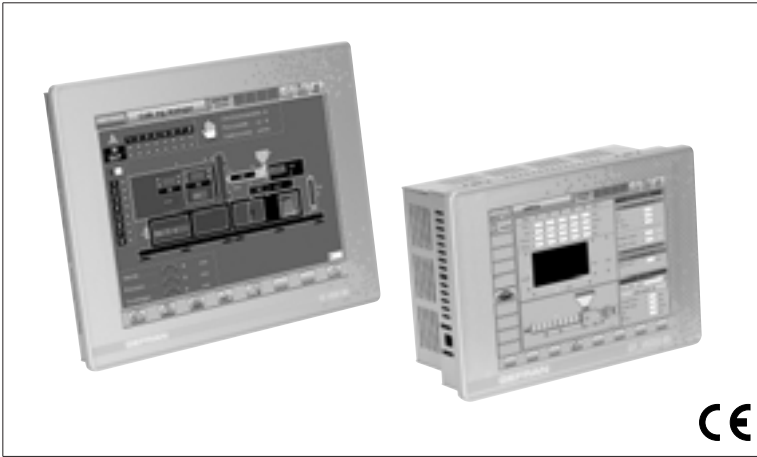




INSTALLATION AND
OPERATION MANUAL

Code 80543A / Edition 02 - 12/07

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 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 TL product. The following information is indispensable for the correct use of the GF_VEDO TL: proper wiring, correct jumper settings and the correct connection to external devices. Keep in mind that most of the hardware options can be configured via software by means of the setup data stored in the eeprom. As a result, there are just a few options solely for hardware, which significantly simplifies configuration of the GF_VEDO TL.

Graphic symbols

Graphic symbols are used to differentiate among the types and importance of the information in these Instructions and to facilitate the reader's understanding.

- 

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

Information of a general and applicative nature.
- 

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.
- 

Important notes for product safety and reliability.
- 

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

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

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



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 TL 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 TL terminals create the machine/operator interface by means of LCD monitor, touch-screen, and a wide variety of peripheral I/Os.

GF_VEDO TL terminals are applied mainly to machine control for packaging, metals, wood and plastic applications. This Installation Guide describes the main characteristics of the operator panels and refers to the following models:

GF_VEDO 65CT	Operator interface with 6.5" LCD TFT color display
GF_VEDO 65CK	Operator interface with 6.5" LCD TFT color display and integrated 47-key keyboard
GF_VEDO 104CT	Operator interface with 10.4" LCD TFT color display
GF_VEDO 104CK	Operator interface with 10.4" LCD TFT color display and integrated 54-key keyboard

Preliminary warnings



Read the following preliminary warnings before installing and using the GF_VEDO TL 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.

SN:		(Serial no.)
CODE:		(Finished product code)
TYPE:		(Order Code)
SUPPLY:		(Type of electrical power supply)
VERS:		(Software 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. 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 - 104CT - VW - C1 - S1 - G

- Model: GF_VEDO 104CT
- Operating 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 in PDF format available on Gefran's website: www.gefran.com.

In the event of presumed instrument malfunction, before contacting Gefran Technical Service Assistance, refer to the Troubleshooting Guide given in Section "Maintenance", and if necessary refer to the F.A.Q. Section (Frequently Asked Questions) on the Gefran Web Site www.gefran.com

2 • INSTALLATION AND CONNECTION



This section contains the instructions necessary for correct installation of the GF_VEDO TL into the machine control panel or the host system 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..

Electrical power supply

- the GF_VEDO TL 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
- if the terminal is connected to NOT isolated electrical equipment (e.g. thermocouples), the earth connection must be made with a specific conductor to prevent the connection itself from coming directly through the machine structure.
- if the GF_VEDO TL is used in applications with risk of

damage to persons, machinery or materials, it is essential to connect it up to auxiliary alarm equipment. It is advisable to make sure that alarm signals are also triggered during normal operation. The terminal must NOT be installed in flammable or explosive environments; it may be connected to equipment operating in such atmospheres only by means of appropriate and adequate types of interface, conforming to the applicable safety standards.

Notes Concerning Electrical Safety and Electromagnetic Compatibility:

CE MARKING: EMC Conformity (electromagnetic compatibility)

in accordance with EEC Directive 89/336/CEE and following modifications.

GF_VEDO TL 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.

EMC EMISSION		
Generic standards emission standard for industrial environment	EN 61000-6-4	Generic norm
Emission enclosure	CISPR-11	Class A

Table 1 - EMC Emission

EMC IMMUNITY		
Generic standards, immunity standard of industrial environments	EN 61000-6-2	Generic norm
ESD immunity	EN 61000-4-2	± 4 kV contact discharge ± 8 kV air discharge
RF interference immunity	EN 61000-4-3 +A1	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		
Low voltage directive safety	EN 61132-2	Basic norm 61010-1

Table 3 - LVD Safety

Instrument power supply

- The power supply to the electronic equipment on the switchboards must always come directly from an isolation device with a fuse for the instrument part.
- The electronic instruments and electromechanical power devices such as relays, contactors, solenoid valves, etc., must always be powered by separate lines.
- When the electronic instrument power supply is strongly disturbed by voltage problems from power units or motors, an isolation transformer should be used for the controllers only, earthing the screen.
- It is essential that the plant has a good earth connection:
 - the voltage between neutral and earth must not be $>1V$
 - the resistance must be $< 6\Omega$;
- If the mains voltage fluctuates strongly, use a voltage stabilizer.
- In the proximity of high frequency generators or arc welders, use adequate mains filters.
- The power supply lines must be separate from the instrument input and output ones.

Inputs and outputs connection

- To connect the analogue inputs, strain gauge, linear, (TC, RTD) the following is necessary:
 - physically separate the input cables from those of the power supply, the outputs and the power connections.
 - use woven and screened cables, with the screen earthed in one point only.
- To connect the control outputs, alarm (contactors, solenoid valves, motors, fans, etc.), fit RC groups (resistance and condensers in series) in parallel to the inductive loads that operate in Alternating Current.
(Note: all the condensers must conform to VDE (class X2) standards and withstand a voltage of at least 220V AC. The resistances must be at least 2W).
- Fit a 1N4007 diode in parallel with the coil of the inductive loads that operate in Direct Current.



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.

Dimensions

All measurements are expressed in mm, with tolerance of ± 0.5 .

