GEFRAN

GF_VEDO serie ML
Control Panel

INSTALLATION AND OPERATION MANUAL

CE

code **80545C** / Edition **04 - 01-2013**

GENERAL INDEX

☞ *The contents of each section are summarized immediately following the section heading*

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PREFACE

This manual provides a detailed description of the main technical data of the various versions of Gefran's GF_ VEDO ML product.
The following information is indispensable for the correct use of the GF_VEDO ML.

Graphic symbols

Per differenziare la natura e l'importanza delle informazioni fornite nelle presenti Istruzioni per l'Uso, sono stati utilizzati dei simboli grafici di riferimento che contribuiscono a rendere più immediata l'interpretazione delle informazioni stesse.

Indicates the contents of the various sections of the manual, general warnings, notes, and other important points.

Indicates a particularly delicate situation that could affect the safety or good operation of the product, or an instruction that must absolutely be followed in order to prevent hazardous situations.

Indicates a risk to the user's safety due to the presence of high voltage at the specified points.

Indicates a suggestion (based on the experience of GEFRAN Technical Personnel) that could be very useful under certain circumstances.

Information of a general and applicative nature.

Important notes for product safety and reliability.

Indicates a reference to Detailed Technical Documents available on GEFRAN's website: **www.gefran.com**

1 · PRELIMINARY WARNINGS

- Only trained personnel may install and use the operator terminal.
- The operator terminal must be installed in accordance with the instructions contained in this manual.
- Use only the internal accessories provided and approved by the builder.
- The operator terminal is designed for permanent installation on flat surfaces where the following conditions are guaranteed:
  - low risk of explosion
  - low presence of magnetic fields
  - absence of direct sunlight
  - absence of sudden temperature changes.
- Protect the operator terminal against accidental entrance of any type of liquid, dust, or small pieces of metal.
- This could damage the product and/or cause it to catch fire.
- If the operator terminal is used in applications with risk of harm to persons or damage to machines or materials, it MUST be used with auxiliary alarm devices.
  Therefore, provide for the possibility of checking for tripped alarms even during normal running. It may be connected to

elements that operate in environments with dangerous atmosphere (inflammable or explosive) ONLY by means of appropriate and suitable interfaces that comply with safety regulations.
- Devices that are linked and/or connected to the operator terminal must be appropriate for such installation and use.
- Gefran will not be liable for any changes or alterations made to the product by the installer or by the user.
- The liquids contained in LCDs are irritating. In case of contact with the skin or eyes, rinse IMMEDIATELY with running water and see a doctor.
- Do not use / store the products at temperatures higher or lower than those indicated (see summary of characteristics).
- Although Gefran provides all of the information required for correct evaluation, it does not guarantee that the operator terminal is suitable for the specific application required and does not assume any liability for its installation and use or for the design of the customer's product.

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2 • PRELIMINARY INSTRUCTIONS

☞ *This section contains information and warnings of a general nature which should be read before proceeding with controller installation, configuration and use.*

General description

The GF_VEDO ML operator terminal line is a compact and low-cost solution for machine control.

A single product integrates machine cycle control [SoftPLC] and graphic page display [SCADA], allowing quick and low-cost creation of many automation solutions. The GF_VEDO ML terminals create the machine/operator interface by means of LCD monitor, touch-screen, and a wide variety of peripheral I/Os.

GF_VEDO ML terminals are applied mainly to machine control for packaging, metals, wood and plastic applications. This user's manual describes the main characteristics of the GF_VEDO ML operator panels.

Description	Model
6.5" with keyboard	65CK
6.5" touch	65CT
10.4" with keyboard	104CK
10.4" touch	104CT
12,1" touch	121CT
15" touch	150CT

Preliminary warnings

☞ *Read the following preliminary warnings before installing and using the GF_VEDO ML operator terminals.*
Doing so makes start-up quicker and lets you avoid some problems that might be mistaken for malfunctions or limitations of the terminal.

• Immediately after unpacking the product, make a note of the order code and the other identification data given on the label affixed to the outside of the container   and copy them to the table below.

These details must always be kept close at hand and referred to the personnel involved in the event of help from Gefran Customer Service Assistance.

S.N:	....	(N° of series)
CODE:	....	(Product code)
TYPE:	....	(Order code)
SUPPLY:	....	(Type of power supply)
VERS:	....	(Modul version)

• Check that the terminal is in perfect condition and was not damaged during shipment. Make sure that the package also contains the fastening accessories and the installation CD-ROM if present. Any inconsistencies, omissions or evident signs of damage should be reported immediately to your Gefran sales agent.

• Check that the order code corresponds with the configuration requested for the application the terminal is needed for, referring to Section: "Technical - Commercial Information".

Example: GF_VEDO ML 104CT - VW1 - C1 - S1 - G
• Model: GF_VEDO ML 104CT....
• Operative system: Vx Works
• Expansion 1: CANopen
• Expansion 2: RS232 + AUC
• Lexan: Gefran

Consult the section "Installation and Connection" before installing the terminal on the machine control panel or host system Consult the section "Sales Information" for the order code.

Users and/or system integrators who want more detailed information on serial communication between standard PCs and/or Gefran Industrial PCs and Gefran Programmable Instruments may access the various Technical Reference Documents available on Gefran's website: www.gefran.com.

3 · INSTALLATION AND CONNECTION

This section contains the instructions necessary for correct installation of the GF_VEDO ML into the machine control panel and for correct connection of the controller power supply, inputs, outputs and interfaces.

Before proceeding with installation read the following warnings carefully!
Remember that lack of observation of these warnings could lead to problems of electrical safety and electromagnetic compatibility, as well as invalidating the warranty.

Terminal power supply

- The GF_VEDO ML is NOT equipped with an On/Off switch: the user must provide a two-phase disconnecting switch that conforms to the required safety standards (CE marking), to cut off the power supply upstream of the terminal.
  The switch must be located in the immediate vicinity of the terminal and must be within easy reach of the operator.
  One switch may control more than one terminal

- The operator terminal is powered at 24 V DC ± 25%. Power supplies beyond this range may seriously damage the product. Carefully check the power supply before applying it to the product.

- The power supply to the electronic equipment on the switchboards must always come directly from an isolation device with a fuse.

- The terminal's electrical connections must have a path separated from the system power cables.

- The electronic instruments and electromechanical power devices such as relays, contactors, solenoid valves, etc., must always be powered by separate lines.

- Make sure that the operator terminal is properly and sufficiently grounded.
  Failure to ground or to sufficiently ground it may make operation unstable or cause the product to ma function due to excess interference.
  - the voltage between neutral and earth must not be >1 V
  - the resistance must be <6 Ohm.

- If the mains voltage fluctuates strongly, use a voltage stabilizer.

- In the proximity of high frequency generators or arc welders, use adequate mains filters.

During use

- The emergency button and other safety devices must be guaranteed by the installer and are not controlled by the operator terminal.

- When pressing keys, touch screen or display, do not use sharp objects or objects that might damage the product (nails, screwdrivers, pointed objects).

Service and Maintenance

- Only trained personnel are qualified to remove and replace the operator panel.

- Only Gefran personnel or personnel authorized by Gefran may do repairs.

- Use only a soft damp cloth to clean the front panel and the screen.
  SWITCH OFF THE POWER before cleaning the operator terminal.

- Incorrect replacement of the battery (where provided) may cause the product to malfunction.
  Use only the batteries indicated by the builder.

Disposal

- The terminal or its parts must be disposed of in compliance with the laws in the country of installation.

- Some of the components in the product may harm the environment if incorrectly disposed of.

Notes Concerning Electrical Safety and Electromagnetic Compatibility:

CE MARKING: EMC Conformity (electromagnetic compatibility)
in accordance with EEC Directive 2004/108/CE.
GF_VEDO ML series are mainly designed to operate in industrial environments, installed on the switch boards or control panels of productive process machines or plants. As regards electromagnetic compatibility, the strictest generic standards have been adopted, as indicated in the table below.

BT Conformity (low voltage) in accordance with Directive 2006/95/CE.

EMC conformity has been tested with the following connections.

GEFRAN S.p.A. declines all responsibility for any damage to persons or property caused by tampering, neglect, improper use or any use which does not conform to the characteristics of the controller and to the indications given in these Instructions for Use.

EMC EMISSION		
Generic standards emission standard for industrial environment	EN 61000-6-4	Class A

Table 1 - EMC Emission

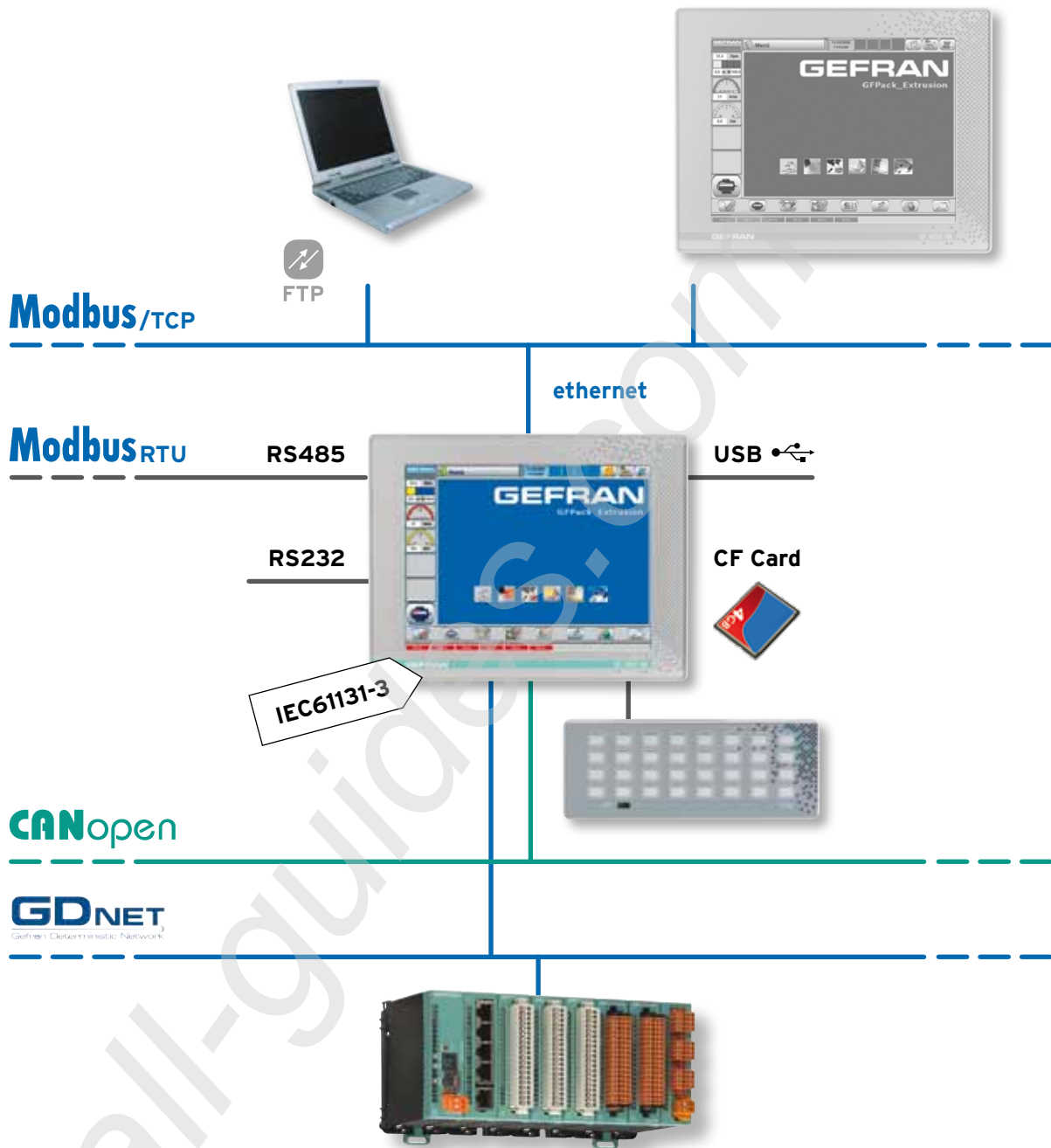| EMC IMMUNITY		
Programmable Controllers	EN 61131-2	Product Standard
ESD immunity	EN 61000-4-2	± 4 kV contact discharge ± 8 kV air discharge
RF interference immunity	EN 61000-4-3	10 V/m amplitude modulated 80 MHz-1 GHz 10 V/m amplitude modulated 1.4 GHz-2 GHz
Radiofrequency interference	EN 61000-4-6	3 V/m amplitude modulated 0.15 MHz-80 MHz
Burst immunity	EN 61000-4-4	± 2 kV power line ± 1 kV signal line
Pulse immunity	EN 61000-4-5	0,5 kV common mode
Magnetic fields immunity	EN 61000-4-8	100 A/m
Voltage dips, short interruptions and voltage immunity tests	EN 61000-4-11	100%U, 10ms

