# eTOP Series 600
# Operating Instructions

Basic User's Manual for eTOP Series 600
Touchscreen Products

**Exor International S.p.A.**
**MANUGENETOP6xx**
**Ver. 1.00**

# Table of Contents

## Introduction

The operational guidelines described below is information which relates to the device, installation, transportation, storage, assembly, use and maintenance.

This Operating Instruction describes the main features of the Exor operator panels. The Manual refers to the following models:

| | |
|---|---|
| eTOP605 | Operator interface with TFT color 5” widescreen display touchscreen |
| eTOP607M | Operator interface with TFT color 7” widescreen display touchscreen, 1GHz CPU |
| eTOP610 | Operator interface with TFT color 10.1” widescreen display touchscreen |

## Safety Guide

The manual contains safety standards that must be respected for the personal safety and to avoid damage. Indications of attention are divided into three levels of severity:

**DANGER:** indicates a failure to observe safety rules and such failure may cause death or serious injuries.


**ATTENTION:** indicates a failure to observe safety rules and that deficiency may cause damage.


**CAUTION:** indicates a failure to observe safety rules and that deficiency may cause defects to the equipment or inconsistencies.

# 1 Product Overview

The Exor eTOP Series 600 HMI products combine state-of-the-art features and top performance with an oustanding design. They are the ideal choice for all demanding HMI applications including factory and building automation.

The eTOP Series 600 HMI panels have been designed to run the JMobile software.

- Designed for use with JMobile HMI software.
- Full vector graphic support. Native support of SVG graphic objects. Trasparency and alpha blending.
- Full object dynamics: control visibility and transparency, move, resize, rotate any object on screen. Change properties of basic and complex objects.
- TrueType fonts.
- Multilanguage applications. Easily create and manage your applications in multiple languages to meet global requirements. Far East languages are supported. Tools available in JMobile Studio support easy third-party translations and help reducing development and maintenance costs of the application.
- Data display in numerical, text, bargraph, analog gauges and graphic image formats.
- Rich set of state-of-the-art HMI features: data acquisition, alarm handling, scheduler and timed actions (daily and weekly schedulers, exception dates), recipes, users and passwords, RSS feeds, rotating menus.
- Includes support for a wide range of communication drivers for Factory systems.
- Multiple drivers communication capability.
- Remote monitoring and control. Client-Server functionality.
- On-line and Off-line simulation with JMobile Studio.
- Powerful scripting language for automating HMI applications. Script debugging improves efficiency in application development.
- Rich gallery of vector symbols and objects.
- Optional plug-in modules for fieldbus systems, I/O and controllers.

# 2 Standards and Approvals

The products have been designed for use in an industrial environment in compliance with the 2004/108/EC EMC Directive.
The products have been designed in compliance with:

| | |
|---|---|
| EN 61000-6-4 | EN 55011 Class A |
| EN 61000-6-2 | EN 61000-4-2 |
| | EN 61000-4-3 |
| | EN 61000-4-4 |
| | EN 61000-4-5 |
| | EN 61000-4-6 |

The installation of these devices into the residential, commercial and light-industrial environments is allowed only in the case that special in measures are taken in order to ensure conformity to EN 61000-6-3.

The products are in compliance with the Restrictions on Certain Hazardous Substances (RoHS) Directive 2002/95/EC

In compliance with the above regulations the products are CE marked.

### *Product Identification*

The product may be identified through a plate attached to the rear cover. You will have to know the type of unit you are using for correct usage of the information contained in the guide.
An example of this plate is shown in the figure below:


| | |
|---|---|
| eTOP607M | product model name |
| ETOP607MU5P1 | product part number |
| 04/15 | month/year of production |
| 09994847559 | serial number |
| 090301B01100000 | version id of the product |

# 3 Technical Specifications

| | |
|---|---|
| **Touchscreen technology** | Projected capacitive |
| **Back-up battery** | 3V 50mAh Lithium, rechargeable, not user-replaceable, model VL2330. |
| **Fuse** | Automatic |
| **Serial Port** | RS-232, RS-485, RS-422 software configurable |
| **User memory** | Flash 128MB for eTOP605<br>Flash 256MB for eTOP607M, eTOP610 |
| **Recipe memory** | Flash |
| **Hardware clock** | Clock/Calendar with back-up battery |
| **Accuracy RTC (at 25°C)** | <100ppm |

## *Environmental conditions*

| | | |
|---|---|---|
| **Operating temperature (surrounding air temperature)** | -20 ÷ +50°C | EN60068-2-14 |
| **Storage temperature** | -20 ÷ +70°C | EN60068-2-14 |
| **Operating and storage humidity** | 5 ÷ 85 % RH not-condensing | EN60068-2-30 |
| **Vibrations** | 5 ÷ 9 Hz, 7 mm $_{p-p}$<br>9 ÷ 150 Hz, 1 g | EN60068-2-6 |
| **Shock** | ± 50 g, 11 ms, 3 pulses per axis | EN60068-2-27 |
| **Protection class** | IP66 front panel * | EN 60529 |

* The front face of the Exor unit, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the “Environmental conditions”. Even though the level of resistance Exor unit is equivalent to these standards, oils that should have no effect on the eTOP can possibly harm the unit. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oil are allowed to adhere to the unit for long periods of time. If the front face protection sheet on the eTOP becomes peeled off, these conditions can lead to the ingress of oil into the unit and separate protection measures are suggested.
If the installation gasket is used for a long period of time, or if the unit and its gasket are removed from the panel, the original level of the protection cannot be guaranteed.