GF_VEDO 65CT dimensions

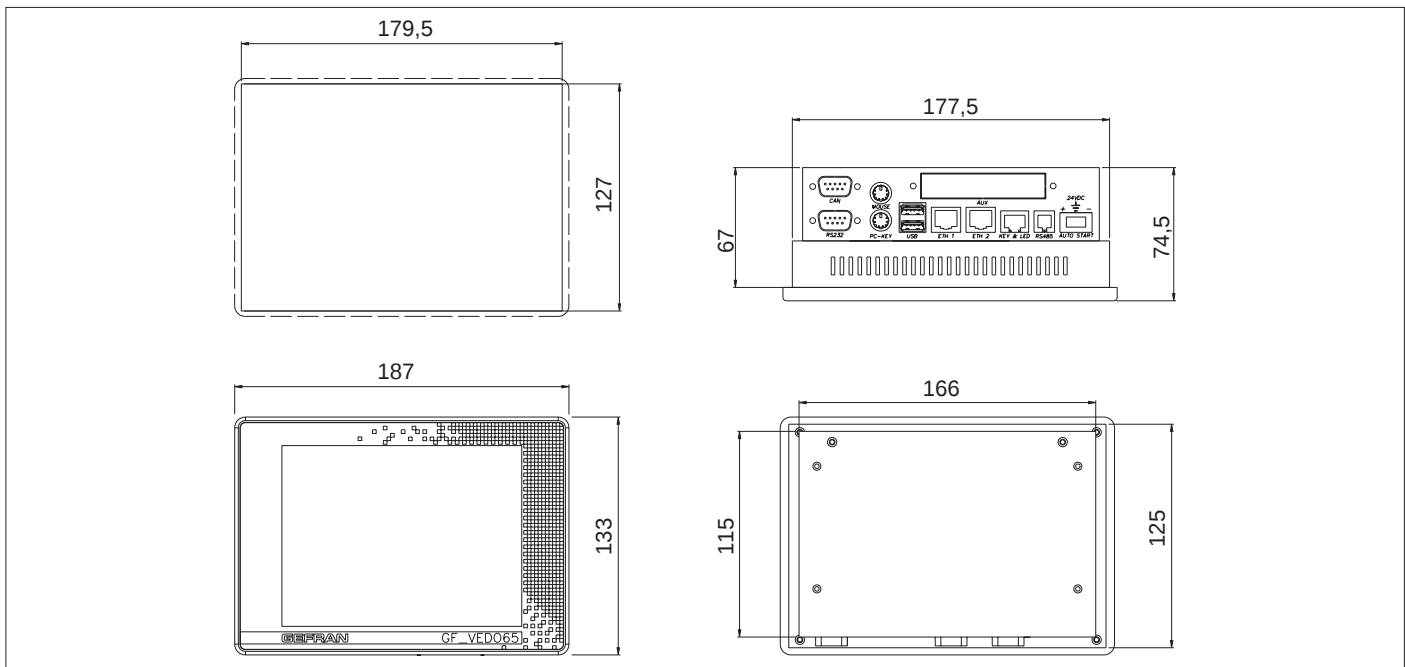


Fig. 1 - Dimensions and cut-out GF_VEDO 65CT

GF_VEDO 65CK dimensions

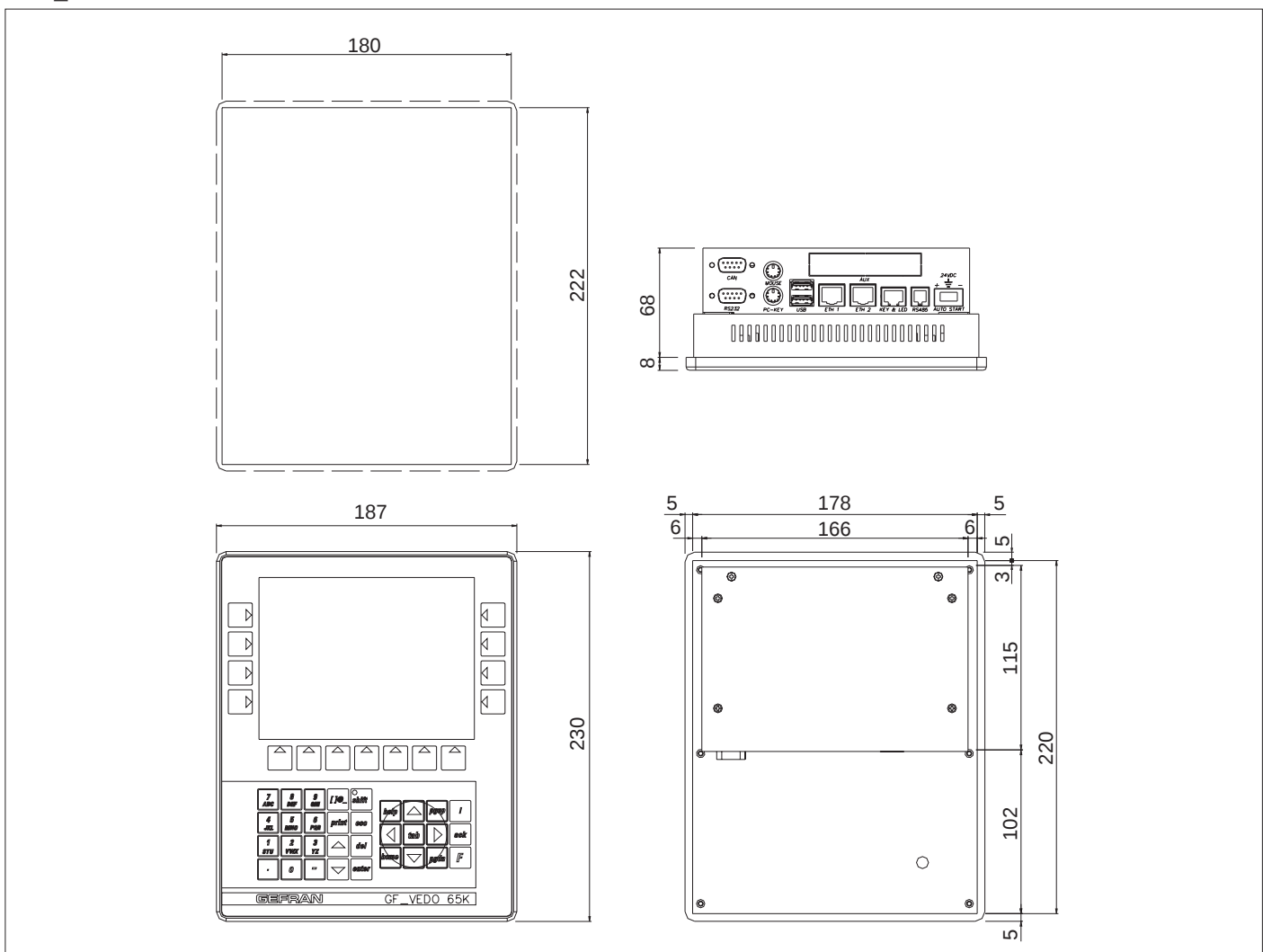


Fig. 2 - Dimensions and cut-out GF_VEDO 65CK

GF_VEDO 104CT dimensions

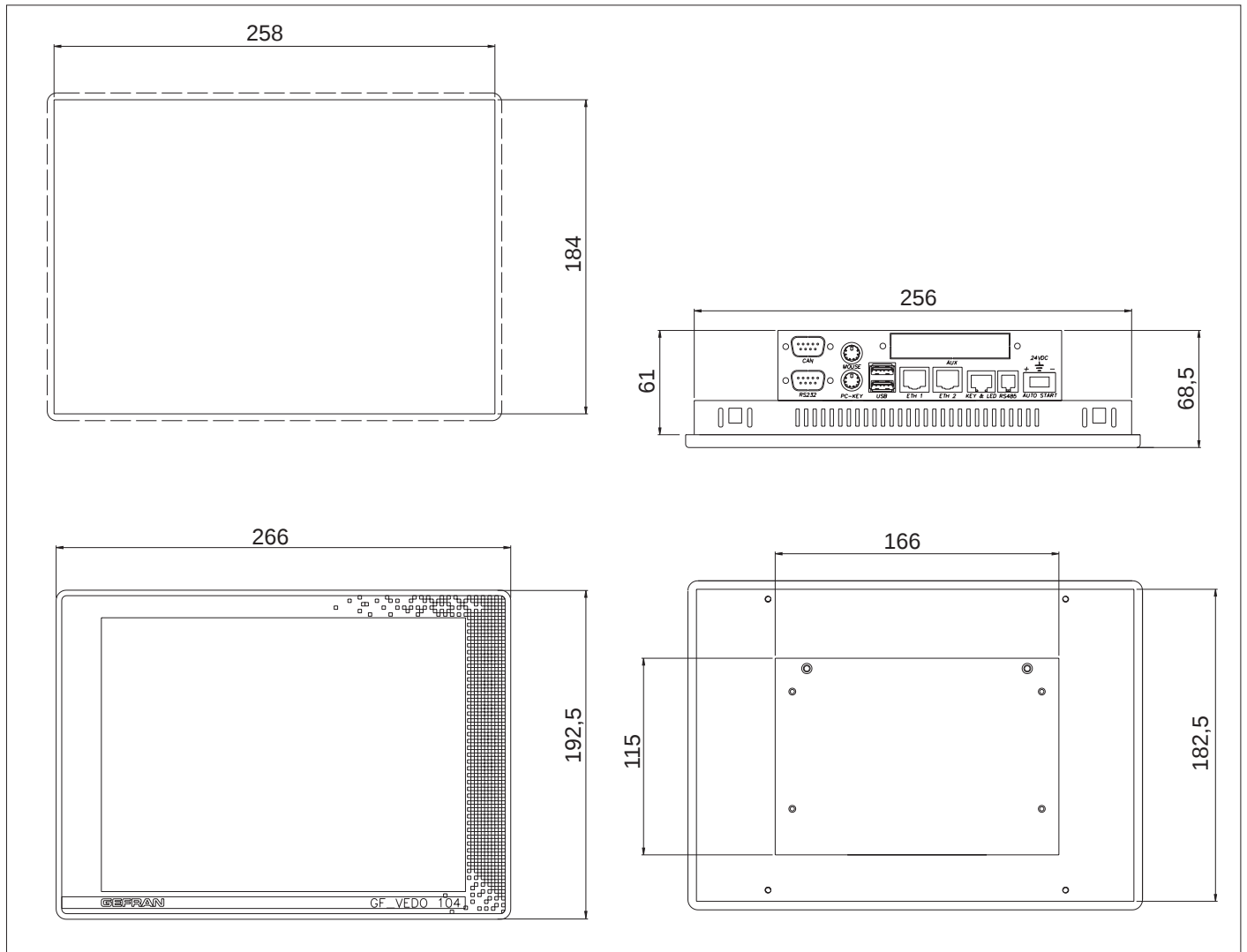


Fig. 3 - Dimensions and cut-out GF_VEDO 104CT

