ENGLISH

FLB 320A - 4G (LTE) EU

EWON FLEXY EXTENSION CARD

IG-0034-00
Publication date 2022-07-27

14 rue Edouard Petit
42000 St-Etienne
Tel : +33 477 92 03 56
Email : contact@rg2i.com
www.rg2i.com

This page is intentionally left blank.

Important User Information

Disclaimer

The information in this document is for informational purposes only. Please inform HMS Industrial Networks of any inaccuracies or omissions found in this document. HMS Industrial Networks disclaims any responsibility or liability for any errors that may appear in this document.

HMS Industrial Networks reserves the right to modify its products in line with its policy of continuous product development. The information in this document shall therefore not be construed as a commitment on the part of HMS Industrial Networks and is subject to change without notice. HMS Industrial Networks makes no commitment to update or keep current the information in this document.

The data, examples and illustrations found in this document are included for illustrative purposes and are only intended to help improve understanding of the functionality and handling of the product. In view of the wide range of possible applications of the product, and because of the many variables and requirements associated with any particular implementation, HMS Industrial Networks cannot assume responsibility or liability for actual use based on the data, examples or illustrations included in this document nor for any damages incurred during installation of the product. Those responsible for the use of the product must acquire sufficient knowledge in order to ensure that the product is used correctly in their specific application and that the application meets all performance and safety requirements including any applicable laws, regulations, codes and standards. Further, HMS Industrial Networks will under no circumstances assume liability or responsibility for any problems that may arise as a result from the use of undocumented features or functional side effects found outside the documented scope of the product. The effects caused by any direct or indirect use of such aspects of the product are undefined and may include e.g. compatibility issues and stability issues.

This page is intentionally left blank.

Table of Contents

1. Product Summary 1
1.1. Specifications 1
1.2. Antenna - FAC91201_0000 1

2. Safety, Environmental & Regulatory Information 2
2.1. Scope 2
2.2. ESD Damage Prevention 2
2.3. Applicable Directives, Standard and Compliances 2
2.3.1. Applicable Safety Standards 2
2.3.2. Certifications 2
2.4. Environmental Conditions 3

3. Hardware Description 4
3.1. Mechanical Layout and Interfaces 4
3.2. Label 4
3.3. Part Number 5
3.4. Front Panel 5
3.5. Antenna Diversity 6

4. Insertion of an Extension Card 7
4.1. Slot Compatibility 7
4.2. SIM Card Insertion 8
4.3. Into the Ewon Flexy Base Unit 9
4.4. Insertion of Multiple Extension Cards 10
4.4.1. Power Requirements 11
4.4.2. Software Compatibility 11
4.4.3. Detection Order 12

5. Card Detection on Embedded Web Page 13
5.1. Connect to Web Interface 13
5.2. Card Detection on Embedded Web Page 13
5.3. Modem Information in Information Page 13

Appendix A. Appendix 14
1. Isolation Scheme 14
1.1. Ewon Flexy base unit 14
1.2. FLB 320x - Cellular 14

Version	Date	Description
1.0	2022-06-01	First release
1.1	2022-07-27	Graphics (logo) update

1. Product Summary

The document describes the hardware of the Ewon® Flexy extension card FLB 320A - Cellular 4G EU which belongs to the Ewon Flexy family.

This guide also addresses shortly how the extension cards integrate the Ewon Flexy base units as well as some recommendations on how to mount them.

The Ewon Flexy family is a range of modular industrial gateway/router and as its name *Ewon Flexy* suggests, it has been designed to enable numerous different combinations of base units with extension cards.

The Ewon Flexy base units have their own Installation Guide which can be found on www.ewon.biz/support.

For additional related documentation and file downloads of the Ewon® Flexy extension card FLB 320A - Cellular 4G EU , please visit www.ewon.biz/support.

1.1. Specifications

WARNING
This device is intended to be used only in fixed applications. The antennas used for this transmitter have to be installed with a safe distance of at least 20 cm from any person and may not be co-located or operating in conjunction with any other antenna or transmitter.

Table 1.

