eTOP Series 500 Glass
Operating Instructions

Basic User's Manual for eTOP Series 500 Glass
Touchscreen Products

Exor International S.p.A.
MANUGENETOP5xxG
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:

eTOP507G	Operator interface with TFT color 7” widescreen display touchscreen
eTOP507MG	Operator interface with TFT color 7” widescreen display touchscreen, 1GHz CPU
eTOP510G	Operator interface with TFT color 10.1” widescreen display touchscreen
eTOP515G	Operator interface with TFT color 15” 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 500 Glass 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 energy and marine applications.
The eTOP Series 500 Glass features a high-brightness, contrast-enhanced ruggedized TFT display with a fully dimmable LED backlight. The product has been designed for use in harsh environments and outdoor applications.Glass bonding assembly and anti-reflective (AR) glass surface treatment provide for superior optical performance. The durable glass touchscreen requires the human touch, eliminating false activations, and offers high reliability and durability; it will continue to work even surface is scratched or contaminated.

The eTOP Series 500 Glass 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.
- Remote maintenance and support with VNC-based 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.
- Display backlight dimmable to 0%.

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 EN 61000-4-8
	EN60945

EN 60079-0

EN 60079-15

EN 60079-31

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:

eTOP507G	product model name
ETOP507U5P1	product part number
01/12	month/year of production
09994847559	serial number
040100A01000000	version id of the product

3 Technical Specifications

Touch screen technology	Projective 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 eTOP507G Flash 256MB eTOP507MG, eTOP510G, eTOP515G
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 ÷ +60°C (vertical installation) -20 ÷ +50°C (horizontal installation)	EN60068-2-14
Storage temperature	-40 ÷ +85°C	EN60068-2-14
Operating and storage humidity	5 ÷ 85 % RH not-condensing	EN60068-2-30
Vibrations	5 ÷ 9 Hz, 7 mm $_{p-p}$ 9 ÷ 150 Hz, 1 g	EN60068-2-6
Shock	± 50 g, 11 ms, 3 pulses per axis	EN60068-2-27
Protection class	IP69K (front panel) IP20 (rear)	EN 60529

Electromagnetic Compatibility (EMC)

Radiated disturbance test	Class A	EN 55011
Electrostatic discharge immunity test	8 kV (air electrostatic discharge) 4 kV (contact electrostatic discharge)	EN 61000-4-2
Radiated, radio-frequency, electromagnetic field immunity test	80 MHz ÷ 1 GHz, 10V/m 1,4 GHz ÷ 2 GHz, 3 V/m 2 GHz ÷ 2.7 GHz, 1 V/m	EN 61000-4-3
Burst immunity test	± 2 KV dc power port ± 1 KV signal line	EN 61000-4-4
Surge immunity test	± 0,5 KV dc power port (line to earth) ± 0,5 KV dc power port (line to line) ± 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: 100% duration: 1 cycle and 250 cycles (50Hz); 40% duration: 10 cycles (50Hz); 70% duration: 25 cycles (50Hz); 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 (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

