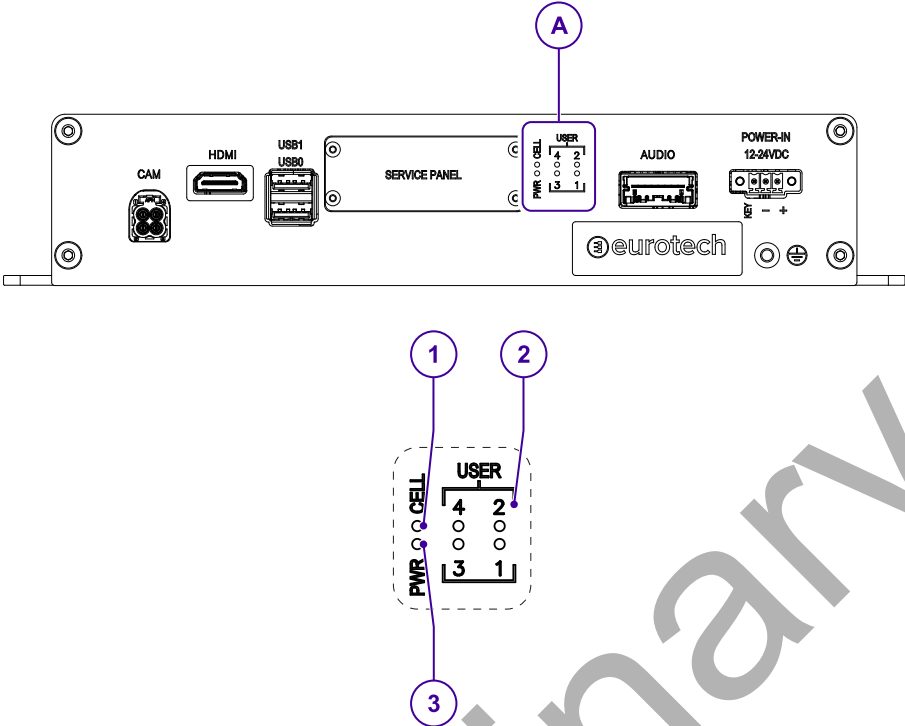


Fig. 3 - LED indicators layout

Ref #	Label	Color	Description
1	CELL	Green	Internal Cellular Modem activity (all product variants but: -x1) - LED ON: Modem ON - LED blinking: Modem connected to cellular network
2	USER1	Bi-color Green / Yellow	General purpose LEDs
	USER2		
	USER3		
	USER4		
3	PWR	Blue	External power source status: - LED ON: External power source is present - LED OFF: External power source is missing (regardless of the KEY Signal (IGN_IN) status)

Tab. 2 - LED indicators description

6.3 Service Panel overview

The Service Panel **A** is placed on the front side of the product and contains the Service Interfaces:

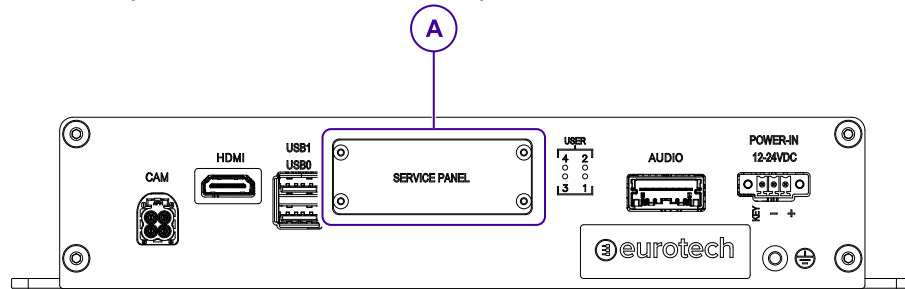


Fig. 4 - Service Panel layout

6.3.1 How to remove the Service Panel cover



NOTICE

The IP rating is not maintained if the Service Panel cover is removed. Do not use the product for a long period with the Service Panel cover removed, or dust and other particulates will go into the product. If you must have access to the Service Panel for a long period, use appropriate precautions to stop dust and other particulates.

To remove the Service Panel cover, use a 1.5 mm hex key and release the four M2.5 x 5 mm Button Head Hexagon Socket Drive Screws (see Fig. 5 below):

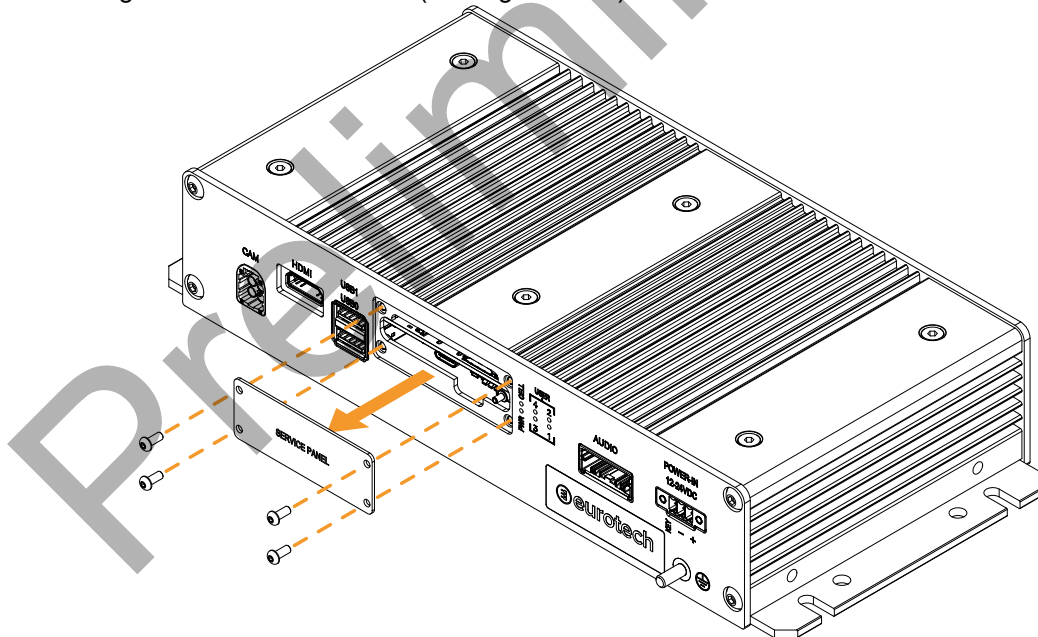


Fig. 5 - How to remove the Service Panel cover



6.3.2 Service Interfaces overview

The Service Interfaces are as follows:

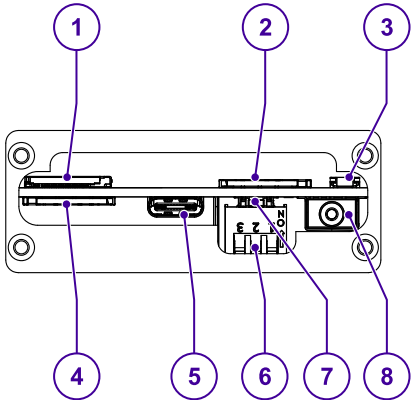


Fig. 6 - Service Interfaces layout

Ref #	Description
1	MicroSD Card Push-push Connector
2	Primary MicroSIM Card Push-push Connector
3	Reset Button
4	Secondary MicroSIM Card Push-push Connector (not supported for LTE Cat 4 internal cellular modem)
5	USB Serial Console (USB Type-C Female connector)
6	DIP switch for boot mode selection and for ignition key control
7	User-programmable Button (default: factory restore)
8	Anti-Tamper sensor for Service Panel cover

Tab. 3 - Service Interfaces description

6.3.3 MicroSD and MicroSIM card connectors

The connectors for the MicroSD and MicroSIM cards are placed in the Service Panel. Both connectors are **push-push** type (push to insert, push to eject).



NOTICE

Only the top-side SIM card connector supports the LTE Cat 4 internal cellular modem. The bottom-side SIM card connector is reserved for future use.

Disable the SIM PIN (Personal Identification Number) before you insert the SIM card. If the SIM PIN is enabled, the cellular connection does not work.