Label	Value(s)	
Bands & Frequencies	LTE - B1 (2100 MHz), B3 (1800 MHz), B7 (2600 MHz), B8 (900 MHz), B20 (800 MHz), B28a (700 MHz) 3G - B1 (2100 MHz), B3 (1800 MHz), B8 (900 MHz)	
Tx Output Power	LTE all Bands: Class 3 (0.2W)	
Antennas Connector	Main: Type SMA-F Female Div: Type SMA-F Female	
Antenna[a] (not included in the delivery)	**Characteristic**	**Value(s)**
	Impedance	50 Ohms
	VSWR	<= 2:1
	Input Power	> 24 dBm average power
	Tightening Torque	0.5 Nm In the absence of a torque wrench, a soft manual tightening is sufficient.

[a]4G antenna has to be purchased separately. HMS Industrial Networks SA offers such antenna under *FAC91201_0000* reference.

1.2. Antenna - FAC91201_0000

For more general & technical information concerning the antennas that can be combined with the proper extension card, refer to the *Cellular 4G Antenna Accessory - FAC91201_0000* datasheet.

2. Safety, Environmental & Regulatory Information

2.1. Scope

The present heading addresses Safety, Environmental & Regulatory Information about the Ewon®
Flexy extension card FLB 320A - Cellular 4G EU.

This extension card belongs to the same compliance frame than the base units. In the present case of a telecommunication extension card, additional directives, standards and instructions apply.

2.2. ESD Damage Prevention

WARNING
Always use ESD precautions when handling extension cards and / or opened base unit as they contain parts and assemblies susceptible to be damaged by electrostatic discharge (ESD).

The extension card described in this document is a module exposing both sides of an electronic printed circuit board. Therefore, it is packed in an antistatic ESD bag. In order to avoid ESD damage, the product must be handled with the necessary precaution including:

- Grounded ESD protective work surface
- Personnel grounding

2.3. Applicable Directives, Standard and Compliances

The FLB 320A - Cellular 4G EU extension card inserted in a base unit belongs to class A Information Technology Equipment (ITE).

In a domestic environment, this product may cause radio interference in which case the user may be required to take appropriate measures

2.3.1. Applicable Safety Standards

The FLB 320A - Cellular 4G EU extension card is in conformity with the following safety standards:

- EN 62368-1:2014 + A11:2017
- UL 62368-1 Second Edition
- CAN C22.2 No. 62368-1-14 Second Edition

2.3.2. Certifications

The FLB 320A - Cellular 4G EU extension card has been certified by authorized bodies:

- UL Certificate of Compliance (COC) UL-CA-2146131-1
- CB certificate : DK-84039-M3-UL

These certi icates can be downloaded as PDF iles on www.ewon.biz/support.

2.4. Environmental Conditions

The equipment operates properly within the following environmental limits if it has been correctly mounted according our recommendations:

Table 2. Environmental conditions

Operating temperature	-25°C to +60°C
Operating altitude	Up to maximum 2000m
Storage temperature	-30°C to +70°C
Storage altitude	Up to maximum 3000m
Storage humidity	10 to 95% non-condensing
Relative humidity	10 to 95% non-condensing

IMPORTANT
In any other mounting situation than the one mentioned, the specified operating temperature has to be derated to -25°C to +40°C.

3. Hardware Description

3.1. Mechanical Layout and Interfaces

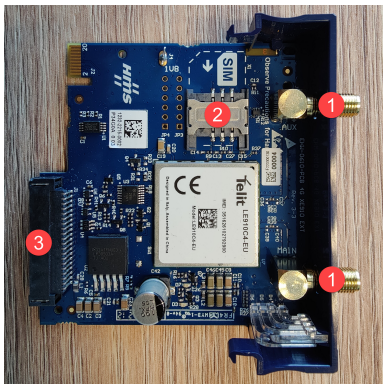


Table 3. Name and position of the connectors

#	Description
1	SMA-F Female Main antenna connector & DIV antenna connector
2	SIM card drawer
3	Backplane connector

3.2. Label

The identification label of the FLB 320A - Cellular 4G EU extension card is placed on the solder side of the PCB.

