

# HMI D1-HMI D2

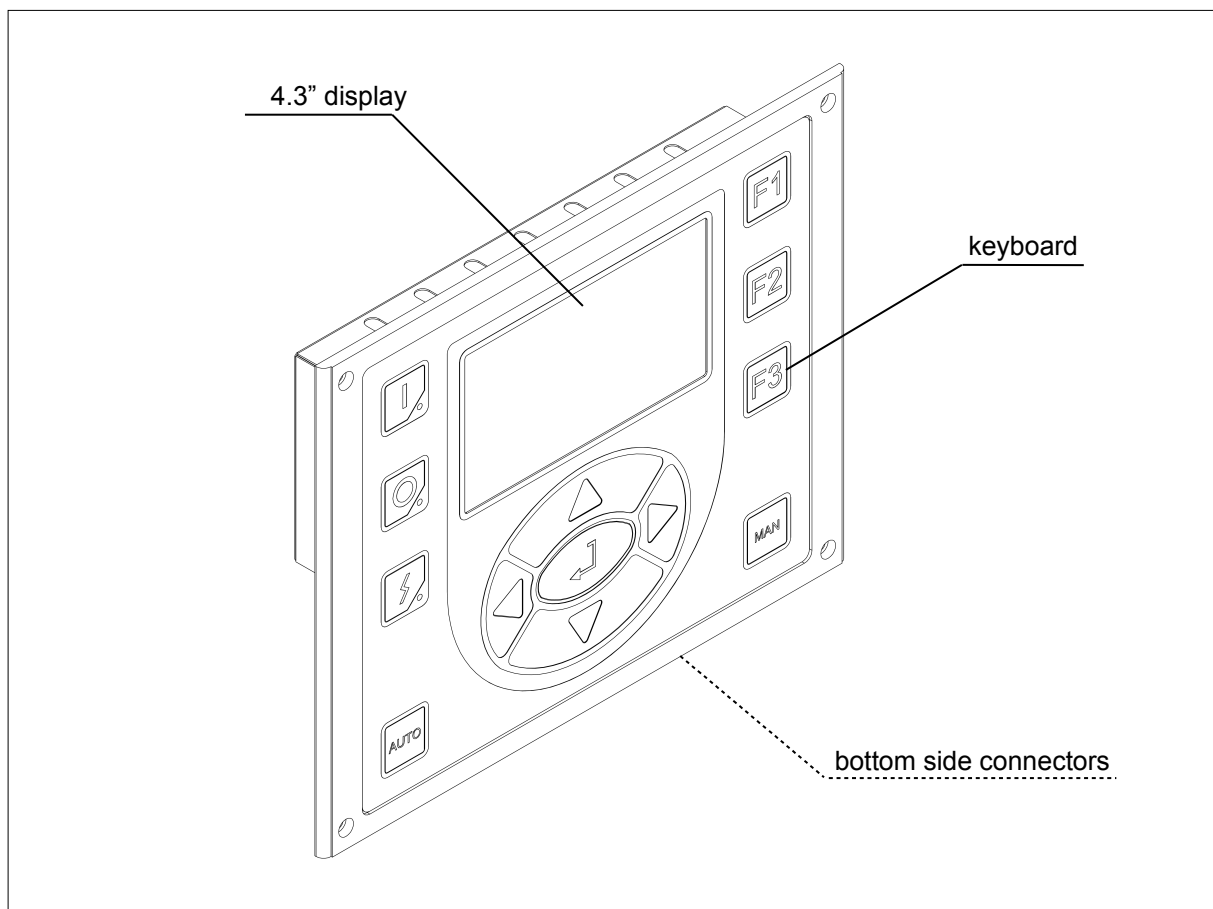
## Process control unit with graphical interface

Installation, use and maintenance manual

### Description

Process control unit with graphical display and keypad. Main characteristics:

- Equipped with 32 bit Renesas RX62N processor with 96kbytes RAM and 512kbits Flash inside
- 64 kbit non-volatile RAM, 32 Mbit flash ROM and 128 Mbit SDRAM
- 1 USB host port (2.0)
- 2 FLXIO / RS 485 ports
- 4.3" LCD display with 24 bits color depth (16.7M colors)
- 13 buttons keypad with 3 LED lamps
- 1 Ethernet port
- RTC with long life lithium coin-cell battery (CR2032)