GF_VEDO 104CK dimensions

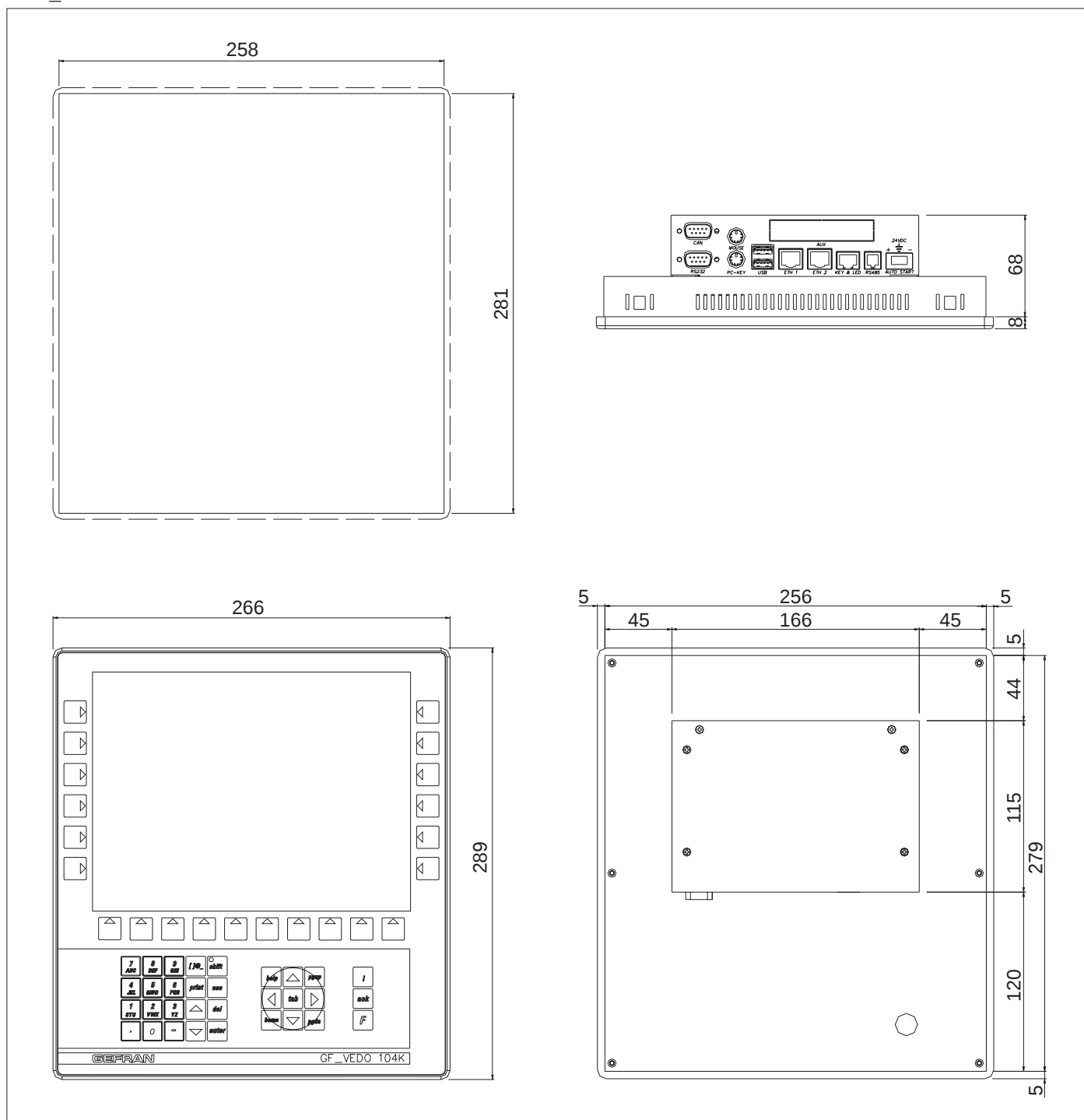


Fig. 4 - Dimensions and cut-out GF_VEDO 104CK

Panel mounting of GF_VEDO TL

GF_VEDO TL panels are designed for front panel installation.

After making the opening shown on the template drawing, fasten the GF_VEDO TL with the blocks required and supplied with the product.