The different parts of the label are described as follows:

Figure 1. Label example of an FLB 320A - Cellular 4G EU extension card

Table 4. Label of an FLB 320A - Cellular 4G EU extension card

Mark	Description
PN	Part Number
SN	Serial Number in the form of *MMMM-YYWW-SSSSPP* • *MMMM*: MTID (product related) • *YYWW*: year and week of production • *SSSS*: sequential manufacturing order • *PP*: product type
Marks	CE, UL, ... logos if applicable

3.3. Part Number

Table 5. Syntax of the part number: **FLYXXXX_00/S**

Syntax	Description	Possible value		
FL	*FL* is the prefix for the extensions of the Ewon Flexy family	FL (constant)		
Y	1 alphabetic sign (CAP) Defines the slots of the base module in which the extension card can be inserted	A	2 first slots only	●●○○
		B	2 last slots only	○○●●
		X	Any slots	●●●●
		C	Any slots. Available for Ewon Flexy 205 only.	●●
XXXX_00	The extension card type. The suffix *_00* is used for software options			
/S	The suffix might have an optional "/" character. It might also be blank or include *S* character. This indicates compliance with the UL/IEC/EN 60950 standard.			

3.4. Front Panel

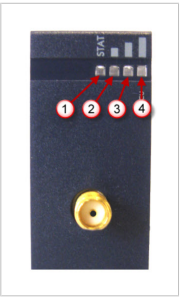


Figure 2. LEDs on the front panel

Table 6. LEDs on the front panel

#	Mark	Description
1	STAT	Tricolor: Red / Orange / Green. Green ON = Modem is online.
2	■	Reception Signal level. Orange ON = level > 1 → poor signal
3	■■	Reception Signal level. Orange ON = level > 10 → signal ok
4	■■■	Reception Signal level. Orange ON = level > 16 → good signal

NOTE
The LEDs represent only the signal level and not the type of technology (LTE, 3G, ...) used to perform a connection.

During the modem boot process, only the first LED *STAT* is steady orange. If it remains orange, it means the modem card was inserted in a wrong slot. This induces a base unit boot error pattern on its *USR* LED as well.

If all signal level LEDs are off, it either means that:

- the modem was not configured;
- the modem configuration is invalid (including wrong PIN-code);
- there is no signal at all (level 0);

- • there is a reception error (level 99);

3.5. Antenna Diversity

Antenna diversity is a is wireless schemes that uses - at least - 2 antennas to improve the quality and reliability of a wireless link. We strongly advice to use the diversity antenna as it helps the gateway to achieve the maximum network coverage.

The FLB 320A - Cellular 4G EU extension card provides 2 SMA connectors: *Main* and *Div*.

- **Main**
  Its purpose is to connect the main antenna. It is always mandatory.
- **Div**
  Its purpose is to connect an optional second antenna and take advantage of the antenna diversity feature.
  If not used, it is recommended to place a cap on the diversity antenna port to avoid premature damage for future use. By default, there is already one. You will have to remove the cap if you intend to use the diversity antenna.

Please note that you don't have to activate our deactivate any settings: the *Div* port is always enabled.

NOTE
The second antenna must not be placed in the immediate vicinity of the main antenna.

To improve diversity gain and isolation and reduce mutual interactions, the two antennas should be placed as far apart as possible, taking into consideration the available space within the application.

Example:
For the antennas FAC91201_0000, the minimum recommended distance is 80 cm between them.

4. Insertion of an Extension Card

4.1. Slot Compatibility

The FLB 320A - Cellular 4G EU extension card must be inserted in one of the *B* slots of the base unit.

The reference code of the extension cards includes a letter de ining their compatibility:

- FL**A** xxxx: designate cards that fit into *A* slots.
- FL**B** xxxx: designate cards that fit into *B* slots.
- FL**X** xxxx: designate cards that fit into any slot.
- FL**C** xxxx: designate cards that fit into any slot of the Ewon Flexy 205.

