CNC 8070

Panel PC.

(Ref: 1709)

FAGOR AUTOMATION

TRANSLATION OF THE ORIGINAL MANUAL

This manual is a translation of the original manual. This manual, as well as the documents derived from it, have been drafted in Spanish. In the event of any contradictions between the document in Spanish and its translations, the wording in the Spanish version shall prevail. The original manual will be labeled with the text "ORIGINAL MANUAL".

MACHINE SAFETY

It is up to the machine manufacturer to make sure that the safety of the machine is enabled in order to prevent personal injury and damage to the CNC or to the products connected to it. On start-up and while validating CNC parameters, it checks the status of the following safety elements. If any of them is disabled, the CNC shows the following warning message.

- Feedback alarm for analog axes.
- Software limits for analog and sercos linear axes.
- Following error monitoring for analog and sercos axes (except the spindle) both at the CNC and at the drives.
- Tendency test on analog axes.

FAGOR AUTOMATION shall not be held responsible for any personal injuries or physical damage caused or suffered by the CNC resulting from any of the safety elements being disabled.

HARDWARE EXPANSIONS

FAGOR AUTOMATION shall not be held responsible for any personal injuries or physical damage caused or suffered by the CNC resulting from any hardware manipulation by personnel unauthorized by Fagor Automation.

If the CNC hardware is modified by personnel unauthorized by Fagor Automation, it will no longer be under warranty.

COMPUTER VIRUSES

FAGOR AUTOMATION guarantees that the software installed contains no computer viruses. It is up to the user to keep the unit virus free in order to guarantee its proper operation. Computer viruses at the CNC may cause it to malfunction.

FAGOR AUTOMATION shall not be held responsible for any personal injuries or physical damage caused or suffered by the CNC due a computer virus in the system.

If a computer virus is found in the system, the unit will no longer be under warranty.

DUAL-USE PRODUCTS

Products manufactured by FAGOR AUTOMATION since April 1st 2014 will include "-MDU" in their identification if they are included on the list of dual-use products according to regulation UE 428/2009 and require an export license depending on destination.

FAGOR AUTOMATION

It is possible that CNC can execute more functions than those described in its associated documentation; however, Fagor Automation does not guarantee the validity of those applications. Therefore, except under the express permission from Fagor Automation, any CNC application that is not described in the documentation must be considered as "impossible". In any case, Fagor Automation shall not be held responsible for any personal injuries or physical damage caused or suffered by the CNC if it is used in any way other than as explained in the related documentation.

The content of this manual and its validity for the product described here has been verified. Even so, involuntary errors are possible, hence no absolute match is guaranteed. However, the contents of this document are regularly checked and updated implementing the necessary corrections in a later edition. We appreciate your suggestions for improvement.

The examples described in this manual are for learning purposes. Before using them in industrial applications, they must be properly adapted making sure that the safety regulations are fully met.

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FAGOR

FAGOR AUTOMATION

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FAGOR AUTOMATION

CNC 8070

(REF: 1709)

ABOUT THE PRODUCT - CNC 8070

BASIC CHARACTERISTICS.

Basic characteristics.	·BL·	·OL·	·L·
Number of axes.	3 to 7	3 to 31	3 to 31
Number of spindles.	1	1 to 6	1 to 6
Number of tool magazines.	1	1 to 4	1 to 4
Number of execution channels.	1	1 to 4	1 to 4
Number of interpolated axes (maximum).	4	3 to 31	3 to 31
Number of handwheels.	1 to 12		
Type of servo system.	Analog / Digital Sercos Digital Mechatrolink		Analog Sercos Digital
Communications.	RS485 / RS422 / RS232 Ethernet		
PCI expansion.	No	Option	No
Integrated PLC. PLC execution time. Digital inputs / Digital outputs. Marks / Registers. Timers / Counters. Symbols.	 < 1ms/K 1024 / 1024 8192 / 1024 512 / 256 Unlimited		
Block processing time.	< 1 ms		< 1 ms

Remote modules.	RIOW	RIO5	RIO70	RIOR	RCS-S
Valid for CNC.	8070 8065 8060	8070 8065 8060	8070 8065 - - -	8070 8065 8060	8070 8065 8060
Communication with the remote modules.	CANopen	CANopen	CANfagor	CANopen	Sercos
Digital inputs per module.	8	24 / 48	16	48	- - -
Digital outputs per module.	8	16 / 32	16	32	- - -
Analog inputs per module.	4	4	8	- - -	- - -
Analog outputs per module.	4	4	4	- - -	4
Inputs for PT100 temperature sensors.	2	2	- - -	- - -	- - -
Feedback inputs.	- - -	- - -	4 (*)	- - -	4 (**)

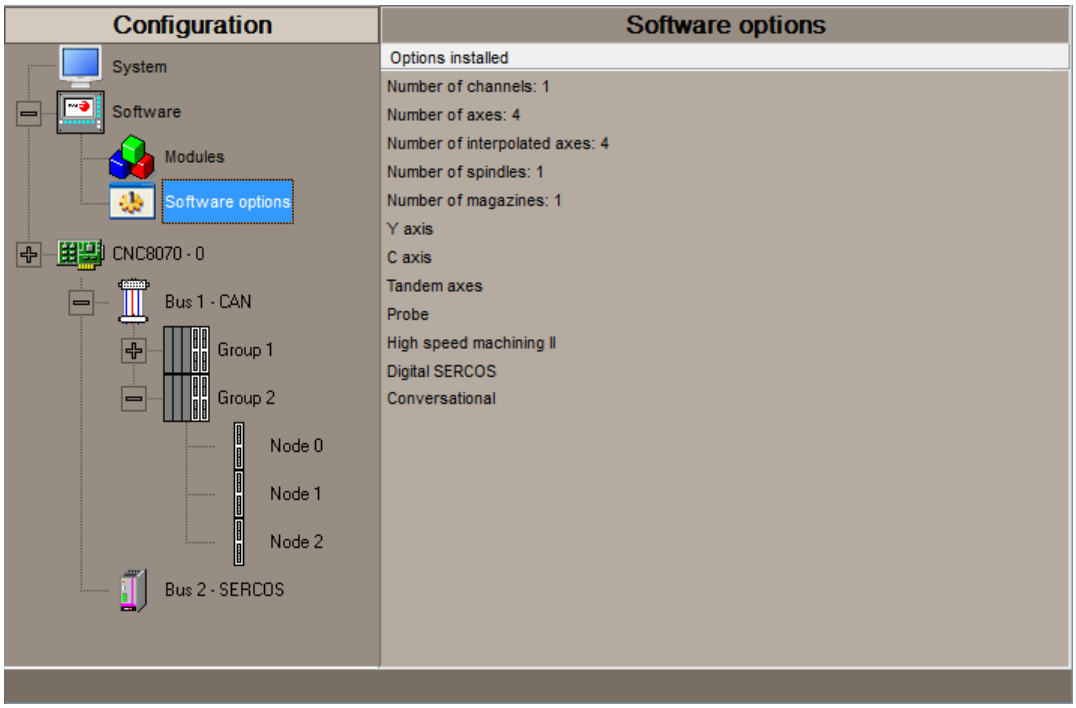
DISCONTINUED

(*) Differential TTL / Sinusoidal 1 Vpp (**) TTL / Differential TTL / Sinusoidal 1 Vpp / SSI protocol / FeeDat / EnDat

Customizing.
PC-based open system, fully customizable. INI configuration files. Tool for display configuration FGUIM. Visual Basic®, Visual C++®, etc. Internal databases in Microsoft® Access. OPC compatible interface

SOFTWARE OPTIONS.

Some of the features described in this manual are dependent on the acquired software options. The active software options for the CNC can be consulted in the diagnostics mode (accessible from the task window by pressing [CTRL] [A]), under software options.



Consult the ordering handbook for information on the software options available for your model.

SOFT ADDIT AXES
Additional shaft.
Add axes to the default configuration.

SOFT ADDIT SPINDLES
Additional spindle.
Add spindles to the default configuration.

SOFT ADDIT TOOL MAGAZ
Additional tool magazine.
Add tool magazines to the default configuration.

SOFT ADDIT CHANNELS
Additional channel.
Add channels to the default configuration.

SOFT 4 AXES INTERPOLATION LIMIT
Limited to 4 interpolated axes.
It limits the number of axes to 4, where the CNC can also interpolate these at the same time.

SOFT OPEN SYSTEM
Open system.
The CNC is a closed system that offers all the features needed to machine parts. Nevertheless, at times there are some customers who use third-party applications to take measurements, perform statistics or other tasks apart from machining a part.
This feature must be active when installing this type of application, even if they are Office files. Once the application has been installed, it is recommended to close the CNC in order to prevent the operators from installing other kinds of applications that could slow the system down and affect the machining operations.

SOFT DIGITAL SERCOS
Sercos digital bus.
Sercos digital bus.

SOFT DIGIT NO FAGOR
Non-Fagor digital servo system.
Mechatrolink digital bus.

SOFT EDIT/SIMUL
EDISIMU mode (editing and simulation).
It allows for the editing, modification and simulation of a part-program.

SOFT IEC 61131 LANGUAGE
IEC 61131 language
IEC 61131 is a PLC programming language that is very popular in alternative markets, which is slowly entering into the machine-tool market. With this feature, the PLC may be programmed either in the usual Fagor language or in IEC 61131 format.

SOFT TOOL RADIUS COMP
Compensación de radio.
Tool compensation allows programming the contour to be machined based on part dimensions of the and without taking into account the dimensions of the tool that will be used later on. This avoids having to calculate and define the tool path based on the tool radius.

SOFT PROFILE EDITOR
Profile editor.
Allows for the part profiles to be edited graphically and to import dxf files.

SOFT RTCP

Dynamic RTCP (Rotating Tool Center Point).

The dynamic RTCP option is required for interpolation machining with 4, 5 or 6 axis.

SOFT C AXIS

C axis.

It activates the kinematics for working with the C axis and the associated canned cycles. The CNC can control several C axes. The parameters of each axis indicate if it will function as a C axis or not, where it will not be necessary to activate another axis for the machine parameters.

SOFT TANDEM AXES

Tandem axes.

A tandem axis consists in two motors mechanically coupled (slaved) and making up a single transmission system (axis or spindle). A tandem axis helps provide the necessary torque to move an axis when a single motor is not capable of supplying enough torque to do it.

When activating this feature, it should be kept in mind that for each tandem axis of the machine, another axis must be added to the entire configuration. For example, on a large 3-axis lathe (X Z and tailstock), if the tailstock is a tandem axis, the final purchase order for the machine must indicate 4 axes.

SOFT SYNCHRONISM

Synchronization of axes and spindles.

The axes and ballscrews may be synchronized in two ways: in terms of speed or position. The CNC configuration takes into consideration the synchronization of 2 axes or 2 spindles. Once synchronized, only the master displays and programs the element.

SOFT HSSA II MACHINING SYSTEM

HSSA-II machining system.

This is the new version of algorithms for high speed machining (HSC). This new HSSA algorithm allows for high speed machining optimization, where higher cutting speeds, smoother contours, a better surface finishing and greater precision are achieved.

SOFT TANGENTIAL CONTROL

Tangential control.