Table 2 - EMC Immunity

LOW VOLTAGE DIRECTIVE SAFETY		
Safety requirements for electrical equipment for measurement, control and laboratory use.	EN 61010-1	Installation category II and pollution degree 2

Table 3 - LVD Safety

GENERAL DESCRIPTION
The GF_VEDO line of operator terminals is a compact and affordable machine control solution.
A single product integrates a PLC and graphic pages display [SCADA], making the creation of automation solutions extremely rapid and economical.
Panel sizes range from 6.5" to 15" with touch screen or integrated keyboard and horizontal or vertical installation.
The panel uses a GEODE 32 bit processor with RAM from a minimum of 256MB to a maximum of 512MB, based on the operating system installed.
Extremely important characteristics are the complete absence of moving parts and a fan-free cooling system.
All of the products are programmable with GF_PROJECT programming environment.
Products based on Windows XPe are available for use of third-party applications as an alternative to products with a real-time operating system.

Modbus/TCP

FTP

ethernet

ModbusRTU   **RS485**   **USB**

RS232   **CF Card**

IEC61131-3

CANopen

GDNET
Gefran Deterministic Network

Dimensions

Horizontal models (see table)
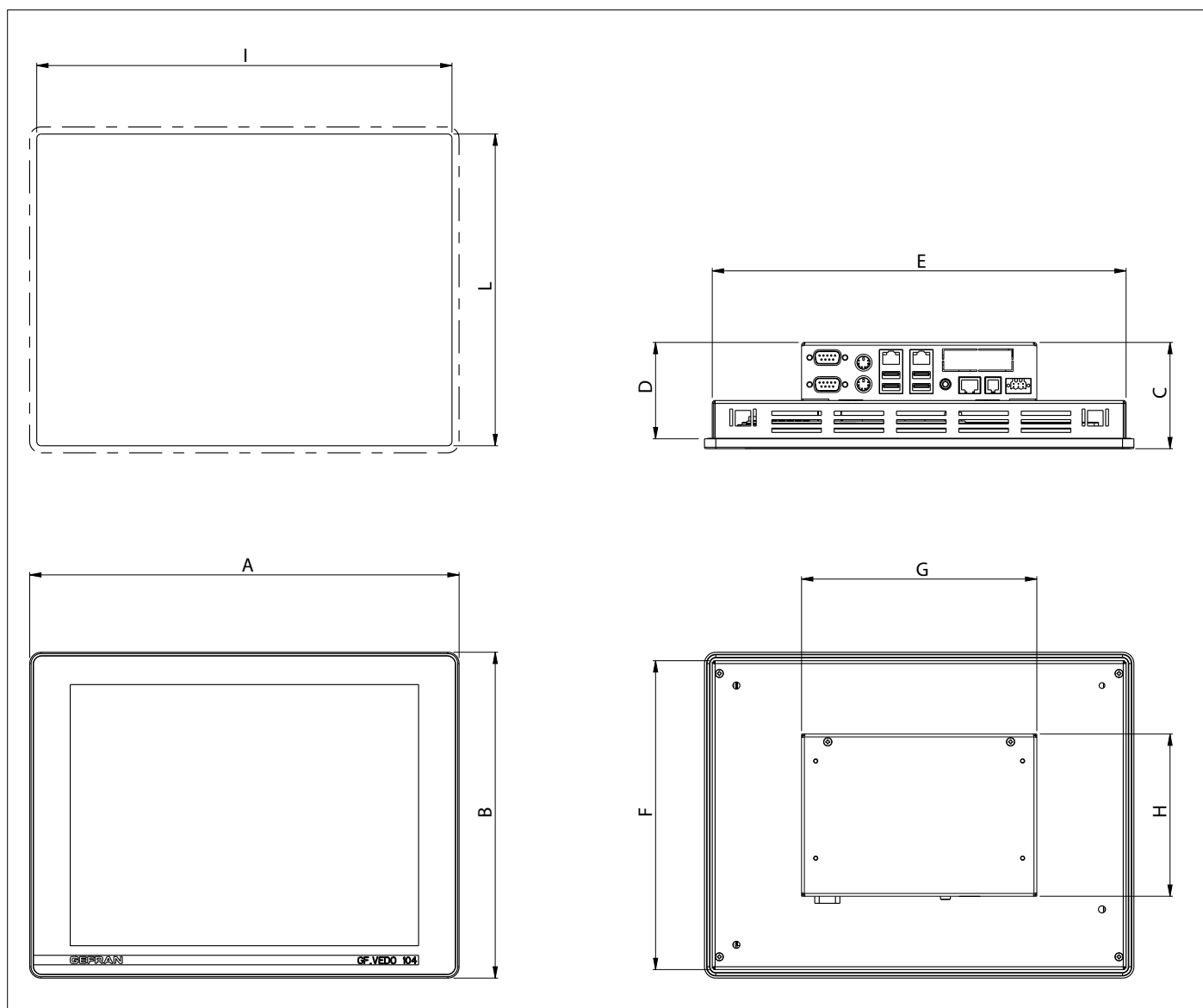
Table dimensions

Model		frame								dima		
		A	B	C	D	E	F	G	H	I	L	
6.5" touch	65CT	187.0	133.0	75.5	68.0	177.5	125.0	166.0	114.5	179.5	127.0	mm
10.4" touch	104CT	266.0	192.5	68.5	61.0	256.0	182.5	166.0	114.5	258.0	184.0	mm
12,1" touch	121CT	305.0	231.0	76.0	68.0	292.0	218.0	166.0	114.5	295.0	222.0	mm
15" touch	150CT	369.0	273.0	76.0	68.0	356.0	260.0	166.0	114.5	359.0	262.0	mm
6.5" with keypad	65CK	187.0	230.0	76.0	68.0	177.5	220.0	166.0	114.5	180.0	222.0	mm
10.4" with keypad	104CK	266.0	289.0	76.0	68.0	256.0	279.0	166.0	114.5	258.0	281.0	mm

Fixing

Angle of installation

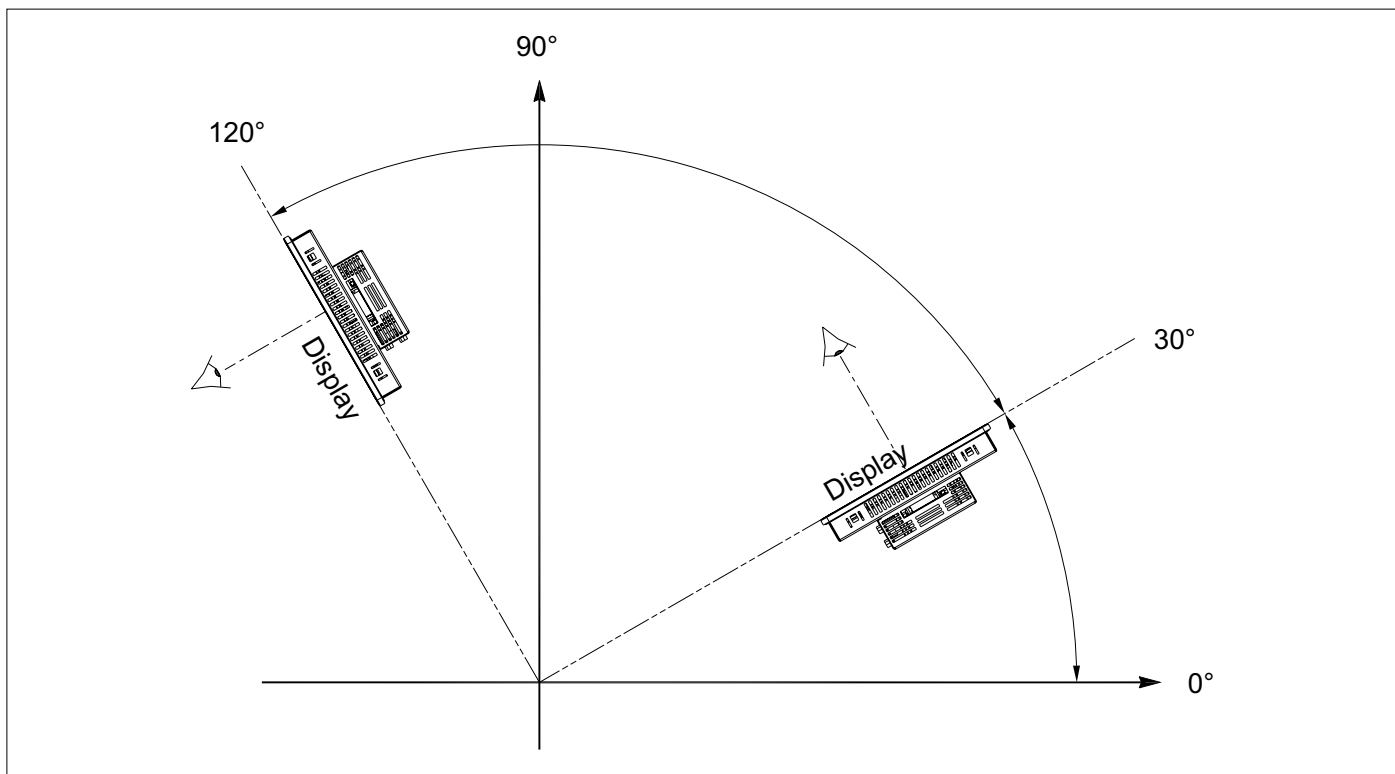The operator terminal can be installed at an angle in the range of 30° and 120° as shown in figure 1.

