MACHINES CAN TALK

Installation Guide

IG 022 / Rev. 1.4

eWON COSY 131

This installation guide describes the hardware of the eWON COSY 131 and explains how to get started with the embedded web site.

support.ewon.biz

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1. Product Summary

1.1. Introduction

The present Installation Guide describes the hardware of the ***eWON COSY 131*** family.

The eWON Cosy 131 family is a set of 3 industrial gateways/routers.

The eWON Cosy 131 is fully compatible with the Talk2M cloud connectivity services (www.talk2M.com).

1.2. Concept of the eWON COSY 131 Family

The Cosy 131 is available in 3 different versions depending on their communication interface:

- Ethernet Switch **Cosy 131 Ethernet**
- WiFi & Ethernet Switch **Cosy 131 WiFi**
- 3G+ & Ethernet Switch **Cosy 131 Cellular 3G+**

1.3. General specification of the hardware platform

Characteristic	Value
Design	Industrial design (24 VDC power supply, DIN Rail mounting, extended temperature)
Processor	ARM9
Clock	Backed up real time clock (RTC) Backup battery lifetime has 10 years expectancy
Ethernet Interface	LAN Ethernet port 10/100 Mbps
Digital Input	2
Digital Output	1
Mounting	Latch for DIN rail EN50022-compliant

1.4. Typical applications

- Remote Access of Ethernet devices using Talk2M connection
- Industrial VPN router

1.5. Type and Part Numbers

The available part numbers are:

Part Number	Type	Description
EC61330_00MA	COSY 131	LAN/WAN – Ethernet Only Switch 4-Ports
EC6133C_00MA	COSY 131	LAN/WAN, WIFI – Ethernet Switch + WiFi
EC6133D_00MA	COSY 131	LAN/WAN -3G+ Penta - Ethernet Switch + 3G+

Table: List of the available part numbers

- Note -

The MA suffix means Multiple languages A (ENG, FR, DE, SP)

The part number syntax is explained in *3.1. Label*

2. Safety, Environmental & Regulatory Information

2.1. Scope

The present heading addresses Safety, Environmental & Regulatory Information for the eWON Cosy 131 family.

2.2. Power supply

The external power supply is a third party device that is not part of this certification.

The device shall be supplied by a LPS power supply certified according to IEC/UL60950-1 or Class 2 per NEC (See annex A.2. Specification of the External Power Supply for detailed information).

2.3. Applicable Directives, Standards and Compliance

The product described in the present Installation Guide complies with the CE, R&TTE directives and the FCC regulations related to the wireless modems.

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

- RoHS Directive 2011/65/EU
- EMC Directive 2004/108/EC
- R&TTE Directive 1999/5/EC (for versions includind RF modems)
  The product conforms to the corresponding R&TTE articles:
  RF spectrum efficiency (Art 3.2); EMC (Art. 3.1b); Safety (Art. 3.1a)
- REACH Directive 2006/121/EC
- For COSY 131, Cellular 3G+ only: to comply with R&TTE directive
  - Antenna must be mounted on a grounded plate
  - RFI suppressors must be mounted on the power supply cable in the following order, starting at 3cm of the connector and going to the power supply:
    - Wurth Elecktronik 742-717-33
    - Wurth Elecktronik 742-716-22
    - Wurth Elecktronik 742-711-11

2.3.2. Applicable Safety Standards

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

- UL Certificate Of Compliance (CoC) for Ordinaty Locations # E350576 for a TMRA of 60°C
- CB certificate # DK-42240-UL

These certificates can be downloaded as PDF files on the eWON Support web site: http://support.ewon.biz/official-documents

2.4. Field implementation & environmental conditions

2.4.1. Ingress Protection

The eWON COSY 131 has an IP20 protection grade. Therefore, the eWON COSY is NOT suited for outdoor mounting. It has to be integrated in an electrical cabinet, protected from excessive heat, humidity and dust. Do not push any sharp object into the air vents or openings of the equipment.

2.4.2. Mounting Recommendations

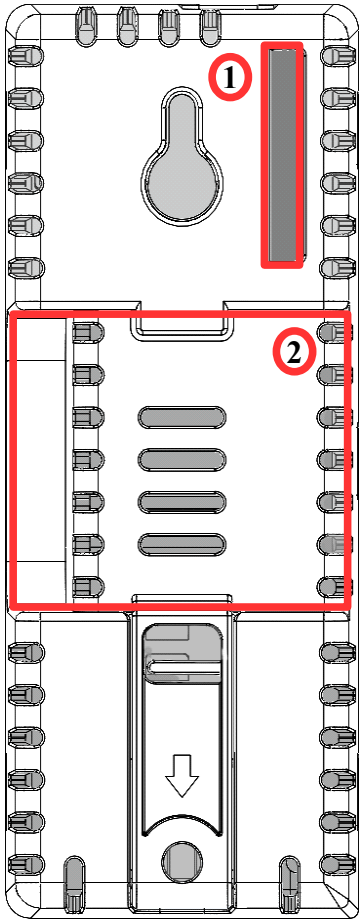
The normal mounting position of the eWON COSY is wall mounted on a horizontal Omega type DIN-rail (EN 50022).

- **Mounting the unit on DIN-rail**
  Pull the slide lock (located at the bottom of the unit's back-side) downwards and present the unit in front of the DIN rail. Tilt the eWON upwards in order to hang it on the upper edge of the DIN rail by its hook. Gently tilt the unit downwards until it finds its original position. Pull the slide lock upwards to fix and lock the unit on the DIN rail.