"Tangential Control" maintains a rotary axis always in the same orientation with respect to the programmed tool path. The machining path is defined on the axes of the active plane and the CNC maintains the orientation of the rotary axis along the entire tool path.

SOFT DRILL CYCL OL

Drilling ISO cycles for the OL model.

Drilling ISO cycles for the OL model (G80, G81, G82, G83).

SOFT PROBE

Probing canned cycles.

The CNC may have two probes; usually a tabletop probe to calibrate tools and a measuring probe to measure the part.

This option activates the functions G100, G103 and G104 (for probe movements); probe canned cycles are not included.

SOFT THIRD PARTY CANOPEN

Third-party CANopen.

Enables the use of non-Fagor CANopen modules.

SOFT FVC UP TO 10m3

SOFT FVC MORE TO 10m3

Medium and large volumetric compensation.

5-axis machines are generally used during the manufacturing of large parts. The accuracy of the parts is limited by the machine manufacturing tolerances and is effected by temperature variations during machining.

In sectors such as the aerospace industry, machining demands mean that classic compensation tools are becoming suboptimal. Volumetric compensation FVC comes in to complement the machine adjusting tools. When mapping the total work volume of the machine, the CNC knows the exact position of the tool at all times. After applying the required compensation, the resulting part is made with the desired precision and tolerance.

There are 2 choices, which depend on the size of the machine, being up to 10 m^3 and over 10 m^3.

SOFT 60 PWM CONTROL

Pulse-Width Modulation.

This function is only available for Sercos bus controlled systems. It is mostly oriented toward laser machines for the cutting of very thick sheets, where the CNC generates a series of PWM pulses to control the power of the laser when drilling the starting point.

This feature is essential for cutting very thick sheets and it requires two quick digital outputs located on the central unit. With this new feature, the OEM does not need to install or program any external device, which reduces machine costs and installation times. The end user also benefits, since the “Cutting with PWM ” feature is much easier to use and program.

SOFT 60 GAP CONTROL

Gap control.

This is mostly oriented toward laser machines. Gap control makes it possible to maintain a set distance between the laser nozzle and the surface of the sheet. This distance is calculated by a sensor connected to the CNC, so that the CNC offsets the sensor variations on the distance programmed with additional movements in the axis programmed for the gap.

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DECLARATION OF CE CONFORMITY AND WARRANTY CONDITIONS

DECLARATION OF CONFORMITY

The declaration of conformity for the CNC is available in the downloads section of FAGOR'S corporate website. http://www.fagorautomation.com. (Type of file: Declaration of conformity).

WARRANTY TERMS

The warranty conditions for the CNC are available in the downloads section of FAGOR's corporate website. http://www.fagorautomation.com. (Type of file: General sales-warranty conditions.

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VERSION HISTORY - CNC 8070

Here is a list of the features added to each manual reference.

Ref. 1709

First version.

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SAFETY CONDITIONS

Read the following safety measures in order to prevent harming people or damage to this product and those products connected to it. Fagor Automation shall not be held responsible of any physical or material damage originated from not complying with these basic safety rules.

Before start-up, verify that the machine that integrates this CNC meets the 2006/42/EC Directive.

PRECAUTIONS BEFORE CLEANING THE UNIT

Do not get into the inside of the unit.	Only personnel authorized by Fagor Automation may access the interior of this unit.
Do not handle the connectors with the unit connected to AC power.	Before handling these connectors (I/O, feedback, etc.), make sure that the unit is not powered.

PRECAUTIONS DURING REPAIRS

In case of a malfunction or failure, disconnect it and call the technical service.

Do not get into the inside of the unit.	Only personnel authorized by Fagor Automation may access the interior of this unit.
Do not handle the connectors with the unit connected to AC power.	Before handling these connectors (I/O, feedback, etc.), make sure that the unit is not powered.

PRECAUTIONS AGAINST PERSONAL HARM

Interconnection of modules.	Use the connection cables provided with the unit.
Use proper cables.	To prevent risks, only use cables and Sercos fiber recommended for this unit. To prevent a risk of electrical shock at the central unit, use the proper connector (supplied by Fagor); use a three-prong power cable (one of them being ground).
Avoid electric shocks.	To prevent electrical shock and fire risk, do not apply electrical voltage out of the indicated range.
Ground connection.	In order to avoid electrical discharges, connect the ground terminals of all the modules to the main ground terminal. Also, before connecting the inputs and outputs of this product, make sure that the ground connection has been done. In order to avoid electrical shock, before turning the unit on verify that the ground connection is properly made.
Do not work in humid environments.	In order to avoid electrical discharges, always work with a relative humidity (non-condensing).
Do not work in explosive environments.	In order to avoid risks, harm or damages, do not work in explosive environments.

PRECAUTIONS AGAINST DAMAGE TO THE PRODUCT

Work environment.

This unit is ready to be used in industrial environments complying with the directives and regulations effective in the European Community.

Fagor Automation shall not be held responsible for any damage suffered or caused by the CNC when installed in other environments (residential, homes, etc.).

Install this unit in the proper place.

It is recommended, whenever possible, to install the CNC away from coolants, chemical product, blows, etc. that could damage it.

This unit meets the European directives on electromagnetic compatibility. Nevertheless, it is recommended to keep it away from sources of electromagnetic disturbance such as:

- Powerful loads connected to the same mains as the unit.
- Nearby portable transmitters (radio-telephones, Ham radio transmitters).
- Nearby radio / TC transmitters.
- Nearby arc welding machines.
- Nearby high voltage lines.

Enclosures.

It is up to the manufacturer to guarantee that the enclosure where the unit has been installed meets all the relevant directives of the European Union.

Avoid disturbances coming from the machine.

The machine must have all the interference generating elements (relay coils, contactors, motors, etc.) uncoupled.

Use the proper power supply.

Use an external regulated 24 Vdc power supply for the keyboard, operator panel and the remote modules.

Connecting the power supply to ground.

The zero Volt point of the external power supply must be connected to the main ground point of the machine.

Analog inputs and outputs connection.

Use shielded cables connecting all their meshes to the corresponding pin.

Ambient conditions.

Maintain the CNC within the recommended temperature range, both when running and not running. See the corresponding chapter in the hardware manual.

Central unit enclosure.

To maintain the right ambient conditions in the enclosure of the central unit, it must meet the requirements indicated by Fagor. See the corresponding chapter in the hardware manual.

Power switch.

This switch must be easy to access and at a distance between 0.7 and 1.7 m (2.3 and 5.6 ft) off the floor.

SAFETY SYMBOLS

Symbols that may appear in the manual.

Danger or prohibition symbol.
This symbol indicates actions or operations that may hurt people or damage products.

Warning or caution symbol.
This symbol indicates situations that certain operations could cause and the suggested actions to prevent them.

Obligation symbol.
This symbol indicates actions and operations that must be carried out.

Information symbol.
This symbol indicates notes, warnings and advises.

Symbol for additional documentation.
This symbol indicates that there is another document with more detailed and specific information.

Symbols that the product may carry.

Ground symbol.
This symbol indicates that that point must be under voltage.

ESD components.
This symbol identifies the cards as ESD components (sensitive to electrostatic discharges).

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RETURNING CONDITIONS

Pack it in its original package along with its original packaging material. If you do not have the original packaging material, pack it as follows:

1. Get a cardboard box whose 3 inside dimensions are at least 15 cm (6 inches) larger than those of the unit itself. The cardboard being used to make the box must have a resistance of 170 Kg (375 lb.).
2. Attach a label to the device indicating the owner of the device along with contact information (address, telephone number, email, name of the person to contact, type of device, serial number, etc.). In case of malfunction also indicate symptom and a brief description of the problem.
3. Protect the unit wrapping it up with a roll of polyethylene or with similar material. When sending a central unit with monitor, protect especially the screen.
4. Pad the unit inside the cardboard box with polyurethane foam on all sides.
5. Seal the cardboard box with packaging tape or with industrial staples.

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CNC MAINTENANCE

CLEANING

The accumulated dirt inside the unit may act as a screen preventing the proper dissipation of the heat generated by the internal circuitry which could result in a harmful overheating of the unit and, consequently, possible malfunctions. Accumulated dirt can sometimes act as an electrical conductor and short-circuit the internal circuitry, especially under high humidity conditions.

To clean the operator panel and the monitor, a smooth cloth should be used which has been dipped into de-ionized water and /or non abrasive dish-washer soap (liquid, never powder) or 75º alcohol. Never use air compressed at high pressure to clean the unit because it could cause the accumulation of electrostatic charges that could result in electrostatic shocks.

The plastics used on the front panel are resistant to grease and mineral oils, bases and bleach, dissolved detergents and alcohol. Avoid the action of solvents such as chlorine hydrocarbons, venzole, esters and ether which can damage the plastics used to make the unit's front panel.

PRECAUTIONS BEFORE CLEANING THE UNIT

Fagor Automation shall not be held responsible for any material or physical damage derived from the violation of these basic safety requirements.

- Do not handle the connectors with the unit supplied with power. Before handling these connectors (I/O, feedback, etc.), make sure that the unit is not powered.
- Do not get into the inside of the unit. Only personnel authorized by Fagor Automation may access the interior of this unit.

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1 PREVIOUS INFORMATION.

About this manual.

This manual describes the characteristics, technical data and connections of the hardware associated with the CNC. The installation manual describes the CNC configuration, machine adaptation and start-up.

Installation and startup.

The hardware described in this manual is ready to be used in industrial environments complying with the directives and regulations effective in the European Community. Before start-up, verify that the machine that integrates this CNC meets the 89/392/CEE directive.

Safety conditions.

In order to avoid personal injuries and damage to this product or to those connected to it, read carefully the section on safety conditions in the introduction to this manual. Fagor Automation shall not be held responsible of any physical damage or defective unit resulting from not complying with these basic safety regulations.

Do not handle the connectors with the unit connected to AC power. Before doing it, make sure that the unit is unplugged from the power outlet.

Do not get into the inside of the unit. This unit MUST NOT be opened by unauthorized personnel. Only personnel authorized by Fagor Automation may manipulate the inside of this unit.

1.

PREVIOUS INFORMATION.

FAGOR AUTOMATION

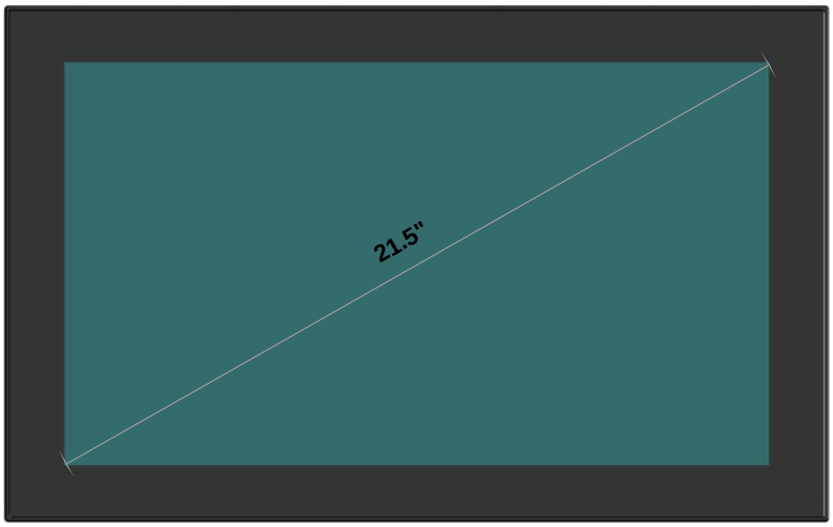
CNC 8070

(REF: 1709)

2 MONITOR-21 MULTITOUCH.

Monitor to display the VGA video signal from the central unit and also to serve as the touch screen, permitting interaction with the central unit. This monitor may be the only one connected to the central unit (for example, with the central unit MCU) or it may be a second monitor (for example, with the central unit ICU). When there are two monitors, both display the same video signal.