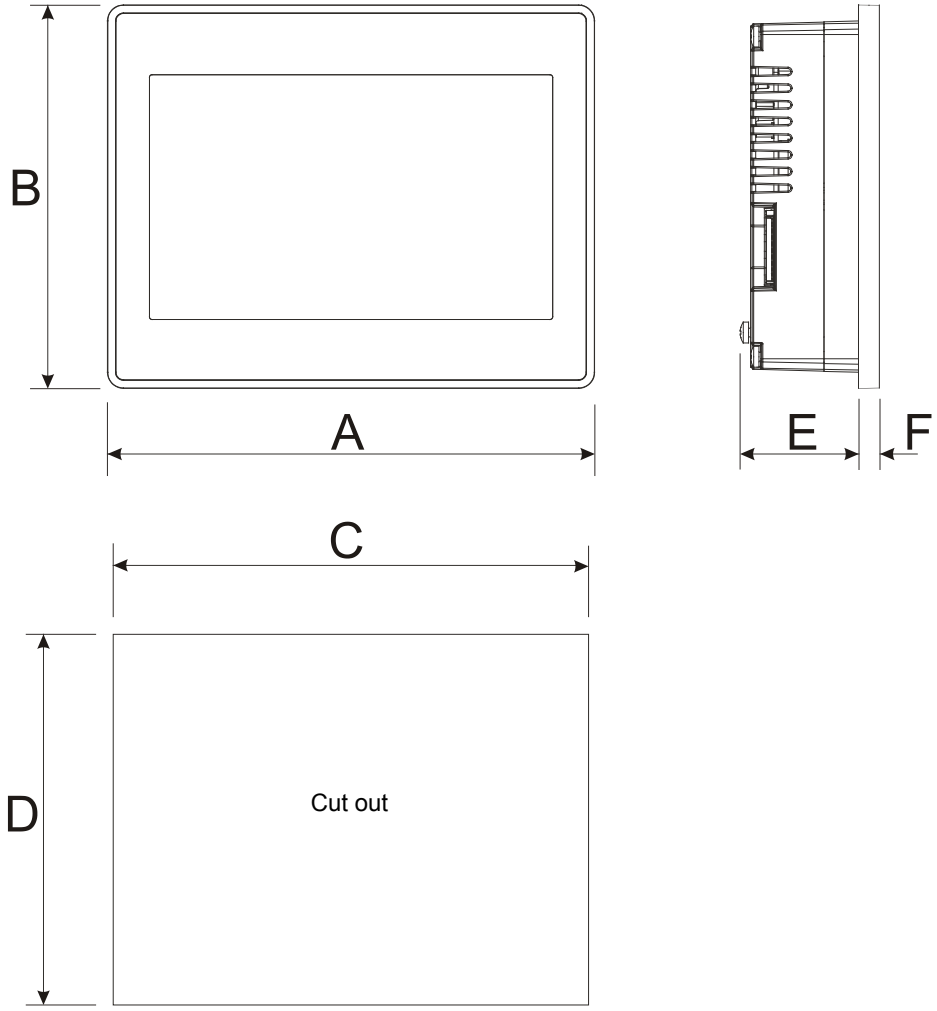
Model	*eTOP507G*	*eTOP507MG*
Display / Backlight	TFT Color / LED	TFT Color / LED
Colors	64K	64K
Resolution	800X480	800X480
Diagonal (inches)	7” widescreen	7” widescreen
Dimming	yes	yes
User memory flash	128MB	256MB
SD card slot	yes	yes
Recipe memory	Yes. Flash memory storage limited only by available 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	2 Host interface, 1 version 2.0, 1 version 2.0 and 1.1	2 Host interface, 1 version 2.0, 1 version 2.0 and 1.1
Expansion slot	2 Optional Plugin	2 Optional Plugin
Battery	rechargeable	rechargeable
Real Time Clock	yes	yes
Voltage	10-32Vdc (*)	10-32Vdc (*)
Current rating (at 24VDC)	0.8A	0.9A
Weight	1 Kg	1 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.

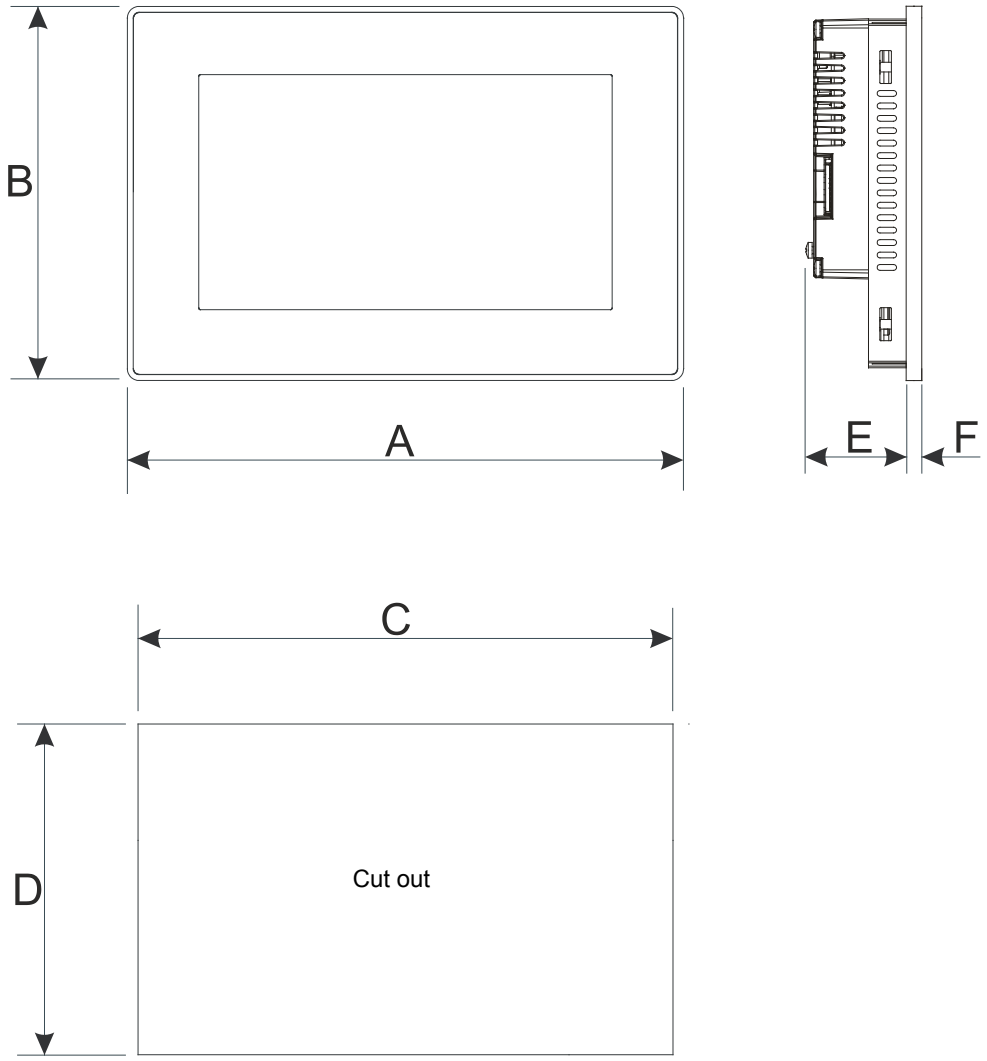
Model	*eTOP510G*	*eTOP515G*
Display / Backlight	TFT Color / LED	TFT Color / LED
Colors	64K	64K
Resolution	1280X800	1024X768
Diagonal (inches)	10.1” widescreen	15”
Dimming	yes	yes
User memory flash	256MB	256MB
SD card slot	yes	yes
Recipe memory	Yes. Flash memory storage limited only by available memory	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	2 Host interface, 1 version 2.0, 1 version 2.0 and 1.1	2 Host interface, 1 version 2.0, 1 version 2.0 and 1.1
Expansion slot	2 Optional Plugin	2 Optional Plugin
Battery	rechargeable	rechargeable
Real Time Clock	yes	yes
Voltage	10-32Vdc (*)	10-32Vdc (*)
Current rating (at 24VDC)	1.0A	1.4A
Weight	1.7 Kg	4 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.