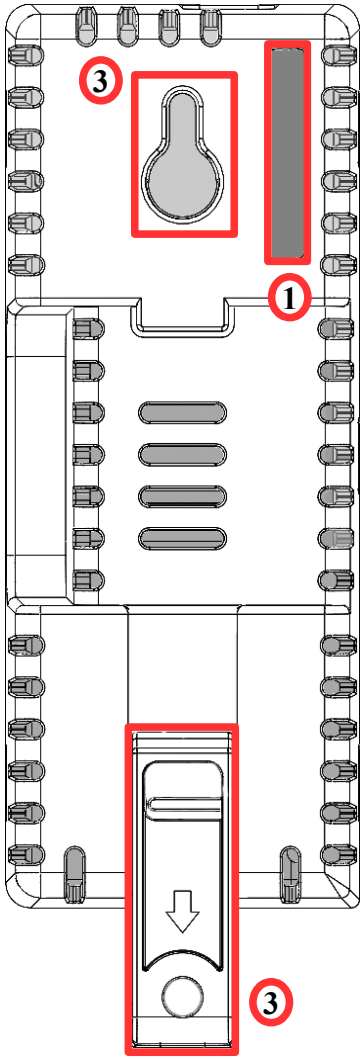
- **Removing the unit from DIN-rail**
  Release the unit by pulling the slide lock downwards while gently tilting the unit upwards. Free the unit by unhooking it from the upper rail edge. See 2.4.2 Mounting instructions

The product is intended to be mounted vertically, label on the right side

Installation on DIN-rai



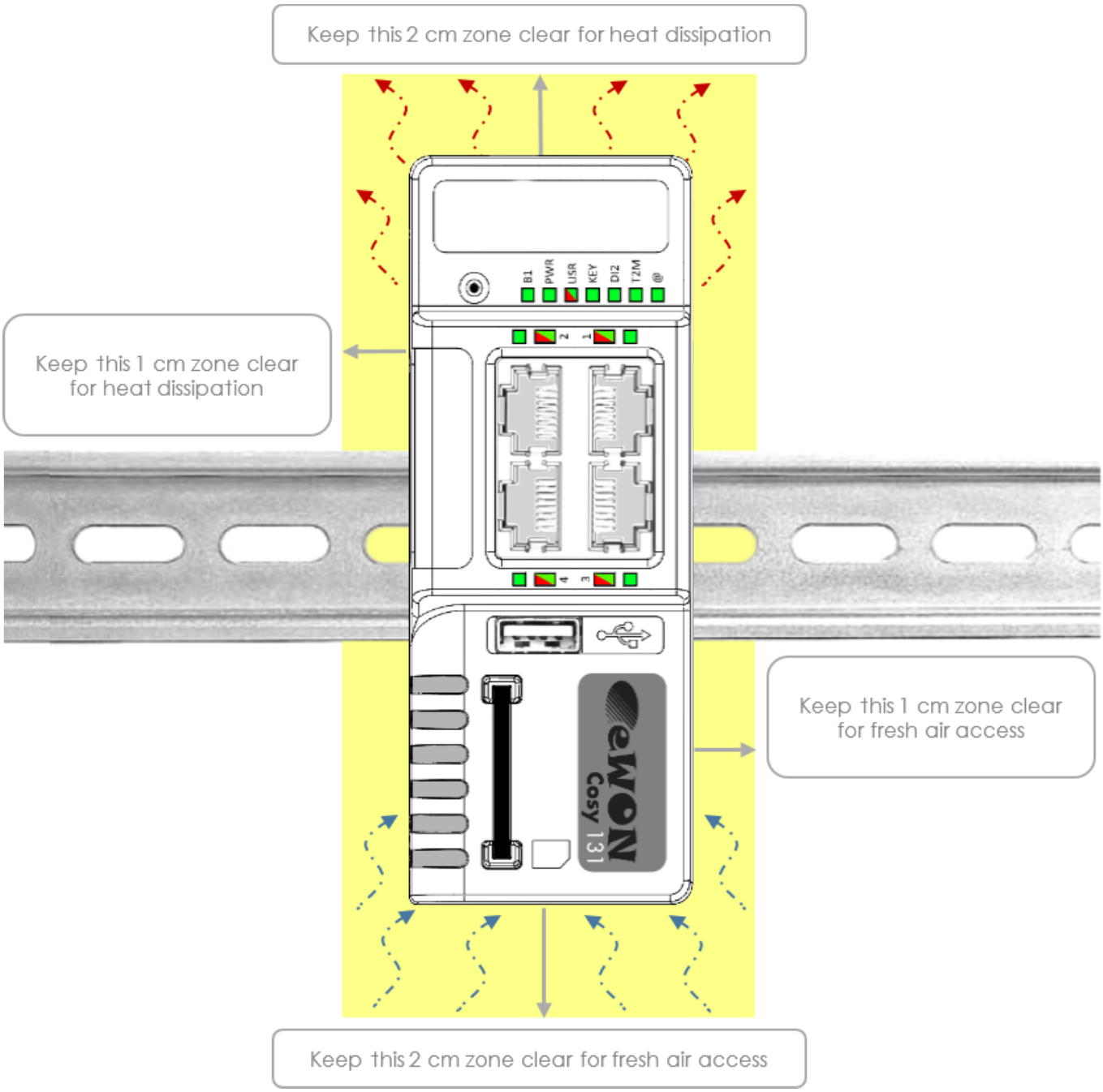
Wall mounting position



1	SIM card slot
2	DIN rail mounting braket
3	Screw holes intended to receive M4 screws with an 8mm diameter head

To ensure a proper ventilation of the equipment, a free gap of at least 2 cm must be respected in front of all upper & lower ventilation openings of the unit.

A free gap of at least 1 cm must be respected on each side of the unit.



- Caution -

In any other mounting position than the one explained here above, the specified temperature has to be derated to -25°C to +40°C.

2.4.3. Cabling rules

Shielded cables must be used for Ethernet and USB connectivity to comply with the EMC requirements.

USB cable must be

- shorter than 3m;
- USB 2.0 type
- Maximum current per contact : 0.5A (or better)
- "A" plug connected to the eWON

2.4.4. Environmental conditions

The equipment will operate properly within the following environmental limits if it has been correctly mounted according to the above mentioned recommendations:

Operating T°	-25°C to +70°C
Relative Humidity	10 to 95% non-condensing
Operating altitude	Up to maximum 2000m
Storage temperature	-40 to +70 °C
Storage Humidity	10 to 95% non-condensing
Storage altitude	Up to maximum 3000m

2.4.5. Earthing

Earthing the eWON is necessary to eliminate unwanted transients (lightning protection) and to conform to the EMC requirements. Therefore, a functional earth (FE) terminal is available on the main connector as shown in A.2. Specification of the External Power Supply, Connect this terminal directly to allow impedance ground. Shielded cables have to be used for Ethernet and USB to comply with the EMC requirements.

2.5. Battery

The COSY contains a CR2032 battery. This battery is used to maintain the real time clock up-to-date even when the unit is not powered.