Fig 1 - Angle of installation

Panel mounting of GF_VEDO ML

GF_VEDO ML panels are designed for front panel installation.
After making the opening shown on the template drawing, fasten the GF_VEDO ML with the blocks required and supplied with the product.
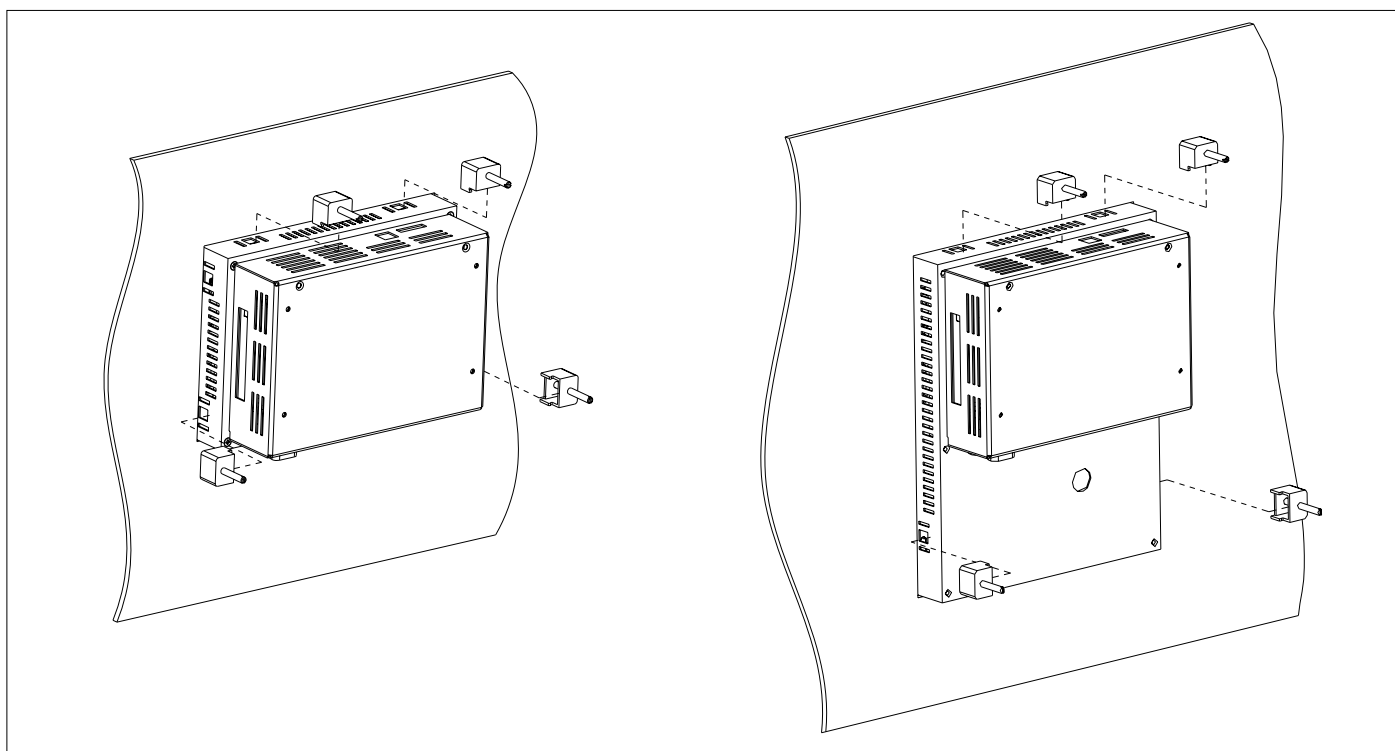

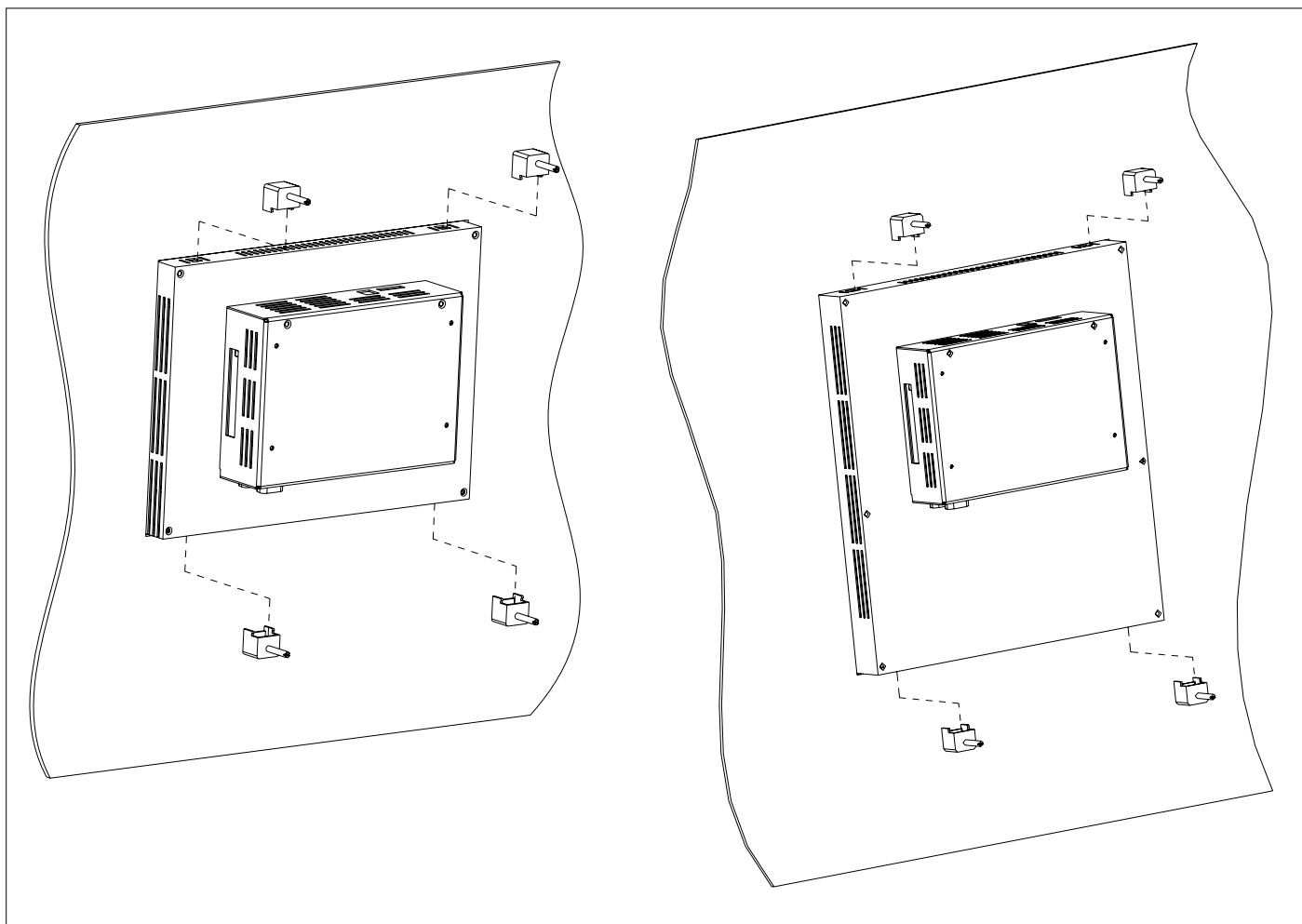Fig 2 - Panel mounting GF_VEDO ML 65CT / GF_VEDO ML 65CK

