

eWON Flexy
8DI-4AI-2DO Extension Card
FLX 3401
Installation Guide



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This installation guide explains how to install the eWON Flexy 8DI-4AI-2DO Extension Card FLX 3401.

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1. Introduction

The present Installation Guide describes the hardware of the **8DI-4AI-2DO Extension Card - FLX 3401** of the eWON Flexy family.

The eWON Flexy family is a range of modular industrial gateway/router.

As the name eWON Flexy suggests, it has been designed to enable numerous different combinations of **Extension Cards and Base Units**. The present Installation Guide is focusing on an extension card which, as such, needs to be inserted in one of the Base Units in order to work. The Base Units have their individual Installation Guide IG-014-0-EN "eWON Flexy - Base Units". The present guide addresses shortly how the Extension Cards integrate the Base Units and we give some recommendations to mount them (see § [3.6 Plugging the Extension Card into the Base Unit](#)).

Note: Though being referred to as *Digital Outputs*, these 2 outputs are actually Normally Open (NO) relays.

2. Safety, Environmental & Regulatory Information

2.1 Scope

The present section addresses Safety, Environmental & Regulatory Information for the 8DI-4AI-2DO Extension Card FLX 3401. This Extension Card is basically belonging to the same compliance frame than the Base Units.

2.2 ESD Damage Prevention

Caution!

Contains parts and assemblies susceptible to damage by electrostatic discharge (ESD). Always use ESD precautions when handling Extension Cards and the opened Base Unit.

The Extension Card described in the present Installation Guide is a module exposing both sides of an electronic printed circuit board. Therefore, it is packed in antistatic ESD bags. 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, Standards and Compliance

The Extension Card described in the present Installation Guide 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 European Directives

The Extension Card described in the present Installation Guide is in conformity with the following EC directives:

- RoHS Directive 2011/65/EU
- EMC Directive 2004/108/EC

2.3.2 Applicable Safety Standards

The Extension Card described in the present Installation Guide is in conformity with the following safety standards:

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

2.3.3 FCC Compliance

The Extension Card described in the present Installation Guide complies with Part 15 of the FCC Rules. Operating is subject to the following two conditions:

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

2.3.4 Certifications

The Extension Card described in the present Installation Guide has been certified by authorized bodies:

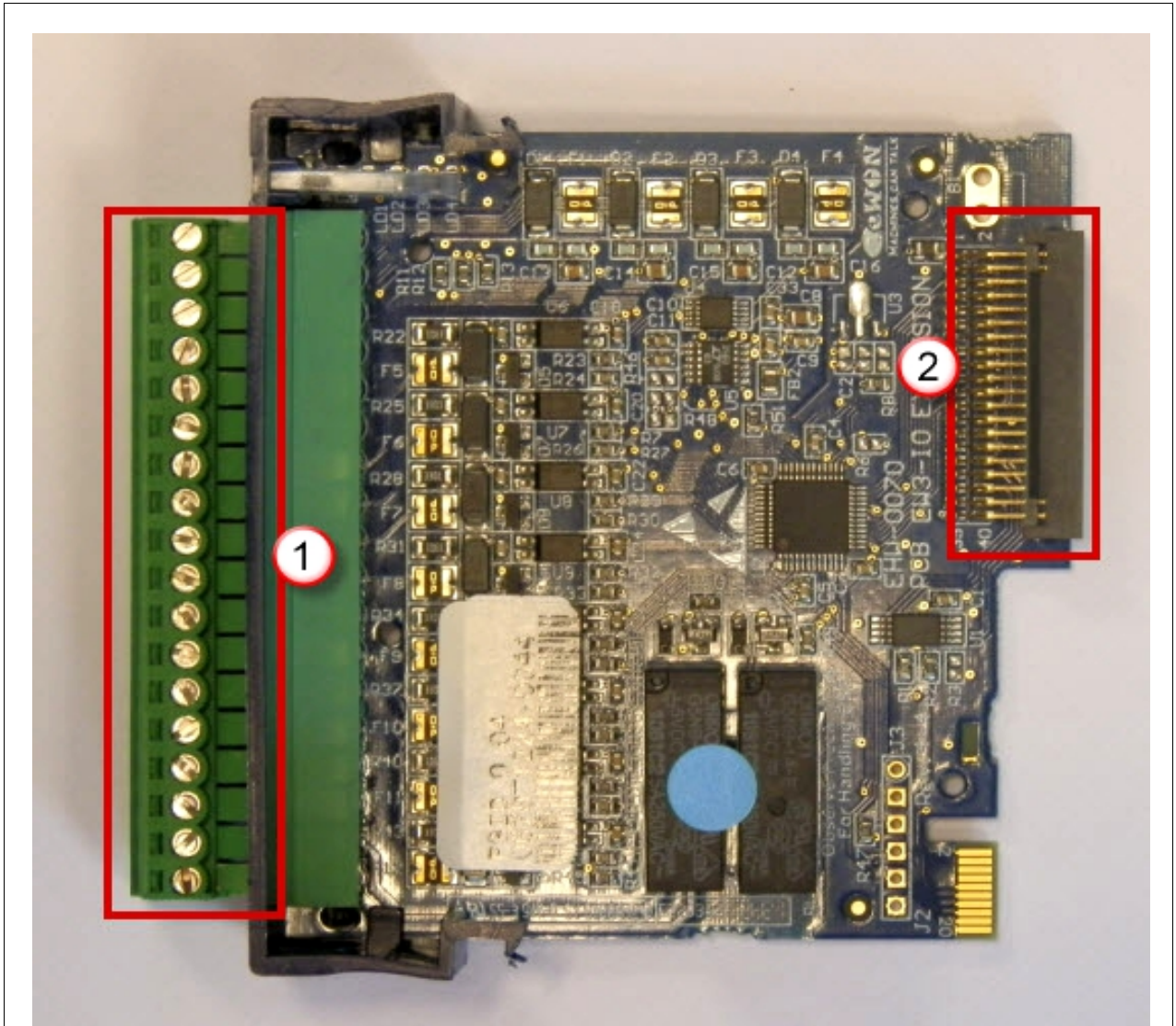
- UL declaration of conformity (DOC) # E350576
- CB certificate # DK-29479-M1-UL