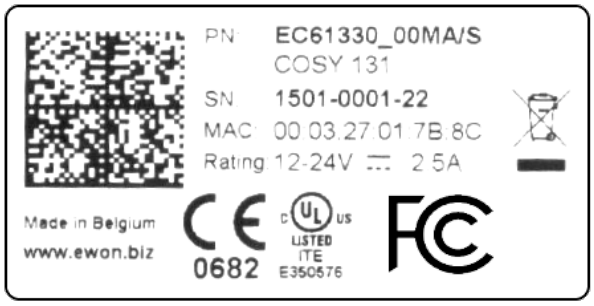
- Caution -

Risk of explosion if battery is replaced by an incorrect type.
The battery is not attended to be replaced on consumer's side. The product shall be returned to manufacture for replacement.

3. Hardware description

3.1. Label

The identification label of the eWON COSY 131 is placed on the right hand side of the housing. The different parts of the label are described below:

eWON COSY 131 Ethernet	Label	Description
	**PN**	Part Number (see syntax table below)
	SN	Serial number on the form **YYWW-SSSS-PP** **YY** = Year of production **WW** = Week of production **SSSS** = sequential mfg order **PP** = product type
	MAC	MAC address of the Ethernet adapter
	Rating	Power supply requirements
	Marks	CE, UL,... logos if applicable

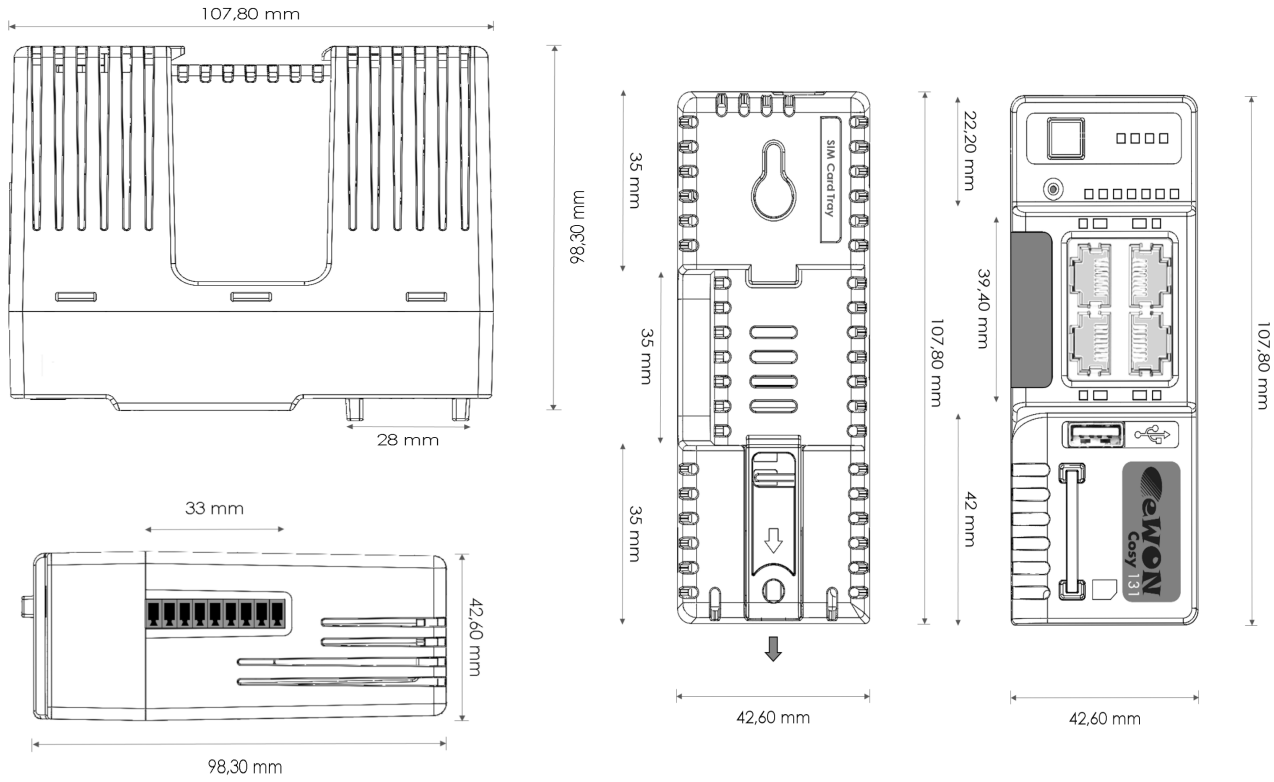
Marks	Description
CE	Conformité Européenne or European Conformity (**EC**)
0682	Notified Body Number, warrantor of the CE Mark validation
c UL us LISTED	**UL Listed** (*Underwriters Laboratories*)
FC	**FCC** *Federal Communications Commission*

Label can have variant marks depending of models	
eWON COSY 131 WiFi	**eWON COSY 131 – 3G Penta**

EC6133m_ccLL[suffix]

Position(s)	Description	Acceptable values	
EC	name of the family	EC for eWON COSY	
6	number corresponding to the HW platform.	6	for "Cosy 131" platform
1	is communication options 1.	1	One Ethernet
3	Is communication options 2.	3	Three Ethernet
3	field communication option.	3	USB
m	modem communication option.	0	No modem
		C	WiFi
		D	HSUPA Modem
cc	is one or more digits or letters that correspond to software options	00 = no software option	
LL	Defines the firmware language	MA	UK + FR + DE + SP
[suffix]	can have an optional "/" character Defines the compliances of the unit	S	compliance with the UL/IEC/EN 60950 standard

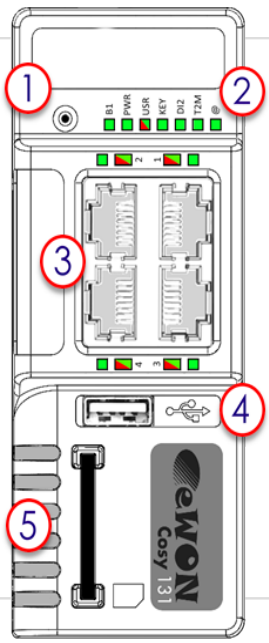
3.2. Mechanical dimensions



3.3. Overal description

3.3.1. Front

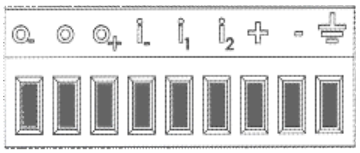
#	Description
1	Reset button
2	Status LEDs panel
3	LAN/WAN Ethernet ports and corresponding status LEDs (**Red**: WAN / **Green**: LAN)
4	USB slot
5	SD card slot *