Module.	Description.
MONITOR-21W MULTITOUCH	21.5" (1920 × 1080) monitor, aspect ratio 16:9, 24-bit color, Multi-touch.
MONITOR-21W MULTITOUCH NEUTRO	

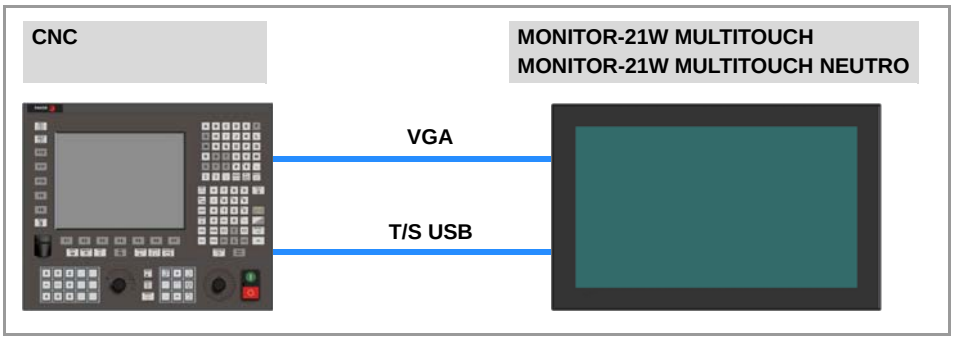


2.1 Specifications.

Type.	Description. MONITOR-21W MULTITOUCH MONITOR-21W MULTITOUCH NEUTRO
General.	• 21.5" (1920 × 1080) monitor, multi-touch screen (10 points) and USB driver. • Dimensions (width x height x depth) - 558.40 × 349.80 × 47.70 mm. - 21.98" × 13.77" × 1.88". • Weight: 8 kg (17.6 lb) • OSD (On Screen Display) menu; rear buttons.
Regulation.	• BSMI, CE, FCC, CCC, UL.
Ambient.	• Storage temperature: Between -20 and 60 °C (-4 and 140 °F). • Working temperature: Between 0 and 55 °C (32 and 101 °F). • Relative humidity: Between 10 and 90 % (non condensing). • Vibration: Between 5 and 500 Hz, 1 Grms (in operation, random). • Degree of protection: Front complies with standard IP65.
Power supply.	• Power (use one of the following options). - 24 V DC via Phoenix-type connector (recommended). - 12 V DC via DC jack connector (consult Fagor Automation). • Maximum consumption: 25 W.
LCD.	• Type: TFT LED LCD FullHD. • Screen: 10-point multi-touch capacitive. • Size: 21.5" (aspect ratio 16:9). • Screen color: 24 bits (16.7 million colors). • Resolution: 1920 × 1080. • Angle of vision: 178° (vertical), 178° (horizontal). • Brightness: 300 cd/m². • Contrast ratio: 5000:1 (typical). • Lamp duration (MTBF): 50,000 hours.
Connectivity.	• Touch controller. - USB (recommended). - RS-232 (consult Fagor Automation). • Video input. - VGA - DVI-D (consult Fagor Automation).

Touch controller.
Fagor Automation recommends using the USB driver for the touch screen. Consult Fagor Automation before using the RS232 driver.

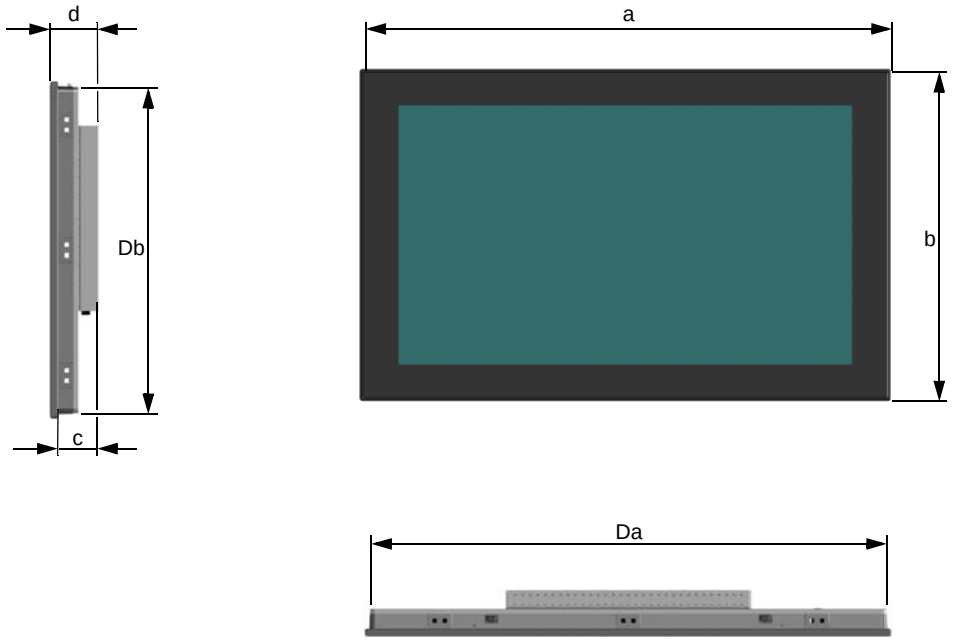
2.2 General diagram.



Connection.	Description.
VGA	VGA video signal input. Maximum length; 5 m (16.40 feet).
T/S USB	Touch screen driver (recommended). Maximum length; 5 m (16.40 feet).

For lengths greater than 5 meters, use a PPC-21W or PPC-19.

2.3 Dimensions.



	mm	inch
a	558.40	21.98
b	349.80	13.77
c	40.70	1.60
d	47.70	1.88

	mm	inch
Da	548.00	21.57
Db	339.25	13.36

2.4 Enclosure and mounting of the module.

2.4.1 Enclosure design.

The enclosure must meet the following requirements:

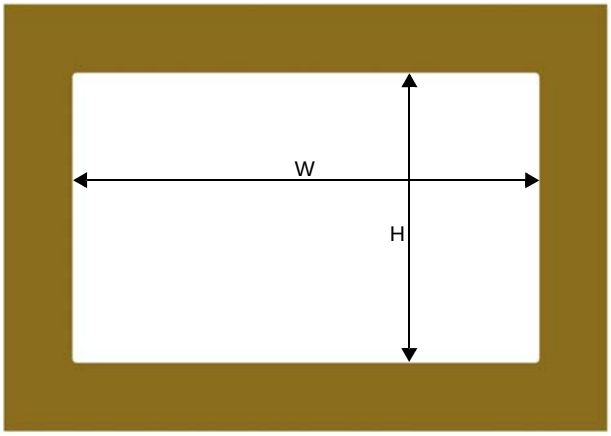
- The degree of protection of the enclosure must be IP54, according to standard IEC 60529.
- Keep the enclosure clean.
- The dissipation surface of the enclosure must be enough to evacuate (by convection) the heat generated inside.
- In the connector area, reserve a space that allows the cables to be connected, respecting their radius of curvature.
- Respect the minimum distances recommended between the enclosure walls and the hardware to let the air flow and improve heat dissipation.

To meet the previous requirements, Fagor recommends the following.

- *The enclosure must not have any ventilation holes, because they could let dust or other substances in.*

Before building an enclosure with glass fiber u another poor heat dissipating material, contact Fagor Automation.

Dimensions of the cut off part and the enclosure.



Radius of the corners = 5 mm (0.2 inches).

	mm	inch
W	550,30±1,0	21,67±0,040
H	341,80±0,7	13,46±0,025

	mm	inch
D (*)	75	2.95

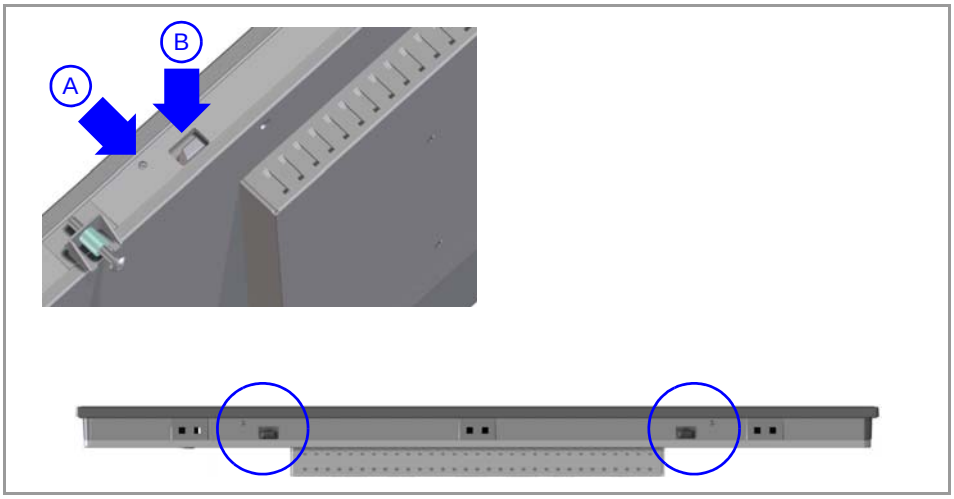
(*) Minimum recommended distance.

2.4.2 Securing the module.

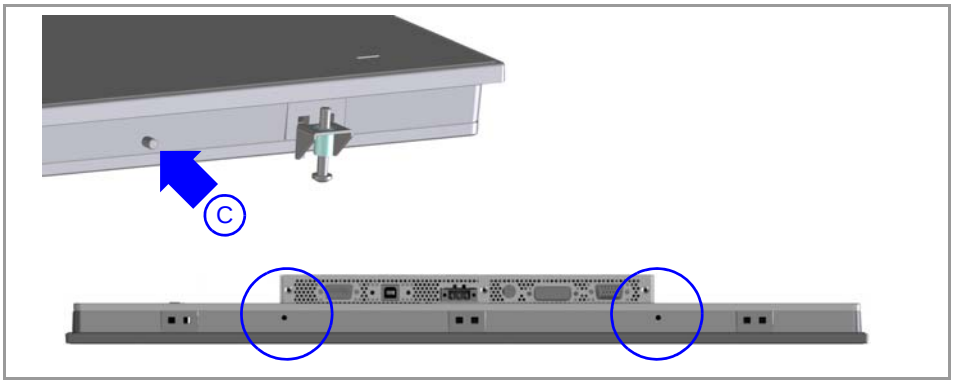
The module must be installed in a proper enclosure that may be located on the machine or on an external support. To insert the unit into the enclosure, it must have a big enough hole to allow to insert it easily, without obstacles and without forcing the unit. See *"2.4.1 Enclosure design."* on page 27.