To insert the MicroSD and MicroSIM cards, orient them as in the figures below:

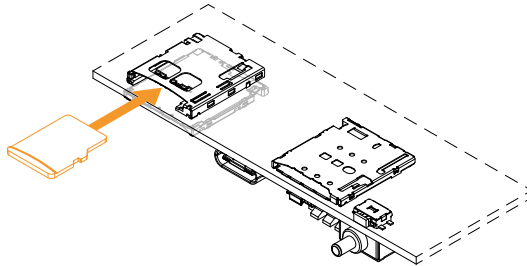


Fig. 7 - MicroSD card orientation

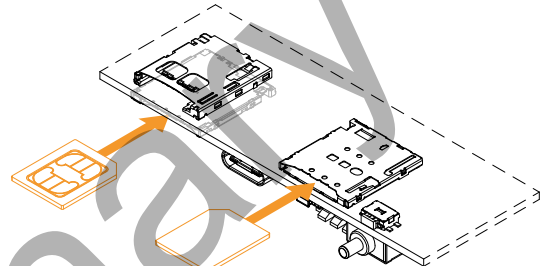


Fig. 8 - MicroSIM card orientation

6.3.4 Reset button

The DynaGATE 10-14 has a reset button that triggers a hardware reset of the device.



6.3.5 USB Serial Console

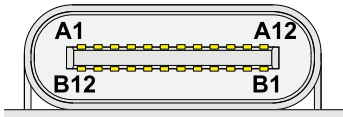
The USB Serial Console is provided through a USB 2.0 Type-C receptacle.

With this receptacle you can use the following mating cables:

- USB 2.0 Type-C Standard Cable assembly.
This cable has USB 2.0 Type-C plug at both ends
- USB Type-C to USB 2.0 Standard-A Cable Assembly.
This cable has a USB 2.0 Type-C plug at one end, and a USB 2.0 Standard-A plug at the other end.

6.3.5.1 USB Serial Console connector specifications

Connector Layout:



Connector Specifications:

- USB 2.0 Type-C receptacle

Mating Connector Specifications:

- USB 2.0 Type-C plug

Connector Pinout (pins not listed are reserved):

Pin #	Signal	Type	Description
A1	GND	P	Ground return
A4	V _{BUS}	P	Bus Power
A5	CC1	IO	Configuration Channel
A6	Dp1	IO	Positive half of the USB 2.0 differential pair – Position 1
A7	Dn1	IO	Negative half of the USB 2.0 differential pair – Position 1
A9	V _{BUS}	P	Bus Power
A12	GND	P	Ground return
B12	GND	P	Ground return
B9	V _{BUS}	P	Bus Power
B7	Dn2	IO	Negative half of the USB 2.0 differential pair – Position 2
B6	Dp2	IO	Positive half of the USB 2.0 differential pair – Position 2
B5	CC2	IO	Configuration Channel
B4	V _{BUS}	P	Bus Power
B1	GND	P	Ground return

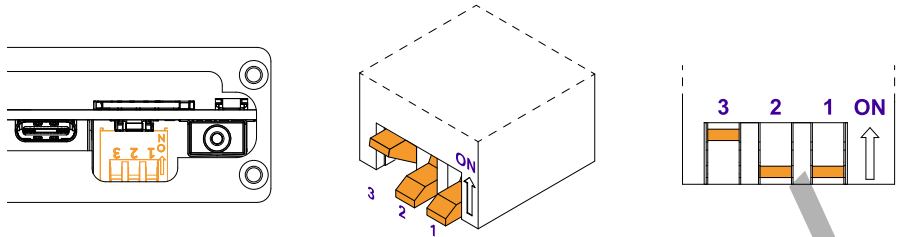
6.3.6 DIP switch definitions

The DynaGATE 10-14 has a 3-slider DIP switch that controls the following functions:

- KEY enable - slider SW1
- Boot mode selection - sliders SW2 and SW3.

To understand the position of the sliders, refer to the arrow that points to the ON direction.

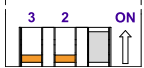
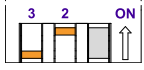
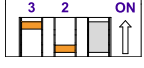
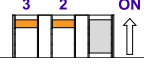
Example: In the following figure, SW1 and SW2 are OFF, SW3 is ON:



The following table shows the sliders positions and their functions:

Slider #	Function	Description	
SW1	KEY enable	SW1 position	Function
			KEY disabled. The Ignition Monitor circuit ignores the KEY Signal (IGN_IN) status.
			KEY enabled. The Ignition Monitor circuit uses the KEY Signal (IGN_IN) status as defined in the "DynaGATE 10-14 EL Software Manual".
The Ignition Monitor circuit operating principle is as follows:			
For more information, refer to the "DynaGATE 10-14 EL Software Manual".			



Slider #	Function	Description	
SW2-SW3	Boot mode selection ¹	SW2-SW3 positions	Function
			Boot according to internal fuse setting (default: boot from internal eMMC)
			Boot from internal eMMC
			Reserved for future use
			Boot from microSD card

6.3.7 User-programmable button: factory restore



NOTICE

The restore operation erases all user data and configuration: use it with caution.

The DynaGATE 10-14 features a user-programmable button that by default activates a factory restore functionality. This functionality restores the DynaGATE 10-14 from a failed state.

For more information, refer to:"DynaGATE 10-14 EL Software Manual".

¹SW2 and SW3 can be permanently overridden as part of a software-based hardening process, available as a Factory Option service. In these hardened configurations, the sliders have no impact on the boot process.

6.4 Rear side interfaces overview

The Rear side interfaces are as follows¹:

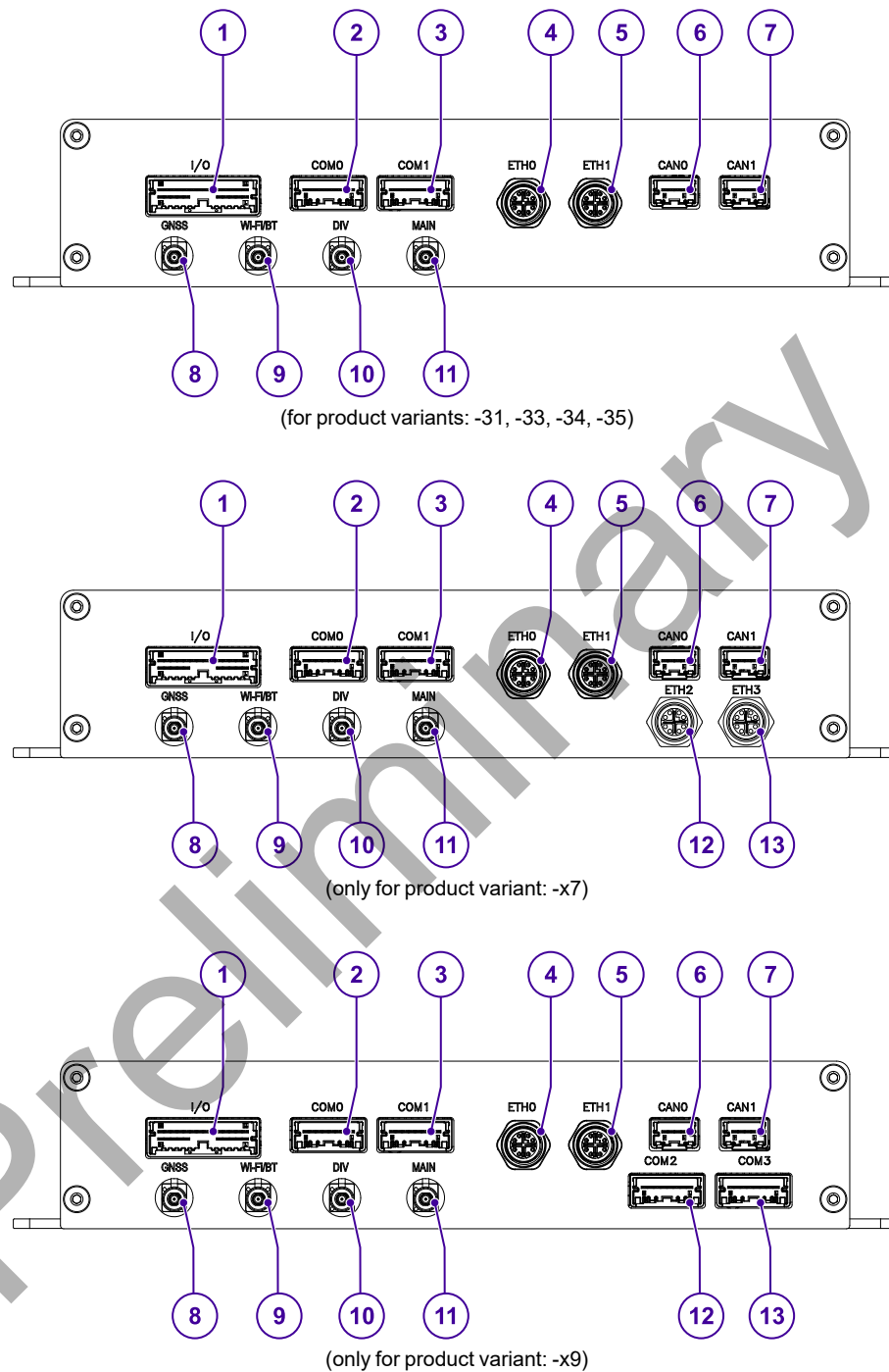


Fig. 9 - Rear side interfaces layout

¹Connectors availability depends on product variant. For more information, refer to: "Technical specifications" on page 19.

Ref #	Label	Description
1	I/O	Digital IN/OUT and Analog IN
2	COM0	Serial port COM0
3	COM1	Serial port COM1
4	ETH0	Ethernet port ETH0
5	ETH1	Ethernet port ETH1
6	CAN0	CAN ports CAN0
7	CAN1	CAN ports CAN1
8	GNSS	Antenna connector for GNSS
9	Wi-Fi/BT	Antenna connector for Wi-Fi/ Bluetooth (all product variants but: -x1)
10	DIV	Diversity antenna connector for internal cellular modem (all product variants but: -x1)
11	MAIN	Main antenna connector for internal cellular modem (all product variants but: -x1)

only for product variant: -x7:

12	ETH2	Ethernet port ETH2
13	ETH3	Ethernet port ETH3

only for product variant: -x9:

12	COM2	Serial port COM2
13	COM3	Serial port COM3

Tab. 4 - Rear side interfaces description

7 FRONT INTERFACES IN DETAIL

The interfaces availability depends on the product variant. For more information, refer to: **"Technical specifications"** on page 19.

This chapter gives the following information:

7.1 CAM (Camera IN) connector (only for product variant: -x5)	43
7.2 HDMI connector	44
7.3 USB connectors	45
7.4 Audio connector (AUD)	46
7.5 PWR (Power IN) connector	48
7.6 Earth connection terminal	49

Preliminary

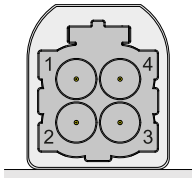


7.1 CAM (Camera IN) connector (only for product variant: -x5)

The DynaGATE 10-14 has a connector (CAM) on the front side that provides 4x GMSL (1.5 Gbps to CSI-2) camera inputs.

7.1.1 CAM connector specifications

Connector Layout:



Connector Pinout:

Pin #	Signal	Type	Description
1	IN0+	I	GMSL Input 0+
2	IN1+	I	GMSL Input 1+
3	IN2+	I	GMSL Input 2+
4	IN3+	I	GMSL Input 3+

Connector Specifications:

- AUTOMATE Type A Mini-FAKRA Quad Port
- Code: Z - Water Blue (Universal)
- Gender: Male (plug)

Mating Connector Specifications:

- AUTOMATE Type A Mini-FAKRA Quad Jack
- Code: Z - Water Blue (Universal)
- Gender: Female (socket)

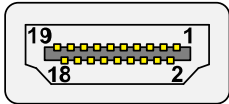


7.2 HDMI connector

The DynaGATE 10-14 an HDMI output on the front side.

7.2.1 HDMI connector specifications

Connector Layout:



Connector Specifications:

- HDMI Type-A Socket
- Gender: Female

Mating Connector Specifications:

- Cable-mount HDMI Type-A Plug
- Gender: Male

Connector pinout:

Pin #	Signal	Description
1	D2+	TMDS Data2+
2	D2_SH	TMDS Data2 Shield
3	D2-	TMDS Data2-
4	D1+	TMDS Data1+
5	D1_SH	TMDS Data1 Shield
6	D1-	TMDS Data1-
7	D0+	TMDS Data0+
8	D0_SH	TMDS Data0 Shield
9	D0-	TMDS Data0-
10	CK+	TMDS Clock+
11	CK_SH	TMDS Clock Shield
12	CK-	TMDS Clock-
13	CEC	Consumer Electronics Control
14	NC	Not Connected
15	SCL	I ² C serial clock for DDC
16	SDA	I ² C serial data for DDC
17	DGND	DDC/CEC Ground
18	+5V	+5V Power
19	HPD	Hot Plug Detect

7.3 USB connectors

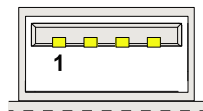
The DynaGATE 10-14 has 2x Host 3.0 USB ports on the front side:

- USB 0; max load: 900 mA
- USB 1; max load: 900 mA

The ports are noise and surge protected.

7.3.1 USB 0 and USB 1 connectors specifications

Connector Layout:



Connector Specifications:

- USB Type-A socket
- Gender: Female

Mating Connector Specifications:

- USB Type-A plug
- Gender: Male

Connector Pinout:

Pin #	Signal	Type	Description
1	V+	P	+5V
2	D-	IO	Data-
3	D+	IO	Data+
4	GND	P	Ground



7.4 Audio connector (AUD)

The DynaGATE 10-14 has the following audio interfaces on the front side:

- 1x Single ended, unbalanced stereo audio output
- 3x Digital audio outputs protected and non-isolated, for channel selection
- External cable loom to map to ITxPT audio connector.

7.4.1 Audio specifications

Stereo audio output specifications:

- Output: 0 to 1 V
- Output impedance: < 10 kΩ (1 kHz)
- Frequency range: 20 Hz to 20 kHz (-30 dB to +30 dB)

Digital audio output specifications:

- Non-isolated – galvanically linked to power input
- Output high = +2.6 V DC to Vin (Power IN +)
- Output low = 0 V to +2.5 V DC
- Protected internally with 50 mA resettable fuse

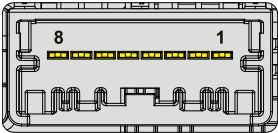
7.4.2 Audio connector specifications



NOTICE

To make sure that the connection keeps the ITxPT compliance, use the optional accessory 99ACC-70000-A0001: Audio ITxPT cable (described on the next page).

Connector Layout:



Connector Specifications:

- Mini50 Unsealed Header
- Single Row, 8 Circuits
- Polarization Option B
- Gray

Mating Connector Specifications:

- Receptacle:
 - Mini50 Unsealed Receptacle
 - Single Row, 8 Circuits
 - Polarization Option B
 - Gray
- Crimp Terminal:
 - Mini50 Unsealed Crimp Terminal
 - L-Grip
 - Tin plated
- Example:
 - Manufacturer: Molex
 - Part number Receptacle: 34791-0081
 - Part number Crimp Terminal: 560023-0448

Connector Pinout:

Pin #	Signal	Type	Description
1	OUT_L	O	Audio Out Left
2	OUT_R	O	Audio Out Right
3	AGND	P	Analog Power Return (Ground)
4	Reserved	R	Reserved
5	DIGO1	O	Audio Digital Output 1 (non-isolated)
6	DIGO2	O	Audio Digital Output 2 (non-isolated)
7	DIGO3	O	Audio Digital Output 2 (non-isolated)
8	GND	P	Ground

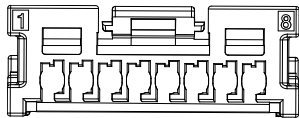
7.4.3 99ACC-70000-A0001: Audio ITxPT cable

Con1: Mini50 Unsealed Receptacle, Single Row, 8 Circuits, Polarization Option B, Gray

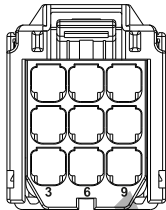
Con2: MCP2.8 GEH Receptacle, 9 Circuits, Polarization Code A, Yellow

Length: 50 cm

Con1 - Insert contacts side view
(to DynaGATE 10-14)



Con2 - Insert contacts side view
(ITxPT)



Connections:

Con2 Pin (ITxPT)	Con1 Pin (to DynaGATE 10-14)	ITxPT Signal	DynaGATE 10-14 function
1	1	Left channel	Audio Out Left
2	3	Common Ground	Analog Power Return (Ground)
3	2	Right Channel	Audio Out Right
4		Not connected	
5		Not connected	
6		Not connected	
7	5	1 st (prio 1)	Audio Digital Output 1 (non-isolated)
8	6	2 nd (prio 2)	Audio Digital Output 2 (non-isolated)
9	7	3 rd (prio 3)	Audio Digital Output 3 (non-isolated)



7.5 PWR (Power IN) connector

The DynaGATE 10-14 has a connector (PWR) on the front side that is the power input interface of the product.