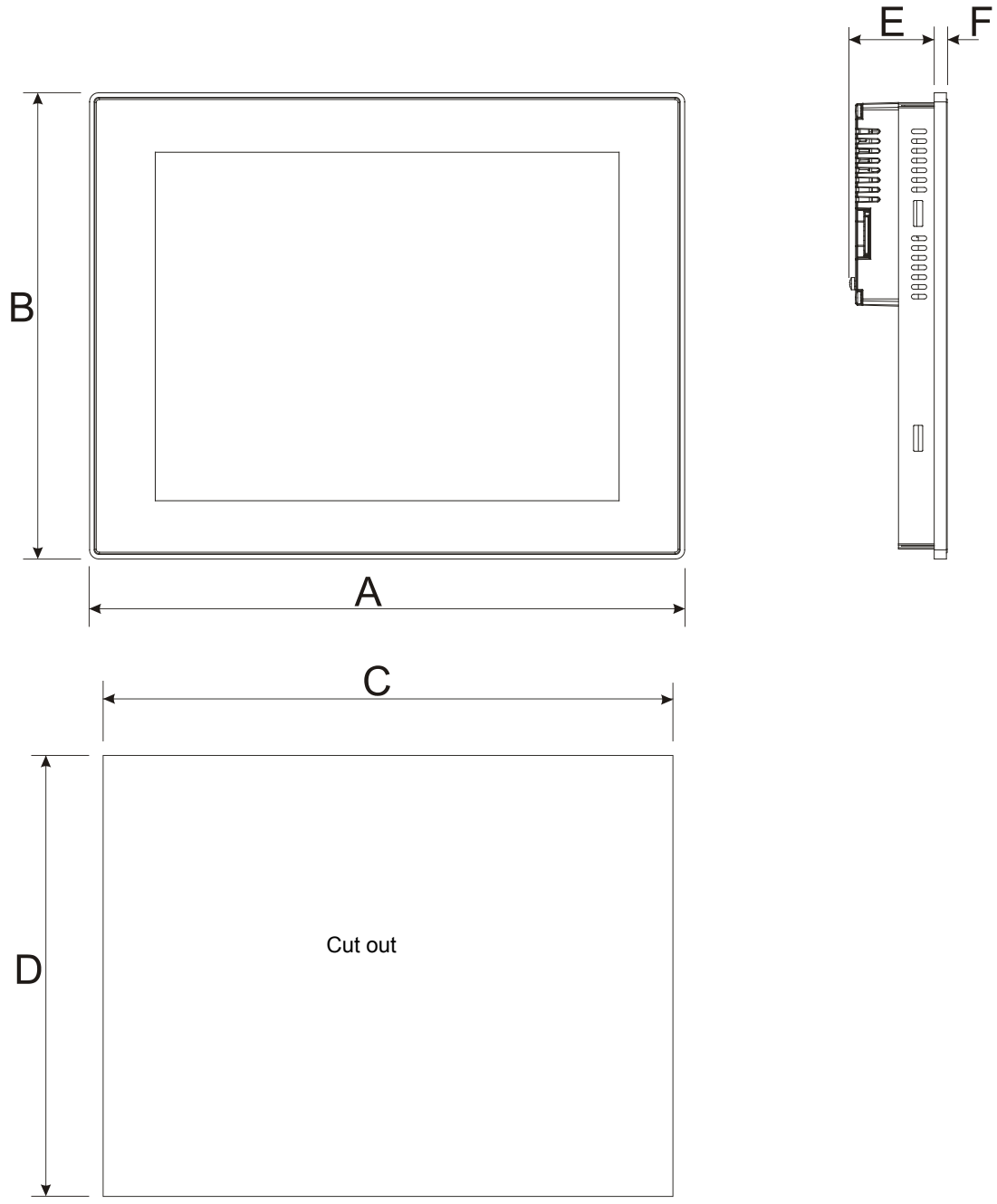
4.1 Dimensions



MODEL	A	B	C	D	E	F
eTOP507G	187mm/7.36”	147mm/5.79”	176mm/6.90”	136mm/5.35”	47mm/1.85”	8mm/0.31”
eTOP507MG	187mm/7.36”	147mm/5.79”	176mm/6.90”	136mm/5.35”	47mm/1.85”	8mm/0.31”