## *Electromagnetic Compatibility (EMC)*

| | | |
|---|---|---|
| **Radiated disturbance test** | Class A | EN 55011 |
| **Electrostatic discharge immunity test** | 8 kV (air electrostatic discharge)<br>4 kV (contact electrostatic discharge) | EN 61000-4-2 |
| **Radiated, radio-frequency, electromagnetic field immunity test** | 80 MHz ÷ 1 GHz, 10V/m<br>1,4 GHz ÷ 2 GHz, 3 V/m<br>2 GHz ÷ 2.7 GHz, 1 V/m | EN 61000-4-3 |
| **Burst immunity test** | ± 2 KV dc power port<br>± 1 KV signal line | EN 61000-4-4 |
| **Surge immunity test** | ± 0,5 KV dc power port (line to earth)<br>± 0,5 KV dc power port (line to line)<br>± 1 KV signal line (line to earth) | EN 61000-4-5 |
| **Immunity to conducted disturbances inducted by radiofrequency field** | 0.15 ÷ 80 MHz, 10V | EN 61000-4-6 |
| **Voltage dips, short interruptions and voltage variations immunity test** | Port: AC mains; Level:<br>100% duration: 1 cycle and 250 cycles (50Hz);<br>40% duration: 10 cycles (50Hz);<br>70% duration: 25 cycles (50Hz);<br>Phase: 0°-180° | |
| Test executed on the 230Vac side of the Exor International S.p.A. Power Supply | | EN 61000-4-11 |

## *Durability information*

| | |
|---|---|
| **Backlight service life (LED type)** | 40000 Hrs. or more<br>(Time of continuos operation until the brightness of the backlight reaches 50% of the rated value when the sorrounding air temperature is 25°C) - see Note 1 |

Note 1: Extended use in environments where the surrounding air temperature is 40°C or higher may degrade backlight quality/reliability/durability.

Surface Chemical Resistance:
Alcohol, Acetone, Methylene Chloride, Isopropanol, Hexane, Methyl ethyl ketone, Turpentine, Mineral Spirit, Unleaded Gasoline, Diesel Fuel, Coal oil, Motor oil, Transmission Fluid, Antifreeze, 10% NaClO, 6% Hydrochloric Acid, 40% Sulfuric Acid, 70% Nitric Acid, 5% Ammonia, 10% Sodium Hydroxide, 3% Hydrogen Peroxide, Toluene, Ammonia-based Glass Cleaner, Laundry Detergents, Cleaner, Black Tea, Coffee, Vinegar, Coca Cola, Grease, Cooking Oil, Salt, Bleach

# 4 Technical Data

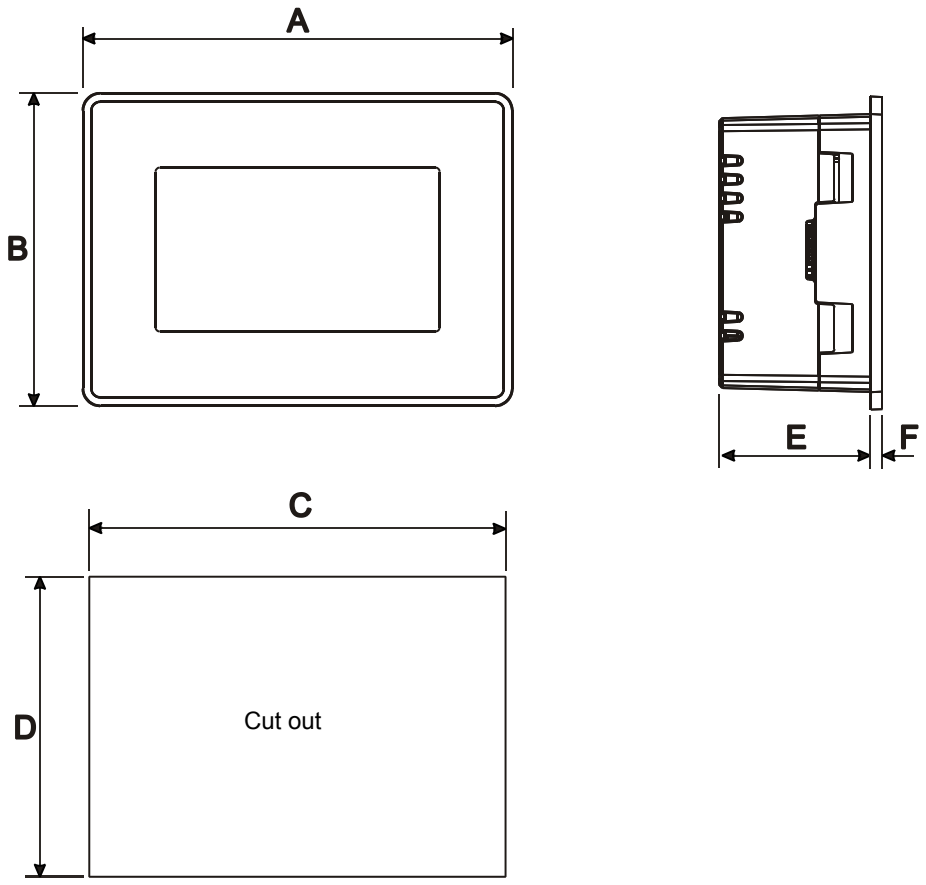
| Model | *eTOP605* | *eTOP607M* |
|---|---|---|
| **Display / Backlight** | TFT Color / LED | TFT Color / LED |
| **Colors** | 64K | 64K |
| **Resolution** | 800X480 | 800X480 |
| **Diagonal (inches)** | 5” widescreen | 7” widescreen |
| **Dimming** | yes | yes |
| **User memory flash** | 128MB | 256MB |
| **SD card slot** | yes | yes |
| **Recipe memory** | Yes. Flash memory storage limited only by available memory | Yes. Flash memory storage limited only by available memory |
| **Serial Port** | RS-232,RS-485, RS-422 DB9 female software configurable | RS-232,RS-485, RS-422 DB9 female software configurable |
| **Ethernet port** | 2 10/100 Mbit with integrated switch | 2 10/100 Mbit with integrated switch |
| **USB port** | 1 Host interface version 2.0 and 1.1 | 2 Host interface, 1 version 2.0, 1 version 2.0 and 1.1 |
| **Expansion slot** | 1 Optional Plugin | 2 Optional Plugin |
| **Battery** | rechargeable | rechargeable |
| **Real Time Clock** | yes | yes |
| **Voltage** | 10-32Vdc (*) | 10-32Vdc (*) |
| **Current rating (at 24VDC)** | 0.6A | 0.6A |
| **Weight** | 1 Kg | 1.3 Kg |

(*) For applications requiring compliance with EN 61131-2 and specifically in reference to 10 ms voltage dips, the minimum power supply voltage is 18Vdc,