In addition to the card reference, each type of extension card bears a visual compatibility symbol on its front panel:

Table 7. Slot compatibility for each type of extension card

Design	Slot Type	Flexy 205	Other Flexy
●●○○	A	Any slot	2 first slots
○○●●	B	Any slot	2 last slots
●●●●	X	Any slot	Any slot
●●	C	Any slot	/

→ Ewon Flexy 205

As the Ewon Flexy 205 has room for 2 slots, the type slot compatibility rule doesn't apply. The FLB 320A - Cellular 4G EU extension card can be inserted in both slots.

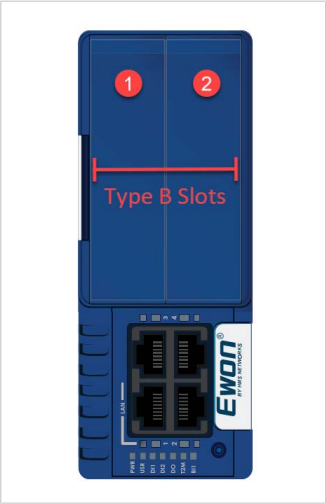


Figure 3. Position of the *B* Slots on an Ewon Flexy 205

→ All other Ewon Flexy

The FLB 320A - Cellular 4G EU extension card must be inserted in the *B* slots which are the two slots on the far right of all other Ewon Flexy.

Figure 4. Position of the *B* Slots on all other Ewon Flexy.

WARNING
Cards that fit only in one slot type have a mechanical mistake-proof security to prevent them from being inserted in an incorrect slot type.

4.2. SIM Card Insertion

You must acquire a SIM card obtained from a wireless phone provider is necessary to communicate through the FLB 320A - Cellular 4G EU extension card.

It must be inserted before inserting the extension card in the base unit as there is no external access to the SIM card holder.

The SIM card holder is located on the components side of the extension card.

Proceed as follows to insert the SIM card:

1. Slide carefully the SIM card in the holder, as shown in the picture below.
   Note the position of the cutoff *(1)* of the SIM card.
2. Make sure the card is fully inserted against its arrest.
   If not, it could damage both the drawer and the SIM card when the extension card will be inserted in the base unit.