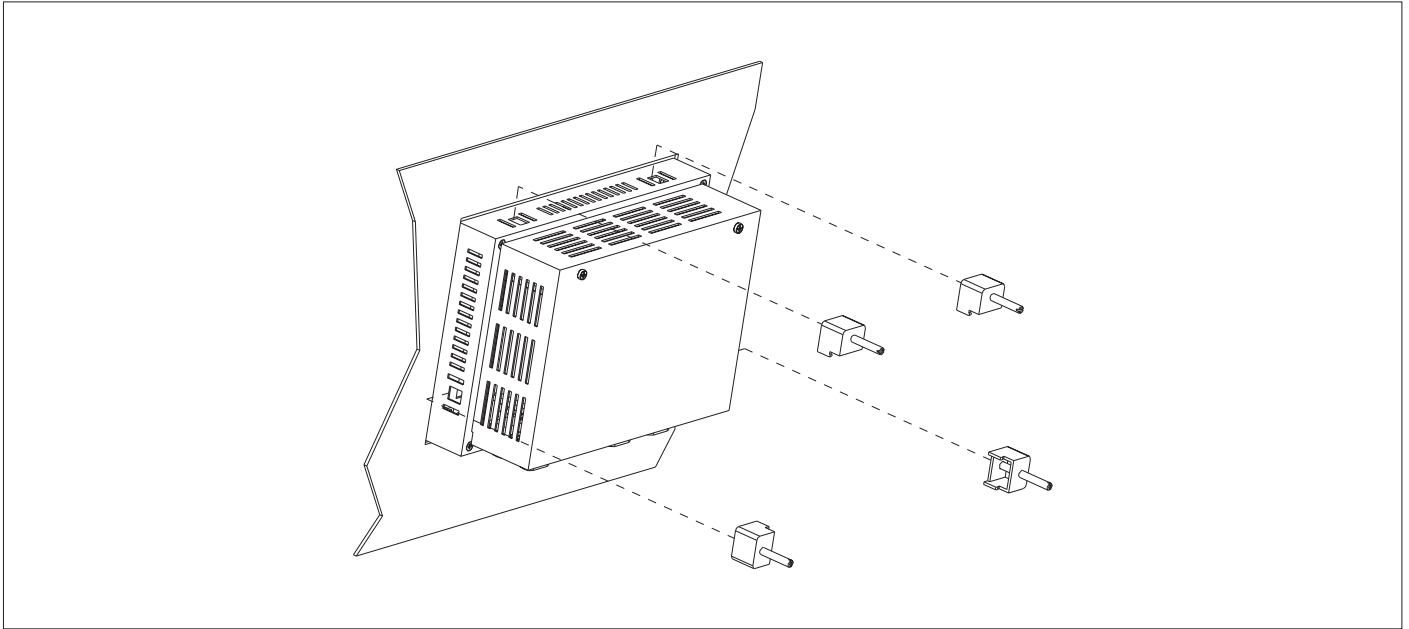


Fig. 5 - Panel mounting GF_VEDO 65CT

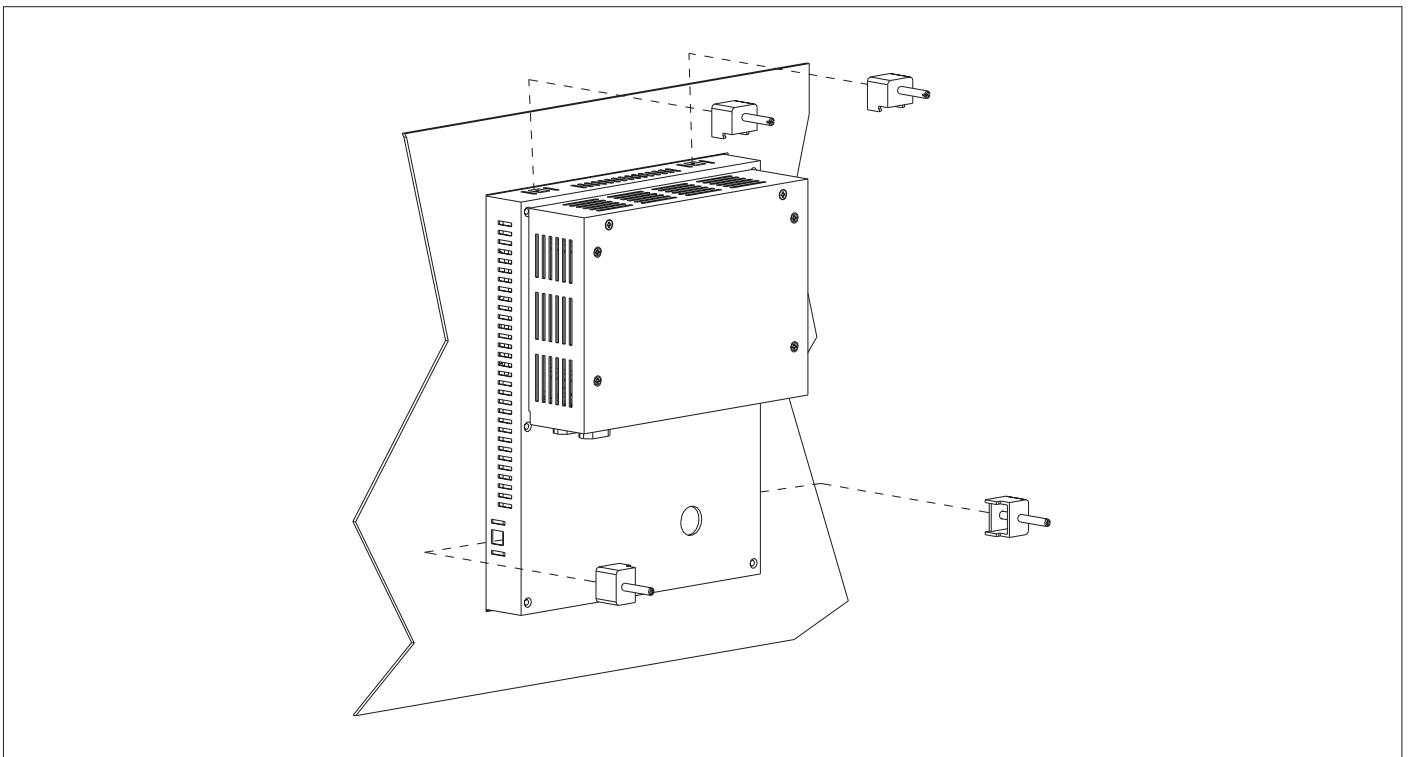


Fig. 6 - Panel mounting GF_VEDO 65CK

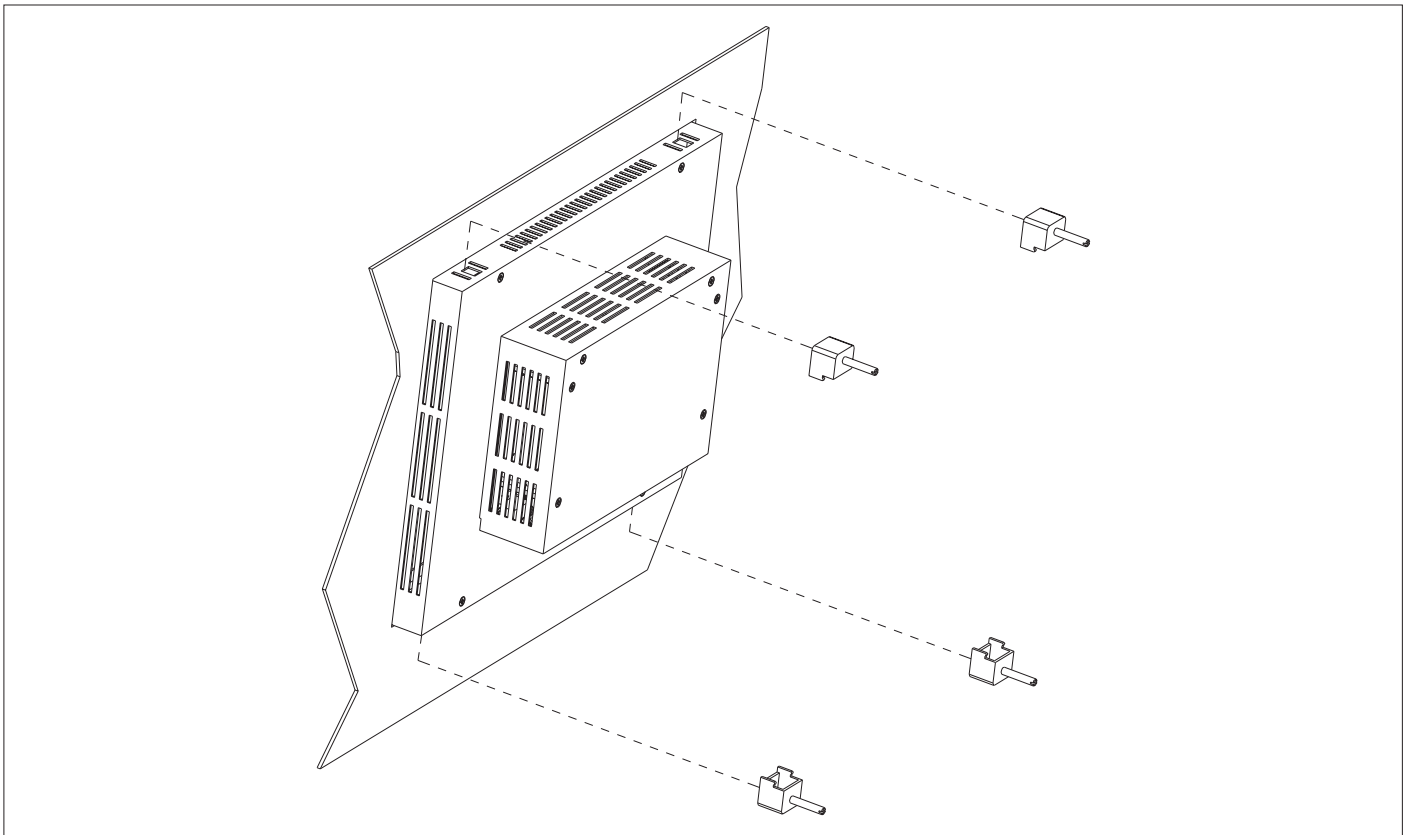


Fig. 7 - Panel mounting GF_VEDO 104CT

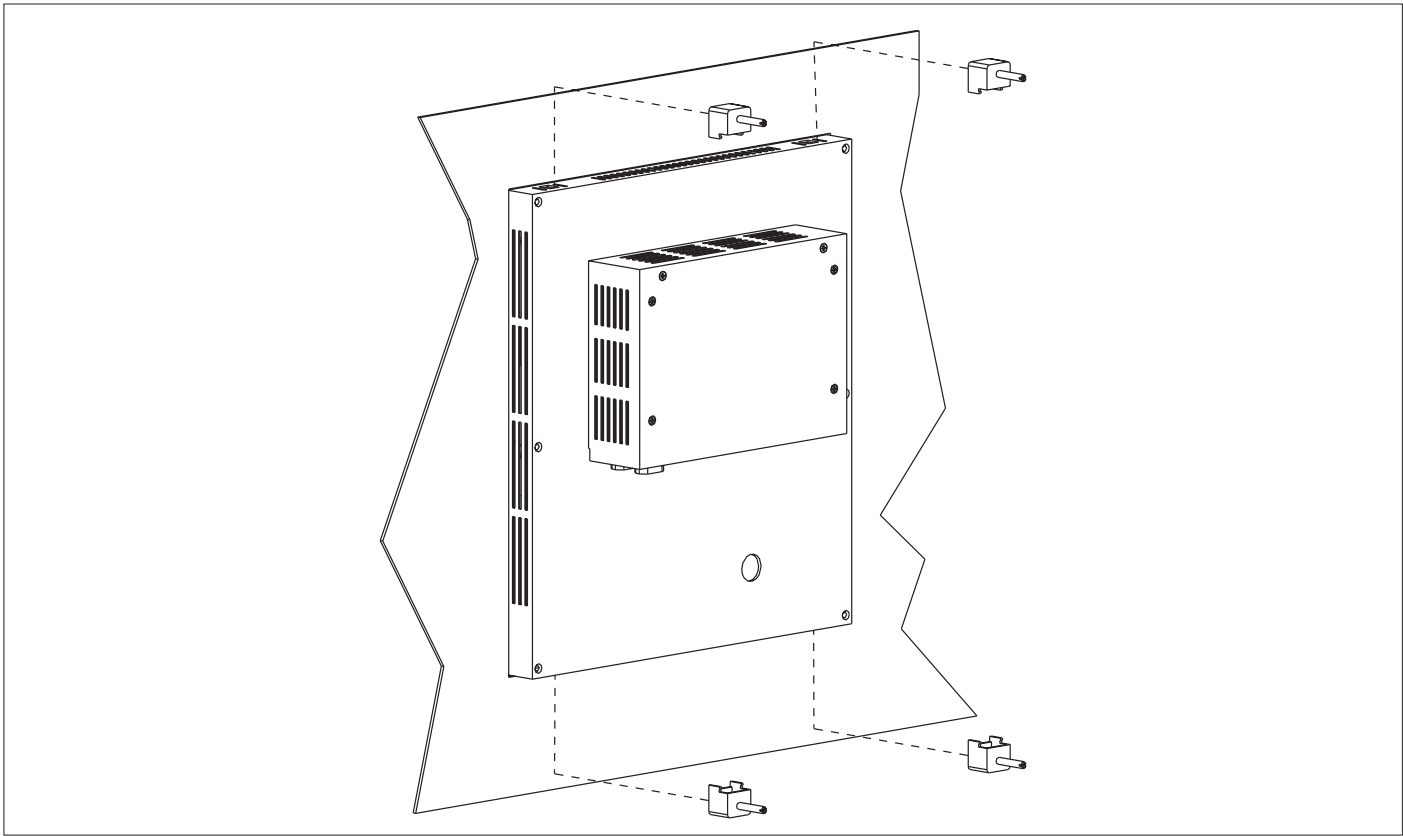


Fig. 8 - Panel mounting GF_VEDO 104CK

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 TL terminals also have an O-Ring inserted at the rear of the display frames, as shown in Figure 9.