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## Ordering information

Products	SMITEC part number
HMI D1 module in base version (with USB host mode only, with two FLXIO master channels, without Ethernet, without SD socket, without RTC, without application software)	KZ010367
HMI D1 module in base version (with USB host mode only, with two FLXIO master channels, without Ethernet, without SD socket, without RTC, with pre-loaded application software)	Contact us
HMI D2 module in base version (with USB host mode only, with two FLXIO master channels, with Ethernet, with RTC, without SD socket, without application software)	KZ010422
HMI D2 module in base version (with USB host mode only, with two FLXIO master channels, with Ethernet, with RTC, without SD socket, without application software, with gasket on back of the frame)	KZ010611
HMI D2 module in base version (with USB host mode only, with two FLXIO master channels, with Ethernet, with RTC, without SD socket, with pre-loaded application software)	Contact us

Accessories	SMITEC part number
RTC CR2032 replacement battery	TB010554
Adhesive gasket for back of the frame *	MA804900

\*: Already present in some models (see products part numbers)

Documentation	SMITEC part number
User manual for HMI D1 and HMI D2	DK400150
FLXMOD system integration manual	DK400076

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## Technical data

General data	
Housing dimensions (width x height x depth)	210 mm x 170 mm x 37.6 mm
Weight	420 g (without connectors)
Connection method for power connector	Spring cage terminals
Conductor cross-section for power connector	0.14 to 1.5 mm <sup>2</sup> (26 ÷ 16 AWG) - 60°C
Functional earth connection	By fast-on terminal on rear-panel
Mode state visual indicators	Two green LED lamps for FLXIO ports status

Environment data	
Permissible operating temperature	+5° to +55°C
Permissible storage and transport temperature	-25° to +85°C
Permissible humidity	10% to 95%, not condensing
Permissible air pressure (operation)	80 to 106 kPa (up to 2000 m above sea level)
Permissible air pressure (storage and transport)	70 to 106 kPa (up to 3000 m above sea level)
Rear degree of protection	IP20 according to IEC 60529
Front degree of protection	IP65 according to IEC 60529 and UL Type 1 (guaranteed only using the adhesive gasket on back of the frame – see accessories)
Overvoltage category	II
Pollution degree	2
Means of protection (UL)	Class III NEC Class 2 power supply

Power supply	
Main power supply $V_m$	24 V DC = (-15% ÷ +20% according to IEC 61131-2)
Maximum allowed ripple	5% of supply voltage (according to IEC 61131-2)
Current consumption from main supply	0.5 A max.
Supply overvoltage protection	Bidirectional Zener clamp ( $V_z > 30$ V)
Supply reverse polarity protection	Protection diode

CPU characteristics	
Microcontroller type	Renesas Technology type RX62N
Microcontroller architecture	Harvard 32 bit
Microcontroller RAM size	96 kbytes
Microcontroller FLASH size	512 kbytes
Board external RAM	128 Mbits SDRAM
Board external non-volatile RAM	64 kbits