These certificates can be downloaded as PDF files on the eWON Support web site:

http://wiki.ewon.biz/Support/07_Documentations/Official_documents

3. Hardware Description

3.1 Mechanical Layout and Interfaces



①	IO mating connector 18 screw terminals
②	Back-plane connector

3.2 Extension Card Label

3.2.1 Label Location and Information Included

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:

	<p>PN</p>	<p>Part Number: identifies the type of the card. Description see 3.2.2 Part Number Structure for Extension Cards</p>
	<p>SN</p>	<p>Serial Number Structure of the Serial Number 1111-2233-0001-44</p> <p>1111 = MTID (product related) 2233 = Year Week 0001 = sequential mfg order 44 = product type</p>
	<p>Marks</p>	<p>CE, UL,... certificate number and logos if applicable.</p>

3.2.2 Part Number Structure for Extension Cards

FLX 3401_00

FL	FL is the prefix for the extensions of the eWON Flexy family	Only FL (constant)		
X	1 alphabetic sign (CAP) Defines the slots of the base module in which the extension can be inserted. See also 3.6.1 Base Unit Slot Compatibility	A	2 first slots only	●●○○
		B	2 last slots only	○○●●
		X	In any slot	●●●●
3401_00	8DI-4AI-2DO Extension Card. The suffix _00 is used for software options.			

3.3 Front Panel LEDs

Item	Mark	Function	Picture
①	DI	Reflects a DI status change. Toggles between ON and OFF at every DI status change (*)	
②	AI	Blinking Green = Acquisition running on all AI	
③	REL1	ON Green when relay 1 is closed	
④	REL2	ON Green when relay 2 is closed	

(*) Two simultaneous status changes on different DI will result in no LED status change.