The module is mounted from inside the enclosure. Once the unit has been inserted into the enclosure, secure it from the inside with the tension jacks. To properly secure it, use all the tension jacks on the back of the unit. Apply a tightening torque of 0.7 Nm.

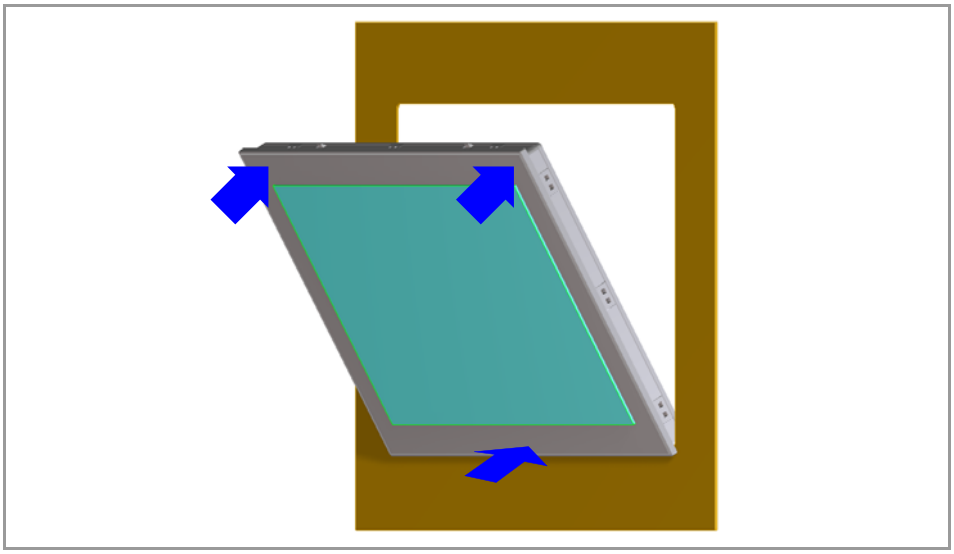
1 Use the two top screws (A) to fasten the pressure hooks (B).



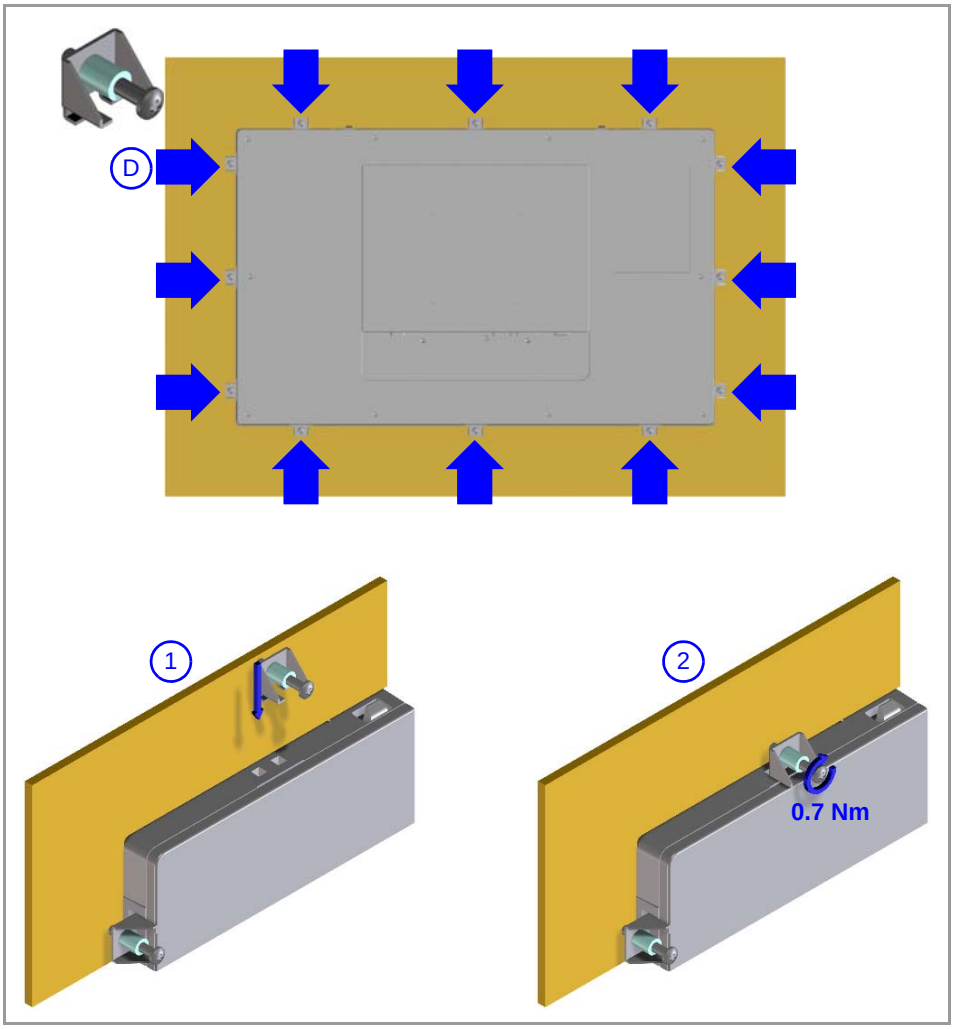
2 Use the two bottom stop screws (C).



3 Rest the monitor on the stop screws inside the hole and push the top part until the pressure hooks hold the monitor.



4 Fasten the monitor on the rear, using all the fastening hooks (D).



2.5 Voltage supply for the module.

The monitor has two power supply connections. Fagor Automation recommends using 24 V DC (Phoenix-type connector) to power the monitor. Consult Fagor Automation before using the 12 V DC option.

Never connect both power systems at the same time.

24 V DC universal power supply.

Option recommended by Fagor Automation to power the monitor. Power the monitor with a 24 V DC ±10% 1.5 A power supply.

1

Pin	Signal.	Function.
1	⏚	- - -.
2	11	0 V reference signal.
3	+24 V	Power supply.

Power supply cable characteristics.

Use generic 12 AWG (4 mm²) to 18 AWG (1 mm²) cable.

Consumption.

Maximum consumption: 25 W.

2.6 Configuring the video signal from the monitor.

The buttons to configure the monitor are on the back.

Power

Auto/Exit

Left

Right

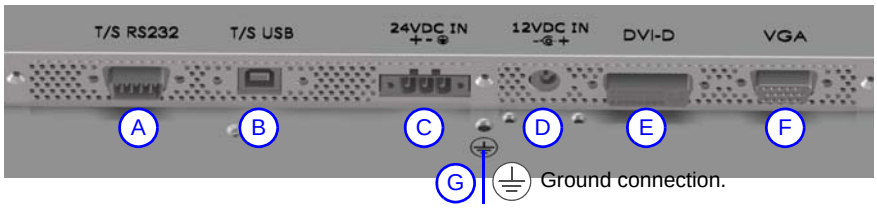
Menu/Sel

Source

Button.	Description.
	Turns the monitor on and off.
Auto Exit	Automatically adjusts the clock, phase, horizontal position and vertical position.
	Increases the brightness.
	Reduces the brightness.
Menu Sel	Activates the OSD menu.
Source	Changes the video input source.

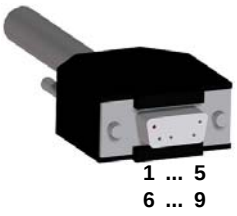
2.7 Connectors.

Bottom view.



(A) T/S RS-232	Touch screen driver (consult Fagor Automation).
(B) T/S USB	Touch screen driver (recommended).
(C) 24 V DC IN	24 V DC supply input (recommended).
(D) 12 V DC IN	12 V DC supply input (consult Fagor Automation).
(E) DVI-D	DVI-D video signal input.
(F) VGA	VGA video signal input.
(G)	Ground connection.

·T/S RS232· Touch screen driver (not recommended).



Plug-in part 9-pin female SUB-D HD connector.

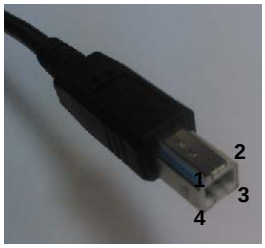
Pin.	Signal.	Function.
1	DCD	Data Carrier Detect.
2	RxD	Received Data.
3	TxD	Transmit Data.
4	DTR	Data Terminal Ready.
5	11	Ground.
6	DSR	Data Set Ready.
7	RTS	Request To Send.
8	CTS	Clear To Send.
9	RI	Ring Indicator.

Touch controller.

Fagor Automation recommends using the USB driver for the touch screen. Consult Fagor Automation before using the RS232 driver.

·T/S USB· Touch screen driver (recommended).

Option recommended by Fagor Automation for the touch controller.



USB type-B controller. Plug-in part.

Pin.	Signal.
1	+ 5 V DC.
2	Data -.
3	Data +.
4	GND.

Maximum length; 5 m (16.40 feet).

Using cables with a length longer than 5 m or extension cords can cause problems in terms of compliance with EMC directives; before using this type of cables in an industrial setting, check whether the installation complies with regulations.

·24 V DC IN· Supply input (recommended).

Option recommended by Fagor Automation to power the monitor.

1

Plug-in part 3-pole Phoenix-type connector (5.08 mm pitch). Rated current; 16 A.

Pin	Signal.	Function.
1	⏚	- - -.
2	11	0 V reference signal.
3	+24 V	Power supply.

Connector data.	
Number of poles.	3.
Pitch.	5.08 mm.
Connection technique.	Screw connection.
Minimum/maximum section.	0.2 / 4 mm².
Rated current In.	16 A.

Cable data.	
Length to be stripped.	7 mm.

See *"2.5 Voltage supply for the module."* on page 30.

·12 V DC IN· Supply input (not recommended).

DC jack connector for the external current adapter. See *"2.5 Voltage supply for the module."* on page 30.

Power supply.
Fagor Automation recommends 24 V DC power for the monitor. Consult Fagor Automation before using the 12 V DC option.

Power supply.
Never connect both power systems at the same time.

·VGA· Video input.

1 ... 5
11 ... 15

Plug-in part 15-pin female SUB-D HD type connector.

Pin.	Signal.
1	MAINS
2	GREEN
3	BLUE
4	- - -
5	11
6	GND_RED
7	GND_GREEN
8	GND_BLUE
9	- - -
10	GND_SYNC
11	- - -
12	- - -
13	HSYNC
14	VSYNC
15	- - -

·DVI-D· Video input.

Consult Fagor Automation before using the DVI-D video input.

2.8 Cable characteristics.

2.8.1 VGA video signal.

Fagor Automation supplies the necessary cable for the VGA connection. The cable is valid for static installations such as cable carrying chains. For further information, refer to the Ordering Handbook.

Connector pinout.

1 ... 5
11 ... 15

Plug-in part 15-pin female SUB-D HD type connector.

Pin.	Signal.
1	MAINS
2	GREEN
3	BLUE
4	- - -
5	11
6	GND_RED
7	GND_GREEN
8	GND_BLUE
9	- - -
10	GND_SYNC
11	- - -
12	- - -
13	HSYNC
14	VSYNC
15	- - -

Cable characteristics.