For more information, refer to: "Power IN connector specifications" on page 73.



NOTICE

To make sure that the connection keeps the ITxPT compliance, use the optional accessory 99ACC-70000-A0004: Power ITxPT cable (described below).

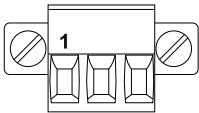
7.5.1 99ACC-70000-A0004: Power ITxPT cable

Con1: Pluggable screw terminal block, Female, 3-pin, 3.5 mm pitch

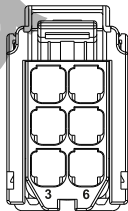
Con2: MCP2.8 GEH Receptacle, 6 Circuits, Polarization Code A, Blue

Length: 50 cm

Con1 - Insert contacts side view
(to DynaGATE 10-14)



Con2 - Insert contacts side view
(ITxPT)



Connections:

Con2 Pin (ITxPT)	Con1 Pin (to DynaGATE 10-14)	ITxPT Signal	DynaGATE 10-14 function
1	1	24V after manual switch	Positive power supply input
2	3	GROUND	Negative power supply input
3	2	24V after ignition switch	KEY Signal
4	Not connected	Full power available (optional)	
5		reserved	
6	Not connected	24V after main switch (optional)	

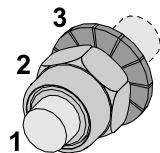
7.6 Earth connection terminal

The DynaGATE 10-14 has a terminal on the front side that is the earth connection interface of the product.

Always use this terminal to connect the product to an earth point in the installation.

For more information, refer to: "Product power requirements" on page 72.

Terminal Layout:



Terminal Label:



Terminal Parts:

Part #	Description
1	M4 stud bolt (length = 12 mm)
2	M4 lock nut
3	M4 serrated lock washer

NOTICE

The earthing conductor to be connected to this terminal must have a size of at least 1 mm².



8 REAR INTERFACES IN DETAIL

The interfaces availability depends on the product variant. For more information, refer to: **"Technical specifications"** on page 19.

This chapter gives the following information:

8.1 I/O (Digital I/Os and Analog INs) connector	51
8.2 COM connectors	54
8.3 Ethernet connectors	57
8.4 CAN connectors	58
8.5 GNSS	60
8.6 Wi-Fi and Bluetooth (all product variants but: -x1)	62
8.7 Cellular Modem (all product variants but: -x1)	64

Preliminary



8.1 I/O (Digital I/Os and Analog INs) connector

The DynaGATE 10-14 has a connector (I/O) on the rear side that provides:

- 11x Digital Inputs (individually opto-isolated – common AGND)
- 4x Digital Outputs (individually opto-isolated)
- 2x Analog Inputs (jointly isolated with digital inputs AGND)

8.1.1 I/O specifications

Digital IN specifications:

- Optoisolation 1.5 kV
- Logic high +3 to 36 V DC
- Logic low 0 to +1 V
- Input impedance 4 K
- Protected internally with 50 mA resettable fuse

Digital OUT specifications:

- Isolated to 1.5 kV
- Open drain mosfet output, max 36 V DC
- Protected with 500 mA fuse (not user-serviceable)

Analog IN specifications:

- Isolated 1.5 kV
- 11-bit resolution
- Full scale range 0 to 36 V DC
- Input impedance ~100 k Ω

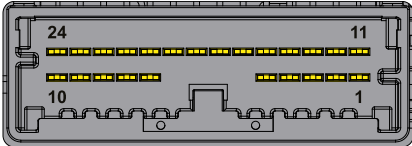
8.1.2 I/O connector specifications



NOTICE

To make sure that the connection keeps the ITxPT compliance, use the optional accessory 99ACC-70000-A0002: Auxiliary (I/O) ITxPT cable (described on the next page).

Connector Layout:



Connector Specifications:

- Mini50 Unsealed Header
- Dual Row, 24 Circuits
- Polarization Option A
- Black

Mating Connector Specifications:

- Receptacle:
 - Mini50 Unsealed Receptacle
 - Dual Row, 24 Circuits
 - Polarization Option A
 - Black
- Crimp Terminal:
 - Mini50 Unsealed Crimp Terminal
 - L-Grip
 - Tin plated
- Example:
 - Manufacturer: Molex
 - Part number Receptacle: 34824-0244
 - Part number Crimp Terminal: 560023-0448

Connector Pinout:

Pin #	Signal	Type	Description
1	OUT1A	O	Isolated Digital Output 1A
2	OUT2A	O	Isolated Digital Output 2A
3	OUT3A	O	Isolated Digital Output 3A
4	OUT4A	O	Isolated Digital Output 4A
5	ANA_IN1	I	Isolated Analog Input 1
6	DIN5_ISO	I	Isolated Digital Input 5
7	DIN4_ISO	I	Isolated Digital Input 4
8	DIN3_ISO	I	Isolated Digital Input 3
9	DIN2_ISO	I	Isolated Digital Input 2
10	DIN1_ISO	I	Isolated Digital Input 1
11	OUT1B	O	Isolated Digital Output 1B
12	OUT2B	O	Isolated Digital Output 2B
13	OUT3B	O	Isolated Digital Output 3B
14	OUT4B	O	Isolated Digital Output 4B
15	ANA_IN2	I	Isolated Analog Input 2
16	GND_ISO	P	Ground Reference
17	GND_ISO	P	Ground Reference
18	GND_ISO	P	Ground Reference
19	DIN11_ISO	I	Isolated Digital Input 11
20	DIN10_ISO	I	Isolated Digital Input 10
21	DIN9_ISO	I	Isolated Digital Input 9
22	DIN8_ISO	I	Isolated Digital Input 8
23	DIN7_ISO	I	Isolated Digital Input 7
24	DIN6_ISO	I	Isolated Digital Input 6

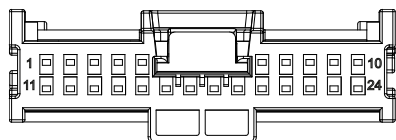
8.1.3 99ACC-70000-A0002: Auxiliary (I/O) ITxPT cable

Con1: Mini50 Unsealed Receptacle, Dual Row, 24 Circuits, Polarization Option A, Black

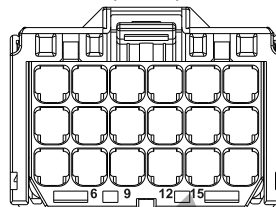
Con2: MCP2.8 GEH Receptacle, 18 Circuits, Polarization Code A, Gray

Length: 50 cm

Con1 - Insert contacts side view
(to DynaGATE 10-14)



Con2 - Insert contacts side view
(ITxPT)



Connections:

Con2 Pin (ITxPT)	Con1 Pin (to DynaGATE 10-14)	ITxPT Signal	DynaGATE 10-14 function
1	10	Low battery	Isolated Digital Input 1
2	9	Odometer	Isolated Digital Input 2
3	8	Doors 1 open	Isolated Digital Input 3
4	7	Doors 2 open	Isolated Digital Input 4
5	6	Doors 3 open	Isolated Digital Input 5
6	24	Doors 4 open	Isolated Digital Input 6
7	23	Doors 5 open	Isolated Digital Input 7
8	22	Doors 6 open	Isolated Digital Input 8
9		reserved	
10		reserved	
11		reserved	
12		reserved	
13		reserved	
14	21	AnyDoorOpen	Isolated Digital Input 9
15	1	Awake request	Isolated Digital Output 1A
16	20	Stop request	Isolated Digital Input 10
17	19	Full power available	Isolated Digital Input 11
18		reserved	

Note: ITxPT requires one common ground linked to vehicle chassis. The user must assume responsibility for connecting the isolated grounds (refer to 8.1.2) to common ground

8.2 COM connectors

The DynaGATE 10-14 has up to 4x RS-232/422/485 protected and isolated serial ports on the rear side, according to the product variants:

- 2x RS-232/422/485 (COM0 and COM1) for product variants -x1, -x3, -x4, -x5, -x7
- 4x RS-232/422/485 (COM0 to COM3) for product variants -x9

The RS-232/485/422 serial modes are software-controlled. For more information, refer to: "DynaGATE 10-14 EL Software Manual".