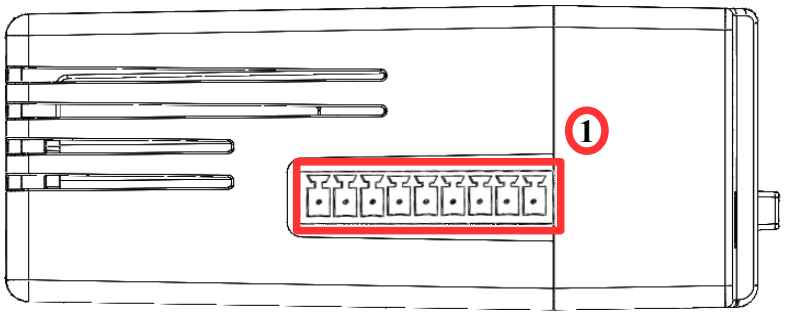


- SD Card is not supported for the moment

3.3.2. Upper side

Connector

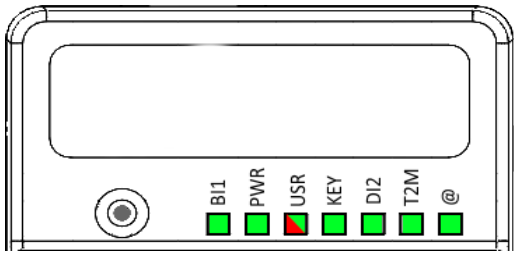




1	Main connector including power input terminal, 1DO and 2 DI

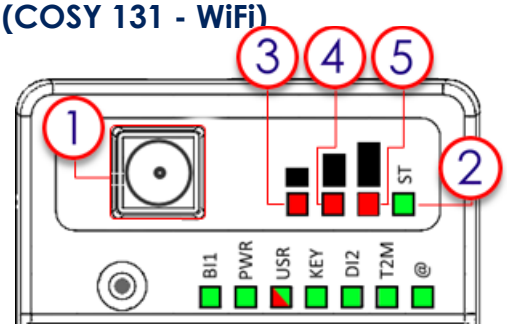
For more information about the connector see in A.1. Main Connector

3.3.2. Status LED panel (COSY 131 – All version):



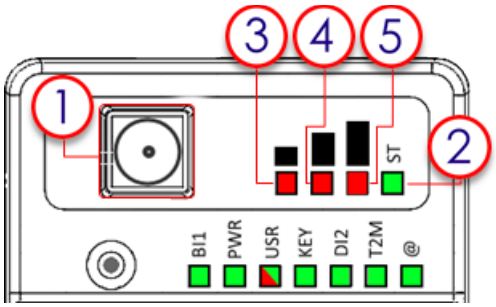
Label	Description
BI1	Button BI1 input Green ON = Reset being pressed
PWR	Power Green ON = Power is present
USR	User Green ON+OFF slowly = Unit is OK RED pattern = special attention required
KEY	Digital IN 1 – Green = ON: Signal on input 1 detected See. Digital Output & Digital Inputs
DI2	Digital IN 2 – Green = ON: Signal on input 2 detected See. Digital Output & Digital Inputs
T2M	Talk2M - Green ON = Talk2M VPN connection established See. Digital Output & Digital Inputs
@	Internet Green ON = Internet is configured on the eWON COSY

3.3.3.1. Status LED panel (COSY 131 - WiFi)



#	Mark	Description
1	/	SMA male connector for WIFI antenna
2	ST	Modem status Green ON = WiFi connected
3		Reception signal level Red ON = Poor signal
4		Reception signal level Red ON = Signal is OK
5		Reception signal level Red ON = Good signal

3.3.3.2. Status LED panel (COSY 131 - Cellular 3G+)



#	Mark	Description
1	/	SMA female connector for GSM antenna
2	ST	Modem status Green ON = Modem connected
3		Reception signal level Red ON = Poor signal
4		Reception signal level Red ON = Signal is OK
5		Reception signal level Red ON = Good signal

3.4. Radio communication models

- Warning -

This device is intended to be used in fixed or mobile applications only (not for portable applications). The antenna used for this transmitter has to be installed in a space providing a safe distance of at least 20 cm without encountering any person and must not be co-located or operating in conjunction with any other antenna or transmitter.

3.4.1. COSY 131 with internal WiFi modem

Cosy 131 – Wifi		
Item	**Value(s)**	
Protocols and Frequencies	IEEE802.11b/g/n, 2.4GHz - Channels: 1 to 11(inclusive)	
Antenna Connector	Type RP-SMA	
Antenna (included in the delivery)	**Charact.**	**Value(s)**
	Impedance	50 Ohms
	Input Power	> 17 dBm, IEEE 802.11b > 15 dBm, IEEE 802.11g/n
	Tightening Torque	0.5 Nm. *In the absence of a torque wrench, a soft manual tightening is sufficient.*

Device conformity has been tested with the reference antenna: Pulse W1030.

- The product complies with the R&TTE directive, the FCC, the IC and Japan regulations related to the Wifi communications.
- Absolute maximum antenna gain as per FCC's rules and regulations, 47CFR:
  - Part 15C : 2.14dBi
- Modifications cannot be made by the user if it influences the normal behavior of the device.
- The user shall be informed about modem identification numbers according to their national authorities.
  This product contains part identified as follows by national authorities:
  – FCC ID: QOQWF111
  – IC ID: 5123A-BGTWF111
  – RRA ID: KCC-CRM-BGT-WF111
  – GITEKI (MIC) ID: 209-J00061

3.4.2. COSY 131 with internal 3G+ Penta modem

Cosy 131 – Cellular 3G+		
Item	**Value(s)**	
Protocols and Frequencies	GSM/GPRS/EDGE - 850, 900, 1800, 1900 MHz UMTS/HSUPA - 800/850, 900,AWS 1700,1900,2100 Mhz	
Class	5 bands GPRS/EDGE Class 33	
Antenna Connector	Type SMA	
Antenna (not included in the delivery*)	**Charact.**	**Value(s)**
	Impedance	50 Ohms
	VSWR	<= 5:1 Absolute max. to avoid permanent damage <= 2:1 Limit to fulfill all regulatory requirements
	Input Power	> 33 dBm (2W) peak power in GSM > 24 dBm average power in WCDMA
	Tightening Torque	0.5 Nm. *In the absence of a torque wrench, a soft manual tightening is sufficie*