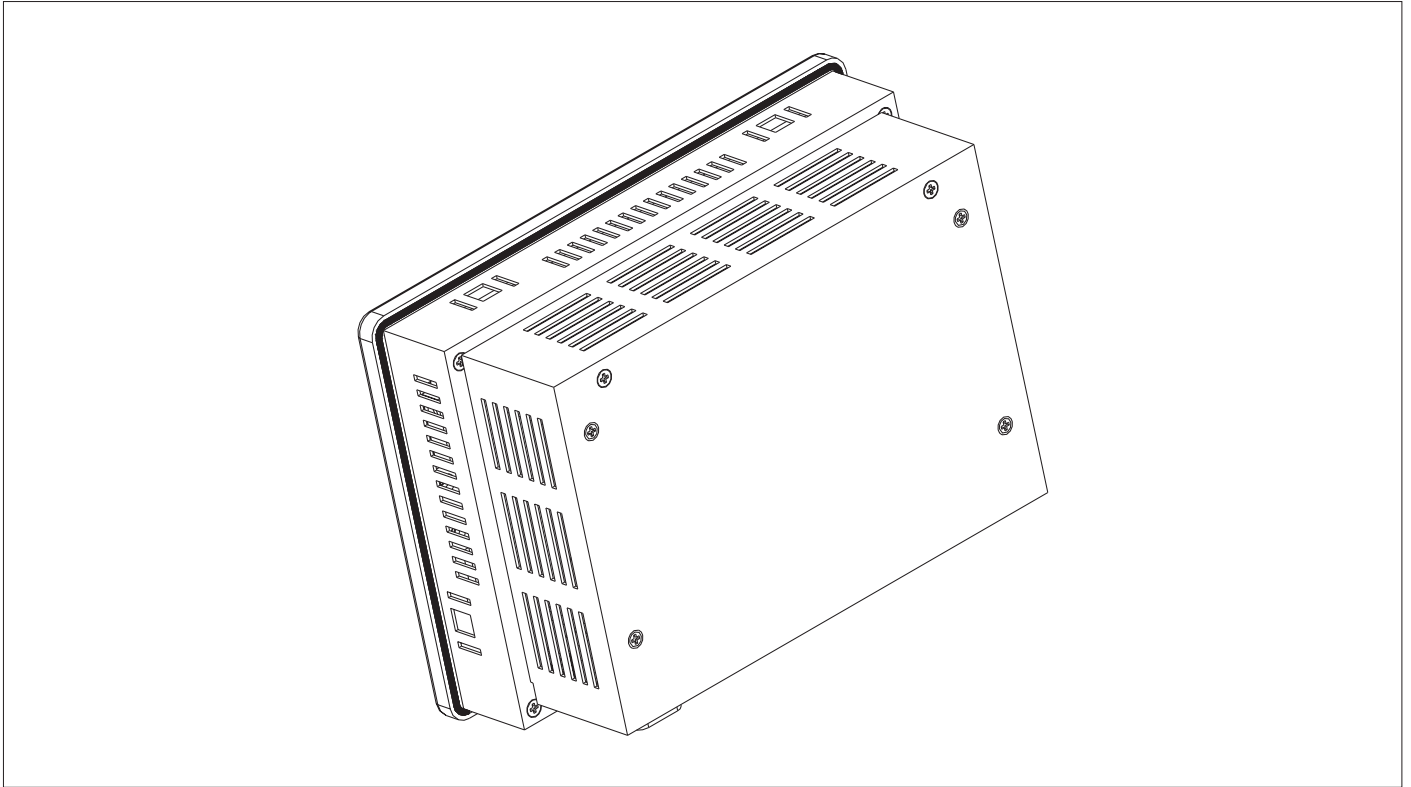


Fig. 9 - O-Ring on GF_VEDO TL terminals

Cleaning the device

Clean the device only with a soft cloth and non-abrasive neutral soap. Do not use solvents.

Table 14 shows the main technical characteristics of each GF_VEDO TL version.
In particular, it shows characteristics for displays, processors, storage devices and interfaces.

3.1 Displays

The various GF_VEDO TL versions have LCD - TFT (Thick Film Transistor) color displays measuring 6.5" or 10.4", as shown in Table 14.

3.2 CPUs and Memories

GF_VEDO TL terminals are equipped with GEODE SC1200 processors.
Mass memory devices such as DOM (Disk On Module) and DRAM memory systems suitable for the operating system can also be installed on the terminals. The terminal has 2 MB of static RAM.

3.3 Supported Operating Systems

GF_VEDO TL 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.

3.4 Bios

The Bios supplied for GF_VEDO TL terminals is Embedded BIOS® 2000 by General Software.

3.5 Integrated keyboard in CK versions

The CK versions of GF_VEDO TL terminals have an integrated keyboard at the bottom of the display.
The keyboard has 15 (GF_VEDO 65CK) or 22 (GF_VEDO 104CK) function keys and 32 keys for entering alphanumeric characters.

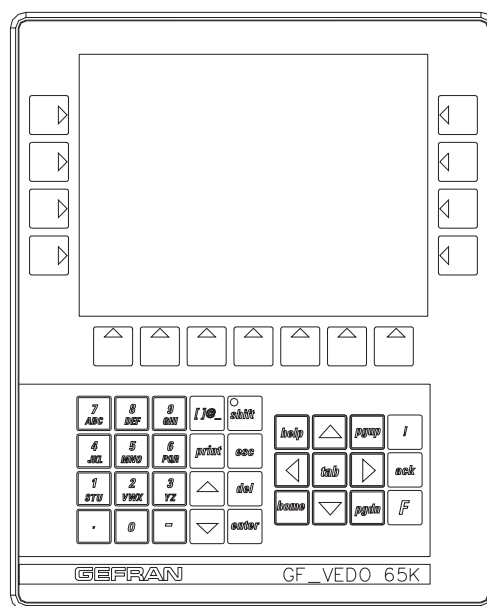


Fig. 10 - Integrated keyboard on GF_VEDO 65CK terminals

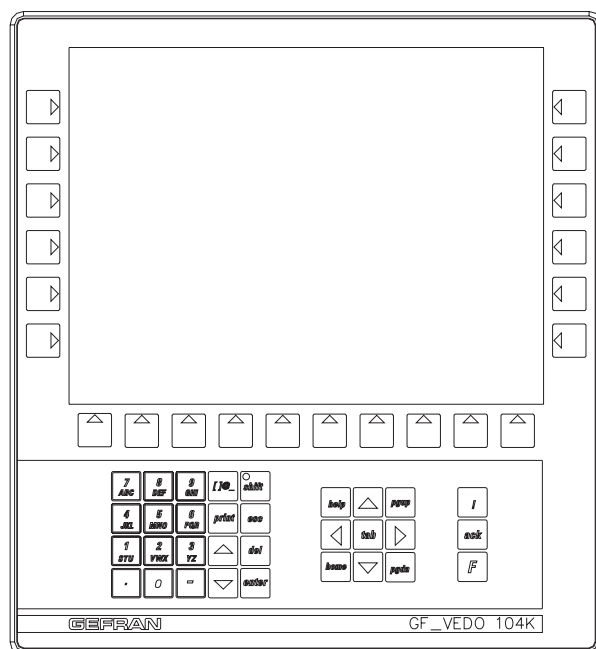


Fig. 11 - Integrated keyboard on GF_VEDO 104CK terminals

3.6 GF_VEDO TL user connections

The user connections specified on Table 14 are made at the bottom by means of Gefran standard and custom connectors.

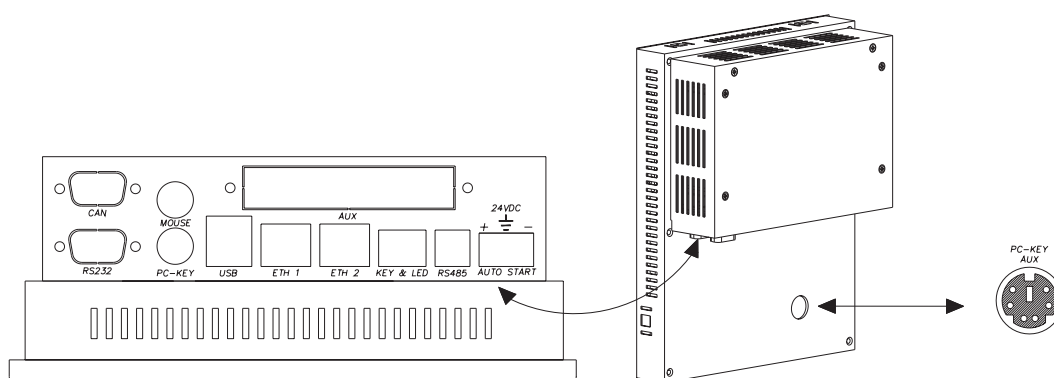


Fig. 12 - GF_VEDO TL connector

Name	Description
CAN	CAN layer2
RS232	RS-232 serial
MOUSE	PS/2 mouse (green)
PC-KEY	PS/2 keyboard (violet)
USB	USB 1.1 Host (500mA)
ETH1	Ethernet 10/100 Base-T
ETH2	Ethernet 10/100 Base-T
KEY & LED	Interface matrix keyboard + LED
RS485	Optoisolated RS-485 serial
AUTO START	Auto power-on
24VDC	Power supply
AUX	Auxiliary (options)
PC-KEY AUX	Auxiliary PS/2 keyboard

Table 4 - GF_VEDO TL connector description

3.6.1 Power supply port

Power supply: 24VDC $\pm$ 25%. The internal power supply is galvanically isolated and protected against polarity reverses and short circuits by a resettable fuse. The panel has a power terminal. The connector diagram is shown in Figure 13.

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. All electronic devices of the control system must be grounded. Ground the devices in a manner conforming to applicable standards and regulations.

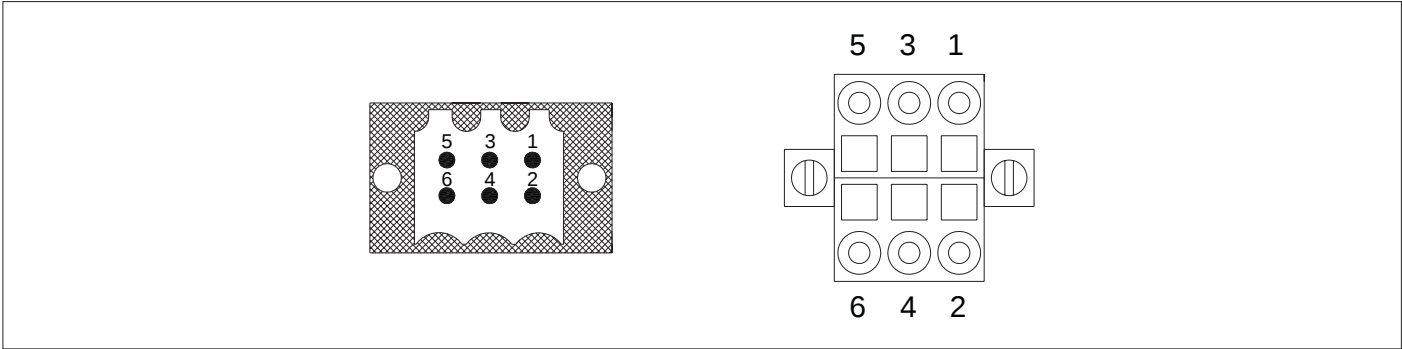


Fig. 13 - GF_VEDO TL power supply/automatic power-on connector

Pin	Description
1	Power supply common
2	Auto power-on output
3	Ground
4	Auto power-on common
5	Power supply +24Vdc
6	Power supply Auto power-on

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

To limit susceptibility to noise, you have to install an electromagnetic emission suppression core as shown in Figure 14. This component, supplied with the product, is a ferrite core coated in plastic for round section wires.