8.2.1 Termination resistors and fail-safe receivers

The serial ports are isolated, surge protected, with termination resistors and fail-safe receivers.

The DynaGATE 10-14 includes software-controlled 120 Ohm termination resistors for the RS-485 or RS-422 serial modes. For more information, refer to: "DynaGATE 10-14 EL Software Manual".

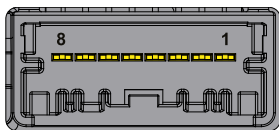
Termination resistors are used to reduce reflections when long cables are used at high baud rates. Reflections can significantly reduce the signal level and introduce 'dead spots' increasing the system's susceptibility to noise and reduce reliability.

To avoid reflections a resistor which matches the impedance of the cable (approx. 120 Ohm for twisted pairs) should be placed across the ends of the cable. The DynaGATE 10-14 termination resistors should be enabled if the system is connected to the end of the cable.

In RS-485 connections there are times when all the line drivers are disabled, and the D+ and D- signals are either floating or pulled together by the terminating resistors. Most modern RS-485 receivers (including those on the DynaGATE 10-14) are designed to cope with this condition but some legacy devices may see this as a break condition or start to oscillate. In these situations, a pull-up resistor between the D+ line and +5 V and between the D- line and 0 V should be used to bias the lines to a '1' state.

8.2.2 COM0 and COM1 connectors specifications (for all product variants)

Connector Layout:



Connector Specifications:

- Mini50 Unsealed Header
- Single Row, 8 Circuits
- Polarization Option A
- Black

Mating Connector Specifications:

- Receptacle:
 - Mini50 Unsealed Receptacle
 - Single Row, 8 Circuits
 - Polarization Option A
 - Black
- Crimp Terminal:
 - Mini50 Unsealed Crimp Terminal
 - L-Grip
 - Tin plated
- Example:
 - Manufacturer: Molex
 - Part number Receptacle: 34791-0080
 - Part number Crimp Terminal: 560023-0448

Connector Pinout in RS-232 mode (pins not listed are reserved):

Pin #	Signal	Type	Description
1	Y1/D1+_TERM	O	TXD1
2	Z1/D1-_TERM	O	RTS1
3	A1_TERM	I	RXD1
4	B1_TERM	I	CTS1
5	GND_ISO	P	Ground Reference
6	GND_ISO	P	Ground Reference

Connector Pinout in RS-422 mode (pins not listed are reserved):

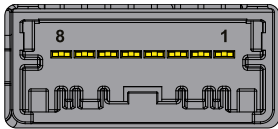
Pin #	Signal	Type	Description
1	Y1/D1+_TERM	O	Y1(OUT+)
2	Z1/D1-_TERM	O	Z1(OUT-)
3	A1_TERM	I	A1(IN+)
4	B1_TERM	I	B1(IN-)
5	GND_ISO	P	Ground Reference
6	GND_ISO	P	Ground Reference

Connector Pinout in RS-485 mode (pins not listed are reserved):

Pin #	Signal	Type	Description
1	Y1/D1+_TERM	I/O	D1+
2	Z1/D1-_TERM	I/O	D1-
5	GND_ISO	P	Ground Reference
6	GND_ISO	P	Ground Reference

8.2.3 COM2 and COM3 connectors specifications (only for product variants -x9)

Connector Layout:



Connector Specifications:

- Mini50 Unsealed Header
- Single Row, 8 Circuits
- Polarization Option A
- Black

Mating Connector Specifications:

- Receptacle:
 - Mini50 Unsealed Receptacle
 - Single Row, 8 Circuits
 - Polarization Option A
 - Black
- Crimp Terminal:
 - Mini50 Unsealed Crimp Terminal
 - L-Grip
 - Tin plated
- Example:
 - Manufacturer: Molex
 - Part number Receptacle: 34791-0080
 - Part number Crimp Terminal: 560023-0448

Connector Pinout in RS-232 mode
(pins not listed are reserved):

Pin #	Signal	Type	Description
1	Y1/D1+_TERM	O	TXD1
2	Z1/D1-_TERM	O	RTS1
3	A1_TERM	I	RXD1
4	B1_TERM	I	CTS1
5	GND_ISO	P	Ground Reference
6	GND_ISO	P	Ground Reference

Connector Pinout in RS-422 mode
(pins not listed are reserved):

Pin #	Signal	Type	Description
1	Y1/D1+_TERM	O	Y1(OUT+)
2	Z1/D1-_TERM	O	Z1(OUT-)
3	A1_TERM	I	A1(IN+)
4	B1_TERM	I	B1(IN-)
5	GND_ISO	P	Ground Reference
6	GND_ISO	P	Ground Reference

Connector Pinout in RS-485 mode
(pins not listed are reserved):

Pin #	Signal	Type	Description
1	Y1/D1+_TERM	I/O	D1+
2	Z1/D1-_TERM	I/O	D1-
5	GND_ISO	P	Ground Reference
6	GND_ISO	P	Ground Reference

8.3 Ethernet connectors

The DynaGATE 10-14 has up to 4x Ethernet (GbE) connectors, according to the product variants:

- 2x GbE connectors for product variants -x1, -x3, -x4, -x5, -x9
- 4x GbE connectors for product variants -x7

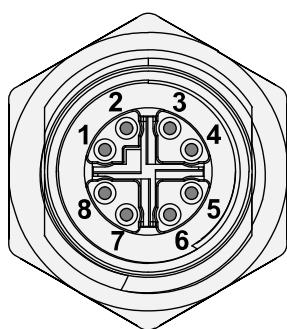
The connectors are available on the rear side.

8.3.1 Ethernet specifications

Feature	Description
Network Standard	Compliant with IEEE 802.3 (10BASE-T, 100BASE-TX, and 1000BASE-T) specifications
Speeds	10 Mbps, 100 Mbps, and 1000 Mbps

8.3.2 Ethernet connectors specifications

Connector Layout:



Connector Pinout:

Pin #	Signal	Type	Description	Male RJ45 Pin #
1	TX+ _D1	O	Transmit Data +	1
2	TX- _D1	O	Transmit Data -	2
3	RX+ _D2	I	Receive Data +	3
4	RX- _D2	I	Receive Data -	6
5	BI+ _D4	I/O	Bidirectional Data +	7
6	BI- _D4	I/O	Bidirectional Data -	8
7	BI- _D3	I/O	Bidirectional Data -	5
8	BI+ _D3	I/O	Bidirectional Data +	4

Connector Specifications:

- Panel-mount; M12 series
- Gender: Female
- Type: X-Coded; 8-pin

Mating Connector Specifications:

- Cable-Mount; M12 series
- Gender: Male
- Type: X-Coded; 8-pin
- Example of cable:
Manufacturer: Metz Connect
Part Number: 142M2X10005
(or equivalent)

8.4 CAN connectors

The DynaGATE 10-14 has 2x CAN (Controller Area Network) ports on the rear side. They are compliant with CAN Specification 2.0, Parts A and B, and CAN FD (flexible data-rate). The ports are isolated and protected against surge.

8.4.1 Termination resistors

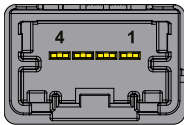
The DynaGATE 10-14 includes software-controlled 120 Ohm termination resistors.
For more information, refer to: "DynaGATE 10-14 EL Software Manual".