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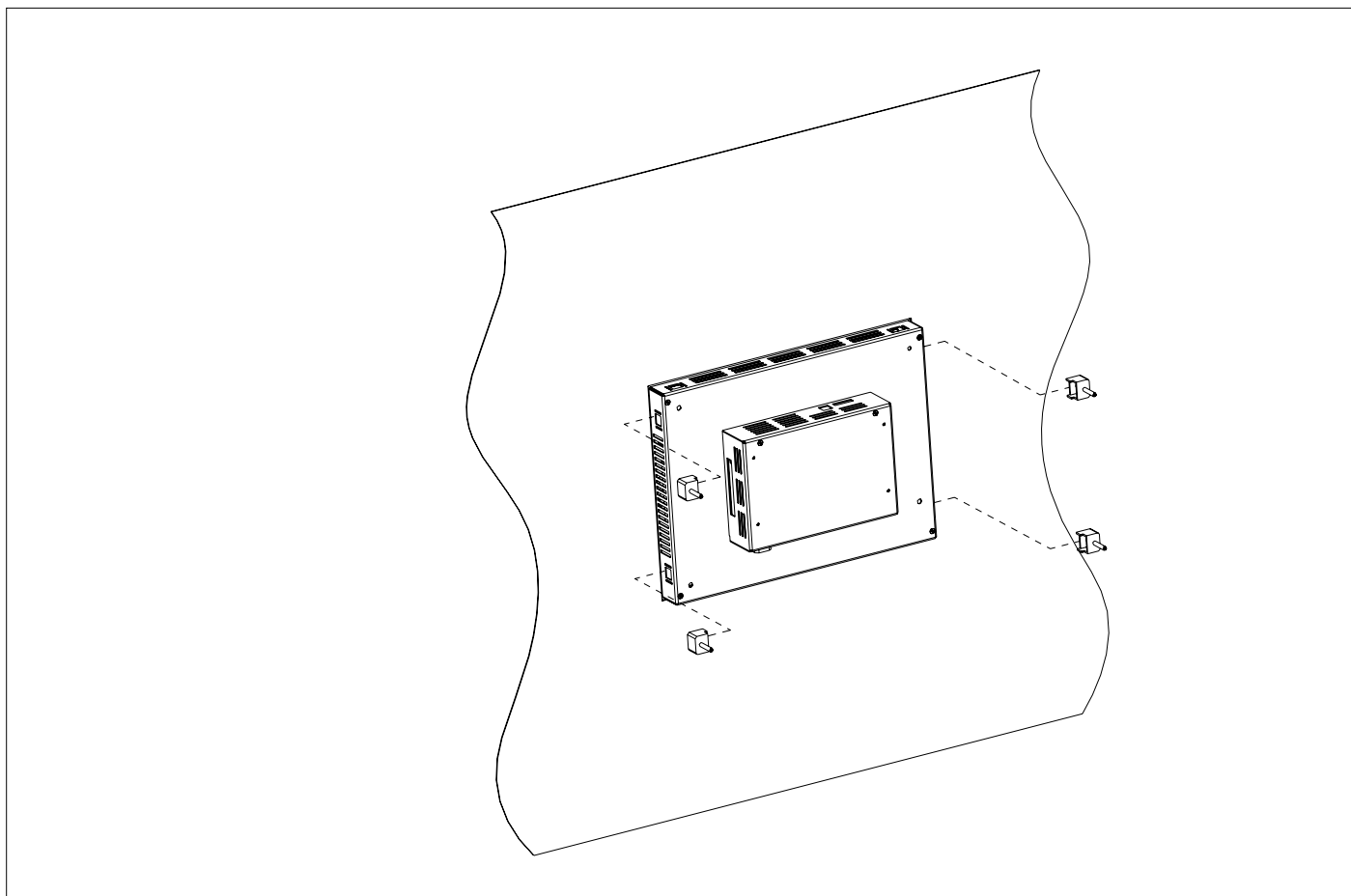Figure 3 - Panel mounting GF_VEDO **ML 104CT** / GF_VEDO **ML 104CK**
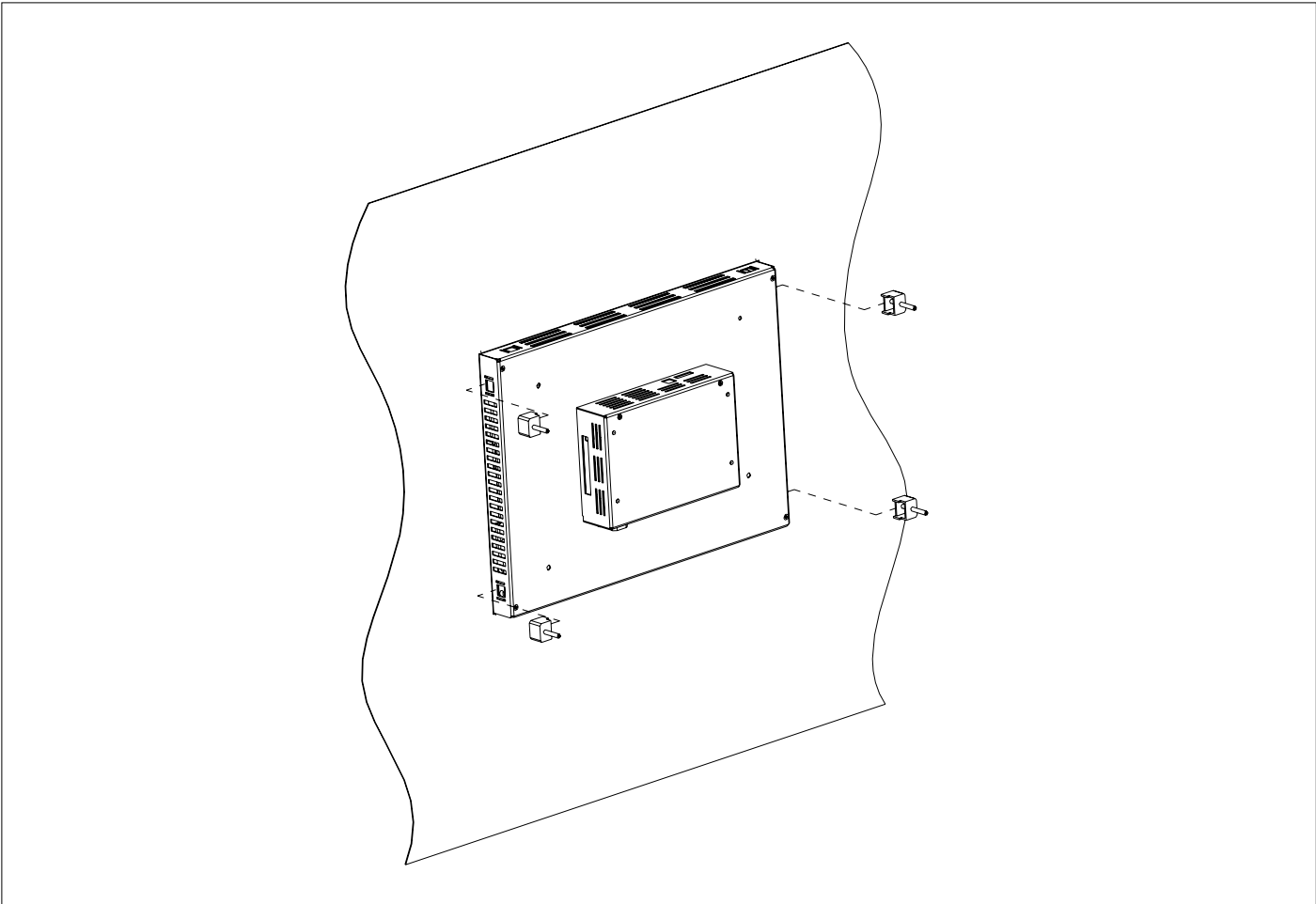

Figure 4 - Panel mounting GF_VEDO **ML 121CT**

Figure 5 - Panel mounting GF_VEDO **ML 150CT**

To ensure correct dissipation of the heat generated by GF_VEDO_ML terminals, provide a minimum distance **"d" of 10 cm** between the rear protective surfaces of the terminals and the surfaces around them.
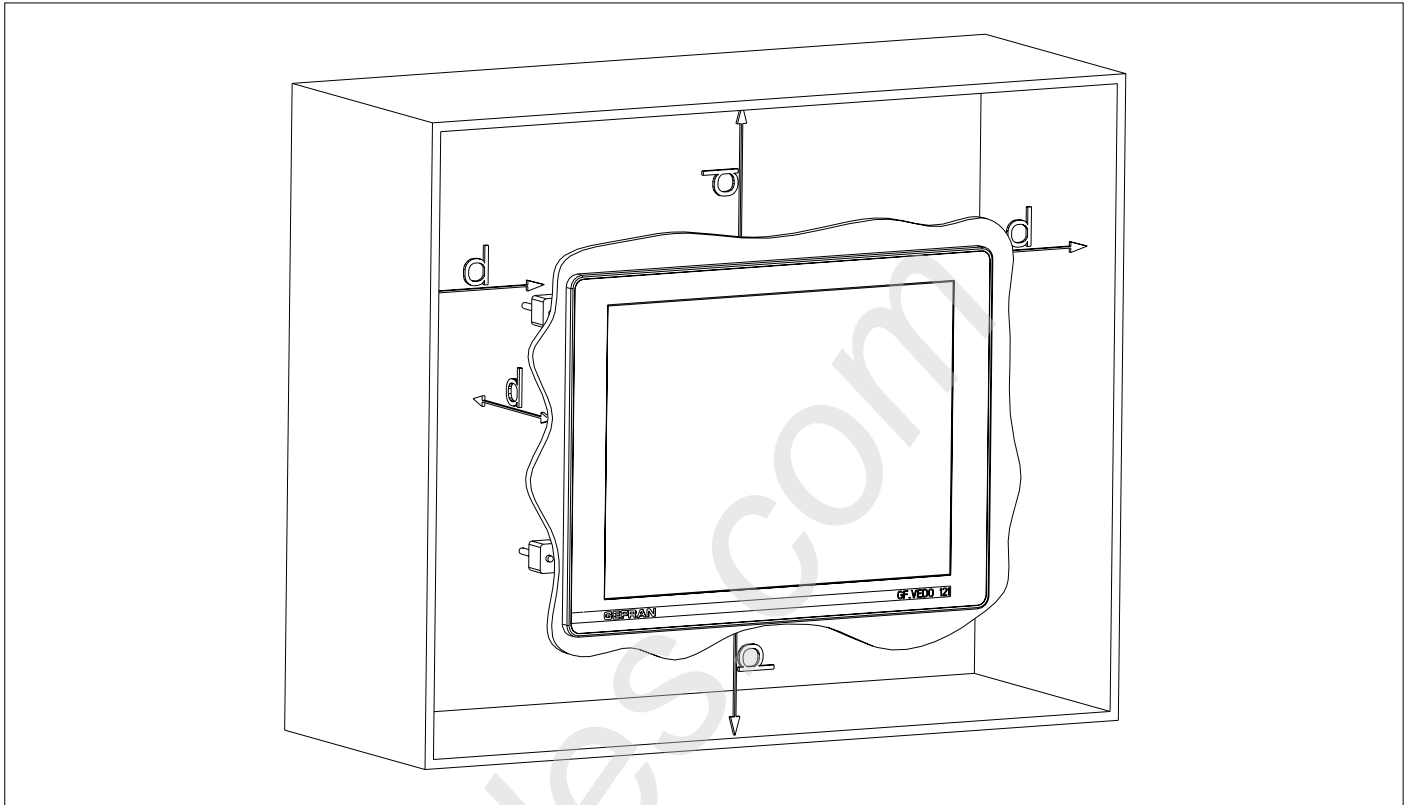

Fig 6 - Minimum distance from surfaces in panel (10 cm)

If protection against water is necessary, it is essential to do as follows when installing the panel:
· make the edges of the hole for the panel perfectly smooth and flat
· tighten each fastening screw (or nut) until the corner of the frame touches the panel
· the panel hole must have the dimensions specified in this manual

