

**EMS BTDIN – Pulse concentrator  
module**Cat. No:  
F80BI

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# EMS BT DIN - Pulse concentrator module

Cat. No:  
F80BI

## 1. DESCRIPTION - USE

- . Module dedicated to Energy Management System (EMS BT DIN) use.
- . It collects, memorises and transmits pulses in output from electrical, gas, water counters or from the pulse output of multifunction measuring devices.

Symbol:



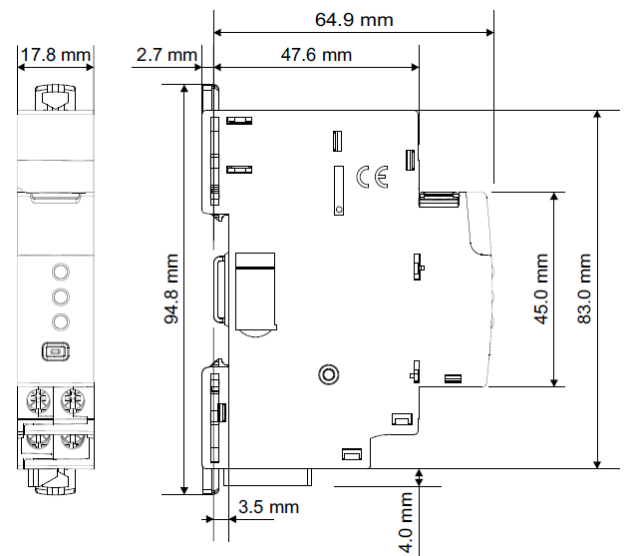
## 2. RANGE

- . Cat. n° F80BI: Pulse Concentrator Module; 3 inputs from voltage-free SPST-NO contact with one common terminal.

Width:

- . 1 module. 17,8 mm width.

## 3. OVERALL DIMENSIONS



## 4. PREPARATION -CONNECTION

Fixing:

- . On symmetric rail EN/IEC 60715 or DIN 35 rail

Operating positions:

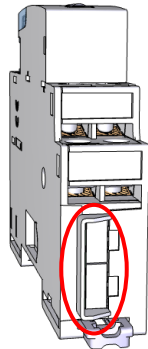
- . Vertical, Horizontal, Upside down, On the side



## 4. PREPARATION –CONNECTION (continued)

Power Supply:

- . Mandatory in 12 VDC via the specific Power supply module Cat n°F80BA
- . Two ways:
  - via specific communication patch cords (cat. nos F80BC250/500/1000) to connect at the downstream through dedicated ports



- via specific communication rails (cat. nos F80BR18/24/36) to connect at the rear through dedicated connectors



Terminals:

- . Terminal depth: 8 mm.
- . Stripping length: 8 mm

Screw head:

- . Mixed, slotted and Pozidriv n°1 (UNI7596 type Z1).

Recommended tightening torque:

- . 1 Nm.

Recommended tools:

- . For the terminals: Pozidriv n°1 or flat screwdriver 4 mm.
- . For fixing: flat screwdriver 5.5 mm (6 mm maximum).
- . For configuration DIP switches: flat screwdriver 2 mm

Conductor type:

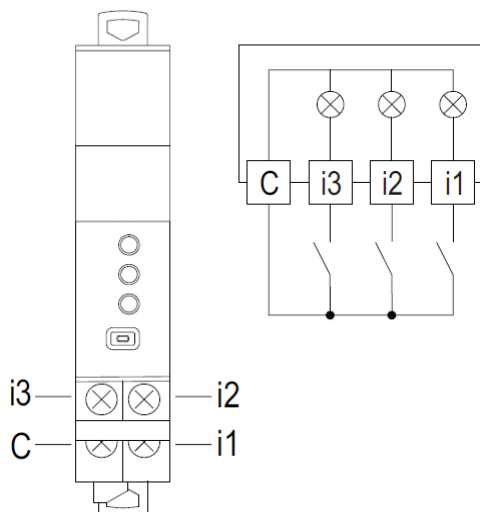
	Copper cable	
	Without ferrule	With ferrule
Rigid Cable	1 x 0,5 mm <sup>2</sup> to 1,5 mm <sup>2</sup> 2 x 1,5 mm <sup>2</sup>	-
Flexible Cable	1 x 0,5 mm <sup>2</sup> to 1,5 mm <sup>2</sup> 2 x 1,5 mm <sup>2</sup>	1 x 0,5 mm <sup>2</sup> to 1,5 mm <sup>2</sup> 2 x 1,5 mm <sup>2</sup>

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## 4. PREPARATION –CONNECTION (continued)

Wiring diagrams:



### Note:

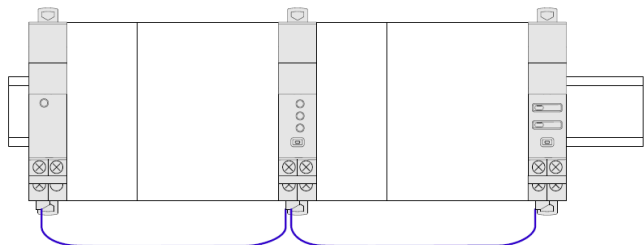
- . Inputs from voltage-free SPST NO contacts
- . Cable length: max. 1000 m
- . Resistance of the circuit:  $R_{max} \leq 125 \Omega @ 25^\circ C$

### Data connection (EMS BT DIN modules inter-connection):

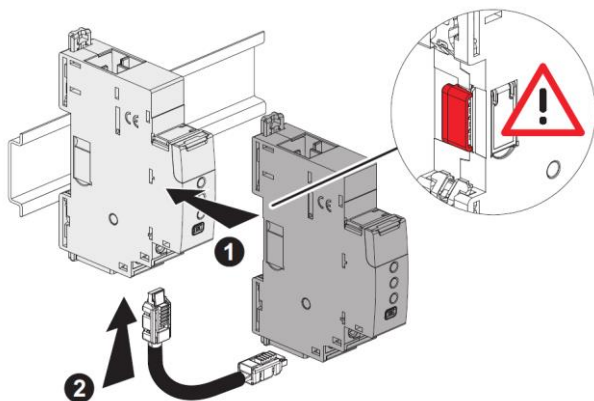
- . Via specific communication patch cords (cat. nos F80BC250/500/1000)



Allow data transmission between the different EMS BT DIN modules.  
This type of connection is recommended when there are few EMS BT DIN modules, distributed all over the enclosure.