8.4.2 CAN0 and CAN1 connectors specifications



NOTICE
To make sure that the connection keeps the ITxPT compliance, use the optional accessory 99ACC-70000-A0003: CAN ITxPT cable (described on the next page).

Connector Layout:



Connector Specifications:

- Mini50 Unsealed Header
- Single Row, 4 Circuits
- Polarization Option A
- Black

Mating Connector Specifications:

- Receptacle:
 - Mini50 Unsealed Receptacle
 - Single Row, 4 Circuits
 - Polarization Option A
 - Black
- Crimp Terminal:
 - Mini50 Unsealed Crimp Terminal
 - L-Grip
 - Tin plated
- Example:
 - Manufacturer: Molex
 - Part number Receptacle: 34791-0040
 - Part number Crimp Terminal: 560023-0448

Connector Pinout:

Pin #	Signal	Type	Description
1	CAN:L	IO	CAN data -
2	CAN:H	IO	CAN data +
3	GND	P	Ground
4	Reserved	R	Reserved

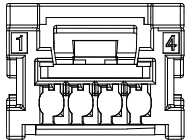
8.4.3 99ACC-70000-A0003: CAN ITxPT cable

Con1: Mini50 Unsealed Receptacle, Single Row, 4 Circuits, Polarization Option A, Black

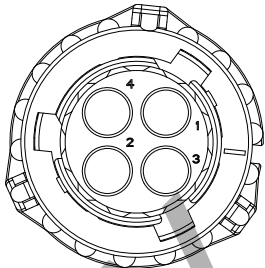
Con2: 2,5MM BU-GEH Housing, 4 Circuits, Black

Length: 50 cm

Con1 - Insert contacts side view
(to DynaGATE 10-14)



Con2 - Insert contacts side view
(ITxPT)



Connections:

Con2 Pin (ITxPT)	Con1 Pin (to DynaGATE 10-14)	ITxPT Signal	DynaGATE 10-14 function
1	2	CAN High	CAN data +
2	1	CAN Low	CAN data -
3	3	Option CAN ground	Ground
4		Not used	



8.5 GNSS

The DynaGATE 10-14 has two GNSS solutions, according to the product variants:

- u-blox NEO-M9V receiver with UDR and ADR for product variants -x1, -x3, -x5, -x7, -x9
- u-blox ZED-F9P receiver with RTK for product variants -x4

The antenna connector is placed on the rear side.

8.5.1 GNSS specifications (product variants -x1, -x3, -x5, -x7, -x9)

Feature	Description
Receiver type	92-channel u-blox M9 engine GPS L1 C/A, QZSS L1 C/A/S, GLONASS L1OF BeiDou B1I (1561.098 MHz) only, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN
Navigation update rate	Up to 50 Hz (4 concurrent GNSS)
Horizontal position accuracy	1.5 m CEP (with SBAS) 2.0 m CEP (without SBAS)
ADR position error	2% of distance traveled without GNSS
UDR position error	10% of distance traveled without GNSS (duration < 60 s)
Acquisition¹	Cold start: 24 s Aided start: 2 s Hot start: 2 s
Sensitivity¹	Tracking & Nav.: -160 dBm Reacquisition: -159 dBm Cold start: -148 dBm Hot start: -158 dBm

¹ For default mode: GPS/GLONASS/BeiDou/Galileo + SBAS/QZSS

8.5.2 GNSS specifications (product variants -x4)

Feature	Description
Receiver type	184-channel u-blox F9 engine GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C E5b, BDS B1I B2I, QZSS L1C/A L1S L2C, BAS L1C/A
Navigation update rate	RTK up to 20 Hz ¹
Position accuracy²	RTK 0.01 m + 1 ppm CEP
Convergence time²	RTK < 10 s
Acquisition	Cold start: 24 s Aided start: 2 s Hot start: 2 s
Sensitivity	Tracking & Nav.: -167 dBm Cold start: -148 dBm Hot start: -157 dBm Reacquisition: -160 dBm

¹ The highest navigation rate can limit the number of supported constellations

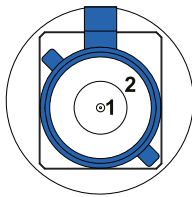
² Depends on atmospheric conditions, baseline length, GNSS antenna, multipath conditions, satellite visibility, and geometry

8.5.3 GNSS antenna - Installation guidelines

- Do not co-locate or operate the antenna in conjunction with another antenna or transmitter
- Do not install the antenna inside metal cases.

8.5.4 GNSS antenna connector specifications

Connector Layout:



Connector Pinout:

Pin #	Description
1	Male inner pin contact
2	Female connector body

Connector Specifications:

- FAKRA connector
- Code: C - Blue
- Gender: Male panel mount

Mating Connector Specifications:

- FAKRA connector
- Code: C - Blue
- Gender: Female



8.6 Wi-Fi and Bluetooth (all product variants but: -x1)

The DynaGATE 10-14 integrates a 802.11 a/b/g/n/ac (2.4 GHz, 5 GHz) - BLE5 (2.4 GHz) module. The antenna connector is placed on the rear side.

8.6.1 Wi-Fi and Bluetooth specifications

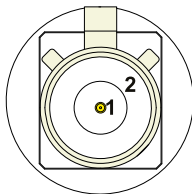
Feature	Description
RF Spec	- Wi-Fi - 802.11 a/b/g/n/ac (2.4 GHz, 5 GHz @ 20/40/80 MHz) - BT/BLE5
Interfaces	- WLAN SDIO 3.0 - BT UART - BT PCM/I2S - LTE Coexistence UART (WCI) - Low frequency 32.768 kHz sleep clock - Single Antenna port, 50 Ω - Control signals
Support Data Rate	802.11a (5 GHz): 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b (2.4 GHz): 1, 2, 5.5, 11 Mbps 802.11g (2.4 GHz): 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (2.4 GHz / 5 GHz): 20 MHz BW: Up to 72.2 Mbps using short GI (MCS0-7) 40 MHz BW: Up to 144.4 Mbps using short GI (MCS0-7) 802.11ac (5 GHz): HT20 (MCS0-8), VHT40 (MCS0-9), VHT80 (MCS0-9)
Frequency Bands and related max RF Transmitted Power	Bluetooth: 2400 MHz to 2483.5 MHz < 9dBm WiFi b/g/n/ac 2.4 GHz band: 2412 MHz to 2472 MHz < 17.5 dBm WiFi a/n/ac 5 GHz bands: - U-NII-1: 5150 MHz to 5250 MHz < 13.9 dBm - U-NII-2A: 5250 MHz to 5350 MHz < 15 dBm - U-NII-2C, U-NII-2e: 5470 MHz to 5725 MHz < 15 dBm - U-NII-3: 5725 MHz to 5825 MHz < 15 dBm
Data Standard	IEEE 802.11a/b/g/n/ac
Modulation	BPSK, QPSK, CCK, 16QAM, 64QAM, 256QAM

8.6.2 Wi-Fi/Bluetooth antenna - Installation guidelines

Do not install the antenna inside metal cases.

8.6.3 Wi-Fi/Bluetooth antenna connector specifications

Connector Layout:



Connector Pinout:

Pin #	Description
1	Male inner pin contact
2	Female connector body

Connector Specifications:

- FAKRA connector
- Code: I - Beige
- Gender: Male panel mount

Mating Connector Specifications:

- FAKRA connector
- Code: I - Beige
- Gender: Female



8.7 Cellular Modem (all product variants but: -x1)

The DynaGATE 10-14 integrates a worldwide LTE Cat 4 module.

The antenna connectors are placed on the rear side.