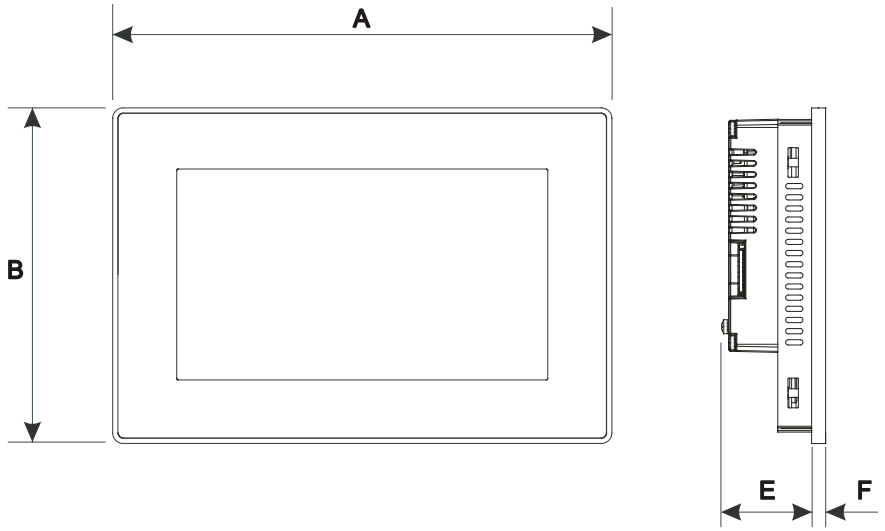
| Model | *eTOP610* |
|---|---|
| **Display / Backlight** | TFT Color / LED |
| **Colors** | 64K |
| **Resolution** | 1280X800 |
| **Diagonal (inches)** | 10.1” widescreen |
| **Dimming** | yes |
| **User memory flash** | 256MB |
| **SD card slot** | yes |
| **Recipe memory** | Yes. Flash memory storage limited only by available memory |
| **Serial Port** | RS-232,RS-485, RS-422 DB9 female software configurable |
| **Ethernet port** | 2 10/100 Mbit with integrated switch |
| **USB port** | 2 Host interface, 1 version 2.0, 1 version 2.0 and 1.1 |
| **Expansion slot** | 2 Optional Plugin |
| **Battery** | rechargeable |
| **Real Time Clock** | yes |
| **Voltage** | 10-32Vdc (*) |
| **Current rating (at 24VDC)** | 1.00A |
| **Weight** | 1.7 Kg |

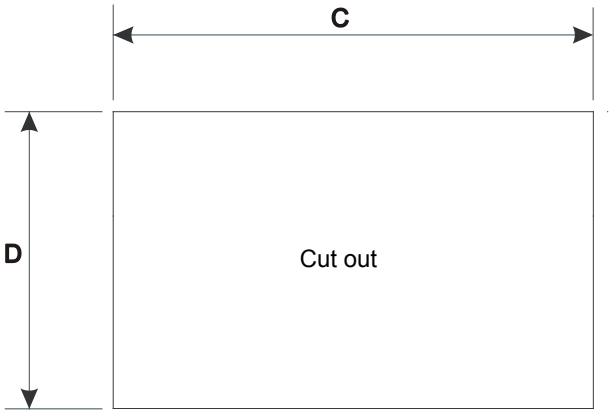
(*) For applications requiring compliance with EN 61131-2 and specifically in reference to 10 ms voltage dips, the minimum power supply voltage is 18Vdc

## 4.1 Dimensions




| MODEL | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| ***eTOP605*** | 147mm/5.78” | 107mm/4.21” | 136mm/5.35” | 96mm/3.78” | 56mm/2.40” | 8mm/0.31” |




| MODEL | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| ***eTOP607M*** | 187mm/7.36” | 147mm/5.79” | 176mm/6.90” | 136mm/5.35” | 47mm/1.85” | 8mm/0.31” |
| ***eTOP610*** | 282mm/11.1” | 197mm/7.80” | 271mm/10.67” | 186mm/7.32” | 56mm/2.20” | 8mm/0.31” |

## 4.2 Installation Environment

Avoid prolonged exposition to direct sunlight to avoid the risk of overheating the device.

The equipment is not intended for installation in contact with corrosive chemical compounds. Check the resistance of the front panel film to a specific compound before installation.

Do not use tools of any kind (screwdrivers, etc.) to operate the touch screen of the panel.

In order to meet the front panel protection classifications, proper installation procedure must be followed:
- the borders of the cutout must be flat
- screw up each fixing screw until the bezel corner get in contact with the panel.
- the cutout for the panel must be of the dimensions indicated in this manual.

The IP66 is guaranteed only if:
- max deviation from the plane surface to the cut-out: ≦0.5mm
- thickness of the case where is mounted the equipment: from 1,5mm to 6mm
- max surface roughness where the gasket is applied: ≦120 um