The GF_VEDO ML terminals also have an O-Ring inserted at the rear of the display frames, as shown in Figure 7.
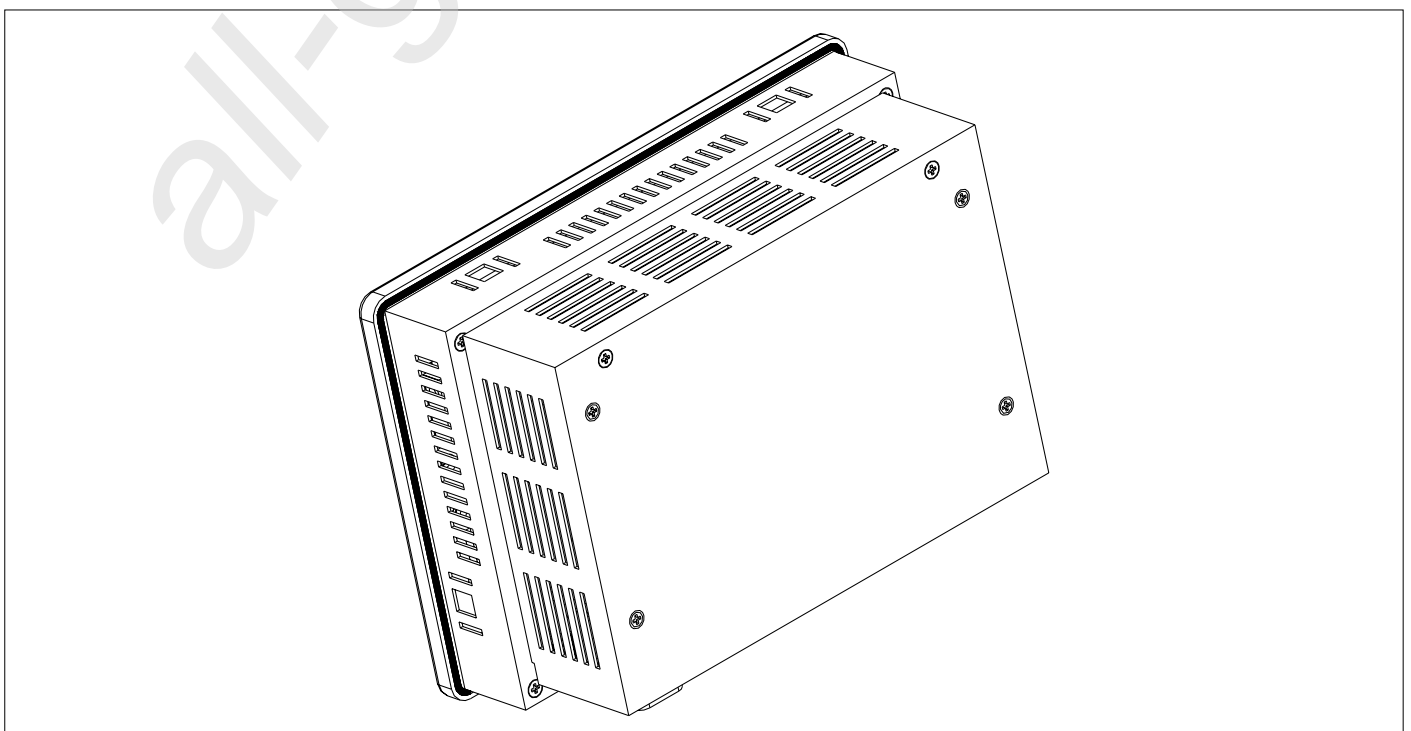

Figura 7 - O-Ring on GF_VEDO TL terminals

4 · TECHNICAL SPECIFICATIONS

Table 14 shows the main technical characteristics of each GF_VEDO ML version.

In particular, it shows characteristics for displays, processors, storage devices and interfaces.

4.1 Supported Operating Systems

GF_VEDO ML terminals offer the user various types of operating systems:

·   **VxWorks**: a real-time operating system by Wind River System.
   Just like most real-time operating systems, VxWorks includes a multitasking kernel with optional scheduling
   and rapid interrupt response.

·   **Windows XP Embedded**: the modular version of Microsoft Windows XP Professional.

4.2 Bios

The Bios supplied for GF_VEDO ML terminals is Phoenix Awar BIOS .

4.3 Integrated keyboard in CK versions

The CK versions of GF_VEDO ML terminals have an integrated keyboard at the bottom of the display.

The keyboard has 15 (GF_VEDO ML 65CK) or 22 (GF_VEDO ML 104CK) function keys and 32 keys for entering
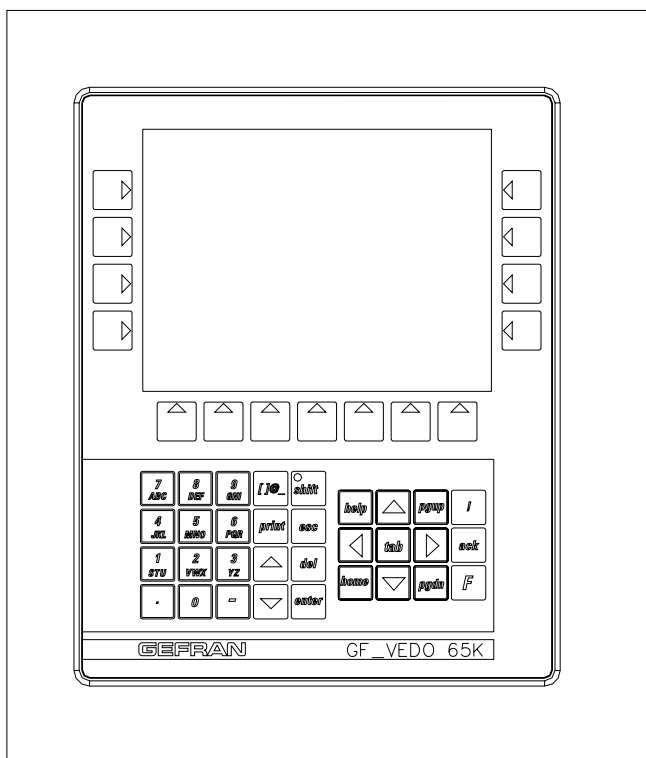alphanumeric characters.

Figura 8
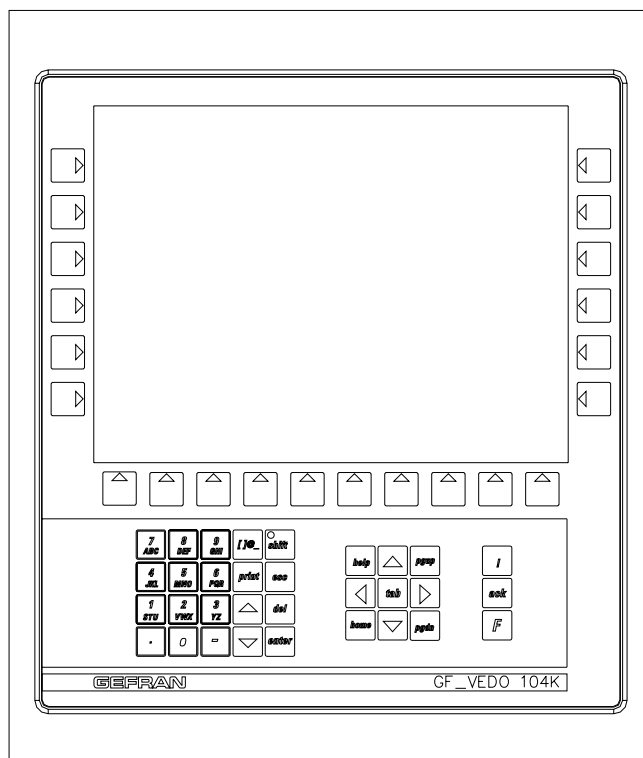Teclado incorporado nos terminais GF_VEDO ML 65CK

Figura 9
Teclado incorporado nos terminais GF_VEDO ML 104CK

4.4 GF_VEDO ML user connections

The user connections specified on Table 4 are made at the bottom by means of Gefran standard and custom connectors.
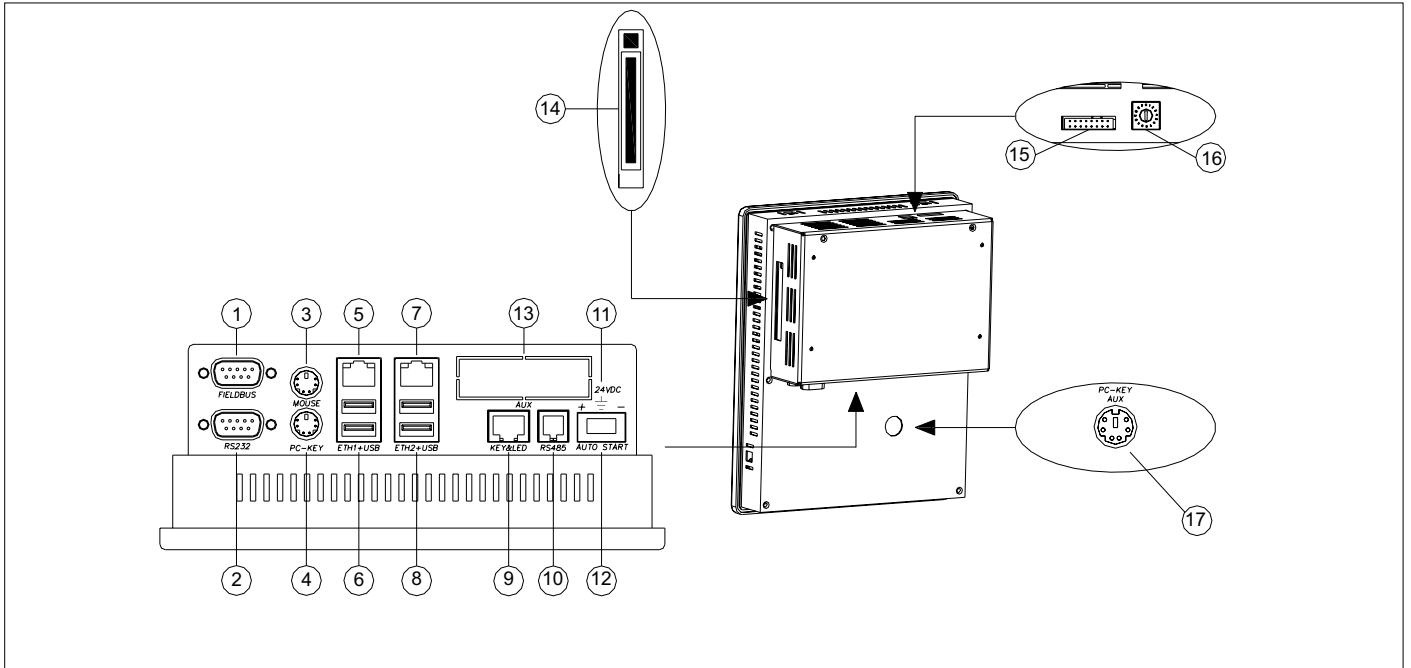
Fig 10 - GF_VEDO ML connector

No	Name	Description
1	FIELDBUS	[Optional] -CAN layer 2
2	RS232	Serial RS-232
3	MOUSE	PS/2 Mouse (green)
4	PC-KEY	PS/2 keyboard (violet)
5	ETH1	Ethernet 10/100 Base-T
6	USB	USB 2.0 Host (500 mA)
7	ETH2	Ethernet 10/100 Base-T
8	USB	USB 2.0 Host (500 mA)
9	KEY &LED	Fieldbuses keyboard
10	RS485	RS-485 optically-isolated serial
11	AUTO-START	Auto-on
12	24 V d.c.	Power supply
13	AUX	Slot reserved for future uses
14	CF	Compact Flash
15	BATTERY	Battery jumper
16	ROTARY	Rotary configuration selector
17	PC-KEY	Auxiliary PS/2 keyboard

Table 4 - GF_VEDO ML connector description

4.4.1 Power supply port

Power supply: 24 V d.c. ±25%. The internal power supply is galvanically isolated and protected against polarity reverses and short circuits by a resettable fuse. The connector diagram is shown in Figure 11.