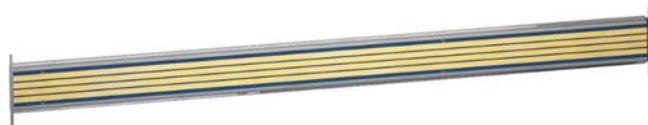
**Implementing:** with this configuration, the plastic protection cover of the backside communication ports on the EMS BT DIN module must be kept on.



## 4. PREPARATION –CONNECTION (continued)

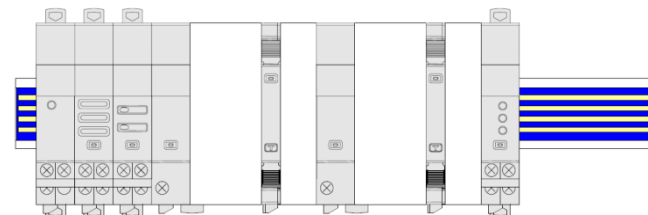
### Data connection (EMS BT DIN modules inter-connection) (continued):

- . Via specific communication rails (cat. nos F80BR18/24/36).

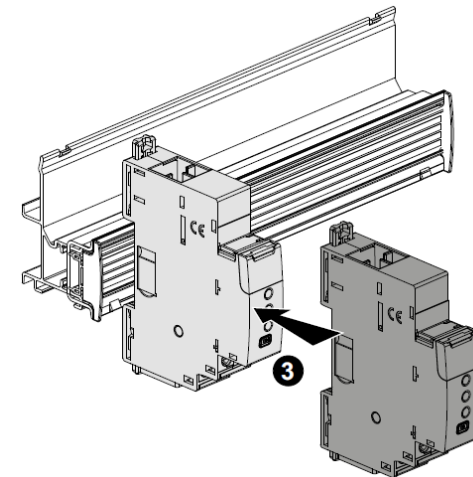
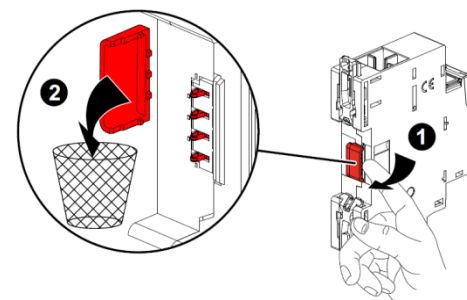


. Allow data transmission between the different EMS BT DIN modules.

This type of connection is recommended when there are several EMS BT DIN modules on the same DIN row.



**Implementing:** with this configuration, the plastic protection cover of the backside communication ports on the EMS BT DIN module must be removed.



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## 4. PREPARATION –CONNECTION *(continued)*

### Data connection (EMS BT DIN modules inter-connection)

*(continued)\*:*

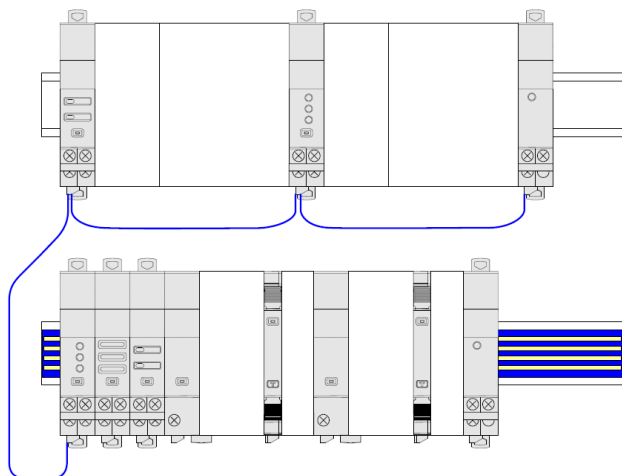
. Via a mix between specific communication patch cords and communication rails in order to create a link between several rows

Two situations:

- Individually connected with communication rails.  
The communication patch cord allows to connect two rows.



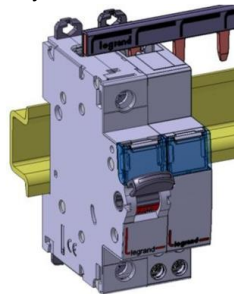
- Individually connected with communication patch cords & communication rail.  
The communication patch cords allow to connect EMS BT DIN module on a row and to connect two rows.



## 4. PREPARATION –CONNECTION *(continued)*

### Position in a row:

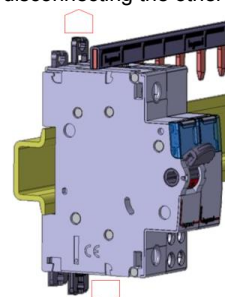
. The product profile and the position of the terminals at the downstream allow the insertion of the prong-busbar by the upstream. In this way the position of the EMS BT DIN device in a row can be freely chosen



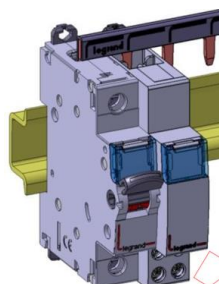
### Module maintenance:

. A device may be replaced in the middle of a row supplied with prong-busbar without disconnecting the other devices.