**Applying the gasket**
The gasket should be applied on the rear of the frame.

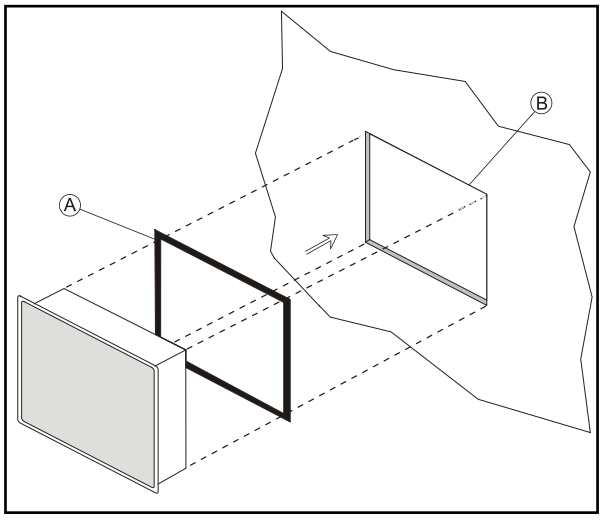



**Fig. 4.1: eTOP605, eTOP607M**

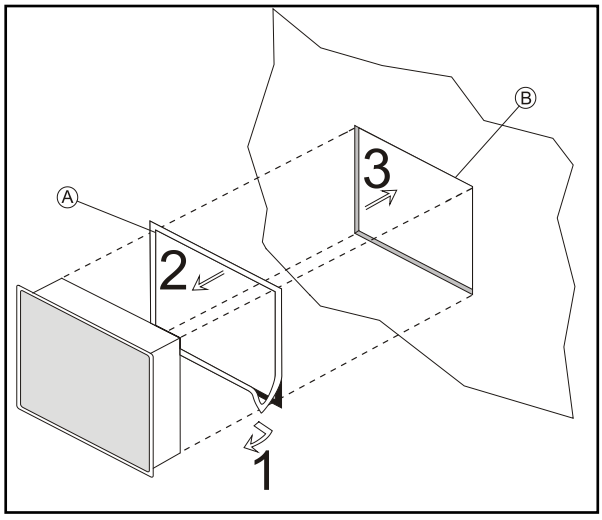



**Fig. 4.2: eTOP610**

**A.** Gasket
**B.** Installation cut-out

## 4.3 Installation Procedure

Place the fixing brackets as shown in figure **(Fig. 4.3)**.