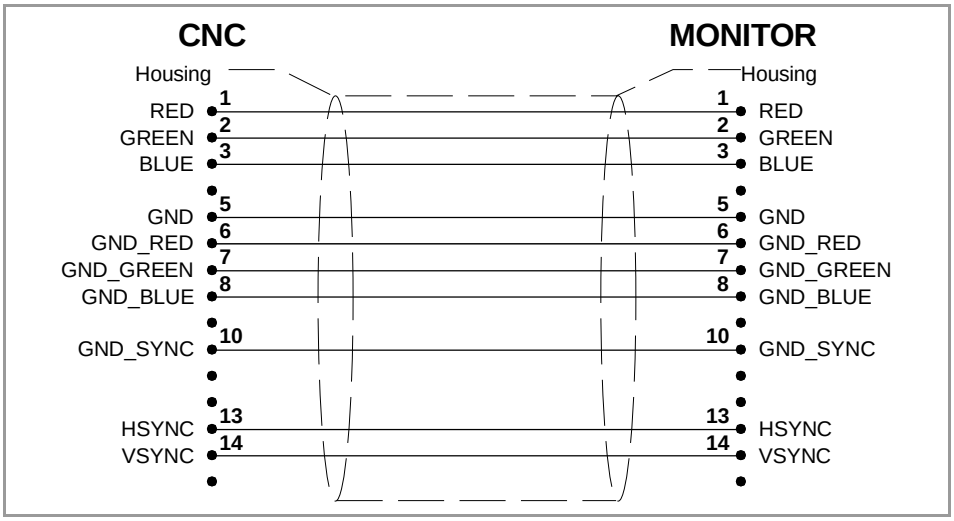
Use specific VGA cable.

·VGA· cable.	
Type.	Shielded.
Flexibility.	Normal.
Impedance.	75 Ω.
Maximum length.	5 m (16.40 ft).

Consult Fagor Automation before using cables longer than 5 m.

Node connection.

Use the VGA output of the central unit. The connection is parallel, 1 with 1, 2 with 2, etc. The cable shield must be connected to the connector at both ends.



2.9 OSD (On Screen Display) menu.

The selected values are stored in the memory of the monitor after pressing the [Menu/Sel] button at the end of the wait time. The saved values are not lost when the monitor is turned off. However, the selected value will not be available if the monitor is turned off before the wait time has been completed. The wait time is approximately 5 seconds, and can be configured from the OSD menu.

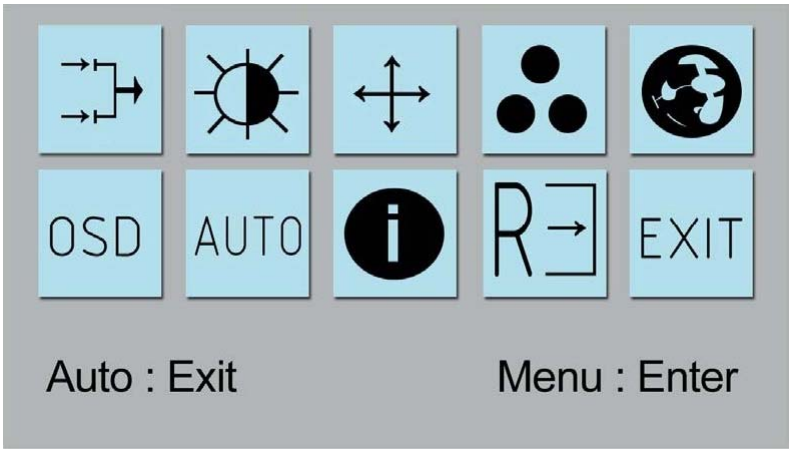
2.9.1 Using the rear keyboard with the OSD menu.

The keys on the rear of the monitor have the following functionality when the OSD menu is active.

Button.	Description.
	**Main OSD menu.** Turns the monitor on and off. **OSD sub-menu.** Turns the monitor on and off.
	**Main OSD menu.** Exits the OSD menu. **OSD sub-menu.** Returns to the previous menu.
	**Main OSD menu.** Moves the selector to the left. **OSD sub-menu.** Moves the selector to the left. Moves the selector up and down. Increases the value of the selected option.
	**Main OSD menu.** Moves the selector to the right. **OSD sub-menu.** Moves the selector to the right. Moves the selector up and down. Reduces the value of the selected option.
	**Main OSD menu.** Activates the OSD menu. **OSD sub-menu.** Confirms the selected option.
	**Main OSD menu.** Changes the video input source. **OSD sub-menu.** Not used.

2.9.2 OSD menu.

To display the OSD menu, press the MENU key on the back of the monitor.

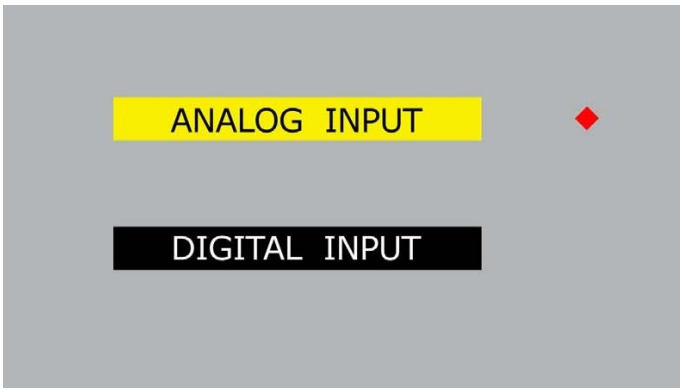


Icon.	Description.
	Video input.
	Contrast/Brightness.
	Geometry (for DVI input).
	Temperature color.
	Language.
	OSD configuration.
	Auto-configuration.
	Information.
	Restore.
	Exit.

Video input.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

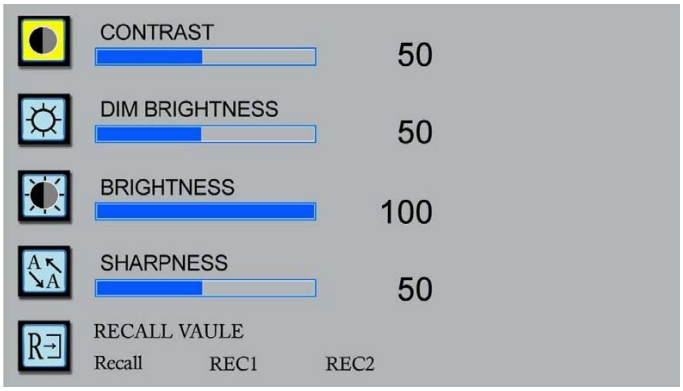
OSD sub-menu.



Contrast/Brightness.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.

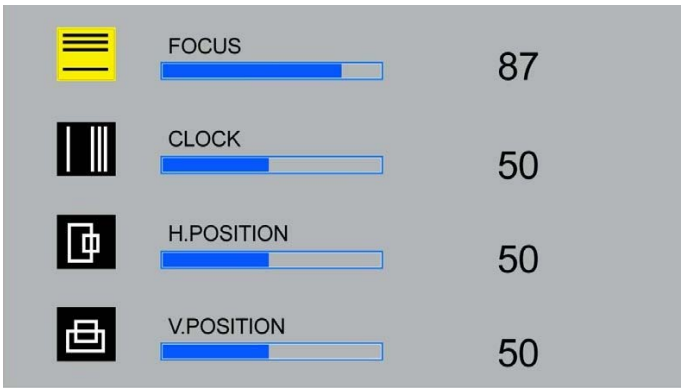


Recall Value	Meaning.
Recall	Recalls the default values.
REC1	Recalls saved settings 1.
REC2	Recalls saved settings 2.

Geometry (for DVI input).

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

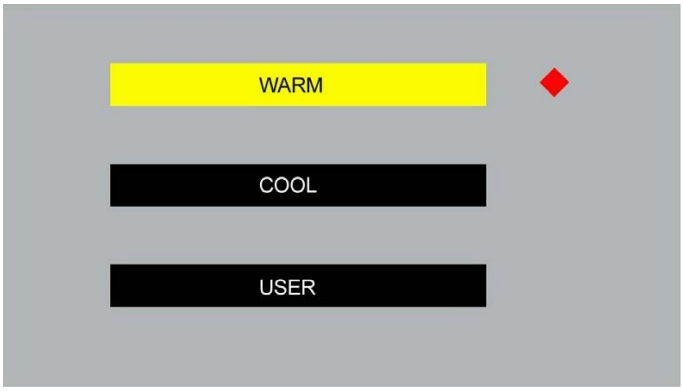
OSD sub-menu.



Temperature color.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.



Language.

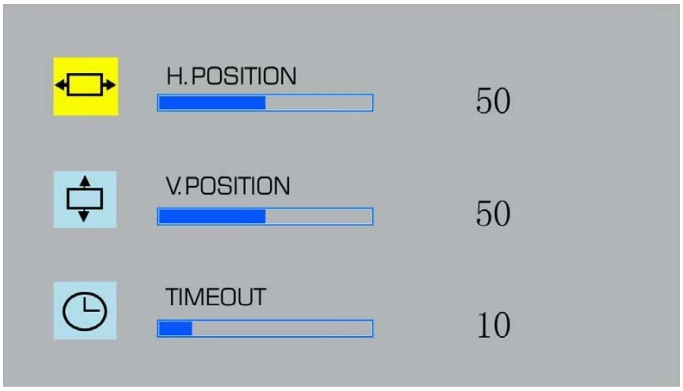
Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.

OSD configuration.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

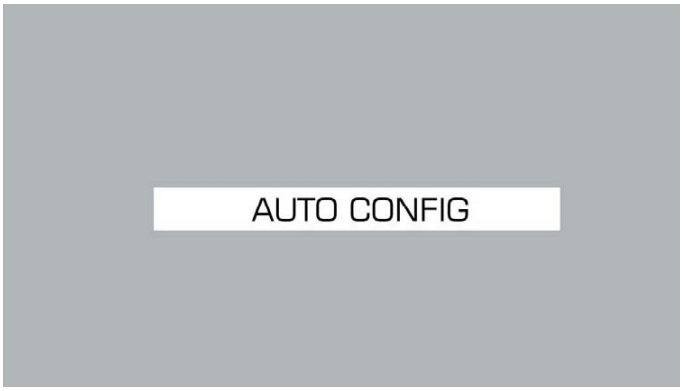
OSD sub-menu.



Auto-configuration.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.



Information.

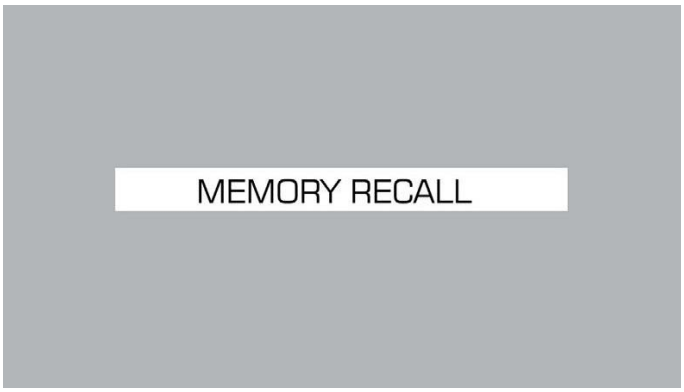
Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.