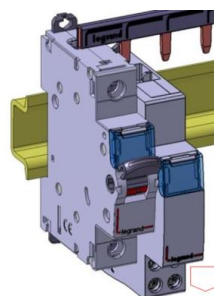
1. Put the clamp in the unlocking position



1. Put the clamp in the unlocking position



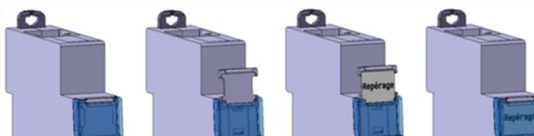
2. Pull the device forward in order to release it from the rail



3. Pull the device downward in order to release it completely from the prongs of the busbar

### Labelling:

. Circuit identification by way of a label inserted in the label holder situated on the front of the product.



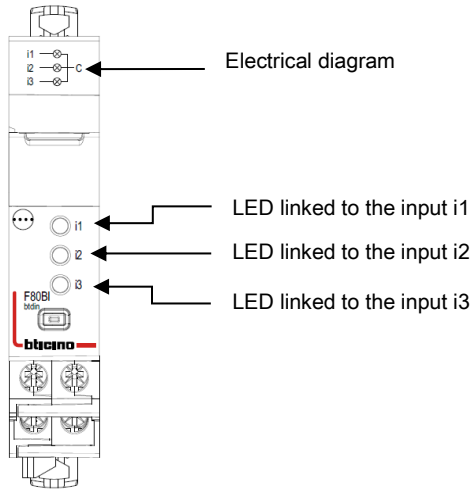
# EMS BT DIN - Pulse concentrator module

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## 5. GENERAL CHARACTERISTICS

### Front face marking:

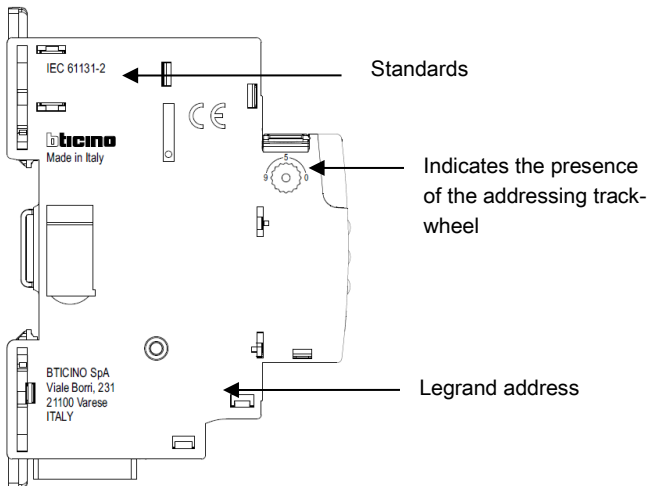
. By permanent ink pad printing (red line) and laser marking



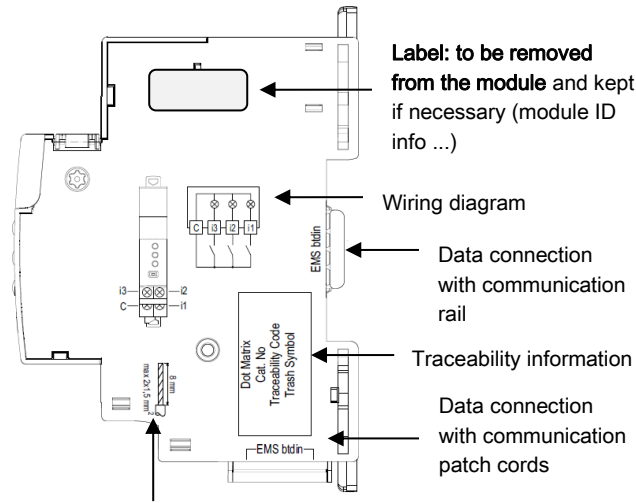
### Lateral side marking:

. By laser.

left side: Standard and programming information



right side: cabling and traceability information



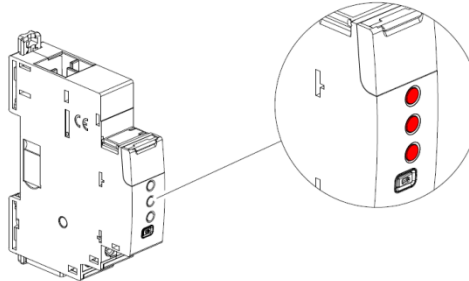
Cabling information

## 5. GENERAL CHARACTERISTICS (continued)

### Measuring LEDs:

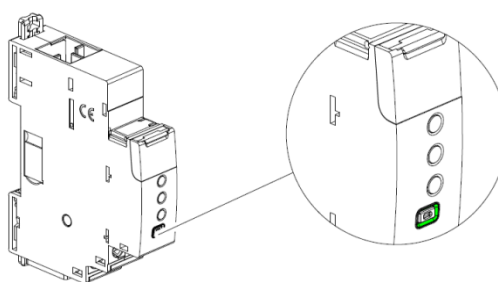
. The device is equipped with 3 signalling LEDs indicating that the module has received a pulse in input:

- blinking red → one light pulse each impulse received






### Multi-Functions button:

. Front face button as several functions:



. Gives information about the operating state on the module

Possible states:

Colour	State	Meaning
 red	Slow blinking	Error (e.g. addressing error)
	Fast blinking	No function
	Steady (pressing the multifunction button longer than 10 sec.)	Total reset [any firmware updates are preserved]
 green	Slow blinking	System process is running. Wait until the Led turns steady
	Fast blinking (pressing the multifunction button for 5 sec.)	put in "Stand-by" the EMS CX <sup>3</sup> module (no remote action and communication available)
	Steady	System OK, connection is running
 orange	Slow blinking	No function
	Fast blinking	Device's firmware update in progress
	Steady	No function

# EMS BT DIN - Pulse concentrator module

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## 5. GENERAL CHARACTERISTICS *(continued)*

### Inputs characteristics:

- . N° of inputs: 3 passives
- . Input type: potential free SPST-NO contact
- . Connections: 3 inputs with common point
- . Input pulse waveform: ON state:  $\geq 20$  ms
- . Input frequency: max. 25 Hz
- . Engineering units programmable, possible values: pulses, Wh, kWh, MWh, varh, kvarh, Mvarh, VAh, kVAh, MVAh, m<sup>3</sup>, km<sup>3</sup>, Mm<sup>3</sup>, Nm<sup>3</sup>, kNm<sup>3</sup>, MNm<sup>3</sup>, J, kJ, MJ, cal, kcal, g, kg, t, L (\*), dm<sup>3</sup> (\*).
- . Pulse weight programmable, possible values: from 0,01 to 32767

(\*) available from the firmware version 1.5.7 (Production date indicated on the label stucked on the side of the module  $\geq 21W23$ )

### Note:

- . Default configuration for the 3 inputs: 10 Wh/imp
- . All the configuration can be made via BT DIN - EMS configurator software (download for free) or via EMS BT DIN Mini configurator module (cat. no F80BV)

### Insulation voltage:

- .  $U_i = 400$  V

### Impulse withstand voltage $U_{imp}$ :

- . EMS ports / Input terminals:
  - wave 1,2 / 50  $\mu$ s: 6 kV
- alternate current 50 Hz / 1 min.: 3 kV

### Pollution degree:

- . 2 according to IEC/EN 60898-1.

### Overvoltage category:

- . III

### Dielectric strength:

- . 2500 V

### Plastic material:

- . Self-extinguishing polycarbonate.
- . Heat and fire resistant according to IEC/EN 60695-2-12, glow-wire test at 960°C.
- . Classification UL 94 / IECEN 60695-11-10: V1

### Ambient operating temperature:

- . Min. = -25°C. Max. = +70°C

### Ambient storage temperature:

- . Min. = -40°C. Max. = +70°C

### Protection Index:

- . Protection index of terminals against direct contacts: IP2X (IEC/EN 60529).
- . Protection index of terminals against solid and liquid bodies (wired device): IP 20 (IEC/EN 60529).
- . Protection index of the front face against solid and liquid bodies: IP 40 (IEC/EN 60529).
- . Class II, front panel with faceplate.

## 5. GENERAL CHARACTERISTICS *(continued)*

### Average weight per device:

- . 0,054 kg.

### Volume when packed:

- . 0,21 dm<sup>3</sup>.

### Consumption:

- . Values at 12 VDC
  - 24,0 mA    0,288 W

## 6. SYSTEM ARCHITECTURES

The EMS BT DIN is a polyvalent system and, according to the needs of the customer, can be set up and/or used as "Stand-alone" or "Supervised" system. Based on this choice the configuration and addressing methods are different.

Four possible architectures are provided:

### 6.1 Stand-alone system

6.1.1 with local addressing (through the track wheel)

6.1.2 with remote addressing (through a computer)

### 6.2 Supervised (Computer Supervisory System)

6.2.1 with local addressing

6.2.2 with remote addressing

### 6.1 Stand-alone system

. **Stand-alone** = autonomous system. To be used by the end-user if it is not necessary to have a computer for the supervision outside the envelope. Everything can be managed on site.

#### 6.1.1 Stand-alone system with local addressing (through the track wheel)

Local addressing advantages:

- No configuration software needed to set-up the installation
- **It is not necessary to use a computer to manage settings** (configurations, test, ...) and to use the system (visualize and be alerted, ...). Everything can be done through the Mini configuration module (local display, cat. no F80BV). [Refer to the technical sheet dedicated to this module for details].
- No communication Interfaces or gateways are required.
- Installation can be done without the intervention of a System Integrator

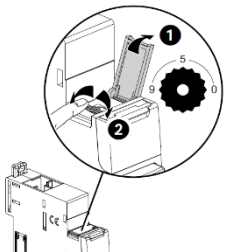
### Programming procedure:

. For EMS BT DIN modules which need some: mandatory through the lateral DIP-switches of each EMS BT DIN module (see § "Module configuration")

### Addressing procedure:

. For all EMS BT DIN modules: mandatory through the track wheel located on the top upper face of each EMS BT DIN modules

. Marked from 0 to 9 in order to locally define the Modbus address of the EMS BT DIN modules

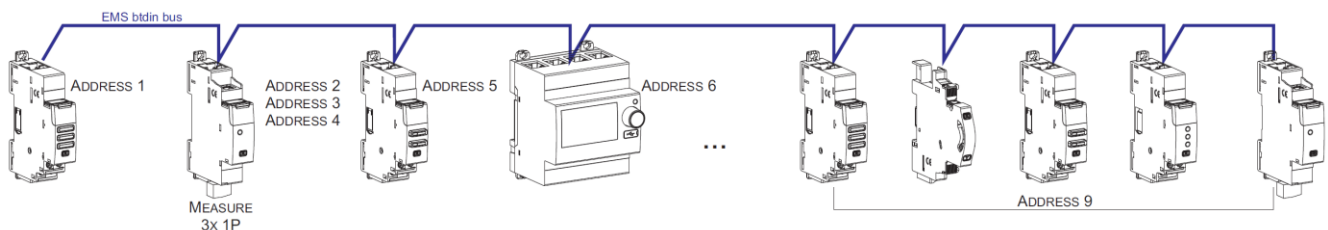


#### Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 12, Addresses of the module 12, 13, 14)

