FLB 3601 – 3 USB Ports Extension Card

INSTALLATION GUIDE

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14 rue Edouard Petit
42000 St-Etienne

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

www.rg2i.com

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1 Preface

1.1 About This Document

This document describes the hardware of the FLB 3601 – 3 USB ports extension card which belongs to the Ewon Flexy family.

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.

For additional related documentation and file downloads, please visit www.ewon.biz/support.

1.2 Document History

Version	Date	Description
1.0	2016-07-05	First release
1.2	2018-08-03	Changed: Template
1.3	2019-09-03	Changed: *Safety, Environmental & Regulatory Information, p. 5* Changed: *Ewon Flexy Extension Cards Environmental Conditions, p. 9*

1.3 Related Documents

Document	Author	Document ID
Ewon Flexy – Base Units	HMS	IG-0014-00
Ewon Flexy 205	HMS	IG-0028-00

1.4 Trademark Information

Ewon® is a registered trademark of HMS Industrial Networks SA. All other trademarks mentioned in this document are the property of their respective holders.

2 Product Summary

The present Installation Guide is focusing on the FLB 3601 – 3 USB ports extension card which, as such, needs to be inserted in one of the Flexy base units to work.

The base units have their own Installation Guide which can be found in the *Related Documents, p. 3*.

This guide also addresses shortly how the extension cards integrate the base units as well as some recommendations on how to mount them. See *Base Unit Slot Compatibility, p. 9* for more details.

3 Safety, Environmental & Regulatory Information

3.1 Scope

The present heading addresses Safety, Environmental & Regulatory Information about the FLB 3601 – 3 USB ports extension card.

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

3.2 ESD Damage Prevention

> **!** 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

3.3 Applicable Directives, Standards and Compliances

The FLB 3601 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.

3.3.1 Applicable European Directives

The FLB 3601 is in conformity with the following EC directives:

- RoHS Directive 2011/65/EU
- RE Directive 2014/53/EU

3.3.2 Applicable Safety Standards

The FLB 3601 is in conformity with the following safety standards:

- IEC / EN 60950-1
- UL 60950-1
- CSA-C22.2 No 60950-1-07
- EN/IEC 62368-1
- UL 62368-1
- CAN 62368-1

3.3.3 FCC Compliance

The FLB 3601 complies with Part 15 of the FCC Rules. Operating is subject to the following two conditions:

- This product may not cause harmful interference
- This product must accept any interference received, including interference that may cause undesired operation.

3.3.4 Certifications

The FLB 3601 has been certified by authorized bodies:

- UL Certificate of Compliance (COC) # 20190529_E350576
- CB certificate # DK-84039-UL

These certificates can be downloaded as PDF files on the Ewon support web site: www.ewon.biz/support