8.7.1 Cellular Modem specifications

Feature	Description
Key Features	LTE Cat 4 module optimized for broadband IoT/M2M applications Maximum data rates up to 150 Mbps downlink and 50 Mbps uplink Worldwide LTE and UMTS/HSPA+ coverage MIMO technology
Frequency Bands	WCDMA: 900 (B8), 2100 (B1) E-UTRA LTE FDD 2100 (B1) / 1800 (B3) / 2600 (B7) / 900 (B8) / 800 (B20) / 700 (B28) E-UTRA LTE TDD 2600 (B38) / 2300 (B40)
Data Transmission (Max.)	LTE-FDD data rate (Mbps) 150 (DL)/ 50 (UL) LTE-TDD data rate (Mbps) 130 (DL)/ 30 (UL) DC-HSDPA+ data rate (Mbps) 42 (DL)/ 5.76 (UL) WCDMA data rate (kbps) 384 (DL)/ 384 (UL)
RF Power	0.25 W (24 dBm +1,7/-3,7 dB) – Class 3 @ WCDMA 0.2 W (23 dBm ± 2,7 dB) – Class 3 @ E-UTRA LTE
Main and RX-diversity Antenna Requirements	VSWR ≤ 2 Efficiency > 30% Max Input Power 50 W Input Impedance 50 Ω Cable Insertion Loss < 1 dB : LB (< 1 GHz) < 1.5 dB : MB (1-2.3 GHz) < 2 dB : HB (> 2.3 GHz)

8.7.2 Cellular Modem antennas - Installation guidelines

The antenna must be installed such that it keeps a distance from persons greater than 20 cm, and must not be co-located or operating in conjunction with any other antenna or transmitter.

Do not install the antenna inside metal cases.

8.7.2.1 LTE single antenna operation notes

Single LTE antenna operation can be supported; however, typically, wireless carriers (Mobile Network Operators) impose restrictions. Consult with your carrier before considering single LTE antenna usage.

For optimum performance of the cellular interface, Eurotech recommends the use of both main and diversity antenna connectors.

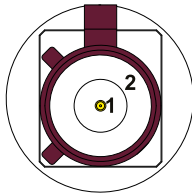
If the diversity antenna is not used/ connected, Eurotech recommends to disable the diversity function.

8.7.3 Cellular Modem antennas connectors specifications

Specifications are the same for both antenna connectors:

- MAIN antenna connector
- DIV antenna connector

Connector Layout:



Connector Pinout:

Pin #	Description
1	Male inner pin contact
2	Female connector body

Connector Specifications:

- FAKRA connector
- Code: D - Bordeaux
- Gender: Male panel mount

Mating Connector Specifications:

- FAKRA connector
- Code: D - Bordeaux
- Gender: Female



9 OTHER INTERFACES IN DETAIL

The interfaces availability depends on the product variant. For more information, refer to:"**Technical specifications**" on page 19.

This chapter gives the following information:

9.1 TPM	67
9.2 Watchdog	67
9.3 RTC and tamper detection	67

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9.1 TPM

The DynaGATE 10-14 includes a TPM 2.0 hardware module: Infineon SLB9670. This is connected to the CPU via an SPI interface.

For more information, refer to: "DynaGATE 10-14 EL Software Manual".

9.2 Watchdog

The DynaGATE 10-14 uses the CPU's internal watchdog to provide a product reset when the software becomes unresponsive.

For more information, refer to: "DynaGATE 10-14 EL Software Manual".

9.3 RTC and tamper detection

9.3.1 The RTC Devices

For more information, refer to: "DynaGATE 10-14 EL Software Manual".

9.3.2 The RTC backup supercap

The DynaGATE 10-14 includes a non-removable RTC backup supercap. The RTC backup supercap can keep the timestamps for at least 10 days when the DynaGATE 10-14 is powered OFF.

Note: This is only valid above -25 °C. Below this value, the supercap retention time will be lower.

IMPORTANT: If the supercap completely discharges while the DynaGATE 10-14 is OFF, the RTC date and time will reset (default date and time is 1st January 2000, 00:00).

Date and time will need to be set again, either manually, or through NTP.

9.3.3 The tamper detection

When the Service Panel cover (or the case) is opened, this event is recorded by the RTC timestamp register.

For more information, refer to: "DynaGATE 10-14 EL Software Manual".

The tamper detection function is active also while the DynaGATE 10-14 is OFF.

IMPORTANT: If the supercap completely discharges while the DynaGATE 10-14 is OFF, any tamper events which were recorded since the product was last powered OFF will be lost.

Instead, the security log will record that time was lost.

10 MECHANICAL SPECIFICATIONS

This chapter gives the following information:

10.1 Product enclosure specifications	69
10.2 Product mechanical dimensions	69

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11 PRODUCT INSTALLATION

This chapter gives the following information:

11.1 Introduction	71
11.2 How to install the product	71

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11.1 Introduction

The product is intended for professional use and must be installed by qualified personnel only.

The product must be installed in a secured location, accessible to authorized personnel only (for example in a cabinet / technical compartment).

The product is intended to be installed horizontally on a plane surface.



NOTICE

Always use the Earth connection terminal to connect the product to an earth point in the installation. For more information, refer to: **"Earth connection terminal"** on page 49.

11.2 How to install the product

To install the product, complete this procedure:

1. Make sure that the place where you install the product is a plane surface
2. Refer to **"Mechanical specifications"** on page 68
3. Use the slots/holes available on the two lateral mounting brackets of the product
4. Add all the necessary hardware to safely fasten the product in place according to your installation requirements. Use 4x M5 screws.

Material, type, and length of the screws, and the maximum torque applicable, depend on your installation requirements.

The mounting brackets specifications are the following:

- Thickness: 3 mm
- Material: EN AW 6060 T5 Extruded; Finish: Black Anodizing.

For more information, refer to: <https://www.eurotech.com/support>.

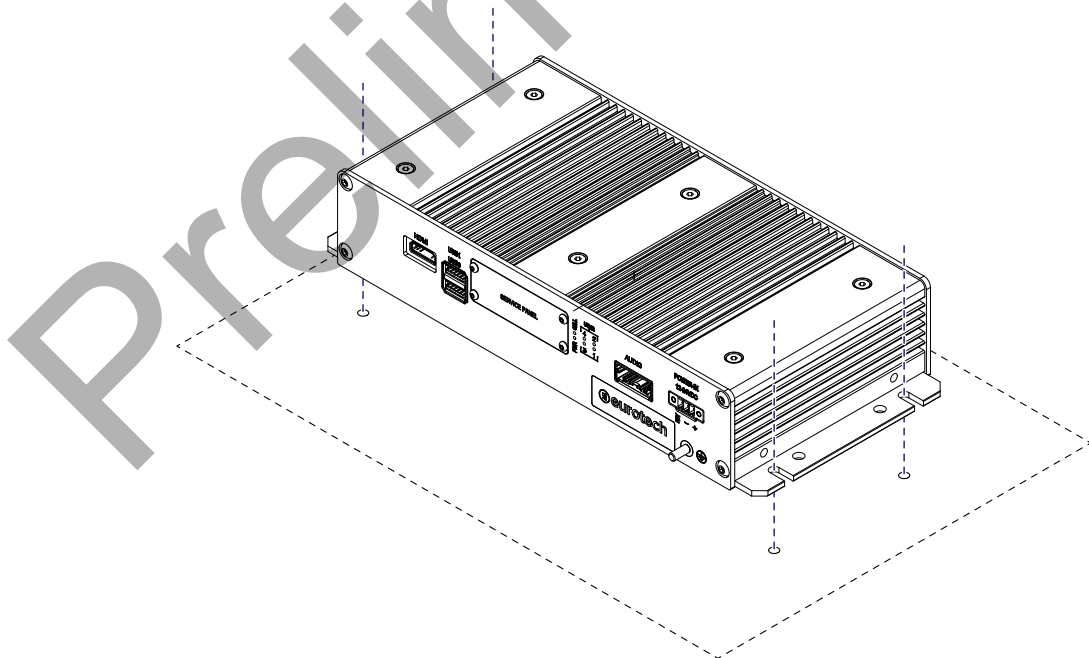


Fig. 11 - Example of how to install the product



12 PRODUCT POWER REQUIREMENTS

This chapter gives the following information:

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12.2 Power specifications	73
12.3 Power IN connector specifications	73
12.4 How to supply power and turn ON the product	74
12.5 Supercap-based power backup feature	76
12.6 Turning OFF the product	76
12.7 Reducing the power consumption of the product	76
12.8 How to reset the product	76

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12.1 Important note

This product does not have an ON/OFF switch.

The Power IN connector is the disconnecting means from the power supply network. Make sure that you can always reach the Power IN connector immediately.