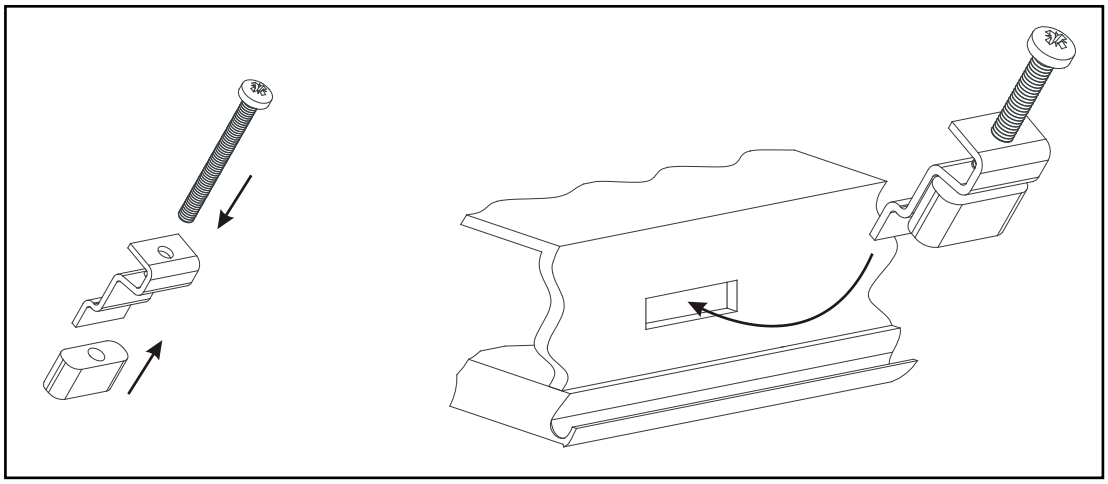


**Fig. 4.3**

**CAUTION**
Screw each fixing screw until the bezel corner gets in contact with the panel.

# 5 Connections

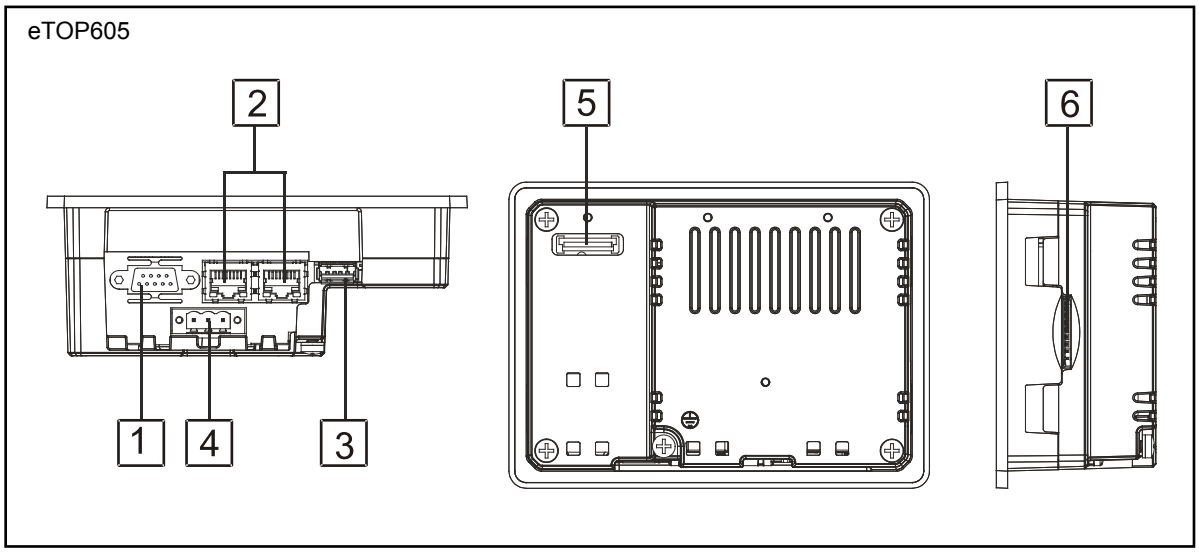



**Fig. 5.1**

1. Serial Port
2. 2x Ethernet Port
3. USB Port
4. Power Supply
5. Expansion slot for Plugin module
6. SD Card Slot

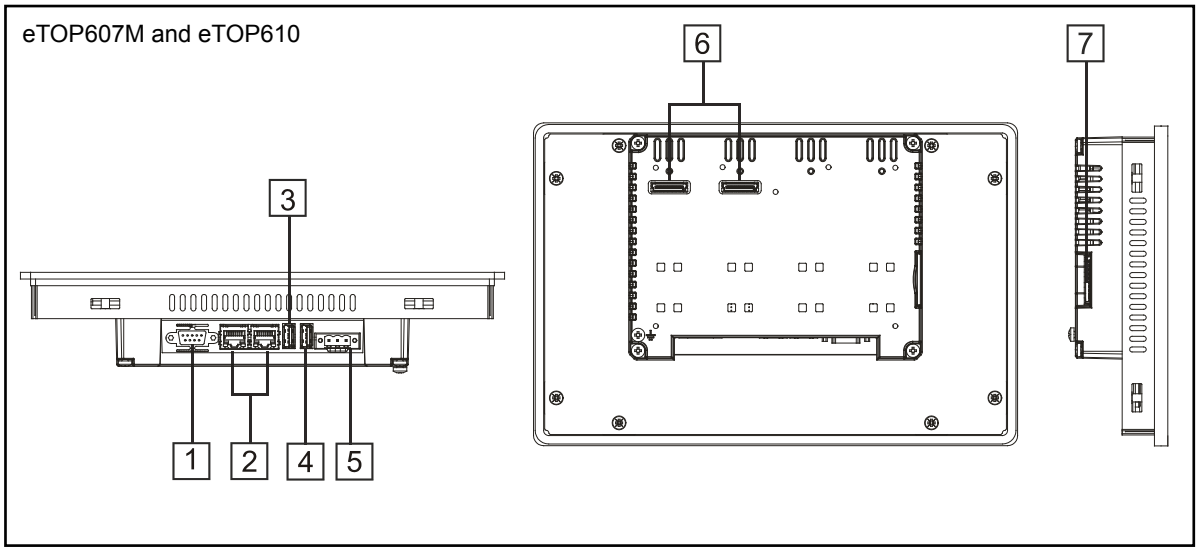



**Fig. 5.2**

1. Serial Port
2. 2x Ethernet Port
3. USB Port (version 2.0 - 1.1)
4. USB Port (version 2.0 High speed only)
5. Power Supply
6. 2x Expansion slot for Plugin module
7. SD Card Slot

## 5.1 Serial Port

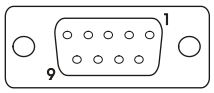
The serial port is used to communicate with the PLC or with another type of controller.
Different electrical standards are available for the signals in the PLC port connector: RS-232, RS-422, RS-485.

The serial port is software programmable. Make sure you select the appropriate interface in the programming software.

**RS-232**

| Pin | Description |
|---|---|
| 1 | GND |
| 2 | |
| 3 | TX |
| 4 | RX |
| 5 | |
| 6 | +5V output |
| 7 | CTS |
| 8 | RTS |
| 9 | |

**SERIAL PORT**




**RS-422, RS-485**

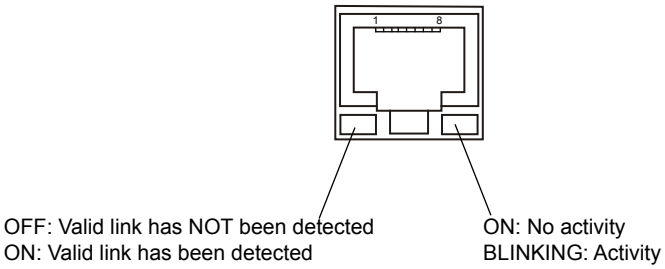
| Pin | Description |
|---|---|
| 1 | GND |
| 2 | |
| 3 | CHA- |
| 4 | CHB- |
| 5 | |
| 6 | +5V output |
| 7 | CHB+ |
| 8 | CHA+ |
| 9 | |

To operate in RS485 pins 4-3 and 8-7 must be connected externally.

The communication cable must be chosen for the type of device being connected.

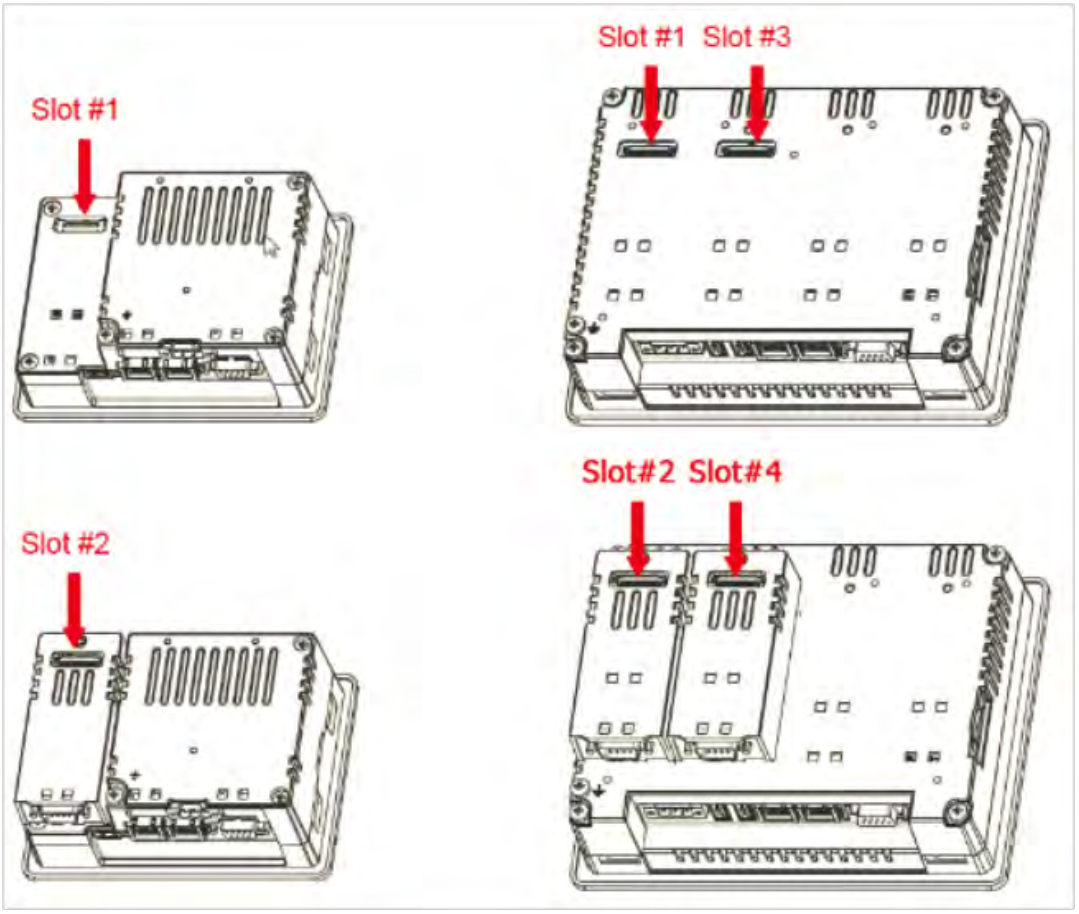
## 5.2 Ethernet Port

The Ethernet port have two status indicators. Please see description in figure.