Device conformity has been tested with the reference antenna: Taoglas TG.09.0113

As see in 2.4.1 Mounting instructions SIM Card Tray is at the rear of the COSY 131

(*) 3G antenna has to be purchased separately, 3G penta band antenna is available from eWON with FAC90501_0000 as reference

- The product complies with the R&TTE directive, the FCC, the IC and Japan regulations related to the GSM modems.
- Absolute maximum antenna gain as per FCC's rules and regulations, 47 CFR :
  - – Part 22H : 5.22dBi;
  - – Part 27 : 3.31dBi;
  - – Part 24E : 6.45dBi.
- Modifications cannot be made by the user if it influences the normal behavior of the device.
- The user shall be informed about modem identification numbers according to their national authorities:
  This product contains part identified as follows by national authorities:
  – FFC ID: RI7HE910
  – IC ID: 5131A-HE910
  – GITEKI (MIC) ID: 005-100269
  – JATE ID: AD12-0318001

3.5. LAN Switch Specifications

3.5.1. Boot process

During the (re)boot process, the eWON prevents the switch feature from working. This means that it might require little time starting from the power on (or the reboot request) to get the LAN switch to be fully operational.

When an eWON router is configured to operate a certain way, it is part of the strategy, if no other method worked, to reboot itself. This is the ultimate eWON strategy to try restoring the requested communication channels and be consistent with requested configuration.

4. COSY IP Address & Access to the Web Configuration

4.1. Factory Default IP settings

Characteristics	Value(s)
LAN IP Address	10.0.0.53
LAN Subnet Mask	255.255.255.0
Gateway	0.0.0.0

4.2. Powering ON

Power on the unit and wait approximately 25 sec. until the boot process is finished.

After a successful boot process the ***USR*** LED is flashing green ON & OFF slowly.

If the ***USR*** LED is flashing RED according to a given pattern, it indicates that the boot process was interrupted due to a problem. Most frequent problems include :

- a duplicate IP address was detected on the LAN Network
  USR LED flashing pattern is RED 1x short, 1x long

For the other LED patterns in case of error, please refer to the General Reference Guide RG-001.

4.3. Setting the eWON COSY LAN IP Address

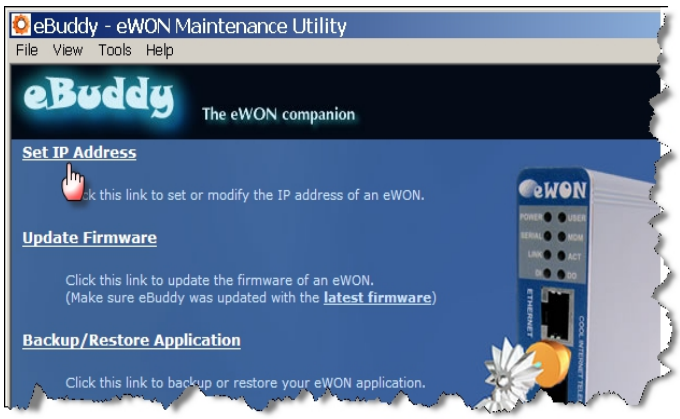
You can easily establish your first communication with your eWON COSY by using our companion tool ***eBuddy*** which can be downloaded from http://support.ewon.biz/software

Connect one of the LAN-ports (by default, port No. 1 is always a LAN port) of your COSY with your PC point-to-point or through a network where there is no risk that the eWON's default IP-address (10.0.0.53) would conflict with another connected device.

Start the eBuddy application. This one scans the network through the Ethernet adapter and retrieves the connected eWON, including its IP address, Subnet Mask and serial number. The application also allows you to change the default IP address without being necessarily in the same network range.

Start the ***eBuddy*** utility on your PC

In the home page,
select ***Set IP Address***



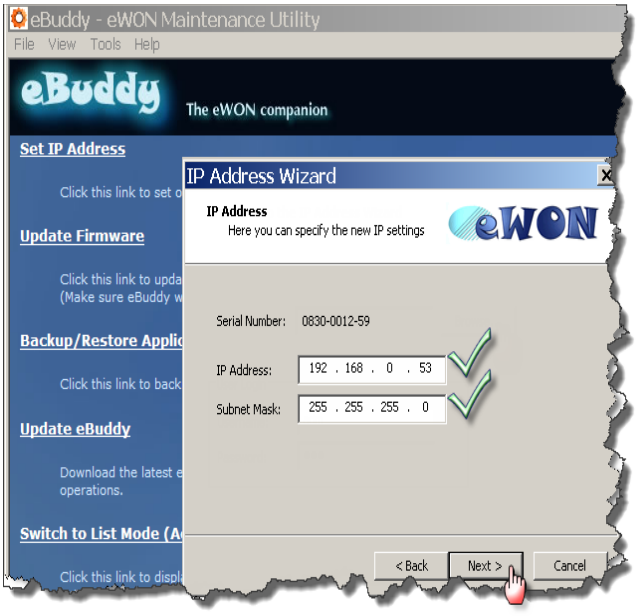
Fill in the Serial Number of your COSY or click on ***Browse*** and select it**.**

The Serial Number of the COSY is on its label, see in 3.1.Label

Click ***Next***

Enter a new LAN IP address and Subnet Mask.

Click ***Next***



Wait until the address is updated and the device has rebooted.

Click ***Finish***.

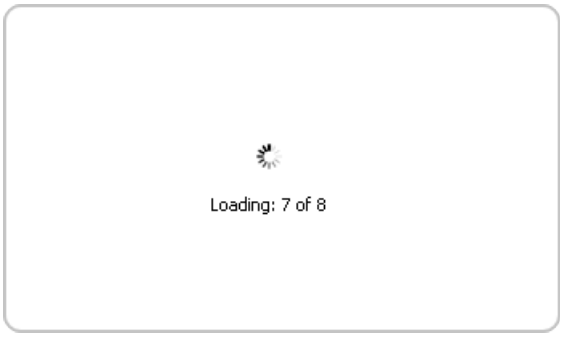
4.4. eWON COSY's Web Interface

To access the web pages of your eWON COSY proceed as follows:

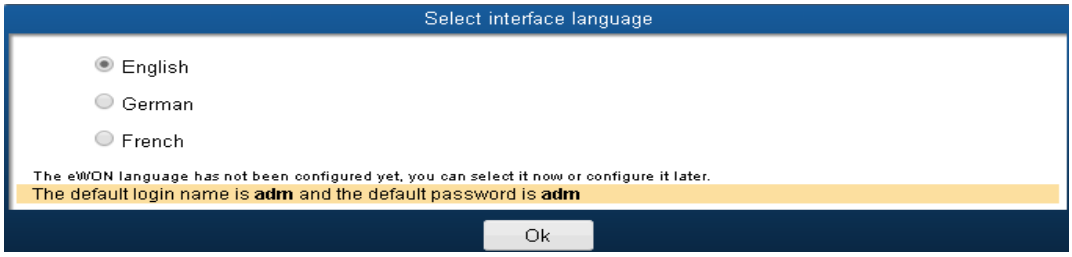
Connect the PC to one of the LAN port of the eWON COSY.