### Consequences of the local addressing mode (through the track wheel):

- . Each device of the system must be addressed.
- . Addresses available: from 1 to 9
- . Address 0 not permitted
- . It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BT DIN mini configuration module (local display) the grouped function will be displayed as a unique "device" with all grouped functions. [Refer to the schemes hereunder]



### Note for the mini configuration module (local display)

- . It is possible to assign it the same address as another EMS BT DIN through the programming menu of the device
- . The mini configuration module can be placed everywhere in the EMS BT DIN bus

## 6. SYSTEM ARCHITECTURES

### 6.1 Stand-alone system (continued)

#### 6.1.2 Stand-alone system with remote addressing (through a computer)

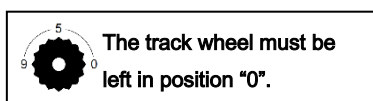
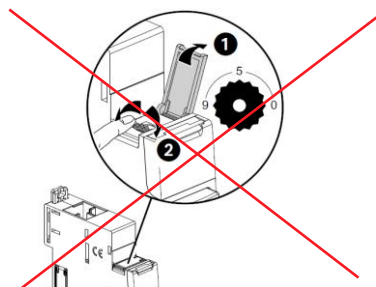
Remote addressing advantages:

- Whole configuration (addresses and functions) can be set up through the EMS Configuration software
- Configuration software available for free
- **Automatic detection of the EMS BT DIN modules** installed in the system (characteristics, functions, configuration...)
- **Increased settings possibilities: load shedding function**
- Increased addressing: **up to 30 Modbus addresses in a system**

#### Programming procedure:

. For EMS BT DIN modules which need some: mandatory through the lateral DIP-switches of each EMS BT DIN module or via the configuration software (see § "Module configuration")

#### Addressing procedure:

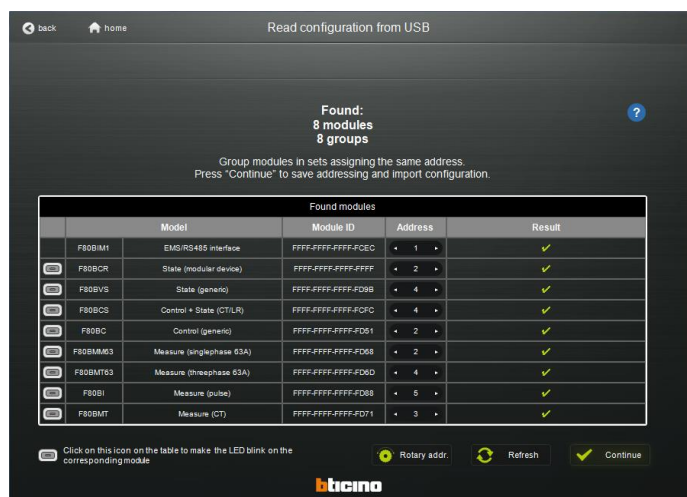
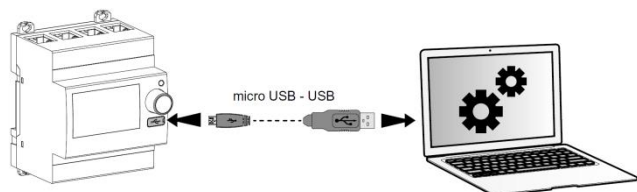


. It is not necessary to address the EMS BT DIN modules. **The track wheel must be left in default position "0".**

. All the addressing/configuring procedure will be done with the Configuration Software (available online for free)

. With remote addressing, the software does the automatic detection of modules installed in the system, but the supervision is not possible until the users assign the remote address and all the characteristics to each module.

**Note: it is mandatory to connect the computer to the mini configuration module with an USB-micro USB cable.** [For more details, refer to the technical data sheet of the Mini configuration module EMS BT DIN]



#### Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)

## 6. SYSTEM ARCHITECTURES

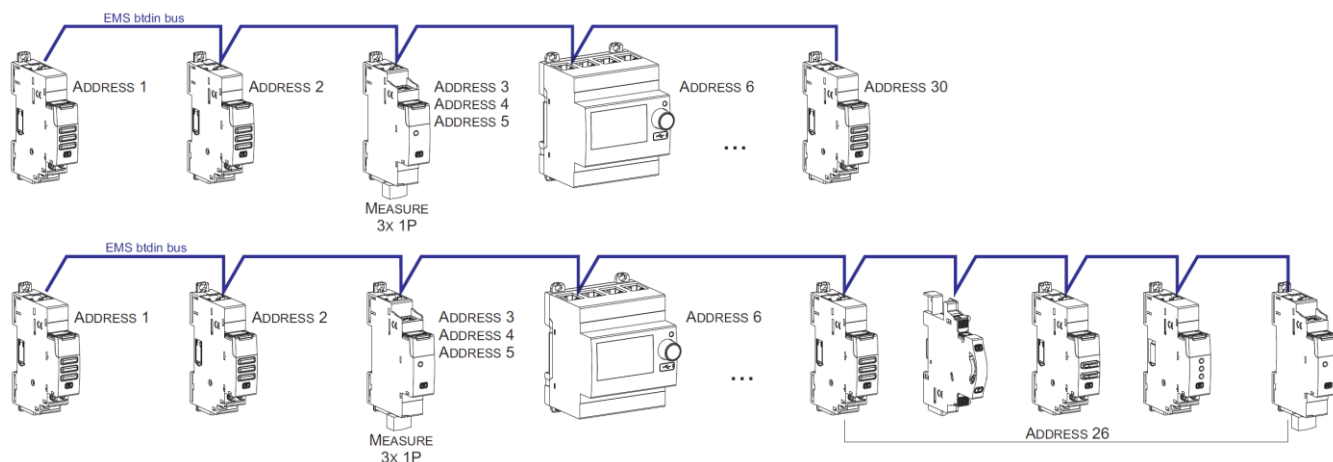
### 6.1 Stand-alone system (continued):