### 5.3 Optional plugin module

eTOP600 serie panels have several optional plugin module, multiple modules configurations are possible.




Slot#2 and Slot#4 are available only if plugin module has the “bus extension connector”.

Each slot carries three communication channels:
- 1 serial interface
- 1 CAN interface
- 1 SPI interface

Note: It is not possible to stack two modules that are using the same type of interface.

Below you can find relation between modules and max number of modules that can be used into eTOP600 serie panels, based on their Interface Type:

| Module | Application | Max Modules | Interface Type | Bus Extension connector |
|---|---|---|---|---|
| PLCM01 | CAN | 1 for eTOP605<br>2 for eTOP607M and eTOP610 | CAN | Y |
| PLCM01-NE | CAN | 1 for eTOP605<br>2 for eTOP607M and eTOP610 | CAN | N |
| PLCM02 | KNX | 1 | Serial | N |
| PLCM03 | Serial RS232 | 2 | Serial | Y |
| PLCM04 | Serial RS485 | 2 | Serial | Y |
| PLCM05 | CODESYS V2 License | 1 | | Y |
| PLCM06 | Profibus DP | 1 | SPI | N |
| PLIO03 | Multifunction I/O | 1 | SPI | N |
| PLIO06 | Compact I/O | 2 | SPI | N |

Max modules refers to max number of modules can be plugged into the HMI (all slots),

If you are planning to use PLCM03 and PLCM04 (additional serial ports) you will obtain following “COM - Slot#” association:

- a module plugged in Slot#1 or into Slot#2 will be COM2,
- a module plugged in Slot#3 or into Slot#4 will be COM3.

If you are planning to use two PLCM01 (CAN interface) you will obtain following Slot# association:

- a module plugged in Slot#1 or into Slot#2 will be the CanPort 0,
- a module plugged in Slot#3 or into Slot#4 will be the CanPort 1.

# 6 Power Supply, Grounding and Shielding

The power supply terminal block is shown in the figure below.

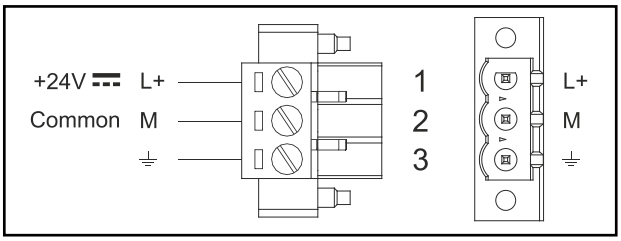



**Fig. 6.1**

**Note:** *Ensure that the power supply has enough power capacity for the operation of the equipment.*

The unit must always be grounded to earth. Grounding helps limit the effects of noise due to electro-magnetic interference on the control system.

Earth connection will have to be done using either the screw or the faston terminal located near the power supply terminal block. A label helps identify the ground connection. Also connect to ground the terminal 3 on the power supply terminal block.

The power supply circuit may be floating or grounded. In the latter case, connect to ground the power source common as shown in figure (see below) with a dashed line.
When using the floating power scheme, note that the panes internally connects the power common to ground with a 1MΩ resistor in parallel with a 4,7nF capacitor.
The power supply must have double or reinforced insulation.
The suggested wiring for the power supply is shown below.

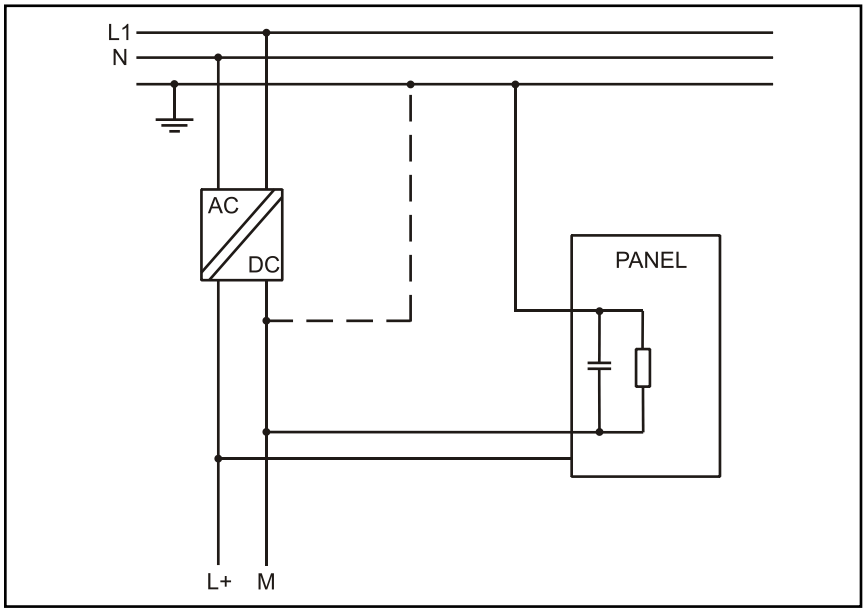



**Fig. 6.2**

All the electronic devices in the control system must be properly grounded. Grounding must be performed according to applicable regulations.

# 7 Battery

These devices are equipped with rechargeable Lithium battery, not user-replaceable.
The following information is maintained by the battery:

- hardware real-time clock (date and time)

Charge:
At first installation must be charged for 48 hours.
When the battery is fully charged, it ensures a period of 3 months of data back-up at 25°C.