3.4 IO Specifications

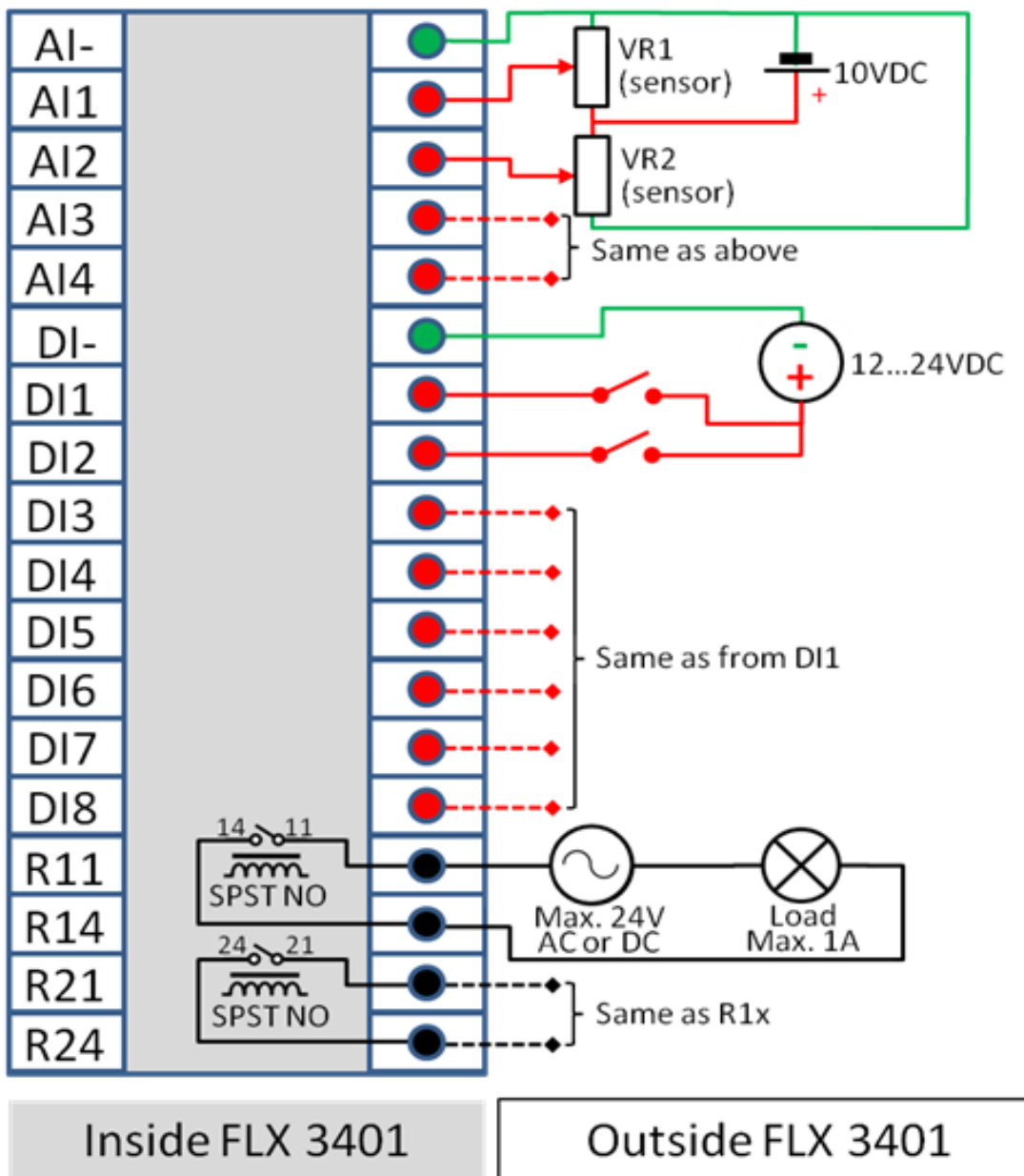
3.4.1 Connector Pinout

AI-	Ground of the analog input (isolated)
AI1	Analog Input 1
AI2	Analog Input 2
AI3	Analog Input 3
AI4	Analog Input 4
DI-	Ground of the digital input (isolated)
DI1	Digital Input 1
DI2	Digital Input 2
DI3	Digital Input 3
DI4	Digital Input 4
DI5	Digital Input 5
DI6	Digital Input 6
DI7	Digital Input 7
DI8	Digital Input 8
R11	Relay 1 NO terminal 11 (*)
R14	Relay 1 NO terminal 14 (*)
R21	Relay 2 NO terminal 21 (*)
R24	Relay 2 NO terminal 24 (*)



(*) Terminal numbers R11, R14, R22 and R24 are derived from 11 (Common) and 14 (NO) that refer to the Single Pole, Single Throw, Normally Open (SPST NO) relay terminal numbering as per standard EN 50005.