#### 6.1.2 Stand-alone system with remote addressing (through a computer) (continued):

#### Consequences for the system architecture:

- for 1 mini configuration module (cat. no F80BV)
  - o up to **30 EMS BT DIN modules** (e.g. 30 devices grouped per functions with addresses from 1 to 30)

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BT DIN display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. [Refer to the schemes here under]



#### Note for the mini configuration module (local display)

- . It is possible to assign it the same address as another EMS BT DIN
- . The mini configuration module can be placed everywhere in the EMS BT DIN bus

### 6.2 Supervised system (Computer Supervisory System)

. **Supervised system** = System to be used through a Computer Supervisory System to remotely read data from the EMS BT DIN devices and/or do operations on these devices (e.g. commands of a motor driven or contactor ...).

#### 6.2.1 Supervised system-with local addressing (through the track wheel)

Local addressing advantages:

- No configuration software needed to set-up the installation
- Installation can be done without the intervention of a System Integrator

#### Programming procedure:

. For EMS BT DIN modules which need some: mandatory through the lateral DIP-switches of each EMS BT DIN module (see § "Module configuration")

#### Addressing procedure:

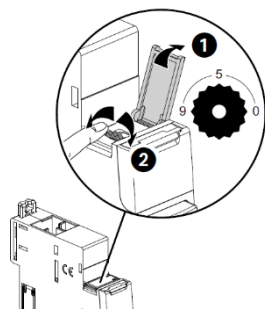
. For all EMS BT DIN modules: mandatory through the track wheel located on the top upper face of each EMS BT DIN modules

. Marked from 0 to 9 in order to locally define the Modbus address to EMS BT DIN modules

In this system the Modbus address of an EMS BT DIN module device or group of modules (several functions) is obtained considering the address of the interface Modbus/EMS BT DIN Interface as tenth and the address of a device or group of function as unit (e.g. Interface address 1 = 10 → address of module n°5 = Modbus address 15)

#### Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 12, Addresses of the module 12, 13, 14)



## 6. SYSTEM ARCHITECTURES *(continued)*

### 6.2 Supervised system (Computer Supervisory System) *(continued)*

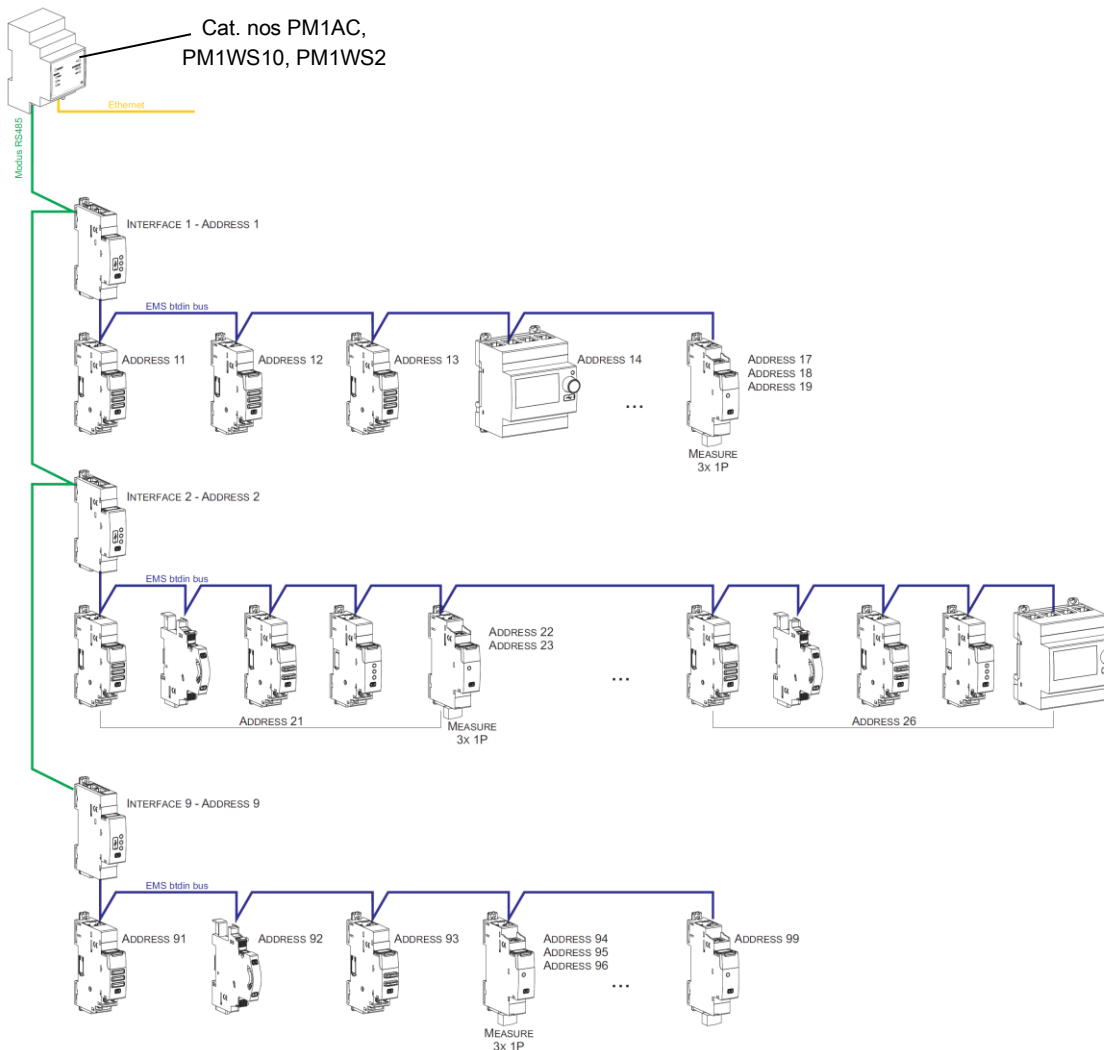
#### 6.2.1 Supervised system-with local addressing (through the track wheel) *(continued)*