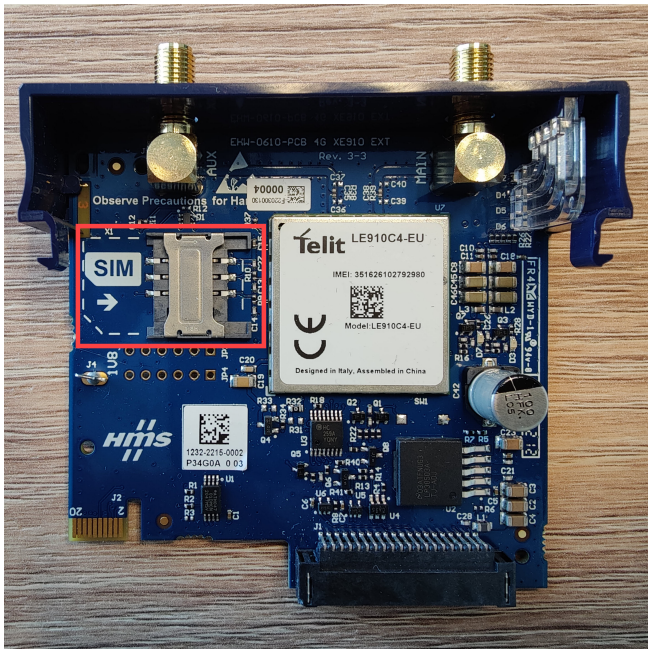


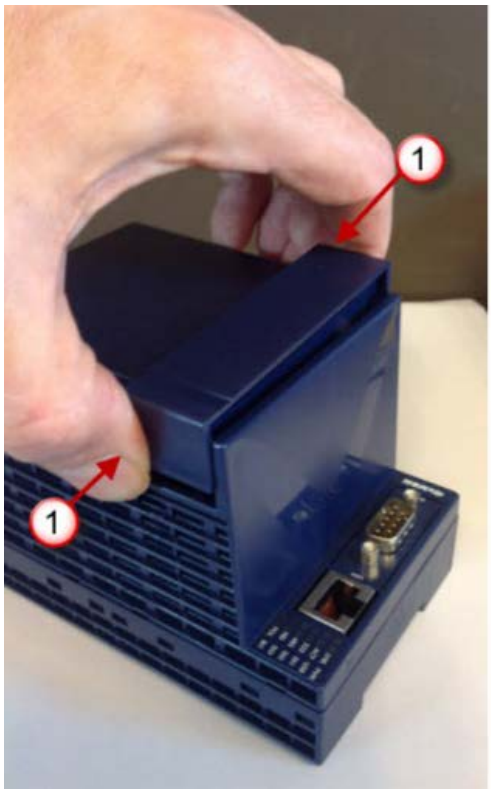
Figure 5. SIM card insertion

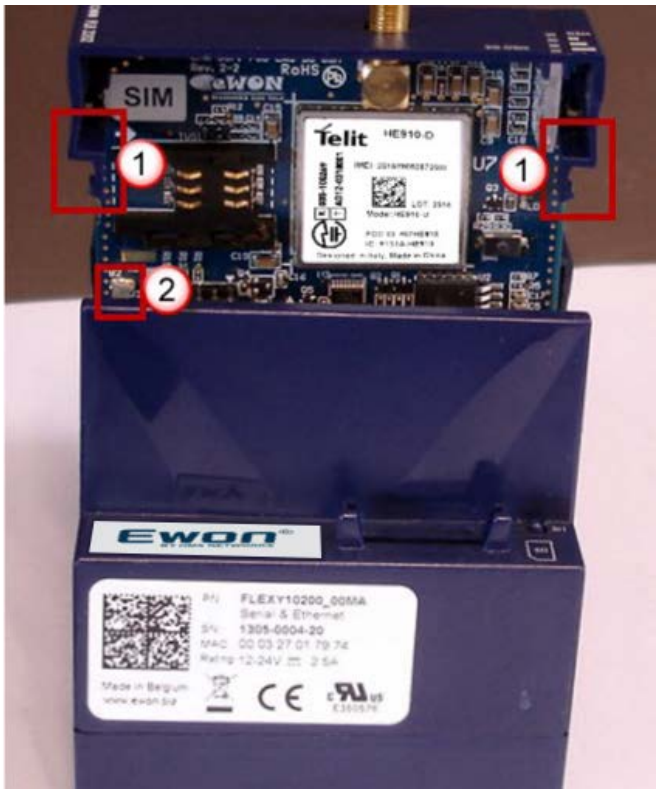
4.3. Into the Ewon Flexy Base Unit

Wait 30 seconds after turning off the equipment before inserting (or removing) an extension card to avoid possible damage to the base unit and the extension cards.

To insert the FLB 320A - Cellular 4G EU extension card in the Ewon Flexy base unit, proceed as follows:

1. Remove the slot filler of the location the new card will be inserted in. To do so, press on both ends of the cover, note that the hooks are off-centered.





Removal of the slot fillers

Table 8.

1	Hooks to be pressed are off-centered. Press while pulling upwards.
2	This metal tag soldered on the PCB acts as mistake-proof security (mating stop in housing). This mechanism doesn't apply on the Ewon Flexy 205.

2. Insert the extension card carefully and slide it down until the hook clicks. Make sure the card is completely inserted.
   DO NOT insist if a resistance is felt when trying to insert the card. This can occur if the extension card is inserted in a wrong slot type. In such case, check slot compatibility of the relevant extension card.
3. Boot the unit for the inserted extension cards to be detected.
   The web interface of the Flexy base unit has a diagnostic page showing the extension cards in their order of detection (from left to right).

WARNING
If an extension card is inadvertently forced in a wrong slot, the base unit will detect the misplaced card and will not complete its boot process. Therefore, the unit will not be accessible through its LAN interface. The slot error is returned by the *USR* LED (red ON 1sec, OFF 0.5 sec).