3.4.2 Typical Wiring Diagram



3.4.3 Analog Inputs (4)

Characteristic	Value
AI Terminal count	5 (4 channels + common ground)
Isolation between AI	None (common ground)
AI rated input range	Rated 0 to 10 VDC (max. -0.6 V to 12 VDC)
AI max. input range	Over-voltage protection
AD converter resolution	16 bits
Sampling rate	4 sps
Max. gain error	0.40%
Input low pass filter cut-off	@ 1.3 Hz
Functional Isolation	1.5 kV

3.4.4 Digital Inputs (8)

Characteristic	Value
DI terminal count	9 (8 + common ground)
Isolation between DI	None (common ground)
DI voltage range	0 to 24 VDC
DI protection	33 VDC Max
DI OFF state input voltage range	0 to 5 VDC
DI ON state input voltage range	10 to 30 VDC
DI ON state current range	< 2 mA @ 12 VDC to < 6 mA @ 24 VDC
Functional Isolation	1.5 kV from DGND (internal isolated ground)

3.4.5 Output Relays (2)

Characteristic	Value
Terminal count	4 (2 independent outputs)
Relay type	Single Pole, Single Throw, Normally Open = SPST NO
Input voltage max.	24 VDC/VAC
Max. current (ext. source)	3 A
Functional Isolation	1,5 kV

3.5 eWON Flexy Extension Cards Environmental Conditions

Characteristic	Value
Operating temperature	-25 to +70 °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

3.6 Plugging the Extension Card into the Base Unit

3.6.1 Base Unit Slot Compatibility

The **8DI-4AI-2DO Extension Card** (FLX 3401) can be inserted in **all slots of the Base Unit**.

Explanation:

The Flexy Base Units feature two type of slots. The A slots are the two first slots starting from the left. The B slots are the two last slots. Some cards fit in A and B slots. Some not. Cards that fit only one type of slot have a mechanical mistake-proof security.



The reference code of the Extension Cards includes a letter that defines their compatibility either with “A” slots, “B” slots or both:

FLA xxxx - designates cards that fit into “A” slots

FLB xxxx - designates cards that fit into “B” slots

FLX xxxx - designates cards that fit into both “A” and “B” slots

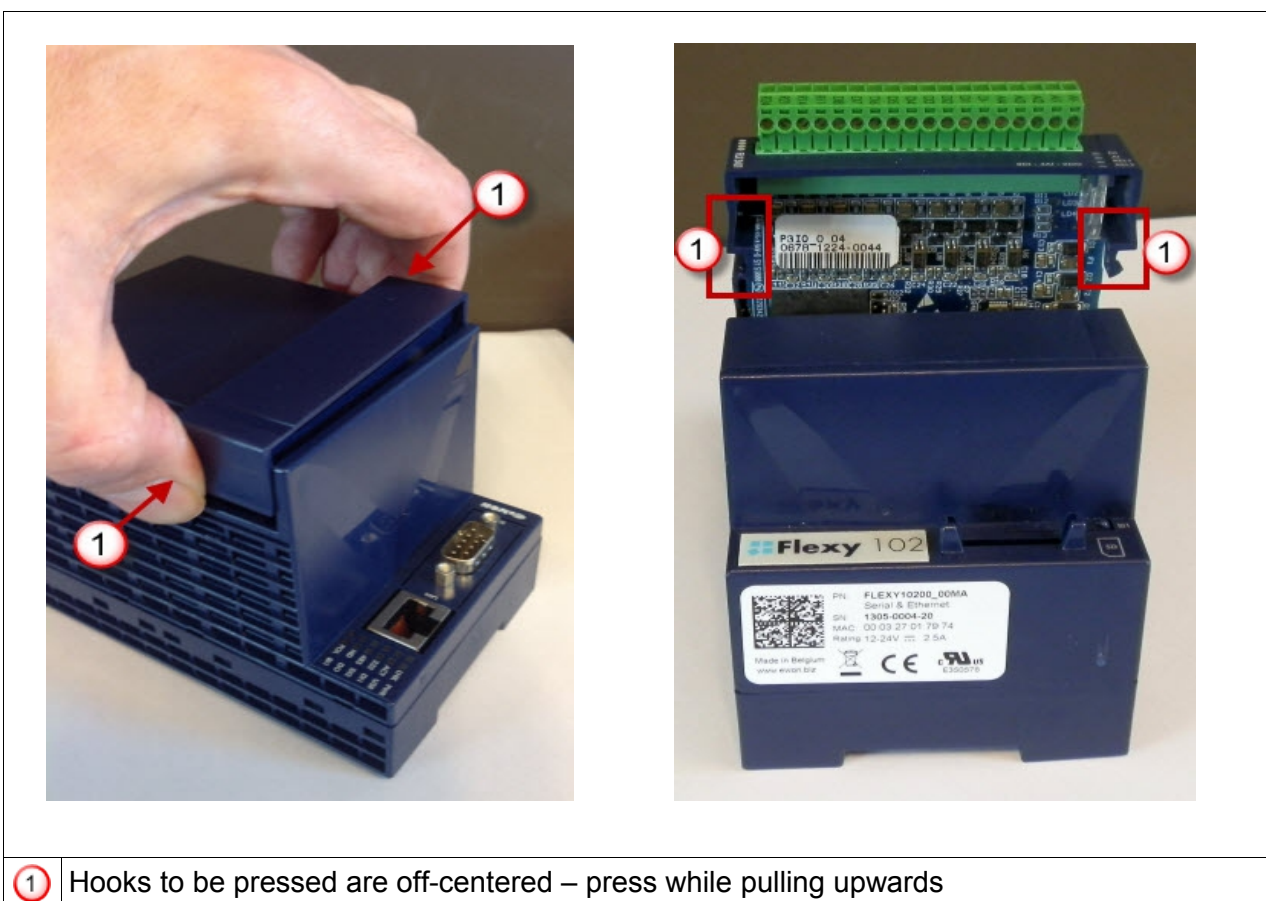
In addition to the card reference, each type of extension card bears a visual compatibility symbol on its front panel. The visual symbols are shown in the table below:

●●○○	2 first slots only (A)
●●●●	In any slot (X)
○○●●	2 last slots only (B)

3.6.2 Extension Card Insertion

Please wait 30 seconds after powering off the equipment before inserting (or removing) an extension card. This is to avoid possible damage to the Base Unit and Extension Card.

Remove the slot filler of the location where you want to insert the new card. To do this, press on both ends of the cover, note that the hooks (1) are out-centered like shown on the pictures.



Insert the Extension Card carefully and slide it down until the hooks are clicking. Make sure the card is completely inserted.

3.6.3 Multiple 8DI-4AI-2DO Extension Cards

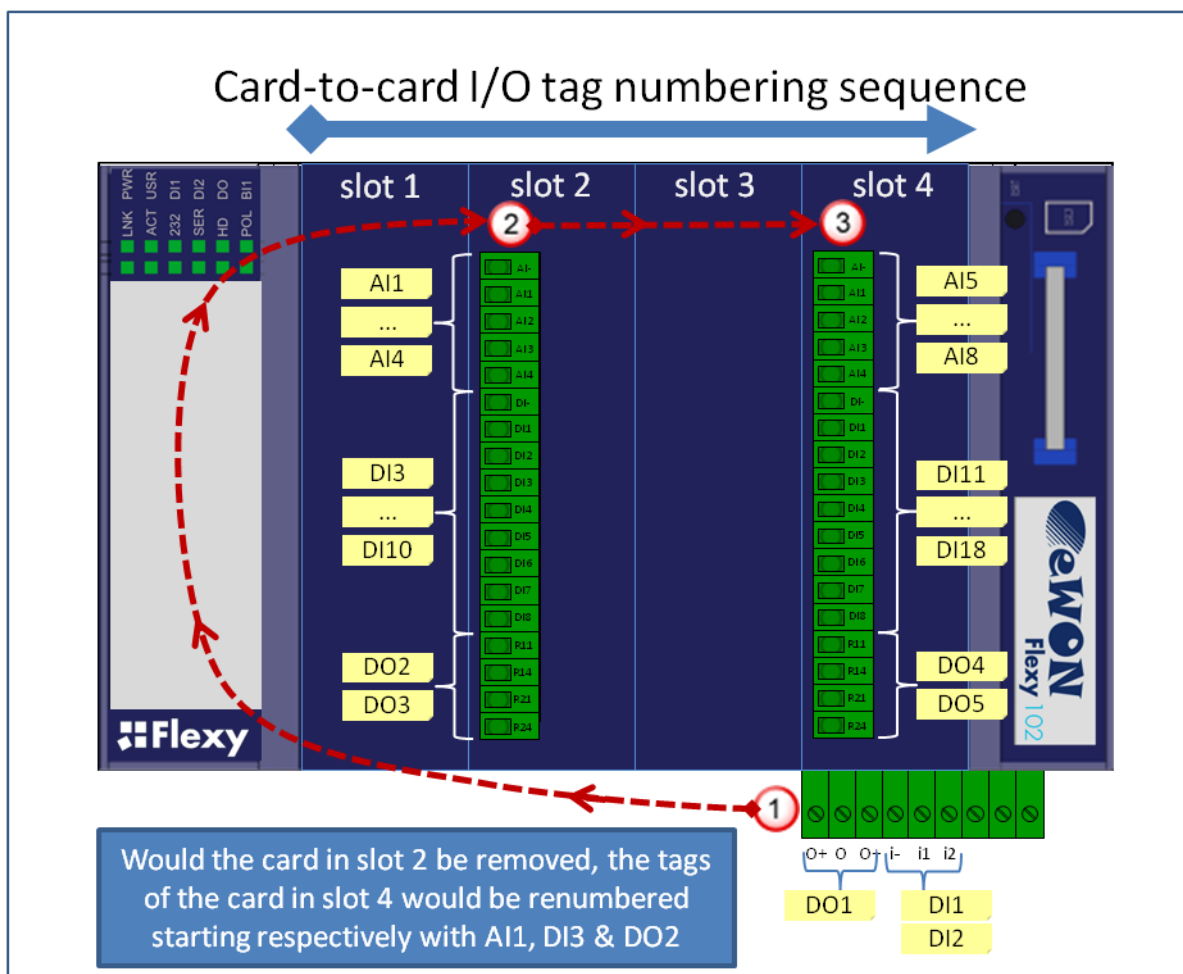
The boot process of the Base Unit includes an automated detection of the inserted Extension Cards. This detection is done sequentially, slot per slot starting from the left to right.

The Extension Cards of type FLX 3401 can be inserted in all slots. The eWON Flexy firmware supports up to 4 Extension Cards of this type.

3.6.4 Basic Principles of the eWON Flexy I/O Tag Addresses

The internal tag addressing of the Flexy range always starts with the Inputs/Outputs of the Base Units. Remember that all Base Units feature 1 Digital Output and 2 Digital Inputs, those are the first ones that have to be considered when creating tags in the eWON.

The example below helps you to understand the syntax of the I/O Server tag addresses in the case of 2 I/O Extension Cards.