MODEL	A	B	C	D	E	F
eTOP510G	282mm/11.10”	197mm/7.80”	271mm/10.67”	186mm/7.32”	56mm/2.20”	8mm/0.31”



MODEL	A	B	C	D	E	F
eTOP515G	392mm/15.43”	307mm/12.08”	381mm/15”	296mm/11.65”	56mm/2.20”	8mm/0.31”

4.2 Installation Environment

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

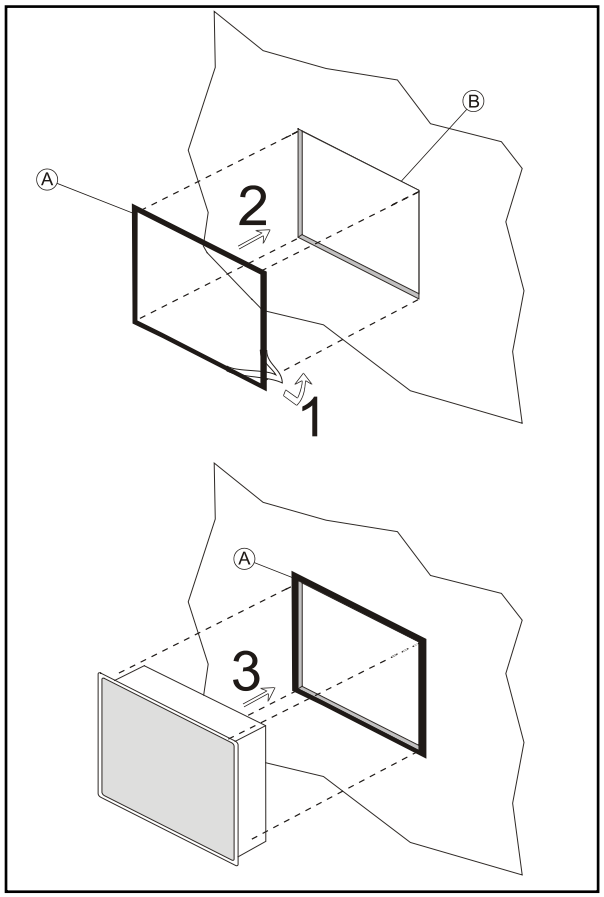
The equipment is not intended for installation in contact with corrosive chemical compounds. Check the resistance of the front panel to a specific compound before installation.

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 IP69K 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