4.4. Insertion of Multiple Extension Cards

4.4.1. Power Requirements

The internal power converter of the Ewon Flexy base units has been dimensioned to cover a broad range of different combinations of extension cards.

Users should make sure the total power demand of the extension cards does not exceed the capabilities of the base unit. That is why the notion of *Energy Points* has been introduced.

The *Ewon Flexy - Base Units* installation guide includes a section giving the *Available Energy Points* of each type of base unit.

The power requirements of each extension card is expressed in *Energy Demand Points*. This number is meant to check whether the balance with the *Available Energy Points* of a given base unit with extension cards is OK or not.

The *Energy Demand Points* of the FLB 320A - Cellular 4G EU extension card is 8. (standard operating mode)

The *Ewon Flexy - Base Units* installation guide also includes examples of practical power balance calculations.

4.4.2. Software Compatibility

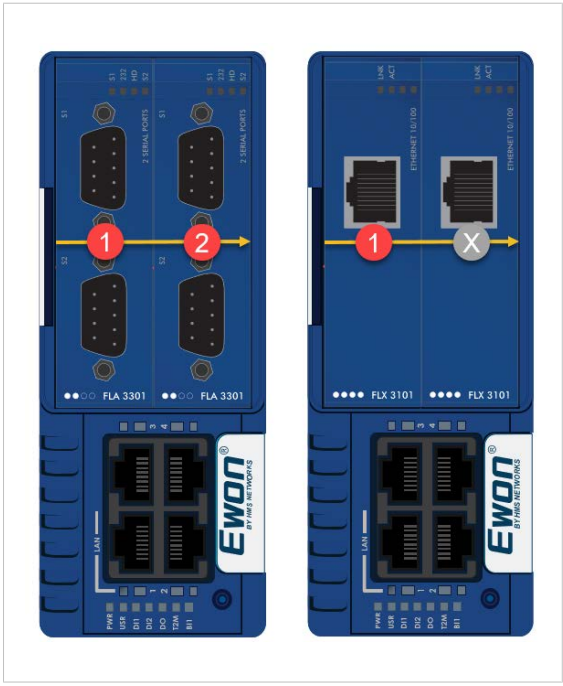
The base unit allows the insertion of multiple extension cards, sometimes of the same type.

Some configurations including multiple extension cards, even if mechanically acceptable, are not supported by the embedded software. Cards in excess are ignored during the automated detection process which means that the base unit and its running extension cards will operate normally.

The Ewon Flexy firmware currently supports up to 1 FLB 320A - Cellular 4G EU extension card.

The ignored card(s) will appear in the *Diagnostic* → *Status* → *System Info* → *System* but they will not be functional.

Example 1. 2 serial ports vs 2 Ethernet ports



This picture shows an example of a configuration that would be OK mechanically and power wise but would not be supported by the firmware.

During the boot process, the first 2 serial port extension cards are detected and both can be used.

In the case of 2 single Ethernet cards, these 2 cards are also detected but the second Ethernet card is not supported by the firmware and cannot be used.

The presence of this *ignored* card in the base unit does not alter the operation of the base unit itself nor does it alter its *accepted* extension cards.

4.4.3. Detection Order

The boot sequence of the base unit includes an automated detection of the inserted extension cards. This detection is done sequentially, slot per slot starting from left to right (when holding the base unit with its logo on the right side).

5. Card Detection on Embedded Web Page

The Ewon Flexy extension cards require no software configuration. They are automatically detected by the base unit when the device boots.

5.1. Connect to Web Interface

To connect to the web interface of your Ewon device, proceed as follows:

1. Configure the network parameters to set the computer that will be linked to your Ewon device on the same IP range than the LAN interface of this Ewon device.
2. Connect the PC to one of the LAN port of the Ewon device once both devices are in the same IP range.
3. Open an Internet browser.
4. Access the homepage of the Ewon device by typing the LAN IP address in the URL field.
   Default IP address is 10.0.0.53.
   A dialog box will pop-up asking for credentials. Default ones are:
   - login: adm
   - paddword: adm

WARNING
For security reasons, changing the default password *adm* is an absolute requirement. To change it, from the menu bar, click on *Setup* → *Users* and double click on the *adm* entry to edit and save its password.