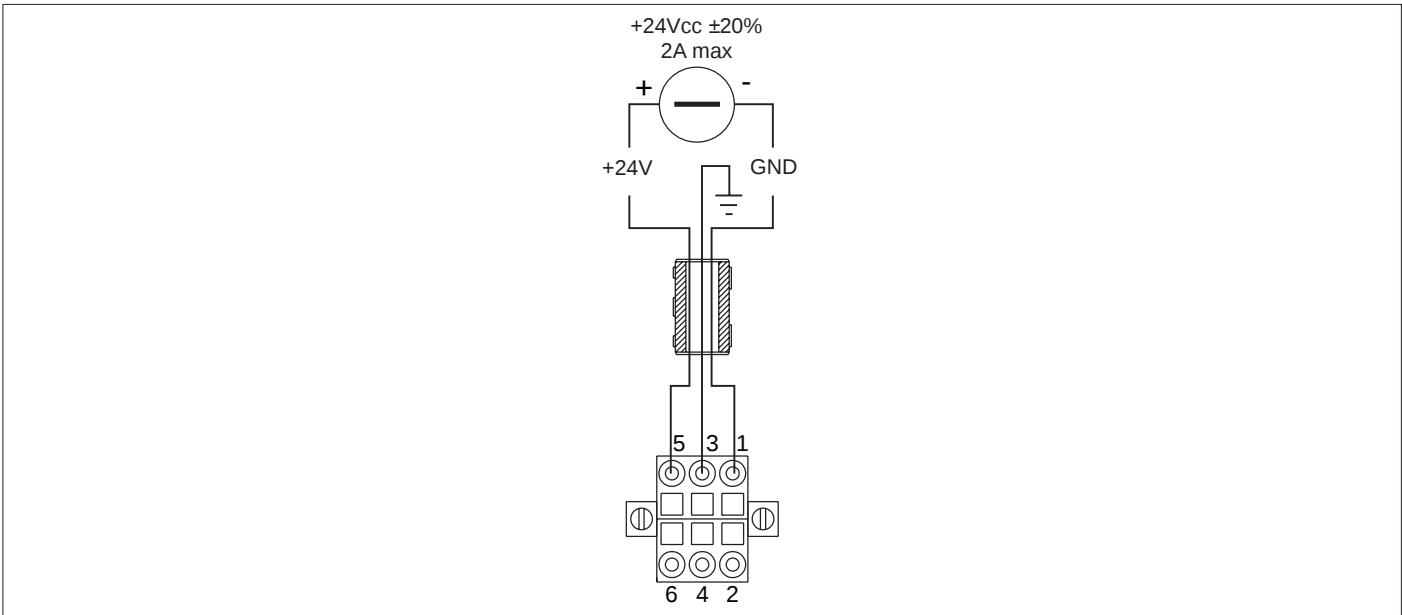


Fig. 14 - Inserting cores in the power supply lines of GF_VEDO terminals

3.6.2 Autostart Port

GF_VEDO TL 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 24VDC relays with a maximum of 100mA at the coil.

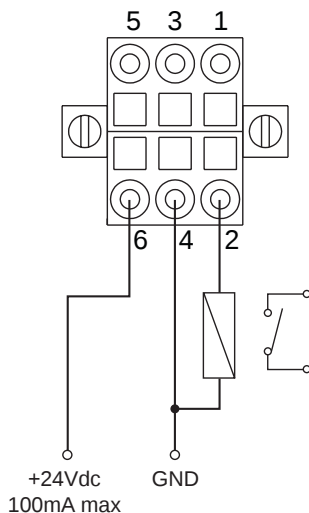


Fig. 15 - Connection of external relay to Autostart port of GF_VEDO terminals

3.6.3 Ethernet ports

GF_VEDO TL 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.

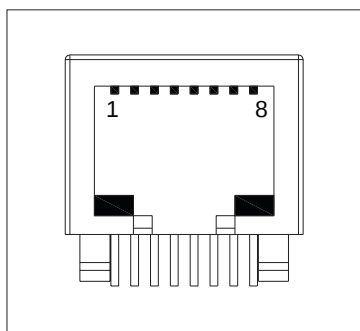


Fig. 16
GF_VEDO TL Ethernet port connector

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 TL Ethernet port

3.6.4 RS-232 port

RS-232 port lets the GF_VEDO TL 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.

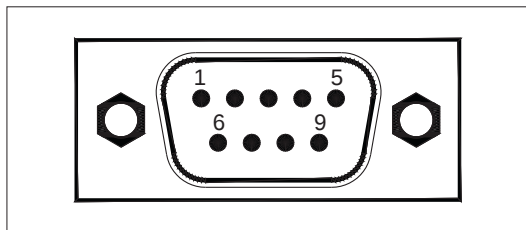


Fig. 17
GF_VEDO TL RS-232 port connector

Pin	In/Out	Code	Description
1	I	DCD	Data Carrier Detect
2	I	RxD	Data reception
3	O	TxD	Data transmission
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 TL RS-232 port

3.6.5 RS-485 port

GF_VEDO TL 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.

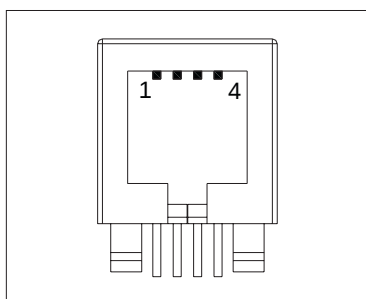


Fig. 18
RJ10 connector for GF_VEDO TL RS-485 port

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 TL RS-485 port

3.6.6 CAN port

The optional CAN port lets GF_VEDO TL 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 TL 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.

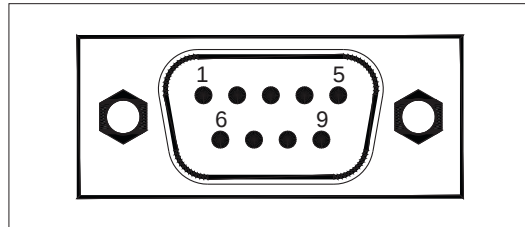


Fig. 19
GF_VEDO TL CAN port connector

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

Table 9
Signal assignment for GF_VEDO TL CAN port

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

3.6.7 USB ports

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

GF_VEDO TL terminals support version USB 1.1 (transmission up to 1.5 Mbit/s).

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

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

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

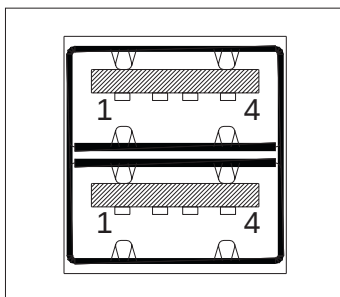


Fig. 20
GF_VEDO TL USB port connector

Pin	Description
1	VBUS
2	D-
3	D+
4	GND
Shell	SHIELD

Table 10
Signal assignment for GF_VEDO TL USB port

3.6.8 AUX port

The AUX port is reserved for future developments.

3.6.9 Matrix Keyboard port (KEY & LED)

GF_VEDO TL uses the KEY & LED port to communicate with series TF32 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.

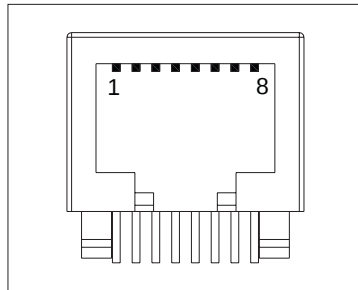


Fig. 21
GF_VEDO TL KEY & LED port connector

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

Table 11
Signal assignment for GF_VEDO TL KEY & LED port

3.6.10 Mouse and Keyboard PS2 port

The PS2 port connects the GF_VEDO TL 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.

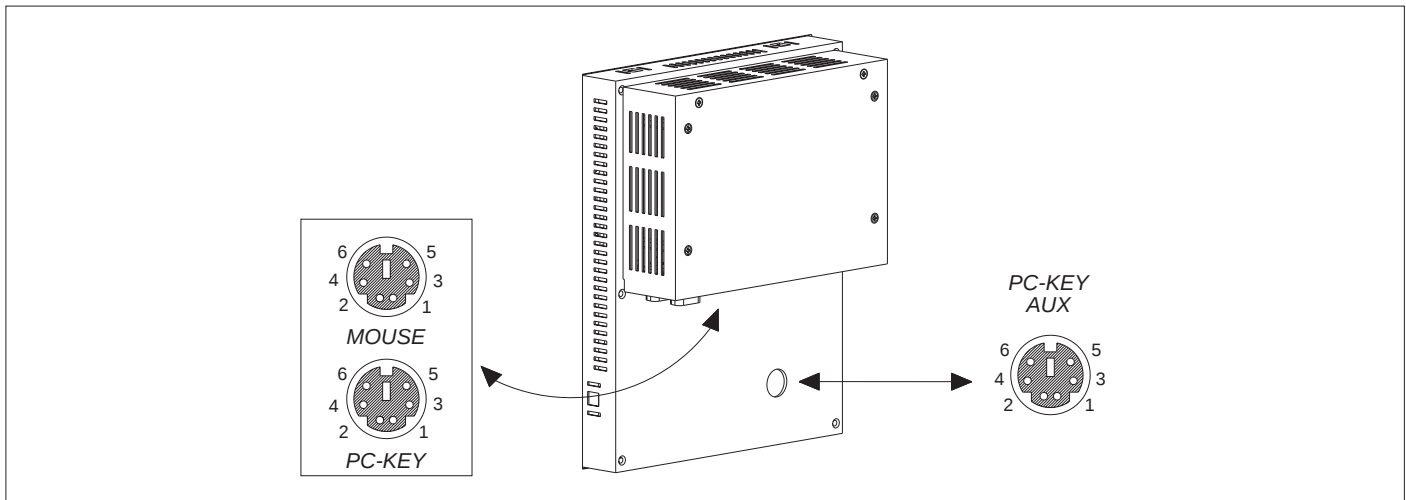


Fig. 22 - GF_VEDO TL PS2 port connector for Mouse and Keyboard

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

Table 12
Signal assignment for GF_VEDO TL
PS2 Keyboard port

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

Table 13
Signal assignment for GF_VEDO TL
PS2 Mouse port

3.7 Access to internal system resources

Before opening the system, ALWAYS switch off the GF_VEDO TL by disconnecting it from the outside power supply. A Phillips screwdriver is needed to access the internal system resources.