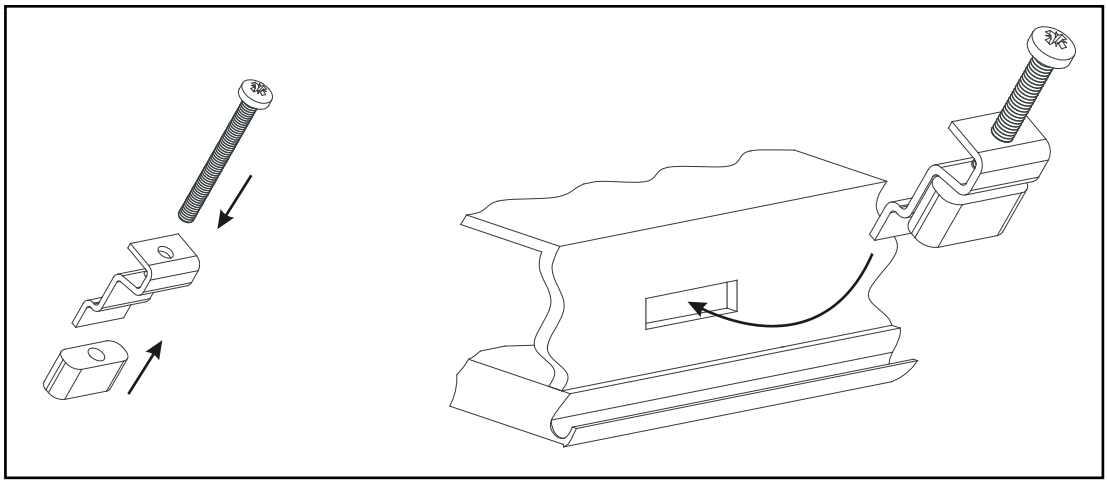
Applying the gasket



A. Gasket
B. Installation cut-out

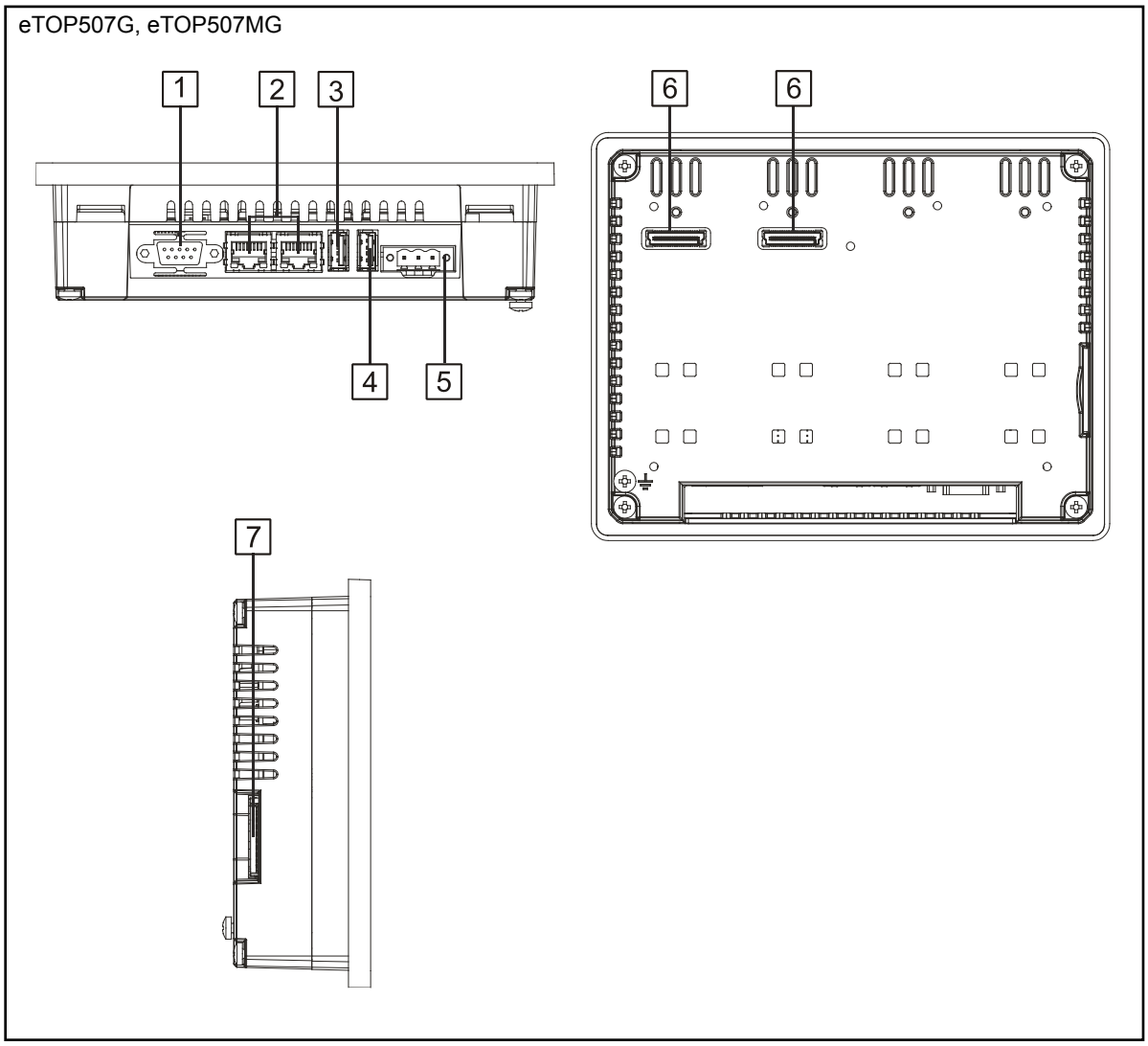
4.3 Installation Procedure

Place the fixing brackets as shown in figure.