Restore.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

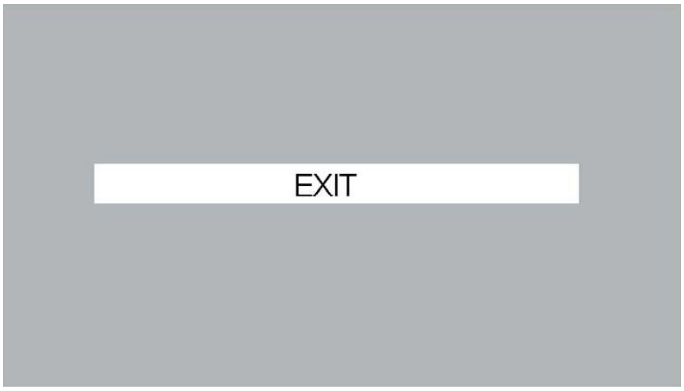
OSD sub-menu.



Exit.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

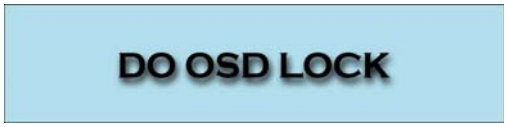
OSD sub-menu.



2.9.3 Locks and unlocks the OSD menu.

Locks the OSD menu.

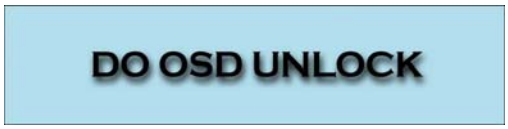
Press the [Left]+[Right] keys and the following message will appear on screen.



Do not release the keys until the screen indicates that the operation has been completed.

Unlocking the OSD menu.

Press the [Left]+[Right] keys and the following message will appear on screen.



Do not release the keys until the screen indicates that the operation has been completed.

Note: All images of the OSD menu are property of Advantech Co., Ltd.

2.

MONITOR-21 MULTITOUCH.

FAGOR AUTOMATION

CNC 8070

(REF: 1709)

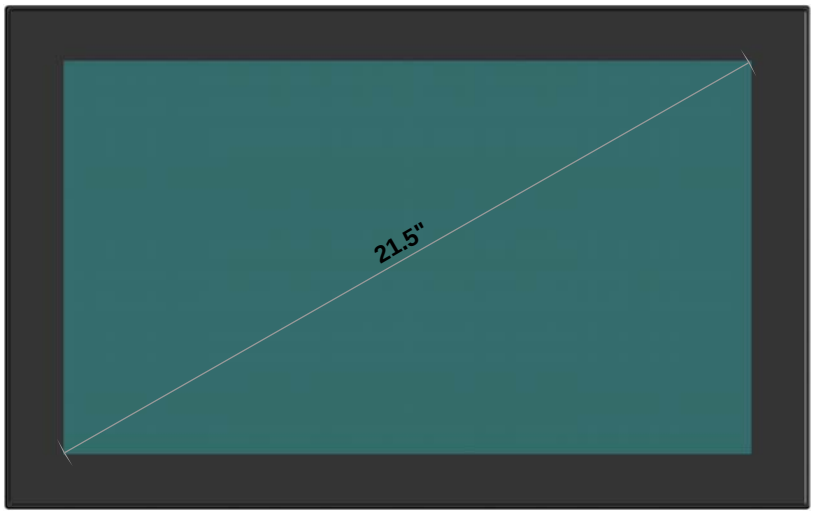
3 PPC-21W.

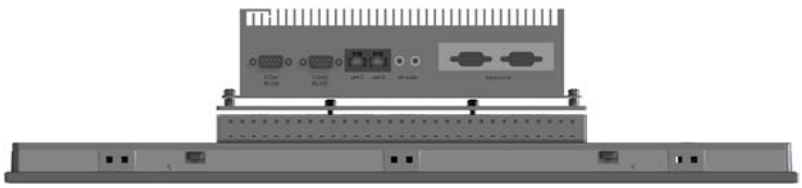
Panel PC with 21.5 multi-touch monitor to control, operate and monitor the CNC via an ethernet connection. The PPC-21W allows the user to operate the CNC using the touch screen or a USB keyboard (for example, the HORIZONTAL KEYB 2.0 + TOUCHPAD). In both cases, the user can work with the PPC in just the same way as if being in front of the CNC screen.

The PPC may be a standalone monitor or workstation (for example, with a modular central unit) or it may be a second monitor or workstation (for example, with an integrated central unit).

Module.	Description.
PPC-21W-☐-☐-☐☐-☐☐	• Panel PC with a 21.5" (1920 × 1080), 24-bit color, 16:9 aspect ratio monitor. • Capacitive multi-touch • Storage: 16 GB SSD.
PPC-21W-☐-☐-☐☐-☐☐-M128	• Panel PC with a 21.5" (1920 × 1080), 24-bit color, 16:9 aspect ratio monitor. • Capacitive multi-touch • Storage: 16 GB SSD + 128 GB SSD.

The CNC to which the PPC-21W will be connected must have the connection enabled through the remote desktop (with RDP protocol support) as well as a functional Ethernet connection with the correct parameters set. The FagorConnect application, which can be installed on the Panel PC, makes it possible to simplify the configuration of the connection between a Panel PC and the CNC.





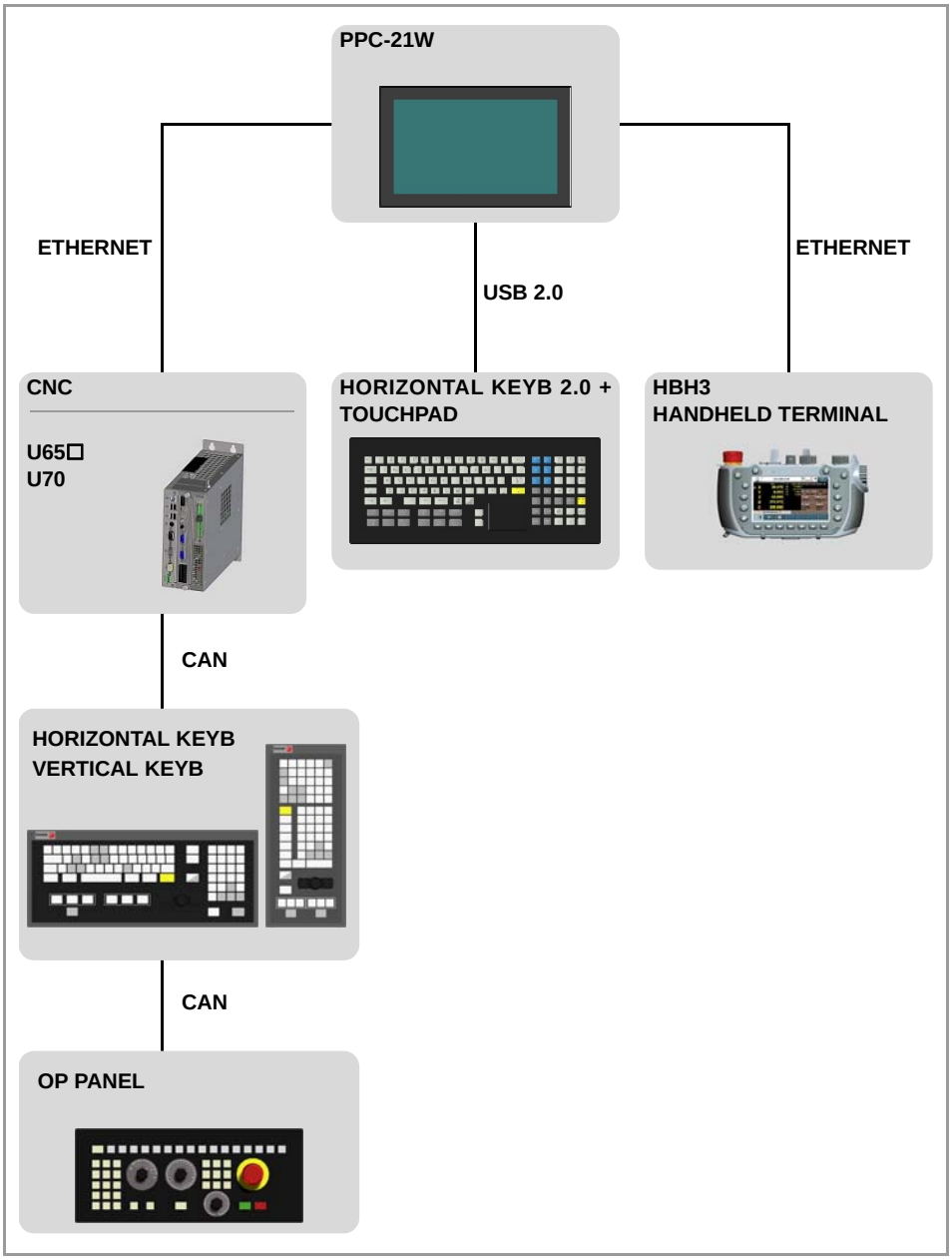
3.1 Specifications.

Type.	Description.
General.	• 21.5" (1920 × 1080 pixel) multi-touch screen monitor (10 points of contact) and USB controller. • Dimensions (width x height x depth) - 558.40 × 349.80 × 121.41 mm. - 21.98" × 13.77" × 4.78". • Weight: 9.6 kg (21.1 lb) • OSD (On Screen Display) menu; rear buttons.
System.	• Processor: 4th Gen Intel® Core™ i3, 1.7 GHz, Dual Core. • Memory: 8GB DDR3L, 1600 MHz. • Graphics: Intel® HD Graphics 5000/4400. • Storage (to choose): - 16 GB SSD (approx. 7GB free for user). - 16 GB + 128 GB SSD. • OS Image: WES7P X64 MUI.
Regulation.	• BSMI, CE, FCC, CCC, UL.
Ambient.	• Storage temperature: -20 ~ 60 °C (-4 ~ 140 °F). • Working temperature: 0 ~ 55 °C (32 ~ 101 °F). • Relative humidity: 10 ~ 95% RH at 40°C (104°F) (non-condensing). • Vibration: Vibration test, IEC 60068-2-6 compliant. Sine vibration at 1 g amplitude between 5 ~ 500 Hz. • Degree of protection: IP65 (at front), IP40 (at rear).
Power supply.	The monitor and the panel PC must be powered separately. • Supply voltage: 24 V DC ± 10 %, 5 A. • Consumption: 55 W (typical), 100 W (max.). Optionally, the monitor can be powered using a 12 V DC current via the DC jack connector (consult with Fagor Automation).
Screen.	• Type: TFT LED LCD FullHD. • Screen: 10-point multi-touch capacitive. • Size: 21.5" (aspect ratio 16:9). • Screen color: 24 bits (16.7 million colors). • Resolution: 1920 x 1080 pixels. • Angle of vision: 178° (vertical), 178° (horizontal). • Brightness: 300 cd/m². • Contrast ratio: 5000:1 (typical). • Lamp duration (MTBF): 50,000 hours.
Connectivity.	**Monitor.** • 1 USB touch controller, to be connected to the panel PC. • 1 RS232 touch controller (non-functional). • 1 VGA video input, to be connected to the panel PC. • 1 DVI-D video input (non-functional). **Panel PC.** • 2 RS-232 (50 ~ 115.2 kbps) serial lines. • 2 RS422/485 serial lines, automatic flow control, 50 ~ 115.2 kbps. • 4 RJ45 LAN ports, 10/100/1000 Mbps, IEEE 802.3u 1000baseT, Fast Ethernet. • 2 USB 2.0 ports (1 used by the monitor's touch controller). • 2 USB 3.0 ports • 1 VGA output, 1920 × 1200 @ 60 Hz, 24 bpp. • 1 HDMI output, 1.4a, 3200 x 2000 @ 60Hz, 24 bpp. • 1 audio input. • 1 audio output.