Note:

check that the power supply is able to deliver the power needed for correct operation of the device.

The device must always be grounded. Grounding helps limit the effects of electromagnetic noise on the control system.
Ground the devices in a manner conforming to applicable standards and regulations.
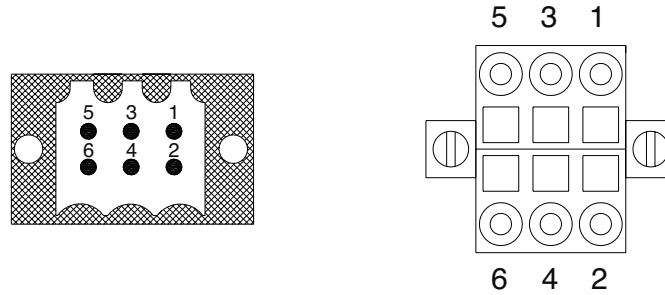
Fig 11 - GF_VEDO ML power supply/auto power-on connector

Pin	Description
1	Power supply common
2	Auto power-on output
3	Ground
4	Auto power-on common
5	Power supply +24 V d.c.
6	Power supply Auto power-on

Table 5 - Assignment of signals to Power Supply/Autostart connector of GF_VEDO ML terminals

To limit susceptibility to noise, you have to install an electromagnetic emission suppression core as shown in Figure 12.
This component, supplied with the product, is a ferrite core coated in plastic for round section wires.

Fig 12 - Inserting cores in the power supply lines of GF_VEDO_ML terminals

4.4.2 Autostart Port

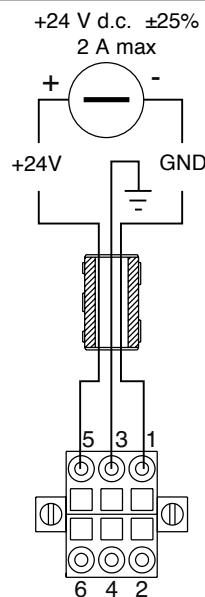GF_VEDO ML uses the optional Autostart output to activate an external relay by means of a programmable internal timer. Activation requires that only the relay be powered, and to run the external devices you have to use the free contact of the relay (activation time approx. 10 seconds).

We recommend the use of 24 V d.c. relays with a maximum of 100 mA at the coil.
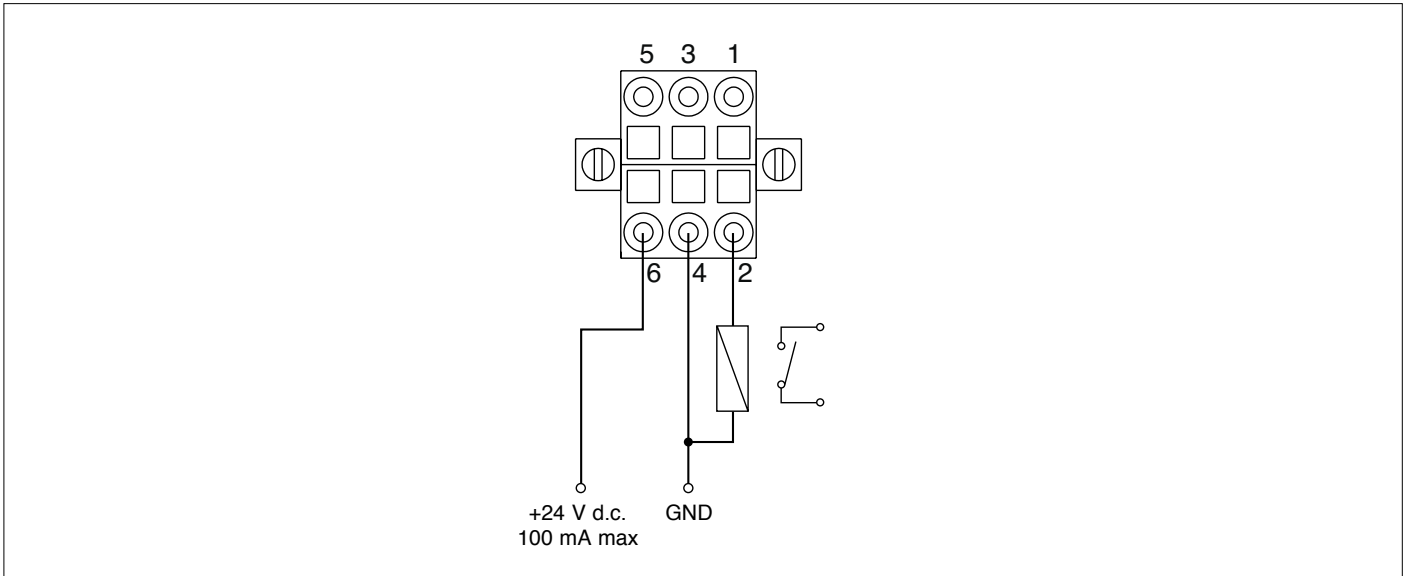
Fig 13 - Connection of external relay to Autostart port of GF_VEDO_ML terminals

4.4.3 Ethernet ports

GF_VEDO ML uses Ethernet ports to dialog via IEEE 802.3 Ethernet protocol. Each Ethernet port can dialog at 10/100 Mbps using an 8-pin RJ45 connector with LED.

We recommend an Ethernet Base-T with braided leads (CAT. 6). The wiring scheme must conform to standard TIA/EIA-T568-A. Signal assignment is shown in Table 6.
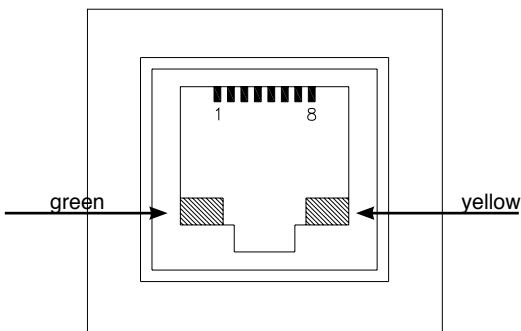
Fig 14
GF_VEDO ML Ethernet port connector

Pin	Name	Description
1	TX_D+	Tranceive data +
2	TX_D-	Tranceive data -
3	RX_D+	Receive data +
4	N.C.	Not connected
5	N.C.	Not connected
6	RX_D-	Receive data -
7	N.C.	Not connected
8	N.C.	Not connected
LED green left		Link
LED yellow right		Data

Table 6
Signal assignment for GF_VEDO ML Ethernet port

4.4.4 RS-232 Port (optional)

RS-232 port lets the GF_VEDO ML dialog with RS-232 serial transmission protocol at a baud rate from 9.6 kBaud to 115 kBaud.

The RS-232 port is not optically isolated and uses a 9-pin (male) D-sub connector. Signal assignment is shown in Table 7.

Fig 15
GF_VEDO ML RS-232 port connector

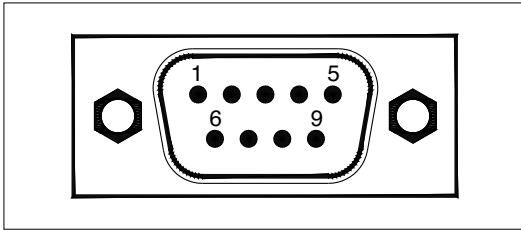| Pin	In/Out	Code	Description
1	I	DCD	Data Carrier Detect
2	I	RxD	Dati ricevuti
3	O	TxD	Dati trasmessi
4	O	DTR	Data Terminal Ready
5	-	GND	GND
6	I	DSR	Data Set Ready
7	O	RTS	Request To Send
8	I	CTS	Clear To Send
9	I	RI	Ring Indicator

Table 7
Signal assignment for GF_VEDO ML RS-232 port

4.4.5 RS-485 Port

GF_VEDO ML uses the RS-485 port to dialog according to OSI specifications at the physical level defined by standard EIA-485.

The RS-485 port is optically isolated and allows dialog from 9.6 kBaud to 115 kBaud via an RJ10 4p4c connector (Registered Jack type 10 with 4 positions and 4 contacts).

Signal assignment is shown in Table 8.
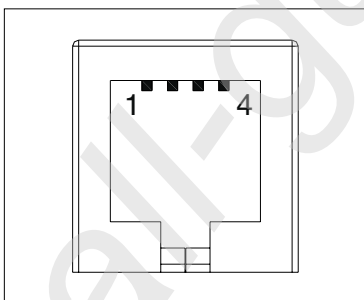
Fig 16
RJ10 connector for GF_VEDO ML RS-485 port

Pin	Name	Description
1	GND	-
2	Tx/Rx +	Data reception/transmission (A+)
3	Tx/Rx -	Data reception/transmission (B-)
4	+V (reserved)	-

Table 8
Signal assignment for GF_VEDO ML RS-485 port

4.4.6 FIELDBUS Port:Option CAN

The optional CAN port lets GF_VEDO ML dialog via the serial standard (ISO 11898-1 of 2003) for the CAN (Controller Area Network) field bus, also known as CAN-bus.

This protocol is specifically designed for excellent operation even in environments with strong electromagnetic noise, and can use a balanced potential line such as an RS-485 as means of transmission.

In particular, GF_VEDO ML implements the CANOpen Layer 2 standard. The CAN port is optically isolated and uses a 9-pin (male) D-sub connector.

Signal assignment is shown in Table 9.

The bus line must be terminated at both and by a 120Ω 1/4W resistor placed across CAN-M and CAN-L, as shown in the picture 17.
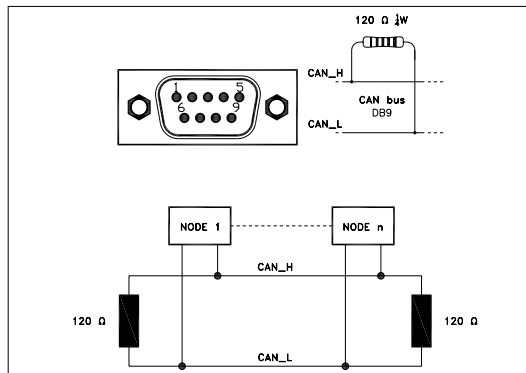
Fig 17
GF_VEDO ML CAN port connector
and termination resistor network

Pin	In/Out	Code	Description
1	-	-	-
2	O	CAN_L	CAN Low
3	O	CAN_GND	CAN Ground
4	-	-	-
5	-	EARTH	Terra
6	-	-	-
7	O	CAN_H	CAN High
8	-	-	-
9	-	-	-

Table 9
Signal assignment for GF_VEDO ML CAN port

The communication cable to be used depends on the type of device to be connected.