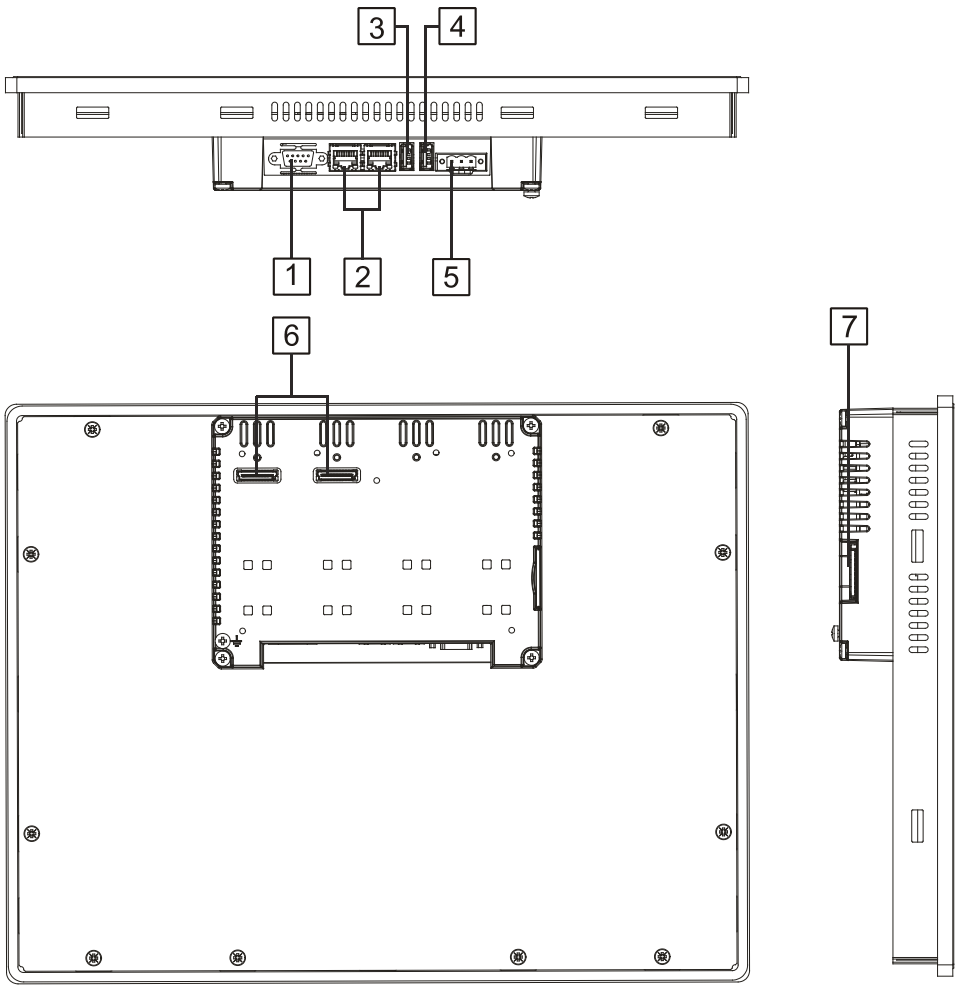
CAUTION
Screw each fixing screw until the bezel corner gets in contact with the panel.

5 Connections



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. Expansion slot for Plugin module
7. SD Card Slot

eTOP510G, eTOP515G



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. Expansion slot for Plugin module
7. SD Card Slot

5.1 Serial Port

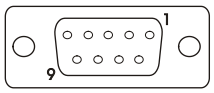
The serial port is used to communicate with the PLC or with another type of controller.
Different electrical standards are available for the signals in the PLC port connector: RS-232, RS-422, RS-485.

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

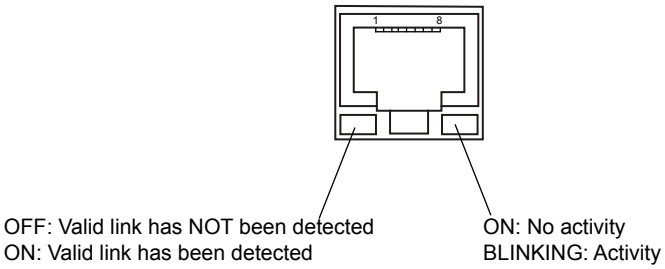
Pin	Description
1	GND
2	
3	CHA-
4	CHB-
5	
6	+5V output
7	CHB+
8	CHA+
9	

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.

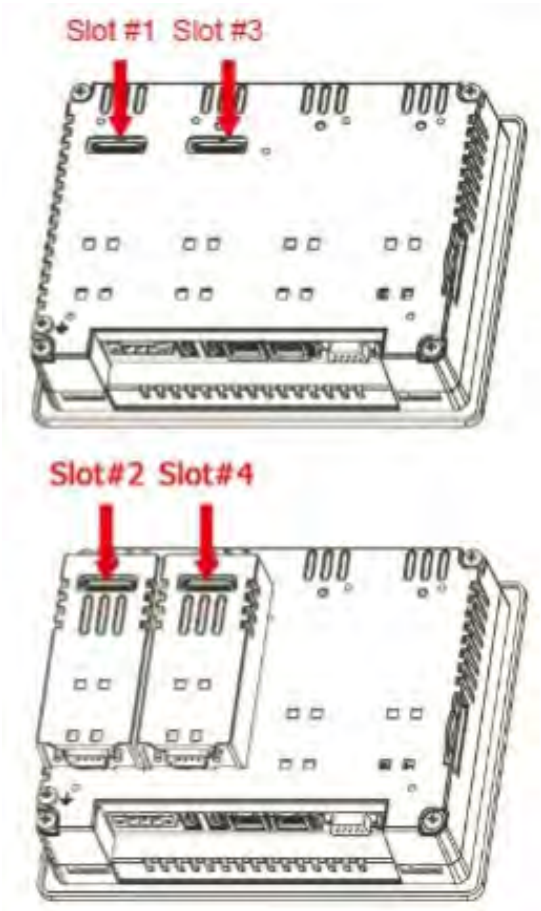
5.2 Ethernet Port

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



5.3 Optional plugin module

eTOP500 Glass Series 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 eTOP500 Glass serie panels, based on their Interface Type:

Module	Application	Max Modules	Interface Type	Bus Extension connector
PLCM01	CAN	1 for eTOP507G 2 for eTOP507MG	CAN	Y
PLCM01-NE	CAN	1 for eTOP507G 2 for eTOP507MG	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.