4 Hardware Description

4.1 Mechanical Layout and Interfaces

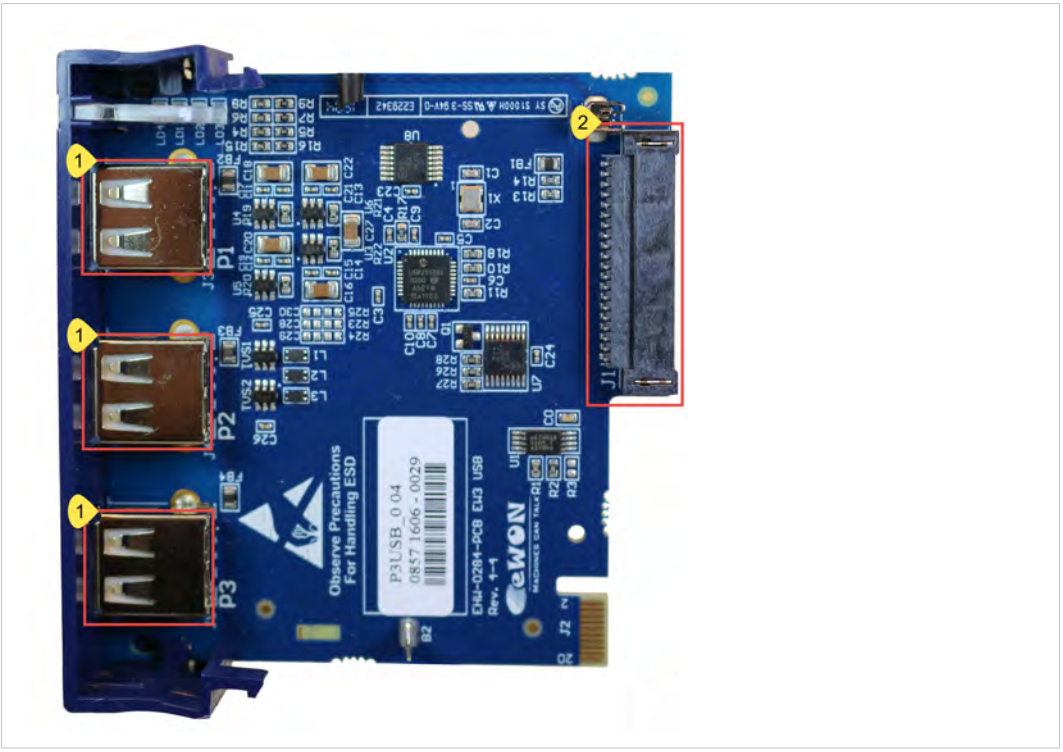

Fig. 1 Mechanical layout and interfaces

1	USB connectors
2	Back-plane connector

4.2 Extension Card Label

4.2.1 Label Location and Included Information

The identification label of the extension cards is placed on the solder side of the PCB.

The different parts of the label are described below:

Label	Description
PN	Part Number (see syntax table below)
SN	Serial Number in the form: **MMMM-YYWW-SSSS-PP** • MMMM : MTID (product related) • YYWW : Year and week • SSSS : Sequential manufacturing order • PP : Product type
MIN. FW	Minimum firmware version required in the Ewon device
Marks	CE, UL... certification number and logos if applicable

Fig. 2 FLB 3601 label

4.2.2 Part Number Structure for Extension Cards

FLYXXXX_00/S				
FL	FL is the prefix for the extensions of the Ewon Flexy family	Only 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 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 => Indicates compliance with the UL/IEC/EN 60950 standard.			

4.3 Front Panel LEDs

Item	Mark	Function
1	STAT	**GREEN** ON when USB Card is ready **RED** if Card is out of current limiting (See *USB Specifications, p. 9*)
2	P1	Blinking **GREEN** when activity on USB 1 **RED** if USB 1 out of current limiting
3	P2	Blinking **GREEN** when activity on USB 2 **RED** if USB 2 is out of current limiting
4	P3	Blinking **GREEN** when activity on USB 3 **RED** if USB 3 is out of current limiting

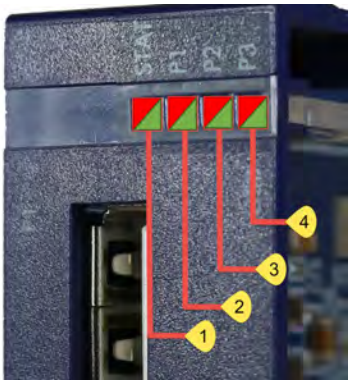

Fig. 3 Front panel LEDs

STAT	P1	P2	P3	Description
Green	Off	Off	Off	Board initialization
Off	Off	Off	Off	Board not in use, USBIP disabled
Green	Green	Green	Green	USBIP enabled
Red	Red	Red	Red	Error on USB hub (see *Checking the Real-time Log, p. 19*)

4.4 Ewon Flexy Extension Cards Environmental Conditions

Characteristics	Value
Operating Temperature	-25 to +60°C
Storage temperature	-40 to +70°C
Relative humidity	10 to 95% non-condensing
Operating altitude	Up to maximum 2000m
Storage altitude	Up to maximum 3000m

4.5 USB Specifications

Characteristic	Value
Absolute maximum of total current limit	500 mA max.
Maximum current limit by USB port	500 mA max.

Earth - gnd is limited to 500V due to USB connector.

4.6 Plug the FLB 3601 into the Base Unit

4.6.1 Base Unit Slot Compatibility

The FLB 3601 must be inserted in one of the “Type B” slots of the base unit.

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

- FL**B** xxxx: designate cards that fit into “Type B” slots.

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

Design	Slot Type	Flexy 205 Location	Flexy 10x & 20x
○○●●	Type B	Any slot	2 last slots only

Ewon Flexy 205

As the Flexy 205 has room for 2 slots, the type slot compatibility rule doesn’t apply. The FLB 3601 can be inserted in both slots.

Fig. 4 Position of the “Type B” Slots on a Flexy 205.

Ewon Flexy 10x & 20x

The FLB 3601 must be inserted in the “Type B” slots which are the two slots on the far right of the Flexy 10x & 20x.

Fig. 5 Position of the “Type B” Slots on a Flexy 10x & 20x.

> **!** 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.