3.7.1 DOM mass memory

GF_VEDO TL has a mass memory containing the operating system, the application, and user information. The GF_VEDO board has a 44-pin 2 mm pitch connector that can be used to connect the board to a solid state disk with IDE AT-compatible interface such as Disk On Module (DOM).

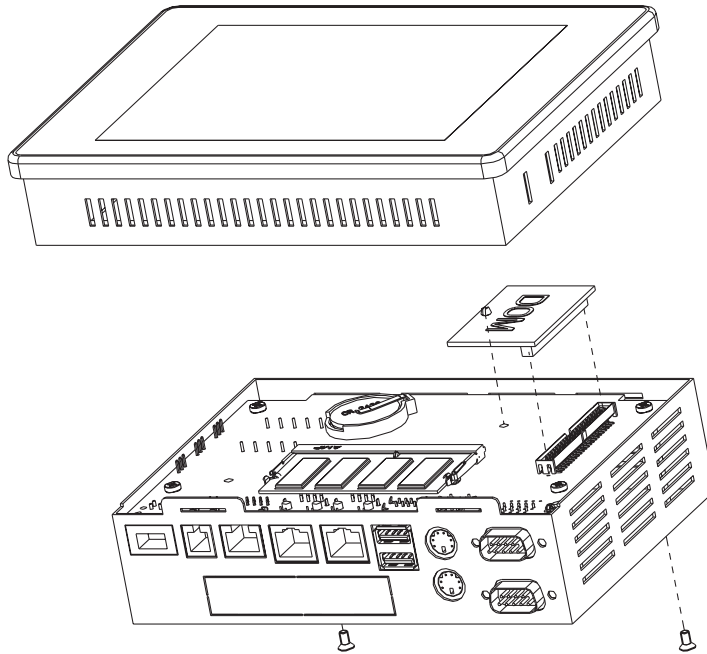


Fig. 23 - DOM mass memory in GF_VEDO TL

3.7.2 System memory: SODIMM

GF_VEDO TL has a SODIMM (Small Outline Dual In-line Memory Module) system memory, which is more compact than normal DIMM.

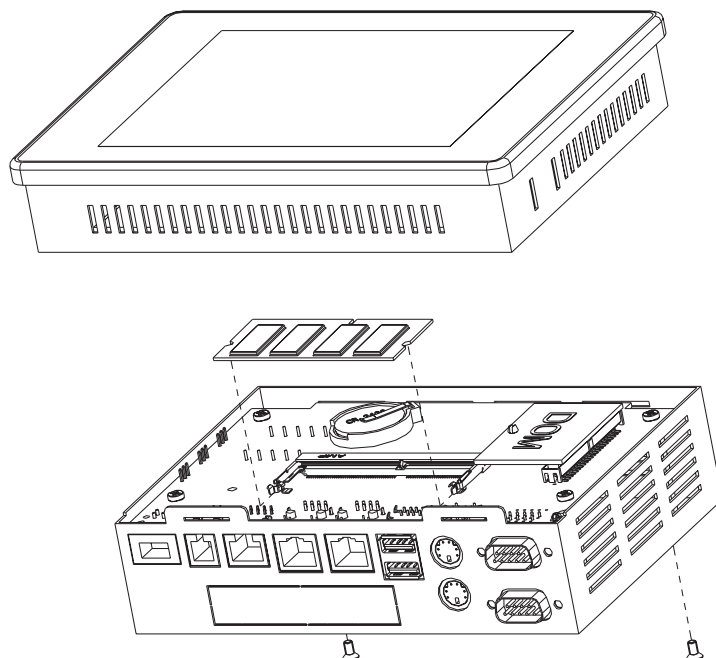


Fig. 24 - SODIMM system memory in GF_VEDO TL

3.7.3 Internal battery

GF_VEDO TL panels use an internal lithium battery (not rechargeable, replaceable).

This makes it possible to keep the data in the static RAM memory when the GF_VEDO TL is off (for a maximum period of 3 years).

When necessary, replace the battery as follows:

- get a replacement battery (button-type, 24 mm diameter, 3V lithium (CR2430))
- switch off the system by disconnecting it from the outside power supply.
- remove the battery
- dispose of the old lithium battery in compliance with regulations
- insert the new battery as shown in Figure 25
- switch on the system.

Note:

if the battery is replaced quickly (in less than 15 minutes) there is no loss of data maintained by the backup battery.