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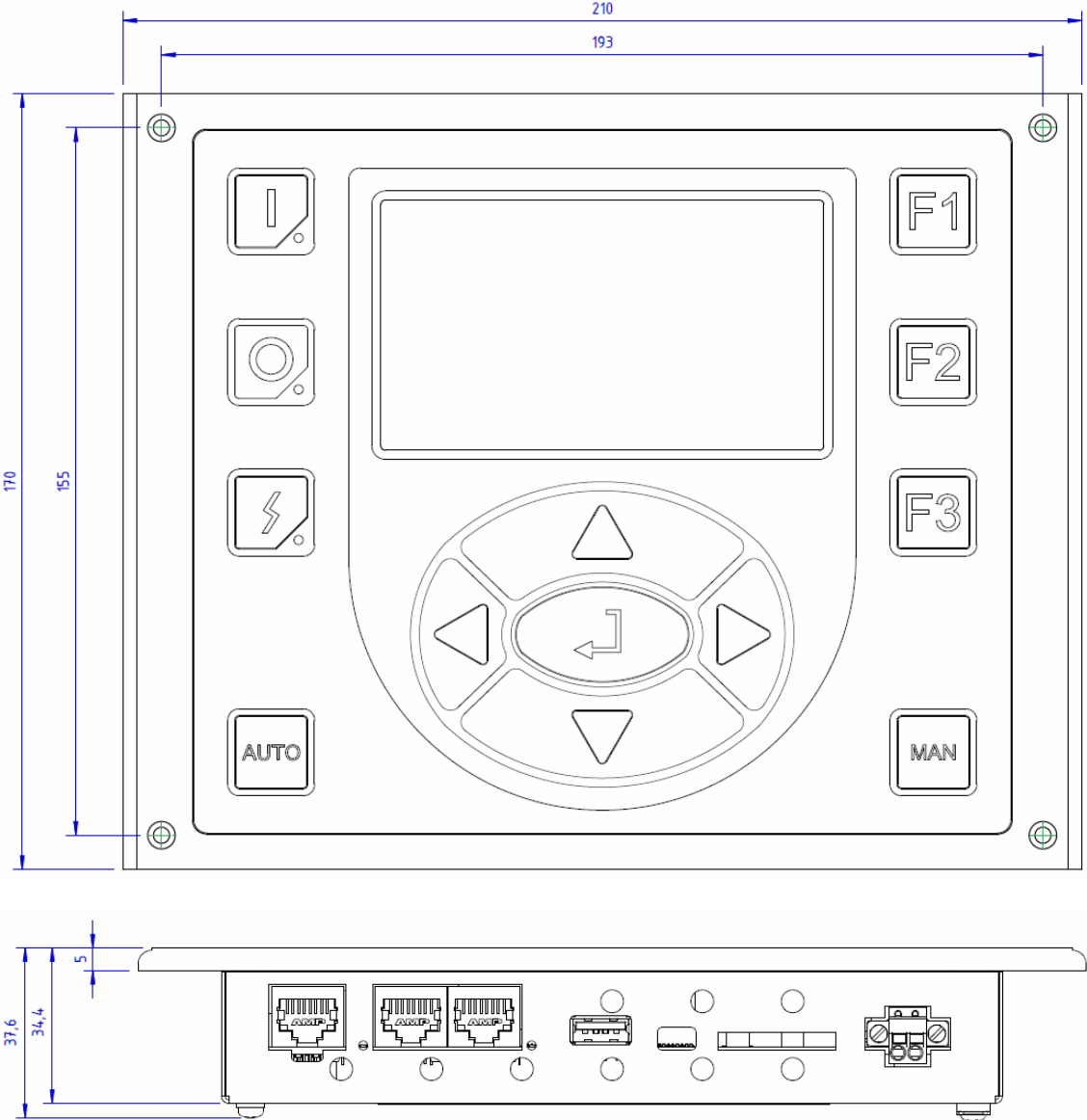
<b>Display characteristics</b>	
Display type	TFT LCD
Display size	4.3" (diagonal)
Color depth	24 bits (16.7M colors)

<b>Communication ports</b>	
FLXIO ports	2 on RJ45 connectors, useable also as EIA RS-485 ports
FLXIO ports speed	Up to 2.5 Mbps
USB 2.0 host ports	1 on standard type A female connector