4.4.7 USB Port

GF_VEDO ML uses USB ports to dialog via USB (Universal Serial Bus) serial communication standard.

GF_VEDO ML terminals support version USB 2.0 (transmission up to 480 Mbit/s).

The USB port connector is type USB-A (4 pins). Signal assignment is shown in Table 10.

Voltage for VBUS is approximately +5 V with maximum current of 500 mA.

Signals D+ and D- refer to the two (pseudo) differential data communication lines.

You can access USB ports of GF_VEDO ML terminals from the panel by connecting a cable (accessory: order separately) as described in Figure 19.

Pin	Descrizione
1	VBUS
2	D-
3	D+
4	GND
Shell	SHIELD
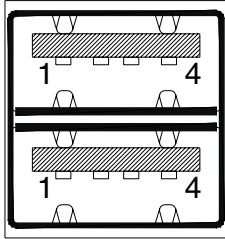
Fig 18
Connector for USB port of GF_VEDO ML terminals

Table 10
Signal assignment of USB port of GF_VEDO ML terminals

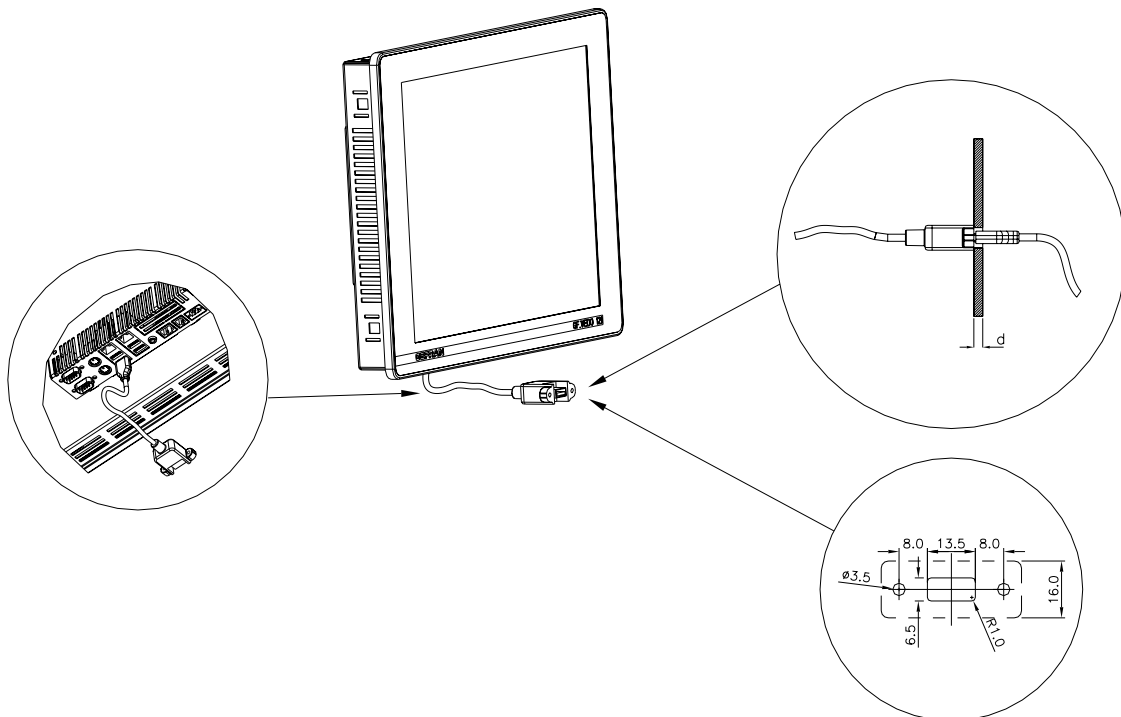**The USB cable (accessory: order separately) must be inserted in a panel with maximum thickness (d) of 2mm**

Fig 19
USB cable for GF_VEDO ML terminals

4.4.8 AUX Port

The slot AUX port is reserved for future developments.

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4.4.9 Matrix Keyboard port (KEY & LED)

GF_VEDO ML uses the KEY & LED port to communicate with series TF keyboards.

It uses a high-speed full-duplex synchronous serial interface (SPI) with proprietary communication protocol.

This allows scanning of the key matrix and control of off/on status of LEDs on the keyboard.

The connector is an 8-pin RJ45 without LED, which allows keyboard communication and power.

Signal assignment is shown in Table 11.
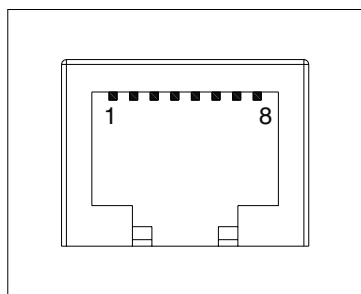
Cable length can be a maximum of 1 meter.

Fig 20
GF_VEDO TL KEY & LED port connector

Pin	Name	Description
1	KEYCLK	Keyboard clock
2	KEYOUT	Keyboard output
3	KEYIN	Keyboard input
4	IRST	Reset GT-Tast
5	POWER	+5 V power supply
6	GND	0 V power supply
7	GND	0 V power supply
8	+12 V	+12 V power supply

Table 11
Signal assignment for GF_VEDO ML KEY & LED port

4.4.10 Mouse and Keyboard PS2 port

The PS2 port connects the GF_VEDO ML to keyboards and mice conforming to PS2 standard.

Two mini-DIN 6-pin female connectors are used (green: Mouse, violet: Keyboard).

Signal assignment is shown in Tables 12 and Table 13.
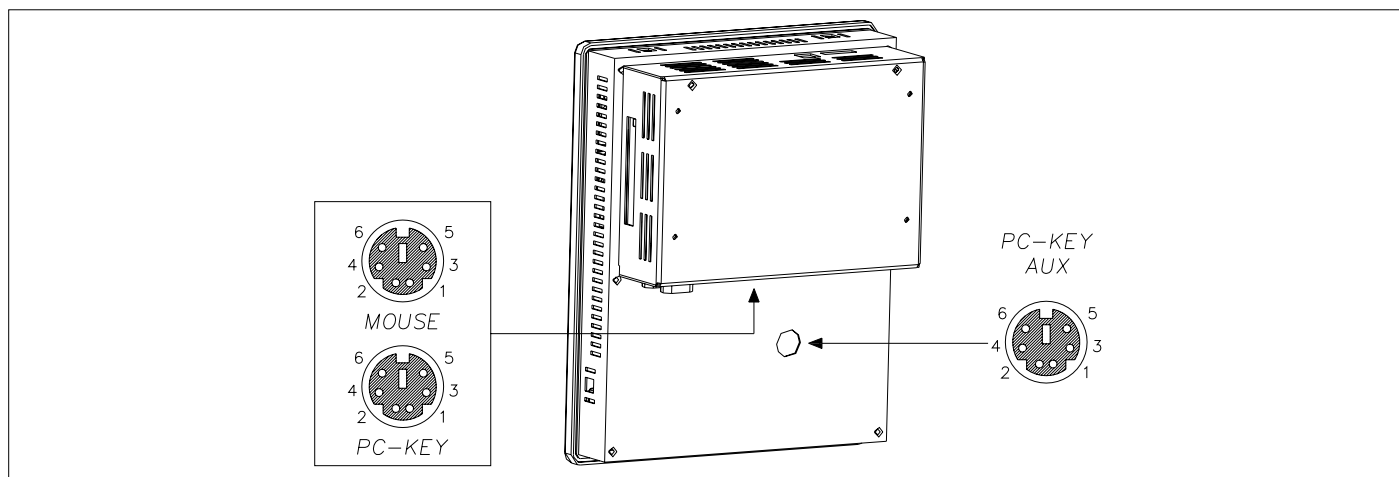
Fig 21 - GF_VEDO ML PS2 port connector for Mouse and Keyboard

Pin	In/Out	Description
1	KBD Data	Data Keyboard
2	N.C.	Not connected
3	GND	GND
4	5 V d.c.	+5 V
5	KBD CLK	Keyboard Clock
6	N.C.	Not connected

Table 12
Signal assignment for GF_VEDO ML
PS2 Keyboard port

Pin	In/Out	Description
1	MS Data	Data Mouse
2	N.C.	Not connected
3	GND	GND
4	5 V d.c.	+5 V
5	KBD CLK	Mouse Clock
6	N.C.	Not connected

Table 13
Signal assignment for GF_VEDO ML
PS2 Mouse port

4.4.11 COMPACT FLASH memory cards

The GF_VEDO ML is supplied with a COMPACT FLASH memory card in which the operating system, application, and user data are stored.

The GF_VEDO card has a connector for COMPACT FLASH cards (Type II, 50 pins) with extraction button on the left.

Fig 22
COMPACT FLASH memory card

4.4.12 Configuration Rotary Selector

The GF_VEDO ML is supplied with a 16-position rotary switch that you will be able to use to select special terminal functions that have not yet been activated.

Fig 23
System configuration rotary selector

4.5 Access to internal system resources

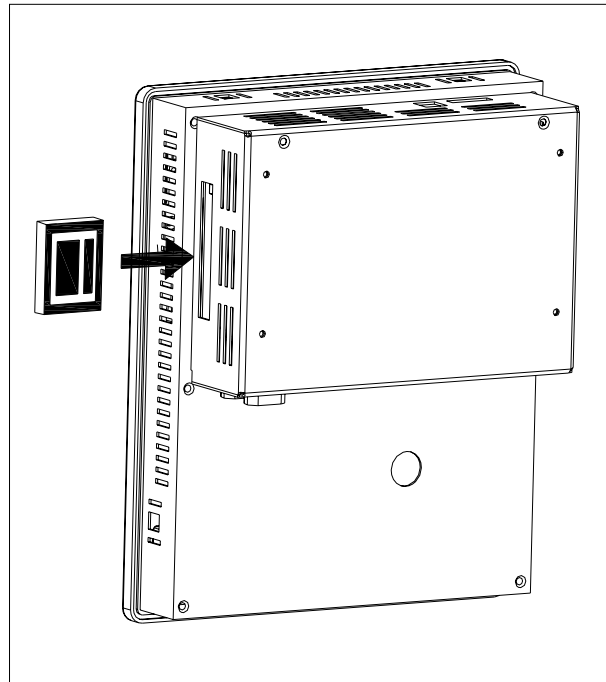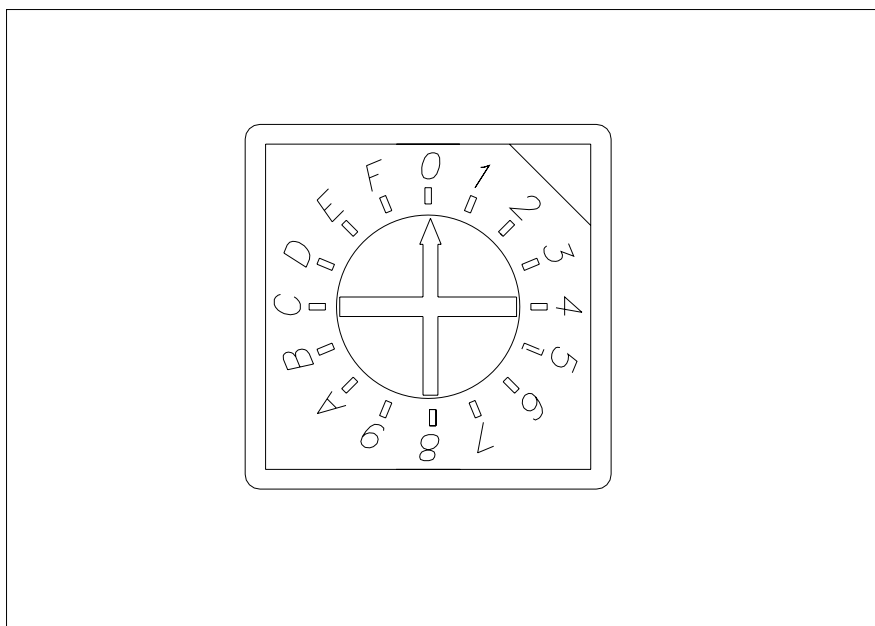The user cannot access the internal resources of GF_VEDO ML terminals, which are protected by a tamper-proof label on the board's support mechanics.
Removing the label voids the product warranty.