Both the touch controller and VGA connection for the monitor must be connected to the Fagor panel PC. Always use the cables supplied by Fagor for the unit.

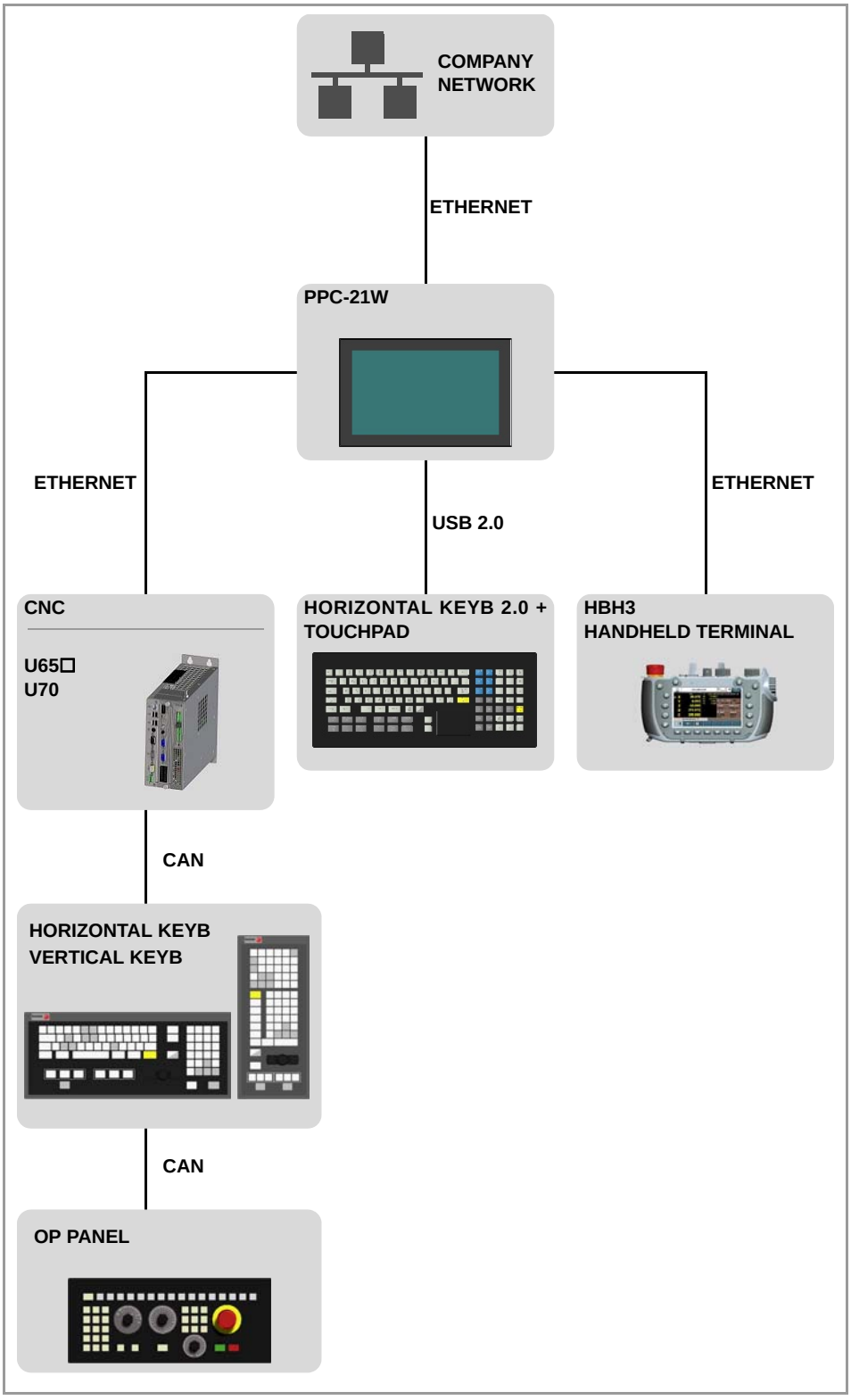
3.2 General diagram.

3.2.1 Networking, without access to the company network.



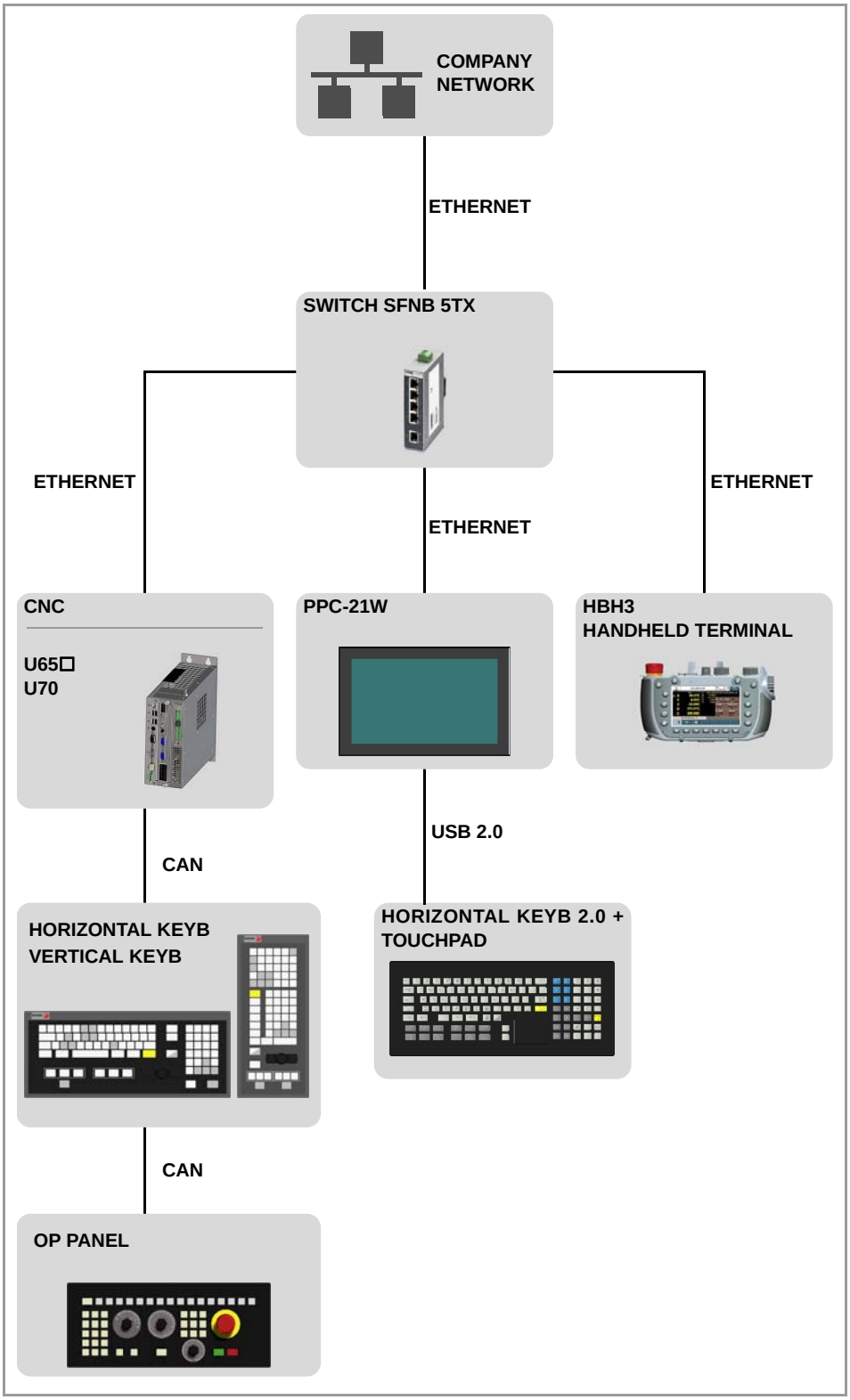
Connection.	Description.
USB 2.0	Connection of a USB keyboard to the PPC-21W. Use the keyboard cable. Maximum cable length: 800 mm (2.62 ft).
Ethernet.	Connecting the CNC to the PPC-21W. Maximum cable length: 100 m (328 ft).
	Connecting the HBH3 to the PPC-21W.
CAN	Connection of keyboards and operator panels. Maximum length of bus; 500 m (1640 ft) for CANopen bus.

3.2.2 Connecting to an ethernet network via the PC-panel.



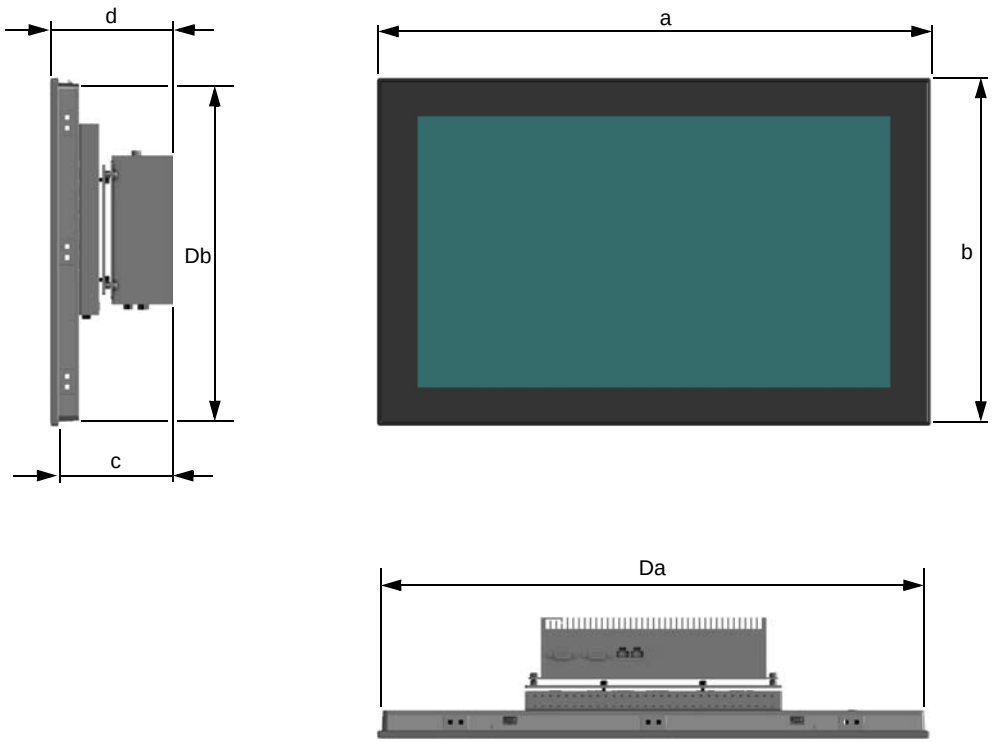
Connection.	Description.
USB 2.0	Connection of a USB keyboard to the PPC-21W. Use the keyboard cable. Maximum cable length: 800 mm (2.62 ft).
Ethernet.	Connecting the CNC to the PPC-21W. Maximum cable length: 100 m (328 ft).
	Connecting the HBH3 to the PPC-21W.
CAN	Connection of keyboards and operator panels. Maximum length of bus; 500 m (1640 ft) for CANopen bus.