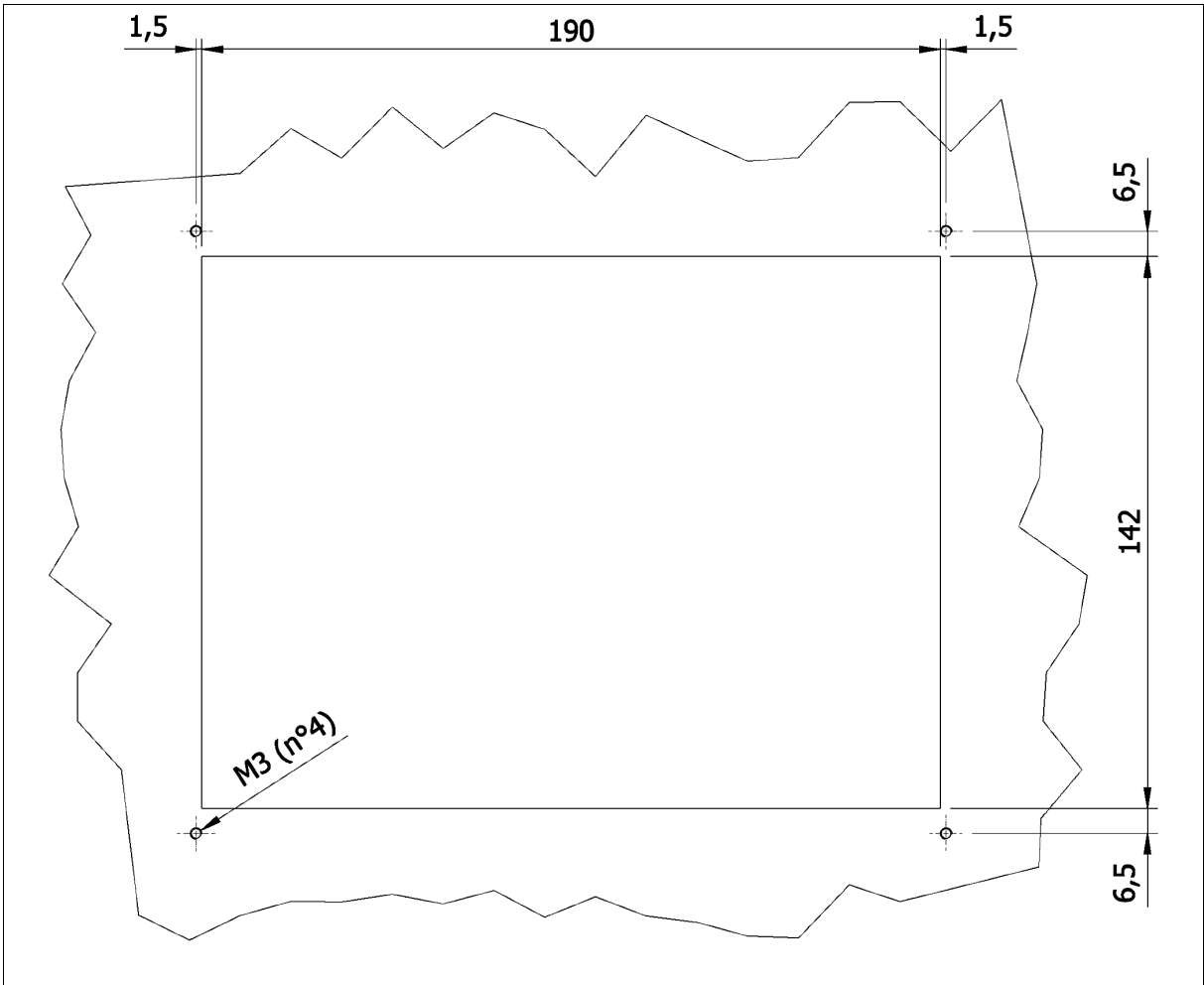
<b>Other characteristics</b>	
USB host output current	250 mA max.
Acoustic peripherals	1 buzzer
Expected battery life	> 10 years

# Mechanical drawing

The image below depicts the mechanical dimensions of the device:



**Recommended panel cut-out**



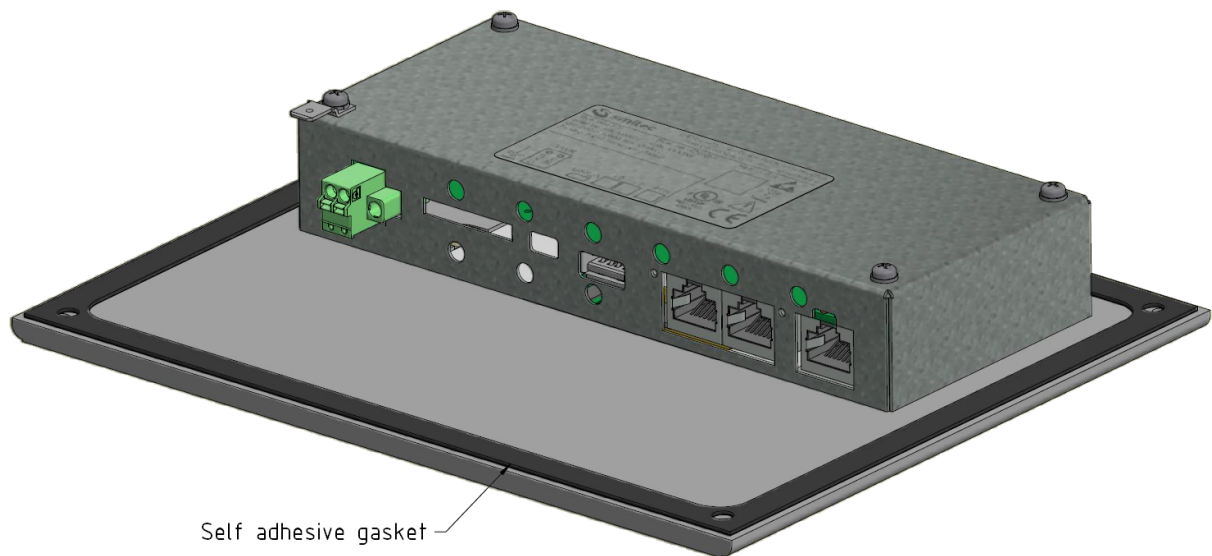
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## Mounting

The modules HMI D1/2 need to be fixed on a stable and rigid panel provided with 4xM3 metal threaded hole, min. 1.5mm deep. Use 4xM3x10mm Fe/Zn (not countersunk head type) screws, min. class 8.8, tightened at 1Nm.

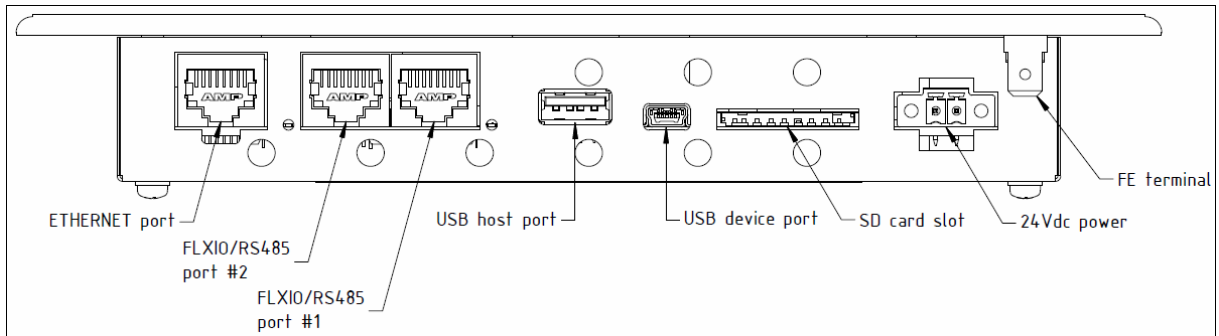
## IP65 protection and UL Type 1

To ensure rated protection, apply the MA804900 self adhesive gasket on back of the frame. While applying it, stretch it slightly to match the 4 holes with the 4 holes of the frame. See the following image.



## Connections

The module has several connectors for power supply and peripherals (depending on version), all located on the bottom side of the module (see illustration below).



**Caution:** HMI D1/2 module is an electronic high technology device with numerous connectors; for these reasons it results an ESD sensitive device. Observe ESD mitigation techniques or damage might occur.