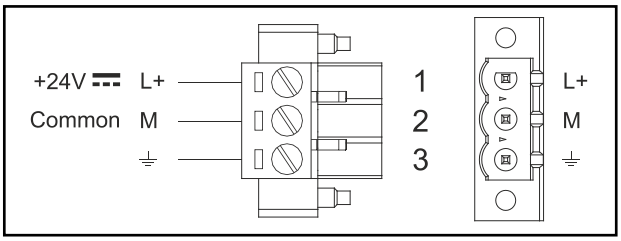


Fig. 6.1

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.

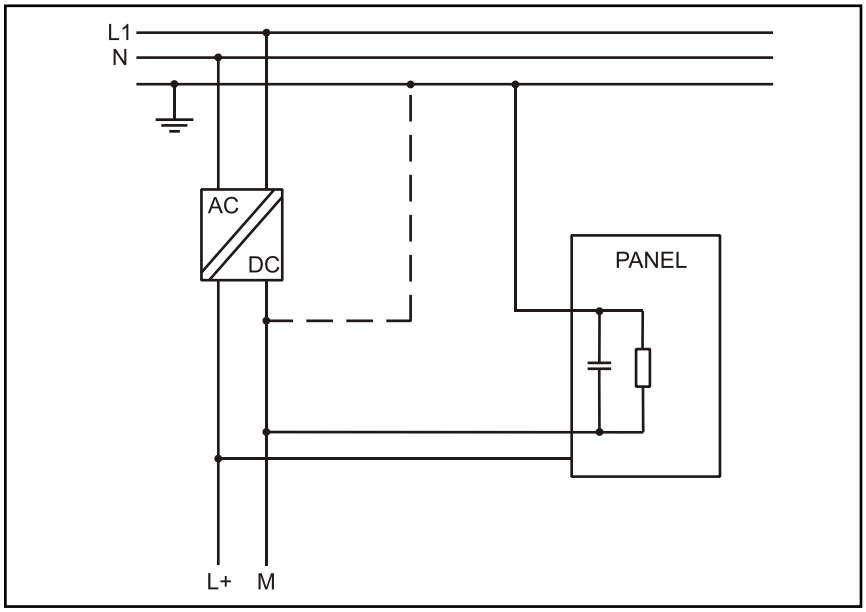


Fig. 6.2

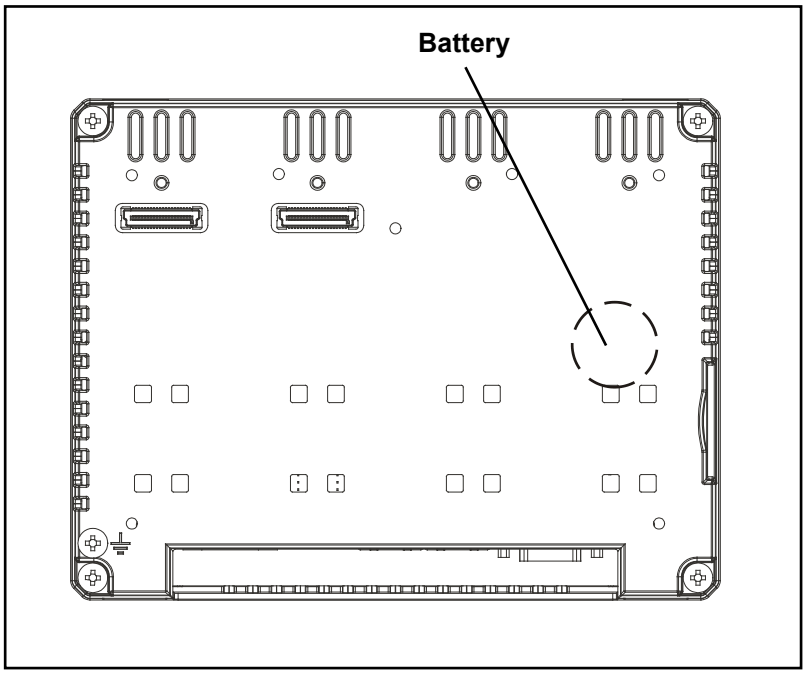
All the electronic devices in the control system must be properly grounded. Grounding must be performed according to applicable regulations.

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.