Note: Following the left-to-right order of slots, the first card to be detected is Extension Card plugged in the most left slot, then the next on its right and so on. Removing an I/O card other than the utmost right one will result in an internal reallocation of tag addresses that may result in a mismatch between physical I/Os and their software configuration. The software tag addresses can be “frozen” by adding the slot number in the tag definition. This prevents accidental I/O mismatch (see next page).

Slot number append to prevent tag address mismatch:

Let's take the example of an eWON Flexy featuring 2 IO cards FLX 3401 in slots #2 and #4 as shown in the picture above. The tag address for the eWON IO server can be extended as follows:

ABx,Ey

Where:

- AB is the type of IO (DI, AI, DO)
- x is the order number
- E is a constant prefix to the slot number
- y is the slot number of the card (0 = main board, 1 = slot #1, 2 = Slot #2, etc..)

Delete Selected Tag		Create New Tag (like first selected)				Page: Default
	Tag Name	Description	Type	IO Server	Topic	
<input type="checkbox"/>	DO1		Floating point	EWON	DO1,E0	
<input type="checkbox"/>	DO2		Floating point	EWON	DO2	
<input type="checkbox"/>	DO3		Floating point	EWON	DO3,E2	
<input type="checkbox"/>	DO4		Floating point	EWON	DO4,E4	
<input type="checkbox"/>	DO5		Floating point	EWON	DO5,E4	

The main IO syntax and order numbering remains unchanged. In the example above, the IO server tag addresses are as follows:

Tag Syntax	Explanation
DO1,E0	Digital Output 1, main board (though E0 is not necessary in this case)
DO2	Digital Output 2, no position specified = second detected DO = first DO on first extension card detected (slot #2 most left).
DO3,E2	Digital Output 3, board in slot #2 = second DO on extension card in slot #2
DO4,E4	Digital Output 4, board in slot #4 = first DO on extension card in slot #4
DO5,E4	Digital Output 5, board in slot #4 = second DO on extension card in slot #4

Behavior if the card in slot #2 is removed:
In the **Tag View** page,

- **DO2** will appear normally as it was not frozen by a slot number append. But it can no longer reflect the status of the first DO of the board in slot #2 that was removed. DO2 now reflects the status of the first DO of the board in slot #4.
- The 3 other DOs with specified slot number E2 and E4 will all appear in error (red cross, value 0), because:
 - a) The address of DO3,E2 of the card in slot #2 could no longer be found, and
 - b) The software addresses of DO4,E4 and DO5,E4 of the card in slot #4 do no longer match with the detected order of physical addresses.

The error messages in the **Trace** log file are "Invalid IO Tag name (DOx, addr. DOx,Ex)".

To have the DOs of the card in slot #4 responding, edit the tags and change their software addresses as follows:
DO4,E4 to DO2,E4 and
DO5,E4 to DO3,E4.

3.6.5 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 Installation Guide IG-014-0-EN “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.

	8DI-4AI-2DO Extension Card FLX 3401
Energy Demand Points	2

The Installation Guide IG-014-0-EN “eWON Flexy - Base Units” includes practical examples of power balance calculations.

4. 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, you should observe the following LED status

Base Unit	USR	flashing green slowly
Extension Card	AI	flashing green (acquisition running)

5. Check Card Detection on the Embedded Web Page

The eWON Flexy Extension Card requires no software configuration. It is automatically detected by the Base Unit when it boots.

5.1 Connecting to the Embedded Web Server

Configure the network parameters of your configuration PC to encompass the IP range of the eWON LAN.

Connect the PC to one of the LAN port of the eWON Flexy.

Open your Internet browser and access the eWON Flexy internal Web page by entering the LAN IP address in the URL field (the default address is <http://10.0.0.53>).

The default login is: adm
with password: adm

Warning!

For security reasons, changing the default password **adm** is absolutely required. To change the **adm** password, from the menu bar, click on **Configuration, Users Setup** and double click on the **adm** entry to edit its parameters. Enter the new password twice and click **Save**.

5.2 Detected Cards Displayed in the System Page

The detected card appears in the eWON **System** hardware configuration page like shown below. The path to the **System** hardware configuration page showing the cards detected by the Base Unit is: **Diagnostic (1) > Status (2) > System Info (3) > System (4)**. The screen capture below gives an example of an FLX 3401 extension card that has been detected in slot 1 (5).

The screenshot displays the eWON embedded web page interface. At the top, there is a navigation bar with several tabs: 'View I/O', 'Alarm Summary', 'Diagnostic' (marked with a red circle 1), and 'Configuration'. Below this is another navigation bar with 'Alarm History', 'Files Transfer', and 'Log off'. A secondary navigation bar contains 'Event Log', 'Status' (marked with a red circle 2), 'Scheduled Actions', 'Real Time Log', and a timestamp '27/02/2000 18:41:15'. On the left side, there is a sidebar menu with various system components, including 'System Info' (marked with a red circle 3) and 'System' (marked with a red circle 4). The main content area is titled 'System' and contains a table with the following data:

Description	Value	Unit	Stat	?
MB Part Num	FLEXY20100_00			
MB Serial Num	1305-0005-21			
MB Ext. Info	PType:0, MTID:712			
Ext1 Part Num	FLX3401_00			
Ext1 Serial Num	678-1224-0031			
Ext1 Ext. Info				
Ext2 Part Num				
Ext2 Serial Num				
Ext2 Ext. Info				
Ext3 Part Num				
Ext3 Serial Num				
Ext3 Ext. Info				
Ext4 Part Num				
Ext4 Serial Num				
Ext4 Ext. Info				

Revision history

Revision Level	Date	Description
1.0	21/11/13	Official product release version
1.1	23/12/13	Append tag numbers

Document build number: 105

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