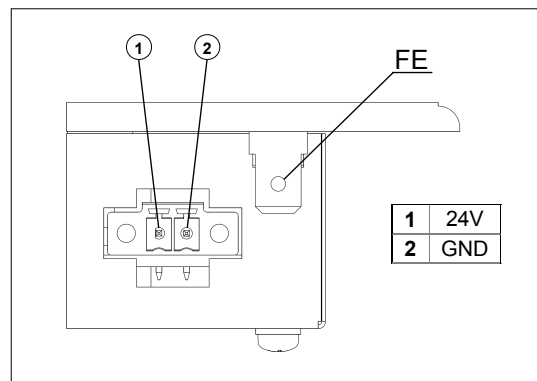


**Attention:** Le module HMI D1/2 est un appareil électronique de haute technologie doté de nombreux connecteurs; pour ces raisons, il en résulte un périphérique sensible aux décharges électrostatiques. Observez les techniques de réduction des décharges électrostatiques, sous peine de dommages.

## Power connector

The power connector is located on the bottom side of the module; the pinout is shown in the illustration aside.

For EMC reasons, a secure connection to earth is always required; a suitable fast-on terminal is provided for the purpose (labelled as FE in the illustration).



**Caution:** Use a cable with cross-section suited to the current involved. A wire smaller than necessary could cause risk of fire and unwanted voltage drops.  
**Caution:** To ensure conformance with EMC directive 2014/30/UE, the length of the cables must not exceed 30 m.





**Attention:** Utilisez un câble de section adaptée au courant impliqué. Un fil plus petit que nécessaire pourrait provoquer un incendie et des chutes de tension indésirables.

**Attention:** pour garantir la conformité avec la directive EMC 2014/30/UE, la longueur des câbles ne doit pas dépasser 30 m.

## SD card connector

This device (depending on version), is provided with a peripheral for interfacing SD cards. These could be used for storing large data or for updating software.

A suitable connector is provided on the bottom side of the module, able to accommodate standard SD cards.

## USB device connector

This port (depending on version), provided with a standard type mini B connector located on the bottom side of the module, is useable as a communication port for connection with a computer; the main purpose is data exchanging.

## USB host connector

This port, provided with a standard type A connector located on the bottom side of the module, is thought for connecting USB flash disks. Any different use should be avoided.



**Note:** The device HMI-D1/2 supports a large variety of USB flash disks but is not guaranteed that all type are correctly managed; in case of troubles with one model of USB Flash disk, try to operate with another.



**Caution:** Never connect a device absorbing a current beyond the rating of the device, or internal damage might occur.



**Attention:** Ne connectez jamais un appareil absorbant un courant supérieur aux valeurs nominales de l'appareil, cela pourrait l'endommager.

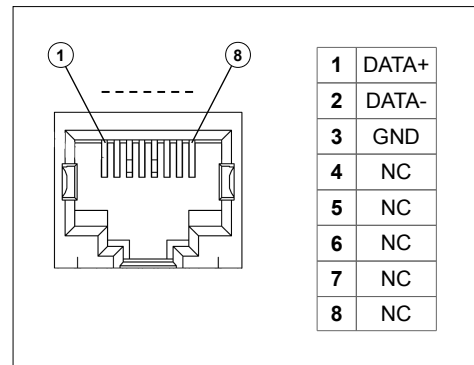
## FLXIO / RS485 connectors

The device can act as a dual-channel FLXIO master, and two RJ45 connectors are provided for the purpose on the bottom side of the module.

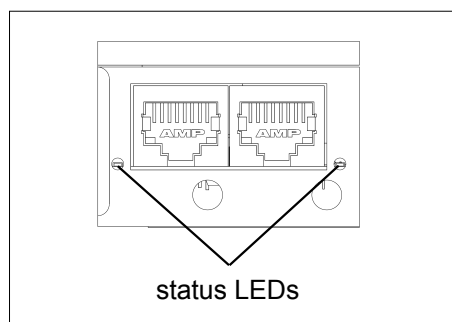
The illustration aside shows the pinout of each connector; use standard CAT 5E Ethernet cable to wire the buses.

Refer to the FLXMOD System Integration Manual for bus wiring topology.

Depending on the configuration of the device, these two ports could be used also as general purpose EIA RS485; the maximum transmission speed is 2.5 Mbps. Even if not mandatory, the use of shielded cable is highly recommended, particularly when transmission speed is high.



Near each connector a green LED lamp is provided to indicate the status of the bus FLXIO; the following table resumes all the possible states.