5.2. Card Detect on on Embedded Web Page

The Ewon Flexy extension cards require no software configuration. They are automatically detected by the base unit when the device boots. (Minimal Ewon Flexy Firmware required: 14.6)

5.3. Modem Informat on in Informat on Page

Extended information about the modem - including manufacturer, type and modem firmware version - is available in the *Info* page.

The path to the Info page is *Diagnostic* → *Status* → *System Info* → *Info*.

Appendix A. Appendix

1. Isolation Scheme

1.1. Ewon Flexy base unit

Table A.1. Isolation scheme for all Ewon Flexy base units

	Flexy 201	Flexy 202, 203	Flexy 205
Connector shielding	Earth connected		
Ethernet signals	Isolated from DGND with a transformer		
MPI / serial ports	/	Isolated from PGND only	/

WARNING
Serial ports GND = DGND

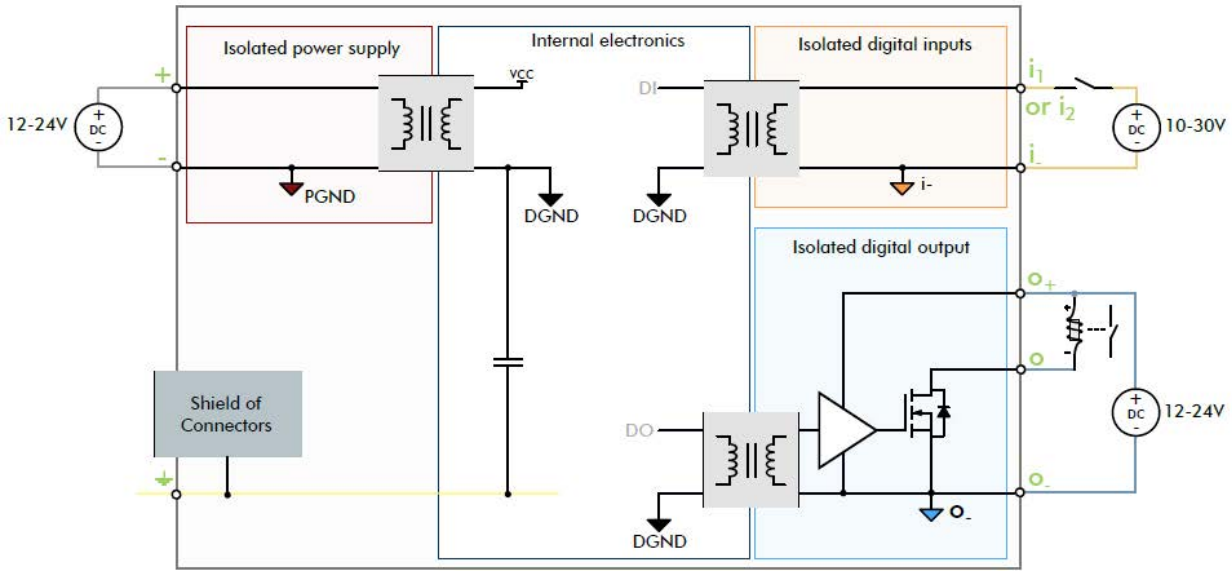


Figure A.1. Graphical representation of Ewon Flexy's isolation scheme

Based on the above picture:

- External and internal power supplies are isolated from each other (1.5kV)
- DI signals: isolated from DO signals, PGND and DGND (optocoupler)
- DO signals: isolated from DI signals, PGND and DGND (optocoupler)
- Earth is isolated from external and internal power supplies

1.2. FLB 320x - Cellular

DGND = GND RF from SMA connector

WARNING
Avoid external connections between GND RF and Earth.

Spécialiste IoT & M2M

14 rue Edouard Petit
42000 St-Etienne

Tel : +33 477 92 03 56
Email : contact@rg2i.com

www.rg2i.com