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

You arrive on a loading page

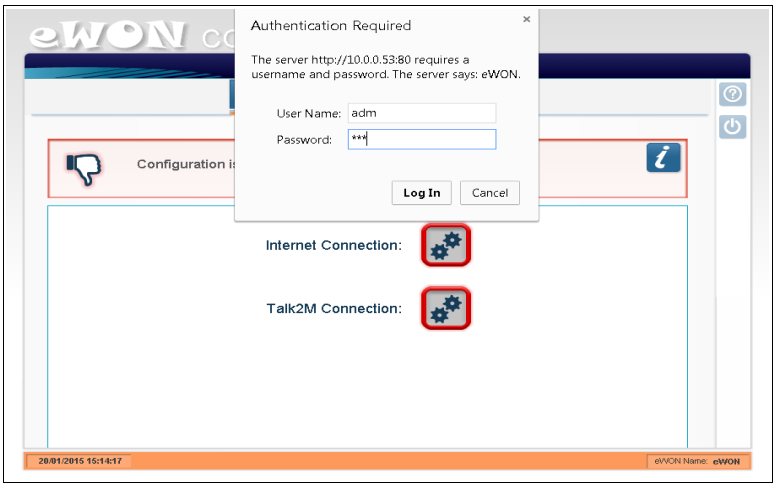


If this is the first boot of the eWON COSY (or after a level 2 reset), you will be asked for a default language.



Before configuring your eWON COSY, an authentication is required.

For a first boot, the default login & password are both "adm".



- Warning -

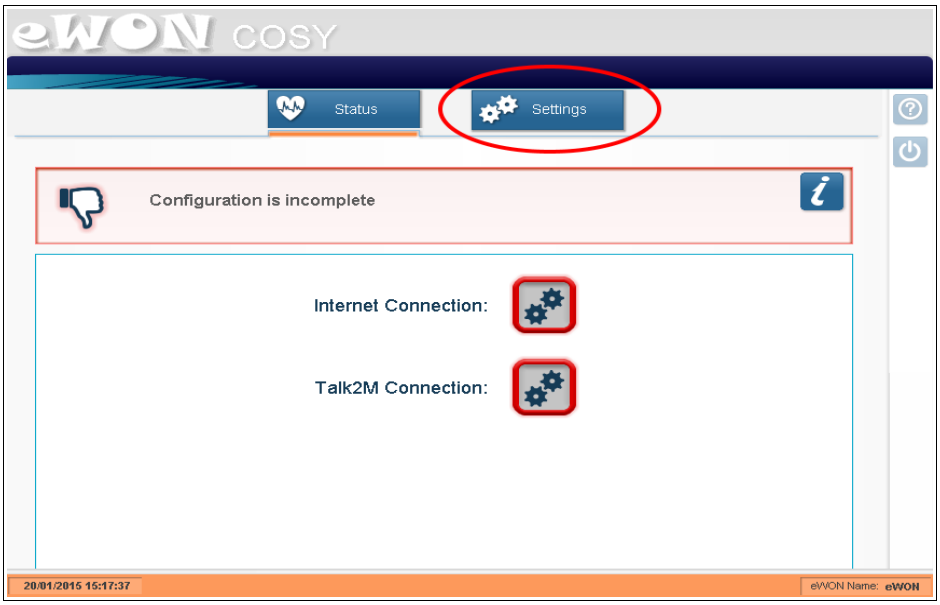
> *For security reasons, changing the default password "**adm**" is absolutely required.*

You will be automatically redirected to the Quick Launch Wizard page:

You can follow the **Quick Start Guide** as an aid to configure your eWON COSY.

Can be downloaded on http://support.ewon.biz/cosy-131

To reconfigure your eWON COSY, you can easily rerun the wizard by clicking on the Settings button on top of the page.



5. Troubleshooting

5.1. Normal Boot Process

The normal boot process of the eWON COSY takes approximately 25 seconds to complete. During this process, all LEDs are shortly ON, except BI1 as long as the RESET button is not pressed. During this boot sequence, the ***USR*** LED is orange. As soon as the boot process is finished and the unit is ready to be used, the ***USR*** LED flashes GREEN slowly.

5.2. Resetting the eWON COSY 131

The reset button B1 is located on the front of the COSY unit (see in 3.3.1.Front). The reset function of this button is active only if pressed while powering on. The eWON COSY features two type of reset levels. A table follows with the impacted configuration zones per reset level.

5.3. First Level Reset (user reset)

The first level reset consists in formatting only the « ***user files*** » part of the non volatile memory. This type of reset does not modify the communication parameters of the eWON COSY.

How do I generate a first level reset?

- Power the unit OFF and ON again
- ***Immediately press and maintain*** the reset button. The LED labeled BI1 turns ON.
- Wait approximately 30 seconds until the ***USR*** LED flashes RED 1x per second.
- Immediately release the button (if you don't, you would reach the second level reset phase). The LED labeled BI1 turns OFF.
- Wait approximately 30 secs until the reset procedure is completed.
- The eWON restarts automatically and the unit is ready to be used, the ***USR*** LED flashes GREEN slowly.

5.4. Second Level Reset (factory reset)

This second level reset formats the entire non volatile memory and returns the eWON to its factory settings. This operation consists in 3 steps:

- Formats the entire non volatile memory, including all COM parameters and IP addresses
- Full hardware auto-test with result shown by the ***USR*** LED
- Return to ex-factory configuration (default config)

How do I generate a second level reset?