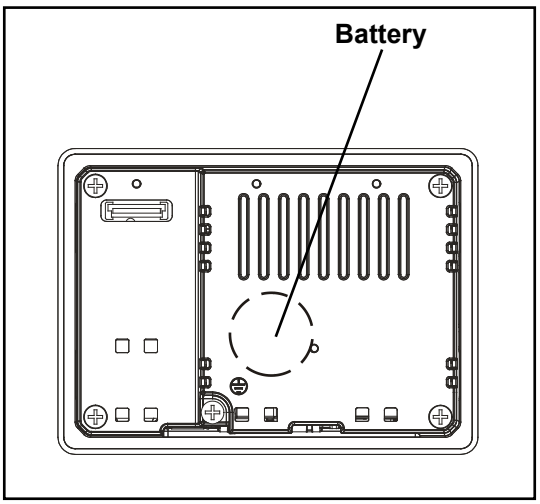



**Fig. 7.1: eTOP605**

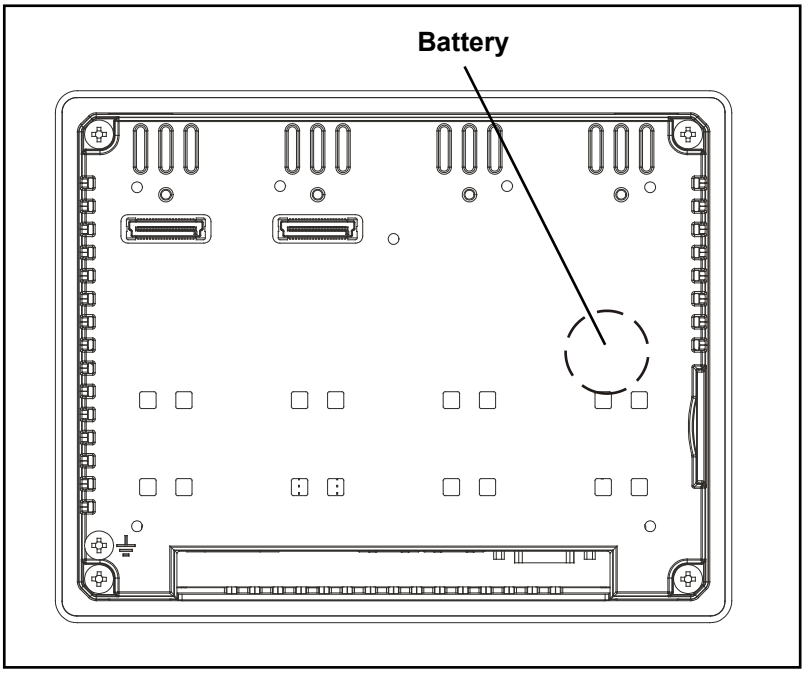



**Fig. 7.2: eTOP607M, eTOP610**

**ATTENTION**
Dispose of batteries according to local regulations.

# 8 Cleaning Faceplates

The equipment must be cleaned only with a soft cloth and neutral soap product. Do not use solvents.

# 9 Getting Started

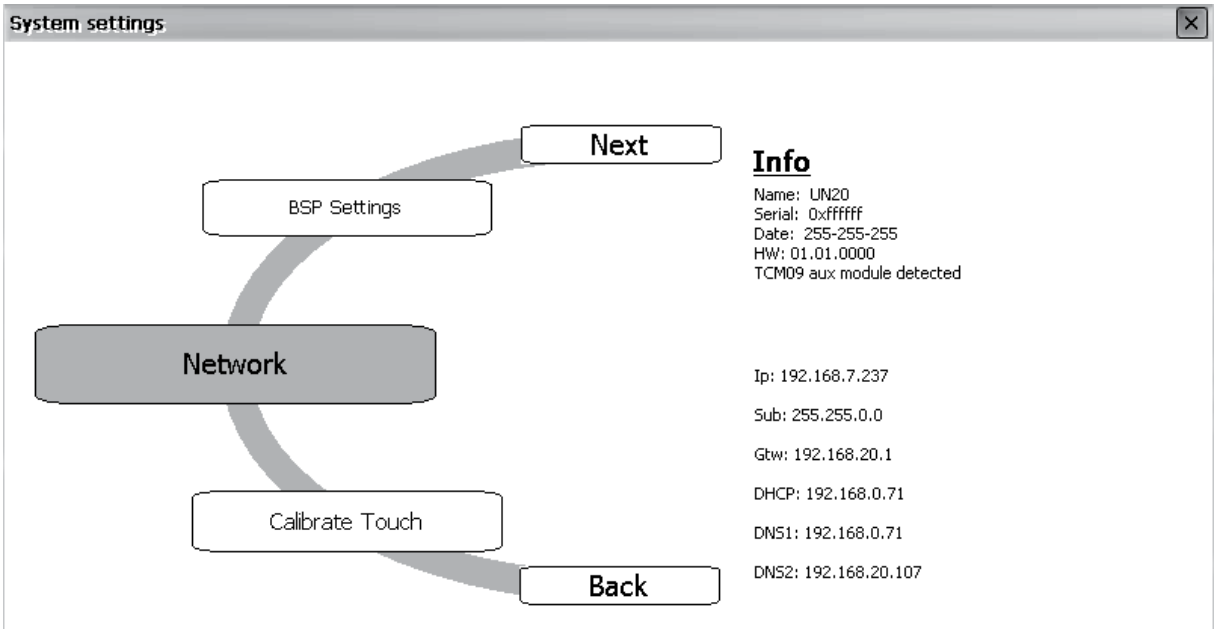
eTOP Series 600 HMI products must be programmed with the software JMobile Studio. JMobile Studio is a software tool that must be properly installed on a computer running Microsoft Windows.

There are two options to transfer a JMobile application project to a HMI device:

| | |
|---|---|
| Ethernet | Connect the HMI device to the computer with an Ethernet network connection. From JMobile Studio choose the command Run/Download to target. You may have to ensure that the proper firewall policy has been configured in the computer to allow JMobile Studio to access the network. |
| USB or SD | Create an Update Package using JMobile Studio and copy it to a USB Flash drive or to an SD memory card. |

# 10 System Settings

eTOP Series 600 HMI products include a System Settings tool to allow configuration of system options.
The user interface of System Settings tool is based on a rotating menu. Use navigation buttons Next/ Back to scroll through the available options.




The active item is highlighted on the left side. The info pane on the right side shows relevant information, when applicable. Touch the active item to start the associated function.