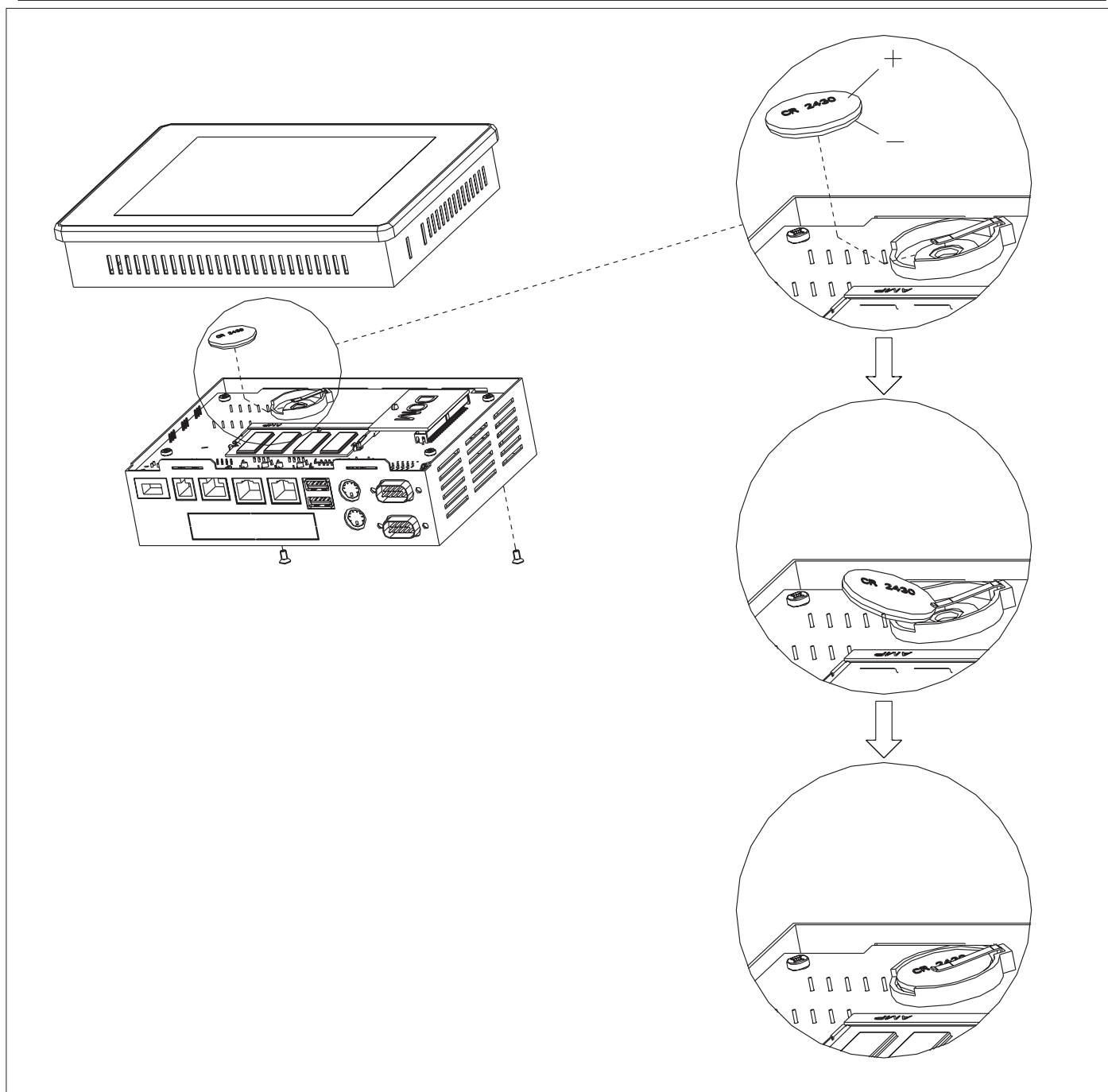
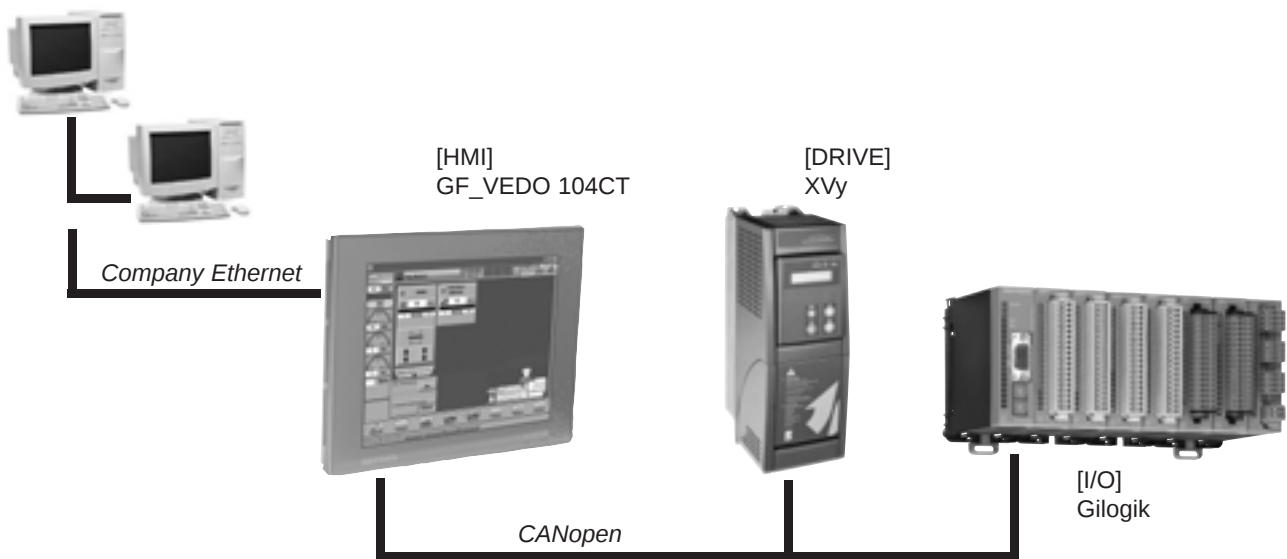
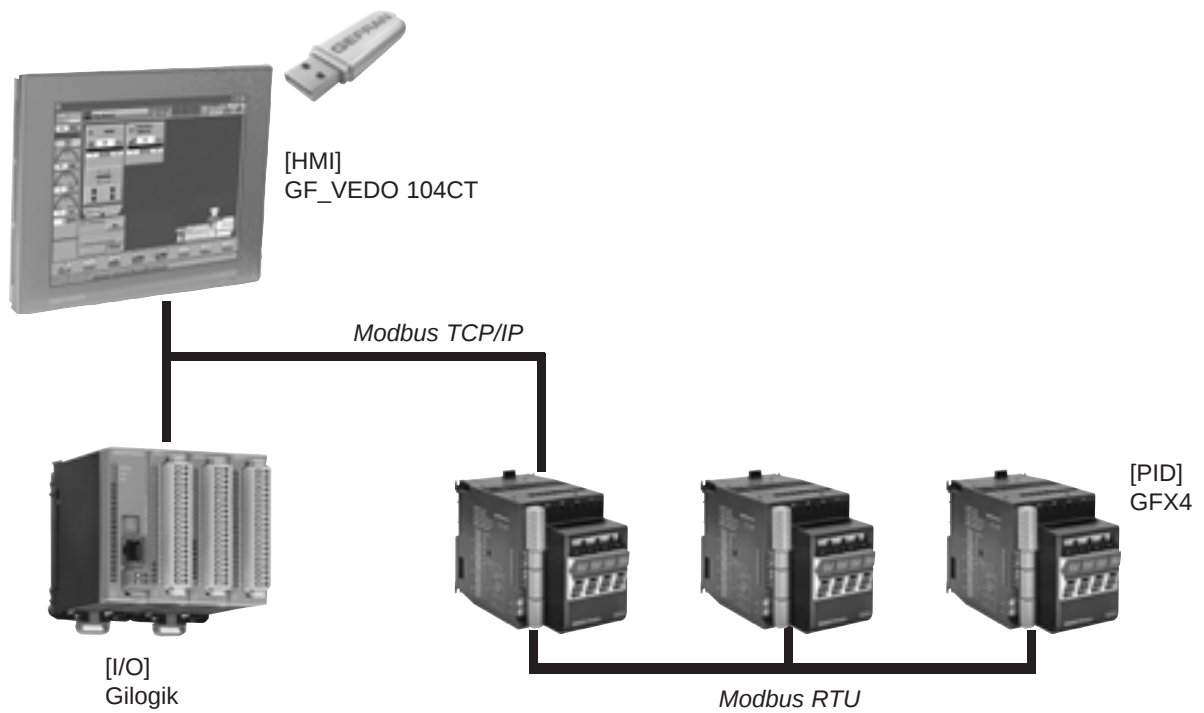


Fig. 25 - Replacing the battery in the GF_VEDO TL

Replace only with the same model battery or with an equivalent compatible with the same operating temperature.



5 • SUMMARY OF CHARACTERISTICS

Model	GF_VEDO 65CT	GF_VEDO 65CK	GF_VEDO 104CT	GF_VEDO 104CK
Display				
Type	TFT colors			
No. colours	262k			
Size	6.5"		10.4"	
Display area	132.5x99.4 mm		211.2x158.4 mm	
Resolution	VGA 640x480		SVGA 800x600	
Luminosity	500 cd/m²		230 cd/m²	
Contrast	450:1		500:1	
Backlighting	CCFL			
Visual angle O/V	140°/120°		120°/100°	
Keyboard				
Keys	-	47	-	54
Touch Screen				
Type	4 wires resistance	-	4 wires resistance	-
Life	>1M operations	-	>1M operations	-
Controller	integrated	-	integrated	-
Processor				
Type	GEODE SC1200			
Frequency	266MHz			
Core	x86			
Memory				
System memory (DRAM)	128MB - 256MB			
User memory (SRAM)	2MB			
Mass memory (DOM)	64MB - 1GB			
I/O Pheripherals				
AUTOSTART (optional)	Connector: 3-pin female, screw type			
Ethernet ETH1 - ETH2	2 x Ethernet 10/100 Mbps (RJ45 with LED)			
RS-232 (optional)	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)			
CAN (optional)	1 x CANopen: from 9.6 to 115kBaud (D-Sub 9 PM)			
USB	2 x USB 1.1 Host (500mA) (connector: 4-pin type A)			
KEY & LED	-	RJ45 connector without LED	-	RJ45 connector without LED
Keyboard/Mouse PS2	Connector: 6-pin miniDIN (green: Mouse - violet: Keyboard)			
Operative Systems				
	VxWorks or WindowsXP Embedded			
Various				
Power supply	24VDC ±25% (connector: 3-pin female, screw type)			
Max consumption at 24VDC	600mA	600mA	700mA	700mA
Resettable fuse	Current surge protection at input circuit			
Battery	3V, 270mA/h lithium, replaceable, un rechargeable, accessible from inside Model: botton CR2430 Maximum granted storage of data in Static RAM: 3 years (terminal off)			
RTC hardware clock	Clock/calendar with buffer battery			
Faceplate protection	IP65 (IEC 529)			
Certifications	CE, UL (awaiting certification)			
Dimensions				
Faceplate (mm)	187 x 133	187 x 230	266 x 192.5	266 x 289
Drilling (mm)	179.5 x 127	180 x 222	258 x 184	258 x 281
Max panel thickness (mm)	4	4	4	4
Weight (Kg)	0.9	1.3	1.4	1.9
Operating/Storage condition				
Operating temperature	0 ... +50°C (IEC 68-2-14)			
Storage temperature	-20° ... +70°C (IEC 68-2-14)			
Operating and storage humidity	5 ... 95% RH non-condensing (IEC 68-2-3)			

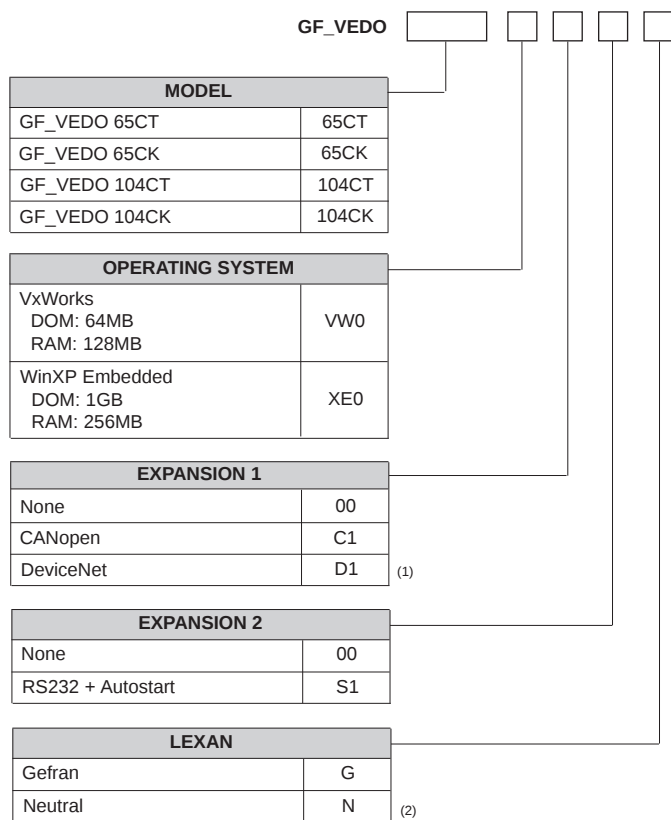
Table 14 - Summary of GF_VEDO TL characteristics



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



⁽¹⁾ ⁽²⁾ Kindly contact GEFRAN for information on available codes.