- Power the unit OFF and ON again
- ***Immediately press and maintain*** the reset button. The LED labeled BI1 turns ON.
- Wait approximately 35 seconds until the ***USR*** LED remains RED steady.
- When this state is reached, release the button. The LED labeled BI1 turns OFF.
- It takes no longer than 2 seconds to complete.
- Check if the auto test is successful, the ***USR*** LED flashes RED with a pattern of 200ms ON and 1,5 sec OFF[1]. The eWON COSY ***does NOT restart in normal mode*** by itself and remains running in this diagnostic mode.
- You have to power the eWON COSY OFF and ON again to reboot the unit in normal mode. As described before, the eWON returns to its default COM parameters and factory IP addresses (like LAN 10.0.0.53) after this level 2 reset is performed.

5.5. Reset Impact Matrix

	Erased or Reset	Preserved
Impact Reset Level 1 (user reset)		LAN IP address + mask
	adm password	Internet access
		Language settings
	eWON Identification	Modem/ Wifi settings
	User Web site	Talk2M config
		Proxy configuration
Impact Reset Level 2 (factory reset)	*adm* password	Nothing
	eWON Identification	
	User Web site	
	LAN IP address + mask	
	Internet access	
	Language settings	
	Modem/ Wifi settings	
	Talk2M config	
	Proxy configuration	

*1 Any other pattern reflects a problem. The pattern will start with 200ms ON (opening of the pattern) followed by OFF and a certain number of times of a 1 sec ON allowing to identify the nature of the detected problem. If you were to be confronted with an error pattern on the **USR** LED, please write down the pattern you observed and contact your distributor.*

Appendix A - Connector Pinout & Related Specifications

A.1 - Main Connector

As shown in the picture, the female mating connector is labeled with the appropriate symbols.

Characteristic	Value
Connector type	MINICONNEC MC model Type MC 1,5/9-ST-3,5 Pitch = 3.50 mm 9-pin female
Connector pinout	

PIN	ICON	ID	Description
1	O-	DO_COM	Output signal (0V ground) connected to the emitter of the MOSFET transistor
2	O	DO	Output signal connected to the drain of the MOSFET transistor
3	O+	DO_VDC	Common of the external predrive power supply (between +12 et +24 VDC)
4	i-	DI_COM	Ground of the input (isolated)
5	i1	DI1	Input signal 1
6	i2	DI2	Input signal 2
7	+	Power in VDD +	between +12 et +24 VDC
8	-	Power in GND -	0V
9	⏚	Functional Earth	

A.2 - Specification of the External Power Supply

The eWON COSY must be powered by a safety Low Power Supply (LPS) in accordance with clause 2.5 of UL/IEC 60950-1 Ed2. Standard, 12-24Vdc, 30W min. Certified for 60°C and for altitudes up to 2000m. The safety LPS power supply is not part of the delivery.

Suggested power supply:

SIEMENS SITOP logo power 24V 2.5A 60W - Siemens order ref: 6EP1332-1SH43.

Equivalents are available on the market.

Power Supply	
Characteristic	**Value**
Power supply voltage	external 12-24 VDC +/- 19%
Max COSY input power	30W max.
Internal voltage protection	max 30V
Input protection	protected against polarity inversion

A.3 - Digital Output & Digital Inputs

Digital Inputs	
Characteristic	**Value**
Type of digital output[2]	Open drain MOSFET
Max. current (ext,source)	200 mA
Isolation (both DI & DO)	1,5 kV
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	From 3,8 mA @ 12 VDC to 8,2 mA @ 24 VDC

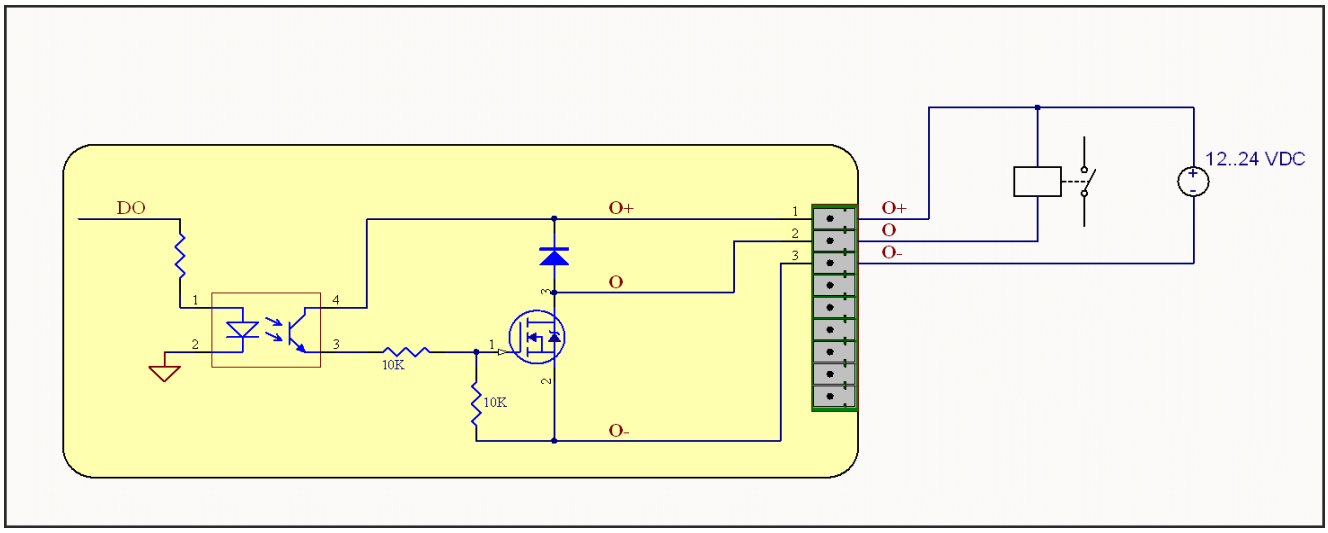
2 *When the eWON COSY reboots, a short phase of ON state is part of the starting process.*

The digital output is activated by an open drain MOSFET transistor driven by an optocoupler. The maximum current flow inside this transistor has a value above the one specified in the eWON, in order to cope with the switching power losses.

The transistor used is in an open drain type with predrive. This means the relay power supply has to be supplied from an external source to the predrive electronics. The diagram below shows the external wiring needed for proper operation of the digital output. A relay has been chosen for this sample application but any load within the specifications can be used instead.

- Note -

This is a sink only output to ground (the transistor acts like a switch ground).