4.5.1 Internal battery

GF_VEDO ML panels are used with an internal 3V 65mA/h rechargeable lithium battery.
This allows the system BIOS configuration data to be maintained in memory when the GF_VEDO ML is off (for a maximum of 3 years).

You can connect/disconnect the battery to/from the GF_VEDO board by inserting/removing the jumpers on pins 15-16 of the BATTERY connector, accessible from outside the terminal.
(With jumper inserted, the battery is connected to the system).
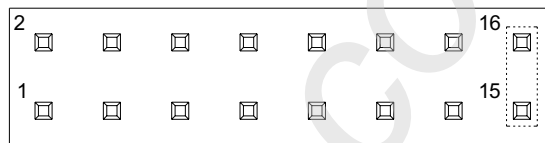
Fig 24 - Battery connection jumper accessible from outside GF_VEDO ML terminals

4.6 Label

The label on the rear of the product shows:
- GEFRAN logo
- CE mark
- UL mark (if approved)
and the following information:

SN	serial number of production
CODE	product code
CK	product tested
TYPE	product type
SUPPLY	required power supply
HW	product hardware version
SW	product software version

SN: 13030750
CODE: F054537
RoHS✓ GEFRAN
Made in Italy
CK☐ CE
TYPE: GF_VEDOML-104CT-VW1-00-S1-G
SUPPLY: 24Vdc +/-25% 25W max.
HW: 14
SW: 3.5.1
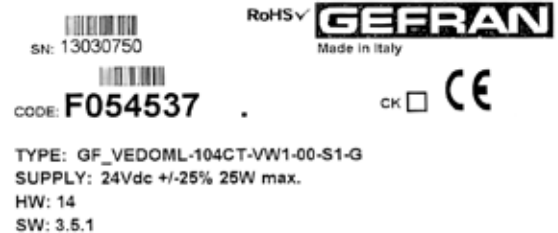
Note: an identical label is applied to the product package

5 · SUMMARY OF CHARACTERISTICS

GF_VEDO ML		65CT	65CK	104CT	104CK	121CT	150CT
Display	Type	TFT colors					
	No. colours	262k					
	Size	6.5"		10.4"		12.1"	15.0"
	Display area (mm)	132,5x99,4		211,2x158,4		246,0x184,5	304,1x228,1
	Resolution	VGA 640x480		SVGA 800x600		SVGA 800x600	XVGA 1024x768
	Luminosity	500 cd/m²		230 cd/m²		450 cd/m²	350 cd/m²
	Contrast	450:1		500:1		1000:1	700:1
	Backlighting type type: [life time at 25°C (h)]	CCFL/50.000		LED/30.000		CCFL/50.000	CCFL/50.000
	Visual angle O/V	140°/120°		80°/60-70°		178°/178°	140°/120°
Keyboard	Keys	-	47	-	54	-	-
Touch Screen	Type	4 wires resistance	-	4 wires resistance	-	4 wires resistance	
	Life	>1M operations	-	>1M operations	-	>1M operations	
	Controller	Integrated	-	Integrated	-	Integrated	
Processor	Type	ADM Geode LX900					
	Frequency	600MHz					
	Core	x86					
Memory	System memory (DRAM)	256MB-512MB					
	Mass memory (Compact Flash)	1GB -2GB					
I/O **Pheripherals**	AUTOSTART (opt)	Connector: 3-pin female, screw type					
	Ethernet ETH1-ETH2	2 x Ethernet 10/100 Mbps (RJ45 with LED)					
	RS-232 (opt)	1 x RS232 not optoisolated from 9.6 to 115kBaud (D-Sub 9 PM)					
	RS-485	1 x RS485 optoisolated from 9.6 to 115kBaud (RJ10)					
	Fieldbus: CAN (opt)	1 x CANopen from 9.6 to 115kBaud (D-Sub 9 PM) Terminals insertable from outside					
	USB	4 x USB 2.0 Host (500 mA) (connector: 4-pin type A)					
	KEY & LED	RJ45 connector without LED					
	Keyboard/Mouse PS2	Connector: 6-pin miniDIN (green: Mouse - violet: Keyboard)					
	Keyboard auxiliary PS2-AUX	Connector 6 pin miniDIN					
	CF	Compact Flash (Type II) connector					
	Rotary	Terminal configuration rotary selector					
	Battery	Battery connection jumper					
	Operative systems	VxWorks or WindowsXP Embedded					
Various	Power supply	24 V d.c. ±25% (connector: 3-pin female, screw type)					
	Max consumpt. at 24 Vd.c.	600mA		700mA		800mA	850mA
	Dissipated power (W)	14		17		19	20
	Resettable fuse	Current surge protection at input circuit					
	Battery type: - duration without power - lifetime	Button ML2032 rechargeable Li-AL 3V 65mA/h. not replaceable > 20 months > 10 years					
	RTC hardware clock	Clock/calendar with buffer battery					
	Faceplate protection	IP65 (IEC 529)					
	Certifications	CE, UL (pending)					

5 · SUMMARY OF CHARACTERISTICS

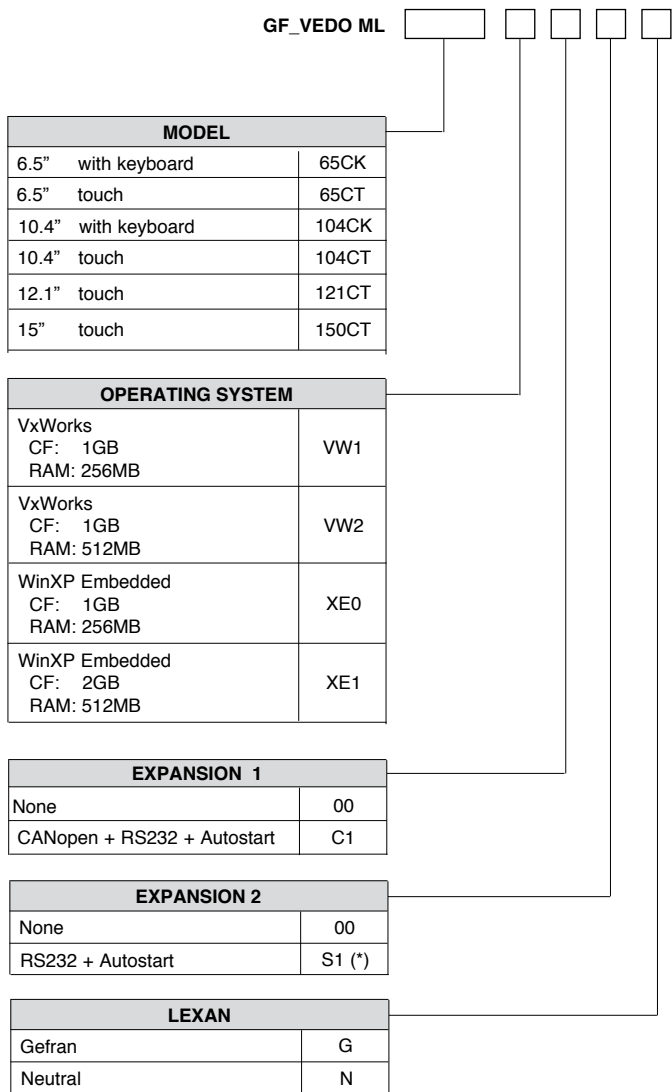| GF_VEDO ML			65CT	65CK	104CT	104CK	121CT	150CT
Operating/Storage condition		Operating temperature	0 ... +50°C (IEC 68-2-14)					
		Vibrations	5...9Hz sinusoid 3,5mm steady / 9...150Hz sinusoid with acceleration 1g					
		Storage temperature	20° ... +70°C (IEC 68-2-14)					
		Operating/storage humidity	5 ... 95% HR non-condensing (IEC 68-2-3)					
Dimensions (mm)		Faceplate	187x133x75,5	187x230x76	266x192,5x68,5	266x289x76	305x231x76	369x273x76
		Drilling	177,5x125x68	178x220x68	256x182,5x61	256x280x68	295x222x68	359x262x68
		Max panel thickness	4	4	4	4	4	4
Weight (Kg)			0.9	1.3	1.4	1.9	1.8	2.1

Table 14 - Summary of GF_VEDO ML characteristics

6 · TECHNICAL/COMMERCIAL INFORMATION

This section contains information regarding the Controller order codes and the main accessories available.

As stated in the Preliminary Warnings of these Instructions for Use, correct interpretation of the Controller order code allows the hardware configuration for the controller to be identified immediately and so it is essential to quote the order code each time the Gefran Customer Care Service is contacted for assistance with any problems.

Order code

GF_VEDO ML ☐ ☐ ☐ ☐ ☐

MODEL	
6.5" with keyboard	65CK
6.5" touch	65CT
10.4" with keyboard	104CK
10.4" touch	104CT
12.1" touch	121CT
15" touch	150CT

OPERATING SYSTEM	

VxWorks
   CF: 1GB
   RAM: 256MB
	VW1

VxWorks
   CF: 1GB
   RAM: 512MB
	VW2

WinXP Embedded
   CF: 1GB
   RAM: 256MB
	XE0

WinXP Embedded
   CF: 2GB
   RAM: 512MB
	XE1

EXPANSION 1	
None	00
CANopen + RS232 + Autostart	C1

EXPANSION 2	
None	00
RS232 + Autostart	S1 (*)

LEXAN	
Gefran	G
Neutral	N

(*) only in absence of the expansion1 (C1)