##### Consequences of the local addressing mode (through the track wheel):

- . Each device of the system must be addressed.
- . Addresses available: from 1 to 9
- . Address 0 not permitted

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BT DIN display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the scheme hereunder]*

**Note:** In this configuration the Modbus address of an EMS BT DIN module device or group of modules (several functions) is obtained considering the address of the interface Modbus/EMS BT DIN Interface as tenth and the address of a device or group of function as unit (e.g. Interface address 1 = 10 and device address = 5 → Modbus address = 15)



##### Consequences for the system architecture:

- for 1 IP/Modbus gateway (cat. no PM1AC):
  - o up to **81 Modbus address**
  - o mandatory limit of max. **9 Modbus/EMS BT DIN interfaces** or max. **1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent) or max. **50 m of Category 6 cable** (FTP or UTP).
- for 1 Modbus/EMS BT DIN Interface (cat. no F80BIM1):
  - o up to **30 EMS BT DIN modules** (ex. 30 devices grouped per functions with addresses from 1 to 9)

**Note:** with local addressing, the Modbus/EMS BT DIN interface, does the automatic detection of modules (characteristics, functions, configuration...)

## 6. SYSTEM ARCHITECTURES *(continued)*

### 6.2 Supervised system (Computer Supervisory System) *(continued)*

#### 6.2.2 Supervised system-with remote addressing (through a computer)

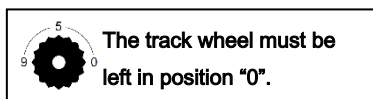
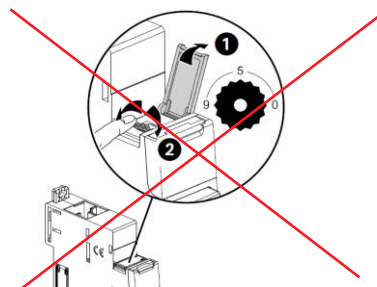
Remote addressing advantages:

- Whole of configuration (addresses and functions) can be done a remotely through the EMS Configuration software
- Configuration software available for free
- **Automatic detection of the EMS BT DIN modules** installed in the system (characteristics, functions, configuration...)
- **Increased settings possibilities: load shedding function**
- Increased addressing: **up to 32 Modbus/EMS BT DIN interfaces**
- Increased addressing: **up to 247 Modbus addresses in a system**

#### Programming procedure:

. For EMS BT DIN modules which need some: mandatory through the lateral DIP-switches of each EMS BT DIN module or via the configuration software (see § "Module configuration")

#### Addressing procedure:

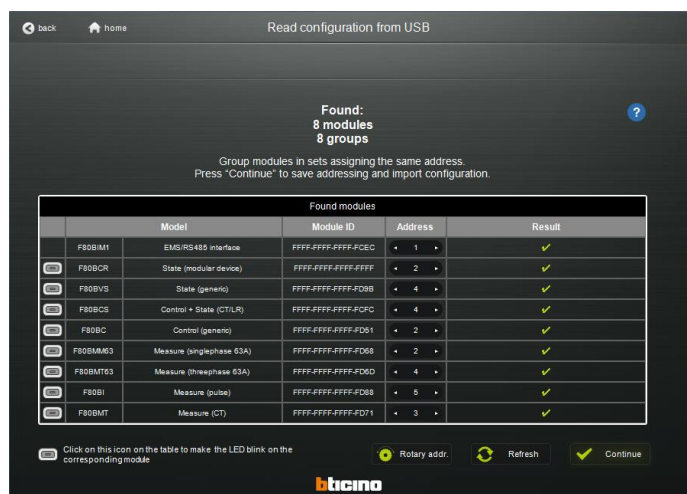
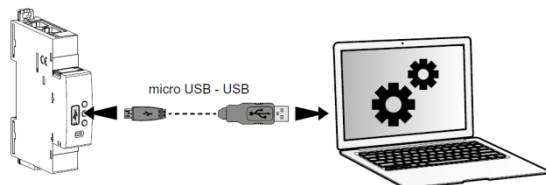


. It is not necessary to address the EMS BT DIN modules. **The track wheel must be left in default position "0".**

. All the addressing/configuring procedure will be done with the Configuration Software (available online for free)

. With remote addressing, the software does the automatic detection of modules installed in the system, but the supervision is not possible until the user assigns the remote address and all the characteristics to each module.