4.6.2 How to Insert into the 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.

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

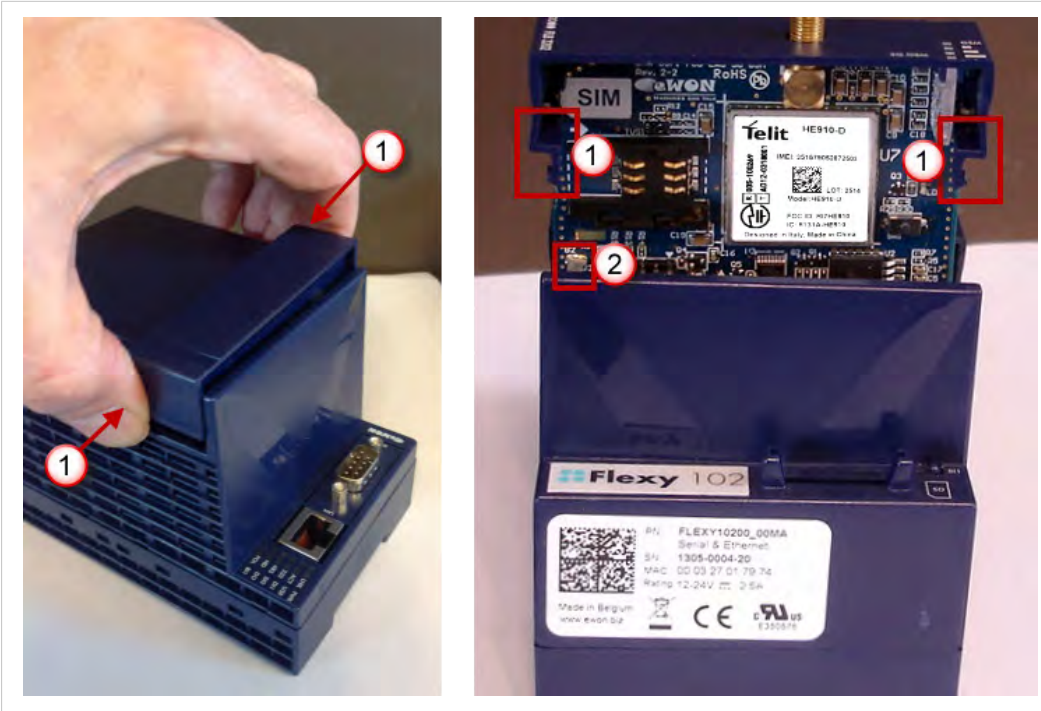

Fig. 6 Remove the slot fillers

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). Doesn't apply on Flexy 205.

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.

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).

> **!** 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 1 sec, OFF 0.5 sec).

4.6.3 Insertion of Multiple FLB 3601

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).

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 Flexy firmware currently supports up to **1** FLB 3601.

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

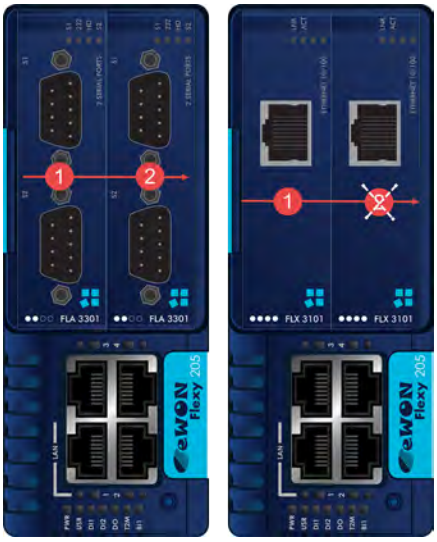

Fig. 7 Order of the Extension Cards

The picture above 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 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.

4.7 Power Requirements

> **!** The “Power Requirements” concept doesn’t apply to Flexy 205 and its inserted extension cards.

The internal power converter of the 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 Installation Guide “eWON Flexy - Base Units” 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 3601 is **9**

The Installation Guide of the “eWON Flexy - Base Units” also includes examples of practical power balance calculations.

5 Powering on the Base Unit with its Extension Cards

When the base unit is powered on, it takes approximately 25 seconds for the unit to go through its self-test procedure. The slots in which the extension cards have been inserted and their type are detected during this process.

If the boot process completes normally, the following LED status should be observed:

- Base unit : **USR** LED flashing green slowly
- Extension card : None

> **!** If the **USR** LED of the base unit is flashing red, it might be because the extension card was improperly inserted (for example in a wrong slot).

6 Check Card Detection on the Embedded Web Page

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

6.1 Connecting to the Embedded Web Server

Configure the network parameters to set the computer being used to reach the web interface on the same IP range than the LAN of the Ewon device.

Once both devices are in the same IP range, connect the PC to one of the LAN port of the Ewon device.

Open an Internet browser and access the homepage of the Ewon device by typing the LAN IP address in the URL field (the default address is http://10.0.0.53).