System Settings has two modes of operation:

**User Mode** JMobile runtime is running or the HMI device is in “factory default” status.
**System Mode** JMobile runtime is not running or the HMI device has a software failure. System Mode includes all options available in User Mode and offers in additions commands dedicated to system upgrade and recovery.

Activation of System Settings in **User Mode**:

| | |
|---|---|
| Factory default status<br>JMobile runtime running | Press “System Setting” button on the HMI screen<br>Recall context menu and select “System Settings”. To recall the context menu click and hold any unused area of the touchscreen for a few seconds. Default hold time is 2 seconds. |

Activation of Systems Settings in **System Mode**:

| | |
|---|---|
| Normal operation | If JMobile runtime is not running: Press “System Settings” button on the HMI screen.<br>If JMobile runtime is running: recall context menu, select “System Settings”<br>Select the Restart option then choose the “Configuration OS” option.<br>**Note**: To recall the context menu click and hold any unused area of the touchscreen for a few seconds. Default hold time is 2 seconds. |
| Recovery operation | Use of an SD memory card prepared with a specific file is required. Create and copy the file “$0030D8$.bin” to the SD card. Insert the card in the SD slot in the HMI. Apply power to the HMI. When the file is detected, the HMI will show a visual feedback:<br>“Tap Tap detected, Going to Config Mode” on the screen<br>**Note**: “$0030D8$.bin” is an empty txt file with specific filename. You can easily create the file by renaming an empty .txt file. |

**User Mode** includes options for basic settings of the device.

| | |
|---|---|
| **Calibrate Touch** | calibrate the touchscreen interface |
| **Plugin list** | show if optional plug-in modules are installed |
| **Network** | configure IP Address of Ethernet interface |
| **BSP settings** | show the BSP (Board Support Package) version, check the operating hours for the device and for the display backlight, manage the buzzer |
| **Time** | change the device date and time, including time zone, Daylight Saving Time and NTP Server |
| **Regional Settings** | customize Windows Regional Settings, such as date format |
| **Display** | settings configure automatic backlight turnoff and adjust brightness |
| **Close** | close System Settings |
| **Restart** | restart the device. “Main OS” option restarts as per default, “Configuration OS” option restart device directly into System Settings in System Mode |

**System Mode** is the complete interface of the System Settings tool where all functions are available, in addition to the options available in “User Mode”.

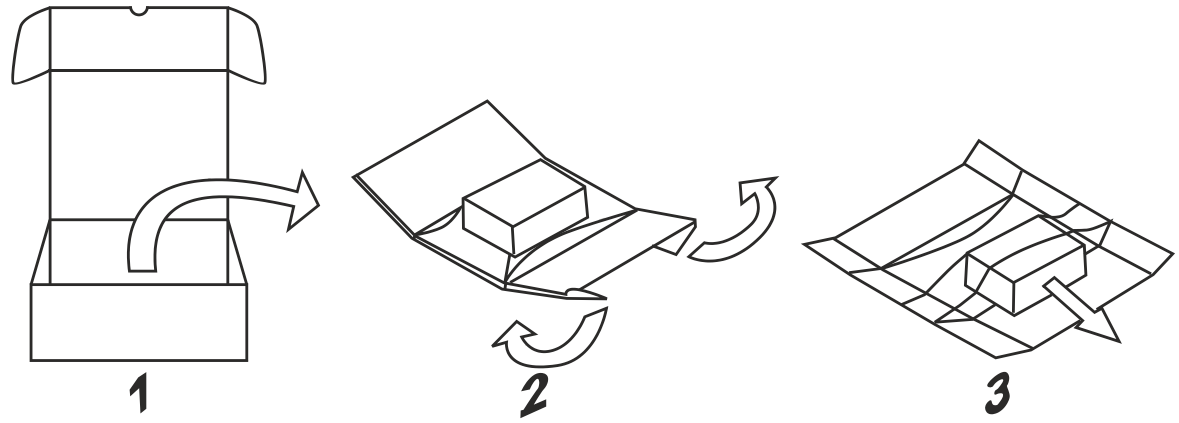
| | |
|---|---|
| **Format Flash** | format internal device Flash disk. All projects, the Runtime and System settings will be deleted, returning the device to factory condition. |
| **Restore Factory Settings** | restore factory settings with choice of what to delete. Can be used as alternative to Format Flash. Options available are:<br>Uninstall HMI removes the Runtime and all projects.<br>Clear system settings reset the system parameters like IP Address, date/time, etc<br>Clear Controller Application remove CODESYS application |

| | |
|---|---|
| **Resize Image Area** | reserved to authorized technical personnel |
| **Download Configuration OS** | update the Configuration OS module of BSP |
| **Download Main OS** | update the Main OS module of BSP |
| **Download Splash Image** | replace the splash screen image displayed by the device at power-up; the image must be supplied in the appropriate binary format. We recommend changing the splash screen image with the use of JMobile Studio |
| **Download OS Partition** | reserved to authorized technical personnel |
| **Download Data Partition** | reserved to authorized technical personnel |
| **Download Disk Image** | reserved to authorized technical personnel |
| **Download Bootloader** | update the Bootloader module of BSP |
| **Upload Bootloader** | reserved to authorized technical personnel |
| **Upload Configuration OS** | reserved to authorized technical personnel |
| **Upload Main OS** | reserved to authorized technical personnel |
| **Upload Splash Image** | copy to an USB Memory or SD Card the current splash screen image in binary format |
| **Upload OS Partition** | reserved to authorized technical personnel |
| **Upload Data Partition** | reserved to authorized technical personnel |
| **Upload Disk-Image** | copy to an USB Memory or SD Card the content of whole Flash disk in binary format |

Only for eTOP607M and eTOP610, System Mode includes also:

| | |
|---|---|
| **Download Main FPGA** | update the Main FPGA module of BSP |
| **Download Safe FPGA** | update the Safe FPGA module of BSP |
| **Download System Supervisor** | update the System Supervisor module of BSP |
| **Upload Main FPGA** | reserved to authorized technical personnel |
| **Upload Safe FPGA** | reserved to authorized technical personnel |
| **Upload System Supervisor** | reserved to authorized technical personnel |

# 12 Unpacking and Packing Instructions




to repack the unit, please follow the instructions backwards.