**Note: it is mandatory to connect the computer to the different Modbus/EMS BT DIN interface with an USB-micro USB cable (one interface at a time).** [For more details, refer to the technical data sheet of the Modbus/EMS BT DIN interface]



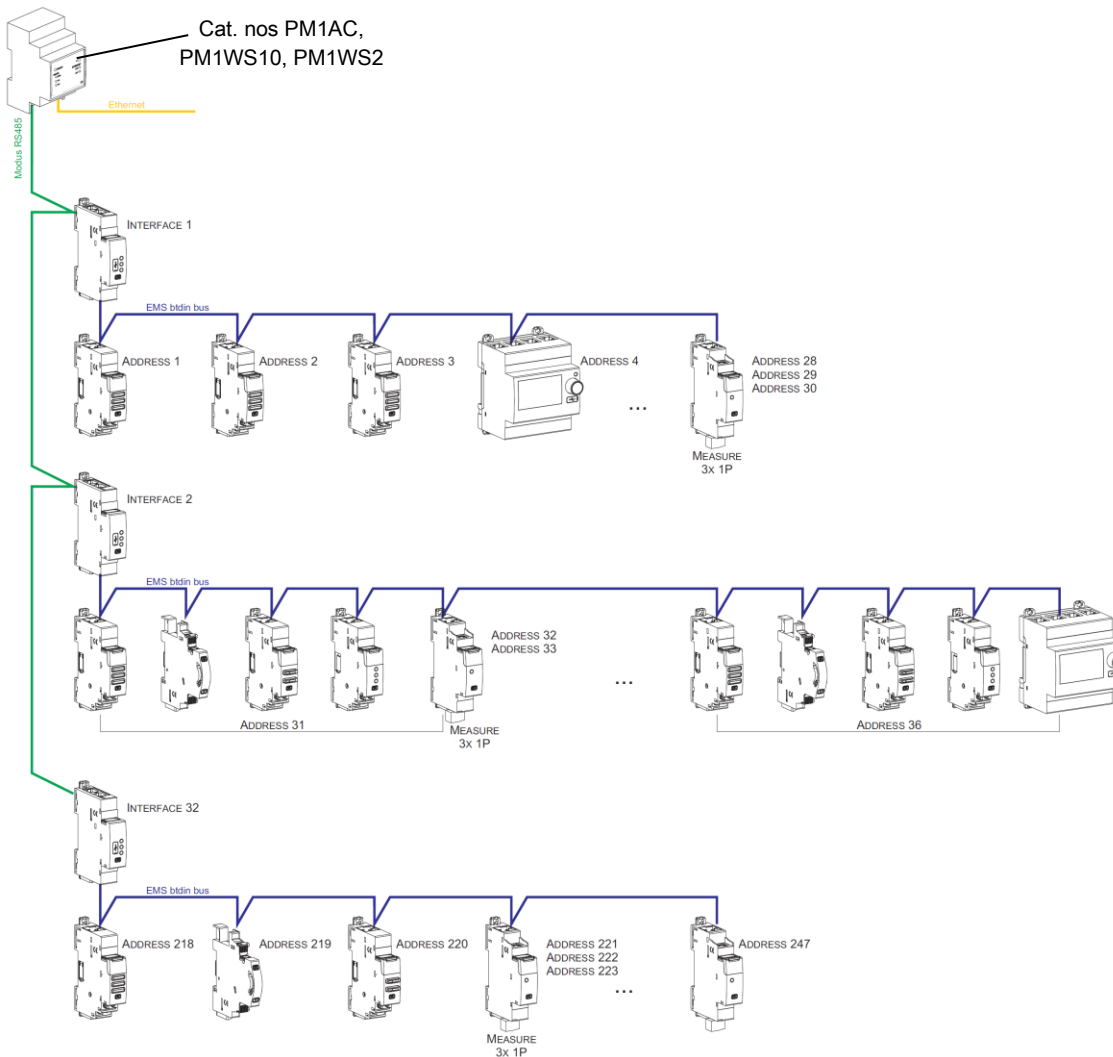
#### Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)

## 6. SYSTEM ARCHITECTURES *(continued)*

### 6.2 Supervised system (Computer Supervisory System) *(continued)*

#### 6.2.2 Supervised system-with remote addressing (through a computer) *(continued)*



#### Consequences for the system architecture:

- for 1 IP/Modbus gateway (cat. no PM1AC):
  - o up to **247 Modbus address**
  - o Because of Modbus: mandatory limit of max. **32 Modbus/EMS BT DIN interfaces** or max. **1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent) or max. **50 m of Category 6 cable** (FTP or UTP).
- for 1 Modbus/EMS BT DIN Interface (cat. no F80BIM1):
  - o up to **30 EMS BT DIN modules** (e.g. 30 devices grouped per functions with addresses from 1 to 30)

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a signalling auxiliary module (cat. no F80BCR), a universal control module (cat. no F80BC), a measuring module, and so on. In this way on the EMS BT DIN display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the scheme up here]*

## 7. COMPLIANCE AND APPROVALS

### Compliance to standards:

- . Compliance with Directive on electromagnetic compatibility (EMC) n° 2014/30/EU
- . Compliance with low voltage directive n° 2014/35/EU.
- . Electromagnetic Compatibility: IEC/EN 61131-2
- . Product standard: IEC/EN62053-31 class B (Annex D)

### Environment respect – Compliance with CEE directives:

- . Compliance with Directive 2011/65/EU modified by directive 2015/863 (RoHS 2) on the restriction of the use of hazardous substances in electrical and electronic equipment such as lead, mercury, cadmium, hexavalent chromium and polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) brominated flame retardants from 1st July 2006
- . Compliance with the Directive 91/338/EEC of 18/06/91 and decree 94-647 of 27/07/04.
- . Compliant with regulation REACH

### Plastic materials:

- . Halogens-free plastic materials.
- . Marking of parts according to ISO 11469 and ISO 1043.

### Packaging:

- . Design and manufacture of packaging compliant to decree 98-638 of the 20/07/98 and also to directive 94/62/CE.

### Environmental profile:

- . PEP document available