A dialog box will pop-up asking for credentials. Default ones are:

- login: adm
- password: adm

> **!** 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.

6.2 Detected Cards Displayed in the System Page

Once connected to the embedded web pages of the Ewon device, the homepage displays the system status including detected extension cards.

To access in details the system status summary, click on ***Diagnostic > Status > System Info > System***.

7 Ewon Configuration to work with a USB Extension Card

The “UsbIPEnable” parameter need to be correctly set in the Ewon Flexy Base unit to activate the FLB 3601 card detection. If the “UsbIpEnable” is not correctly set, the FLB 3601 card will not be activate (all LEDs OFF on the USB card).

7.1 Software Configuration Parameters

Browse to **Setup** > **System** >**Storage** > **Tabular edition** > **Edit Com cfg** & search for “Usb”.

In the ComCfg edition, 4 parameters can be changed:

- **UsbIPEnable**: Enable or disable the USB Extension Card
- **UsbIpLogLevel**: Set the level of the USB log. Three levels are available (starting from general to deep) : 0, 1 or 2
- **UsbIpPwd**: A password can be set on the USB to protect it.
- **UsbIpStartPort**: The port number for USB devices the firmware should increment from.

The USB functionality will start or stop accordingly to the “UsbIpEnable” parameter.There is no need to restart the device to apply the new configuration.

“UsbIpLogLevel”, “UsbIpPwd”, “UsbIpStartPort” parameters are only used in advanced configuration or for debug purpose. Modification of these parameters is not recommended

7.1.1 Default Values after Reset

After a reset the “UsbIPEnable” parameters will be set :

- To 1 if a USB extension board is plugged in the Flexy
- To 0 if a USB extension board is NOT plugged in the Flexy

Check label of Extension card for FW compatibility, the Ewon Flexy Base unit must be updated to the required firmware before insertion of the FLB 3601 – 3 USB ports extension card.

The Ewon base unit will not boot correctly if an FLB 3601 – 3 USB ports extension cardis plugged in an Ewon Flexy with a firmware version under FW 11.2

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A Checking the Real-time Log

The real-time log will show when the USBIP service is started / stopped:

31/05/2016 10:06:08	USBIP	Start the USB interface
31/05/2016 10:06:08	USBIP	Registration successful
31/05/2016 10:06:08	USBIP	Enter the license key
31/05/2016 10:05:44	USBIP	Stop the USB interface
31/05/2016 10:05:42	USBIP	Config has changed

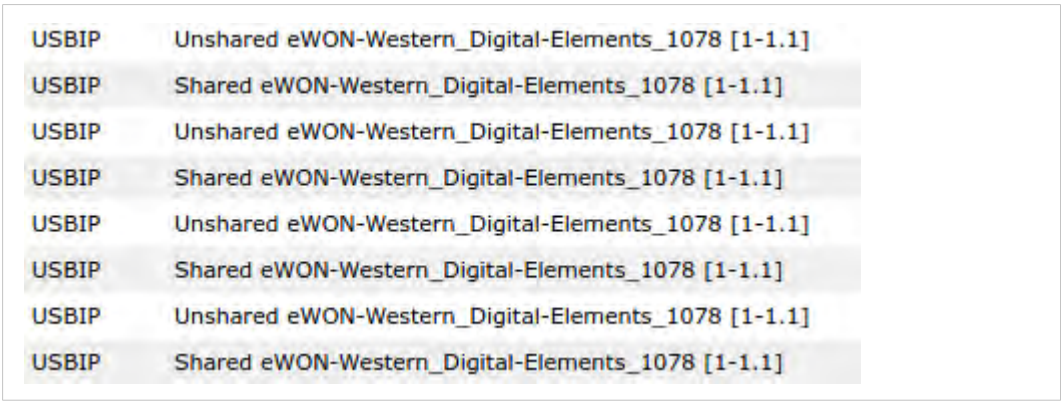
Fig. 8 Real-time Log of an active USB extension card

In case of error (**RED** LEDs on FLB3601 card), check the real-time log to get more information.

The “UsbIpLogLevel” parameter can be set to 2 in order to retrieve additional information in the logs.

The USB hub will only provide 500mA per port and will disconnect any device attempting to draw more. For example, some USB devices (like self-powered HDDs) draw too much current.

In that case, the LED will become RED, then GREEN again and the real-time log will show the repetitive (failed) sharing attempts:



USBIP	Unshared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Shared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Unshared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Shared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Unshared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Shared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Unshared eWON-Western_Digital-Elements_1078 [1-1.1]
USBIP	Shared eWON-Western_Digital-Elements_1078 [1-1.1]

Fig. 9 Real-time Log showing repetitive sharing attempts