LED BEHAVIOUR	SYSTEM STATUS
Blinking slowly	System initialization
	Searching modules on the bus
	FW updating
Off (fixed)	No slaves found on the bus
On (fixed)	Bus operating correctly
Blinking fast	Bus error

If the device is used with ports in different configuration than FLXIO, these LEDs may assume different meanings depending on the installed firmware.

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## Recommendations

- Do not position the equipment so that it is difficult to operate the disconnecting device
- Do not use this equipment in a manner not specified in this documentation otherwise the protection means provided in the device may be impaired
- Replace the real-time clock battery exclusively by the same type than original one (CR2032)
- Any external switch or circuit-breaker and external overcurrent protection devices must be positioned near the equipment

## Maintenance

This device does not require special maintenance except the front cleaning and the replacement of the real-time clock battery when necessary.

## Cleaning

When necessary it is possible to clean the front of the device (keyboard and display window) by a very soft cleaning cloth (microfibre recommended) dampened with water or display cleaning solution.

## RTC battery replacement

The RTC (Real Time Clock) chip and the type of coin-cell battery employed in the HMI Dx, increase reliability to the RTC feature for long time; the estimated life in standard condition of use, is over 10 years.

In any case, if a battery replacement becomes necessary, it can be done making these steps:

1. unplug all the cables from the unit
2. unscrew the rear four M3 screws and remove the metal cover
3. release the battery from the socket
4. insert the new one of same type (CR2032) making attention to the polarity (positive + at sight)
5. replace the metal cover and screw the four M3 screws

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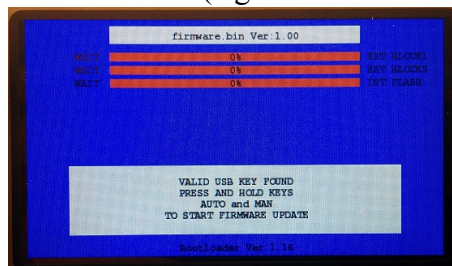
## Application software loading/update

When the device delivered, it has no application software loaded or the software loaded is for testing purposes only and an update is needed.

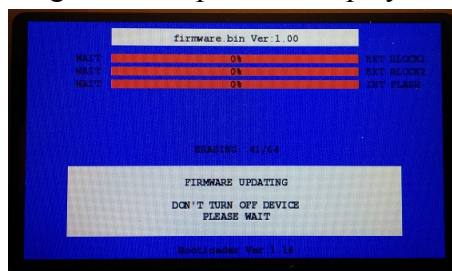
The software loading or update is possible by user through a USB flash disk memory called also USB memory stick and so. To do this, a FAT16 or FAT32 formatted USB flash disk is required; the USB flash disk must have enough free space for the software file to load into the device.

Here the sequence of operations:

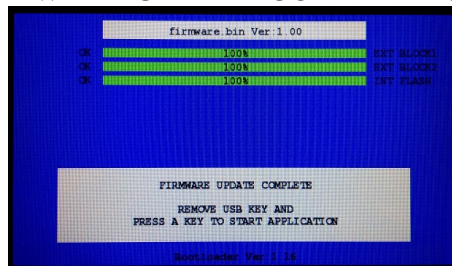
1. copy the software file to load (e.g. FIRMWARE.BIN) in the root folder of the USB flash disk
  - *Note: make sure that only one file with .BIN extension is placed into the root folder because there is no way to select what file to load by the update function in the device*
2. turn-off the device HMI D1/2 and plug the USB flash disk in the USB host port
3. turn-on the device and after it found the software file in the USB flash disk, on the screen appear the name of found file (e.g. FIRMWARE.BIN) with its relevant version



- *Note: the device HMI D1/2 supports a large variety of USB flash disks but is not warranted that all type are correctly managed; in case of troubles with one model of USB Flash disk, try to operate with another one*
4. if the displayed name and version of software file is correct, press AUTO and MAN keys together until the begin of the operation displayed as FIRMWARE UPDATING



5. the update function can runs for some minutes and when completed appear the relevant message FIRMWARE UPDATE COMPLETE on the screen



6. unplug the USB flash disk from the device and press any key to start the application