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

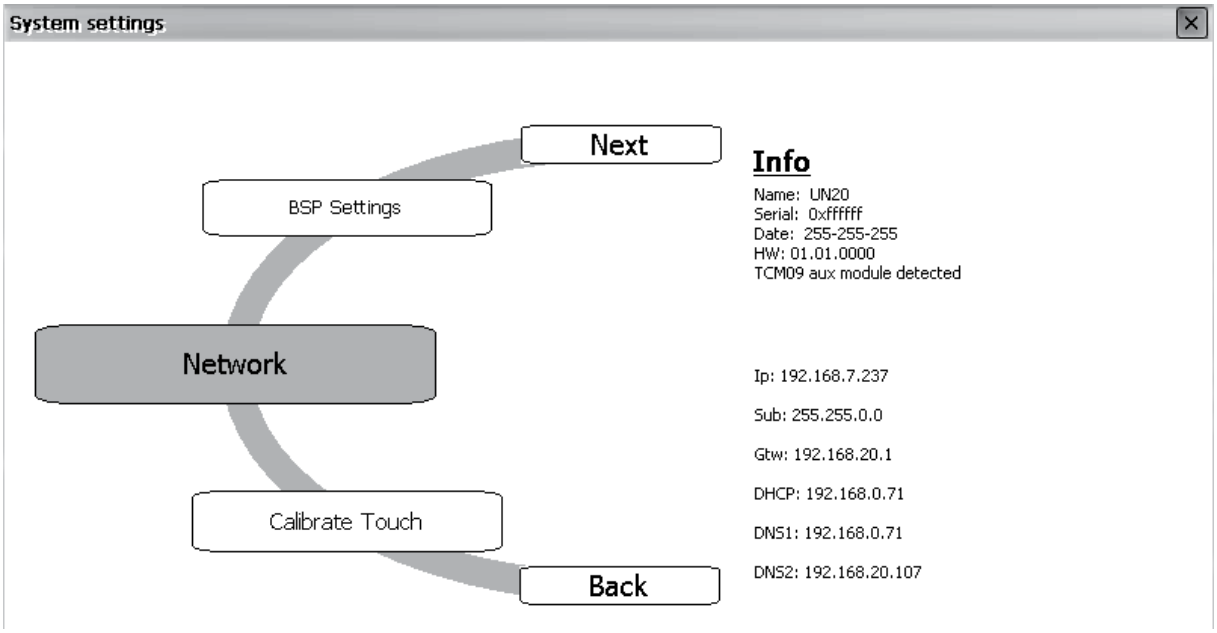
eTOP Series 500 Glass HMI products must be programmed with the software JMobile Studio. JMobile Studio is a software tool that must be properly installed on a computer running Microsoft Windows.

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 500 Glass HMI products have 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 JMobile runtime running	Press “System Setting” button on the HMI screen 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**:

During normal operation	If JMobile runtime is not running: Press “System Settings” button on the HMI screen. If JMobile runtime is running: recall context menu, select “System Settings” Select the Restart option then choose the “Configuration OS” option. **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: “Tap Tap detected, Going to Config Mode” on the screen **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”.

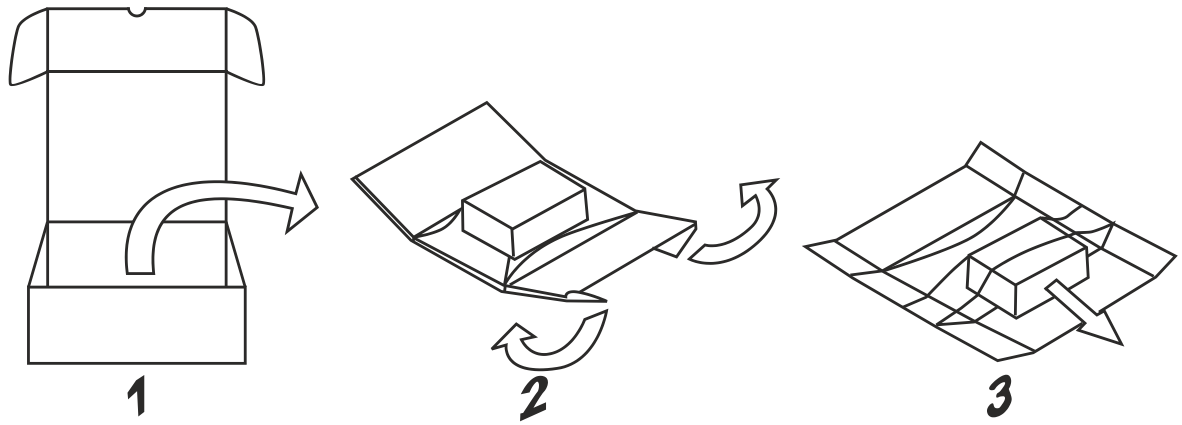
Format Flash	format internal device Flash disk. All projects, the Runtime and System settings will be deleted, returning the device to factory condition.
Restore Factory Settings	restore factory settings with choice of what to delete. Can be used as alternative to Format Flash. Options available are: Uninstall HMI removes the Runtime and all projects. Clear system settings reset the system parameters like IP Address, date/time, etc 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 eTOP507MG, eTOP510G and eTOP515G 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

11 Unpacking and Packing Instructions



to repack the unit, please follow the instructions backwards.