12.2 Power specifications

The power input is protected against: surge, noise, reverse polarity, over-voltage.

Specification	Description
Power Supply	Nominal: 12 and 24 V DC; Range: 9 to 35 V DC with Transient Protection and Vehicle Ignition Sense
Power Consumption	Typical: 10 W; Sleep < 2.5 W

12.3 Power IN connector specifications



NOTICE

The Power IN connector is NOT protected against short circuit.
Always include an external fuse to protect the product.

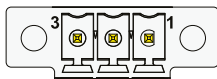


NOTICE

To make sure that the connection keeps the ITxPT compliance, use the optional accessory 99ACC-70000-A0004: Power ITxPT cable (described on page 48).

The Power IN connector has the following specifications:

Connector Layout:



Connector Specifications:

- Base strip, Header
- Gender: Male
- Type: 3-pin, 3.5 mm pitch

Mating Connector Specifications:

- Pluggable screw terminal block
- Gender: Female
- Type: 3-pin, 3.5 mm pitch
- Example:
Manufacturer: Phoenix Contact
Part Number: MC 1,5/ 3-STF-3,5 - 1847068
(or equivalent)

Connector Pinout:

Pin #	Signal	Type	Description
1	VIN +	P	Positive power supply input
2	VIN -	P	Negative power supply input
3	IGN_IN	P	KEY Signal



12.4 How to supply power and turn ON the product

12.4.1 Power supply safety instructions



WARNING

Risk of electric shock. Failure to supply power correctly could result in death or serious injury, and could damage the equipment or other property.

Refer to **"What to do before you supply power to the product"** below.

12.4.1.1 What to do before you supply power to the product

Before you supply power to the product, obey the following safety instructions:

- Make sure that you have understood any instructions for safety, installation, and for operation
- Make sure that your hands are dry
- Make sure that all the cables to use:
 - meet the product requirements and comply with the relevant standards and regulations
 - are in good condition
 - are placed with care
 - are not placed where they may be trampled or compressed
- Make sure that all power-points and plugs:
 - are in good condition
 - are not overloaded
- Make sure that the product has a proper grounding connection
- Make sure that the power supply source meets the product requirements and complies with the relevant standards and regulations
- Make sure that the product installation is made correctly and in compliance with the relevant standards and regulations
- Make sure that you supply power only after the product installation is completed.

If you have questions about these instructions, refer to: <https://www.eurotech.com/support>.

12.4.2 How to supply power and turn ON the product

Note: Refer also to **"Supercap-based power backup feature"** on the facing page.

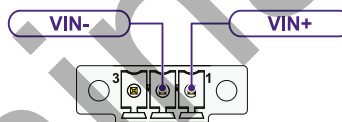
Note: The screw terminal block of the AC/DC Power Supply Adapter (refer also to **"Optional accessories"** on page 21) has the KEY pin connected to the "VIN +" pin.

If you use this AC/DC Power Supply Adapter, the **status of the DIP-switch slider 1** is not applicable:

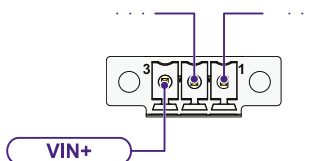
- To turn ON the DynaGATE 10-14, connect the AC/DC Power Supply Adapter

To supply power and turn ON the DynaGATE 10-14, complete this procedure:

1. Setup a DC power source that:
 - Meets the DynaGATE 10-14 power requirements
 - Delivers minimum power of 65 W
2. Check the input voltage (VIN) as close as possible to the Power IN connector. This is to compensate for any cable losses, caused by cable length and other cable characteristics
3. **Make sure that the DC power source is OFF**
4. Setup an external 3 A fuse on the line coming from the positive terminal of the DC power source
5. Connect the DC power source terminals to the Power IN connector:
 - "VIN +" to Pin 1
 - "VIN -" to Pin 2



6. Turn ON the DC power source.
According to the status of DIP switch slider SW1 (available in the Service Panel, refer also to **"DIP switch definitions"** on page 38), one the following options will occur:
 - If SW1 is OFF, the DynaGATE 10-14 will turn ON. The PWR LED will turn ON.
 - If SW1 is ON, the DynaGATE 10-14 will remain OFF.
To turn ON the DynaGATE 10-14, connect Pin 3 (IGN_IN/ KEY Signal) of the Power IN connector to "VIN +". The PWR LED will turn ON.
To keep the DynaGATE 10-14 ON, make sure that Pin 3 remains connected to "VIN +".
When connecting Pin 3 to "VIN +", keep it connected for at least 10 seconds.



12.5 Supercap-based power backup feature

The DynaGATE 10-14 is equipped with supercap-based power backup feature which can power the product for up to 2 minutes (depending on the CPU load and the active peripherals) after the power is removed. This feature enables a safe shutdown.

After 2 minutes have passed, even if the product appears to be OFF, some internal electronics remain powered until the supercap is fully discharged, this may take several minutes

After the bootstrap, to prevent data loss from unexpected power failure, some interfaces may not be immediately available until the supercap is fully charged.

When a power failure is detected during normal operation (supercap is fully charged), the product immediately turns OFF some interfaces. Other interfaces are given time to safely disconnect, save the system state, and unmount the file systems.

For more information, refer to: "DynaGATE 10-14 EL Software Manual".

12.6 Turning OFF the product

To turn OFF the DynaGATE 10-14, execute either a `poweroff` or `shutdown now` command.

The DynaGATE 10-14 will respond as follows, regardless of the SW1 status:

- If the KEY Signal (IGN_IN) is ON, the DynaGATE 10-14 turns OFF and restarts immediately
- If the KEY Signal (IGN_IN) is OFF, the DynaGATE 10-14 turns OFF and remains OFF until the IGN_IN comes ON again

IMPORTANT: After you executed a `poweroff` or `shutdown now` command, the supercap remains in charge until you disconnect the power supply source. Handle the DynaGATE 10-14 with care.

For more information, refer to:

- "DIP switch definitions" on page 38
- "Supercap-based power backup feature" above

Software services are available to initiate a software shutdown when the power supply source is disconnected, or when the KEY Signal (IGN_IN) is turned OFF. For more information, refer to: "DynaGATE 10-14 EL Software Manual".

12.7 Reducing the power consumption of the product

To reduce the power consumption of the DynaGATE 10-14, turn OFF the radio interfaces and disable unnecessary services.

12.8 How to reset the product

12.8.1 Hardware reset

To trigger a hardware reset of the DynaGATE 10-14, push the reset button available in the Service Panel.

12.8.2 Software reset

The product can be reset through software commands. For more information, refer to: "DynaGATE 10-14 EL Software Manual".

13 PRODUCT MAINTENANCE

This chapter gives the following information:

13.1 How to maintain the product 78

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13.1 How to maintain the product



WARNING

**Before you start product maintenance, always remove the power supply.
Failure to remove the power supply could result in death or serious injury.**

Periodically maintain the product to examine its integrity and to ensure its proper operation. A maximum inspection period of 2 years is recommended, though the installer must assess the impact of environmental conditions when selecting an appropriate inspection regime.

To maintain the product, complete this procedure:

1. Obey the instructions contained in the section ["Safety-related information" on page 7](#)
2. Remove the power supply from the product:
 - a. Make sure that your hands are dry
 - b. Turn OFF all the power supply sources
 - c. Disconnect all the cables
 - d. Make sure that all the circuits are discharged
3. Examine the product and cabling:
 - a. Make sure that the product is not damaged
 - b. Make sure that the LED indicators are visible and not damaged
 - c. Make sure that the external cabling is not damaged or frayed
4. Clean the product:
 - To remove the dust, use a dry lint-free cloth
 - To remove the dirt, use water-based non-flammable cleaning products
 - To dry the product, use a dry lint-free cloth
 - Do not use detergents, aerosol sprays, solvents or abrasive sponges
5. Examine the product installation:
 - a. Make sure that all the locking parts (for example: screws, bolts, nuts) are securely fastened
 - b. Make sure that the product is installed correctly (refer also to ["Product installation" on page 70](#))
 - c. Make sure that the product is grounded correctly (refer also to ["Earth connection terminal" on page 49](#)).



NOTES

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