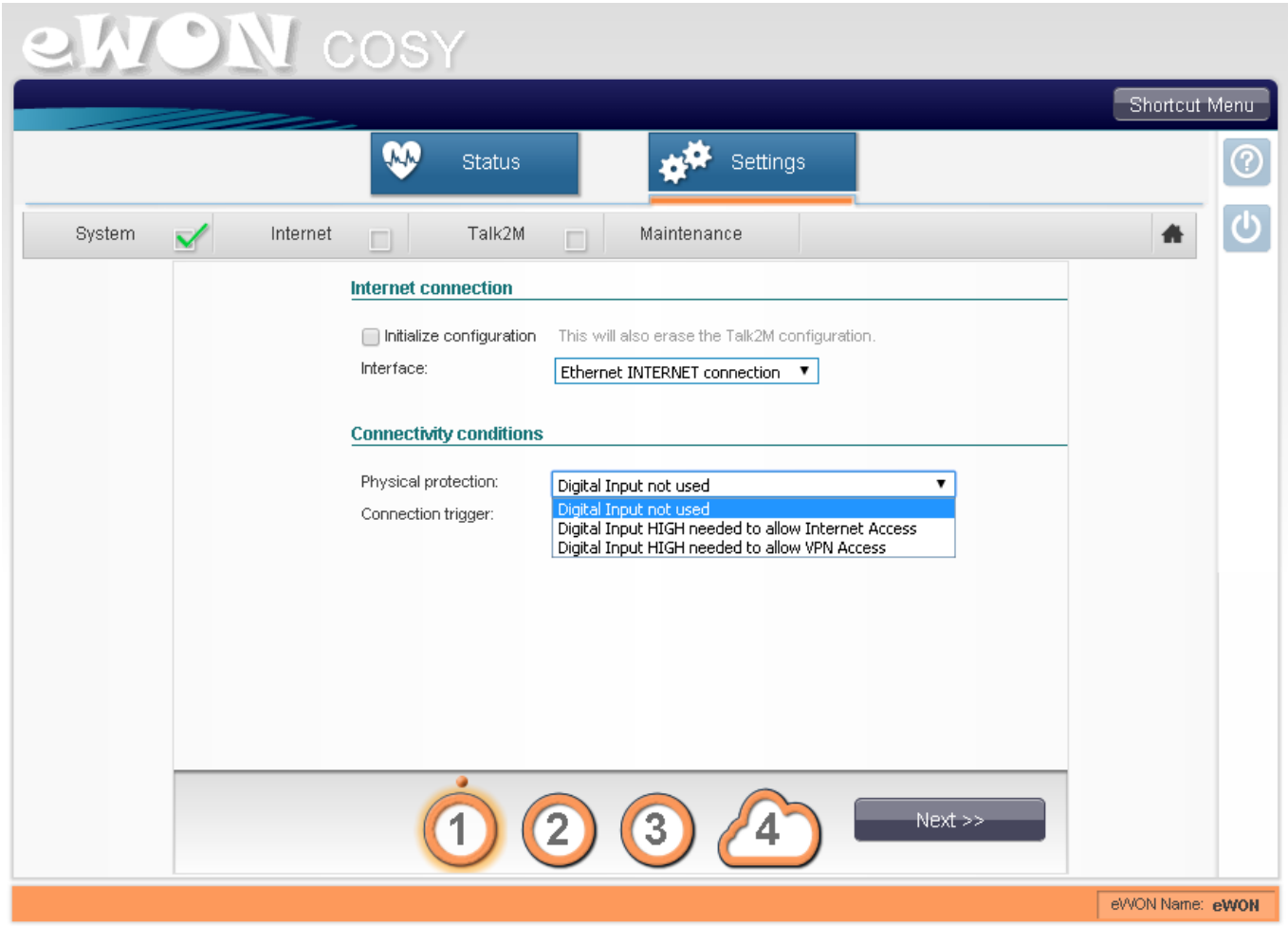
Possible features :

Digital Output & Inputs can be used on the COSY 131, some features can be externalized by wiring the main connector.

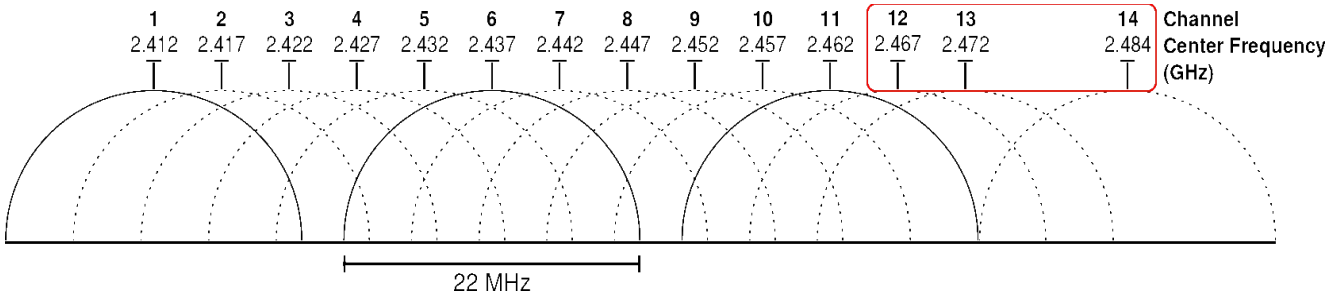
LED	Connector	Description
KEY	**DI1**	On a key switch to authorize or prevent the Internet connection.
		On a key switch to authorize or prevent the VPN connection.
DI2	**DI2**	Not supported.
T2M	**DO**	Can be wired to an external device to propagate the Talk2M status. If the VPN connection is active, the DO is set to 1.

Digital Input (DI1) can be used as a connectivity condition.

The configuration of this condition has to be done during the Internet Wizard where you define if the digital input is used or not and for which purpose.



A.4 - Used Wireless Frequencies



- **Channels 12, 13 & 14 are not supported**

Used channels and frequencies are between: Channel 1 - 2,412 Ghz and 11 - 2,462 Ghz

Revision

Revision History

Revision	Date	Description
1.0	22/01/2015	Original Document
1.1	04/02/2015	Pictures modifications
1.2	27/04/2015	WiFi & DI/DO Updates (3.4.1 A.3, A.4)
1.3	30/06/2015	Added Cabling rules (#2.4.3.Cabling rules)
1.4	17/11/2015	Added section 3.5: LAN Switch Specifications

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