3.2.3 Connecting to an Ethernet network through a switch.



Connection.	Description.
USB 2.0	Connection of a USB keyboard to the PPC-21W. Use the keyboard cable. Maximum cable length: 800 mm (2.62 ft).
Ethernet.	Connecting the elements to the switch Maximum cable length: 100 m (328 ft).
	Connecting the HBH3 to the PPC-21W.
CAN	Connection of keyboards and operator panels. Maximum length of bus; 500 m (1640 ft) for CANopen bus.

3.3 Dimensions.



	mm	inch
a	558.40	21.98
b	349.80	13.77
c	114.41	4.50
d	121.41	4.78

	mm	inch
Da	548.00	21.57
Db	339.25	13.36

3.4 Enclosure and mounting of the module.

3.4.1 Ambient characteristics of the enclosure.

The enclosure must ensure that the temperature inside does not exceed 55 °C (131 °F) while the device is in operating mode, with an ambient temperature of 45 ºC (113 ºF).

3.4.2 Enclosure design.

The enclosure must meet the following requirements:

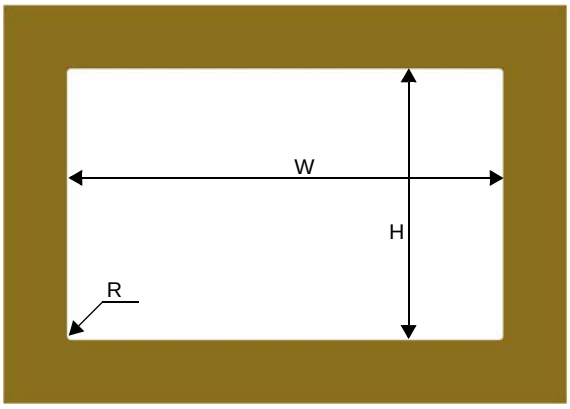
- The degree of protection of the enclosure must be IP54, according to standard IEC 60529.
- The enclosure must have enough surface area to evacuate by convection the heat generated inside.
- The enclosure must respect the minimum distances recommended between the enclosure walls and the central unit to let the air flow and improve heat dissipation.
- In the connector area, reserve a space that allows the cables to be connected, respecting their minimum allowable radius of curvature.
- The angle of the PPC-21W, with regard to the vertical position, should not be greater than 30°.
- Keep the enclosure clean.

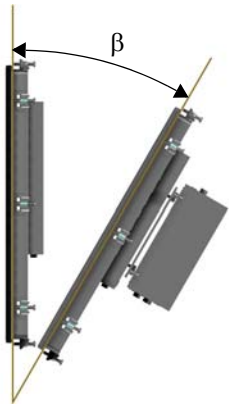
To meet the previous requirements, Fagor recommends the following.

- The enclosure must not have any ventilation holes, because they could let dust or other substances in.
- To improve heat dissipation, install an internal fan inside the enclosure for air circulation.

Before building an enclosure with glass fiber u another poor heat dissipating material, contact Fagor Automation.

Dimensions of the cut off part and the enclosure.





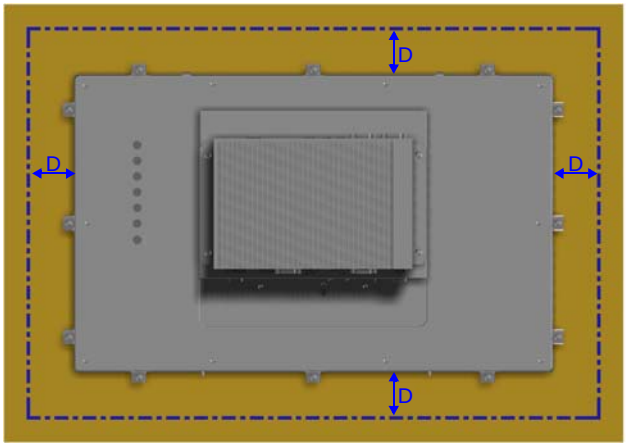
	mm	inch
W	550,30±1,0	21,67±0,040
H	341,80±0,7	13,46±0,025
R (*)	5.00	0.20

(*) Maximum radius at the corners.

	Degrees
β (*)	< 30°

(*) Maximum permitted angle.

Recommended minimum clearances between the PPC-21W and the enclosure walls.



	mm	inch
D (*)	> 50	> 1.97

(*) Minimum recommended distance.

Dissipated power inside the enclosure.

To calculate the total surface area the enclosure must have to dissipate the heat inside, we must consider the dissipated power for all the elements that generate heat inside the enclosure. For example, the power supply, fan, etc.

Hardware.	Dissipated power.
PPC-21W	55 W (typical), 100 W (max.).

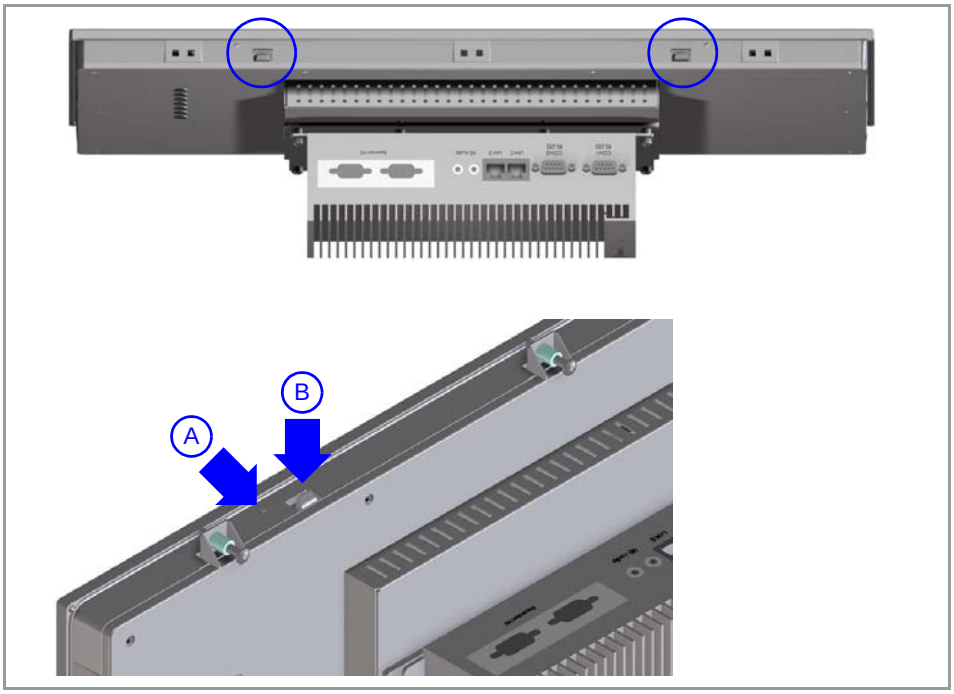
3.4.3 Securing the module.

The module must be installed in a proper enclosure that may be located on the machine or on an external support. To insert the unit into the enclosure, it must have a big enough hole to allow to insert it easily, without obstacles and without forcing the unit. Once the unit has been inserted into the enclosure, secure it from the inside with the tension jacks. To properly secure it, use all the tension jacks on the back of the unit. Apply a tightening torque of 0.7 Nm.

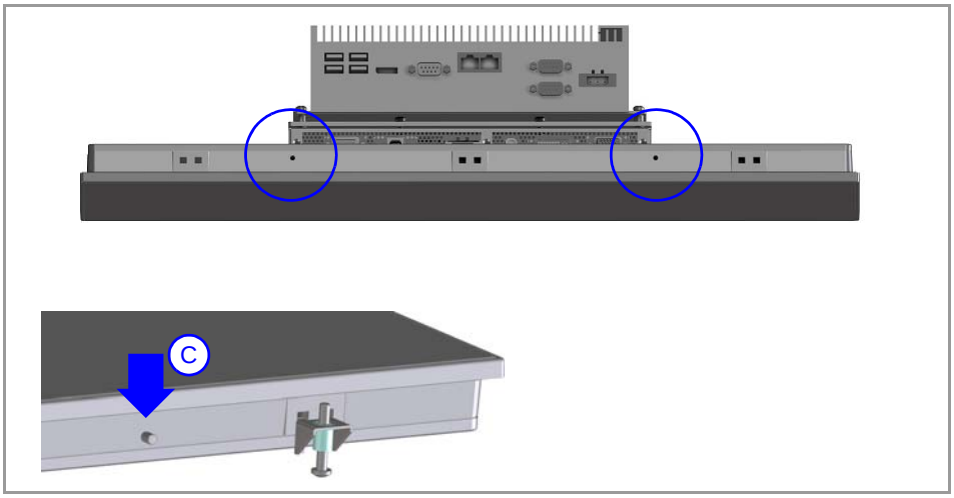
Mounting the equipment.

Follow the instructions below.

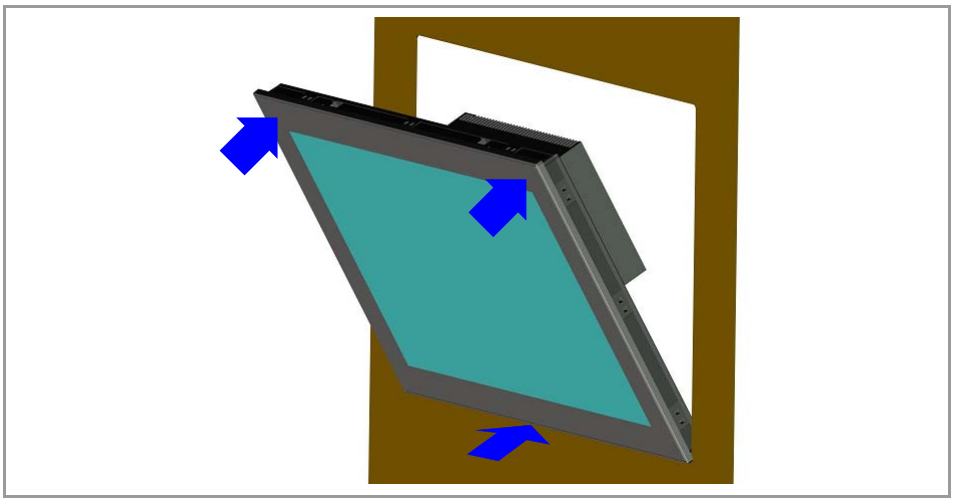
1 Before inserting the equipment inside the enclosure, use the two upper screws (A) to attach the temporary fastening hooks (B) in the desired position. These hooks facilitate the assembly by temporarily securing the module until it is permanently supported at the rear using the 12 fastening attachments. These two hooks should never be used as the final attachment fixture.



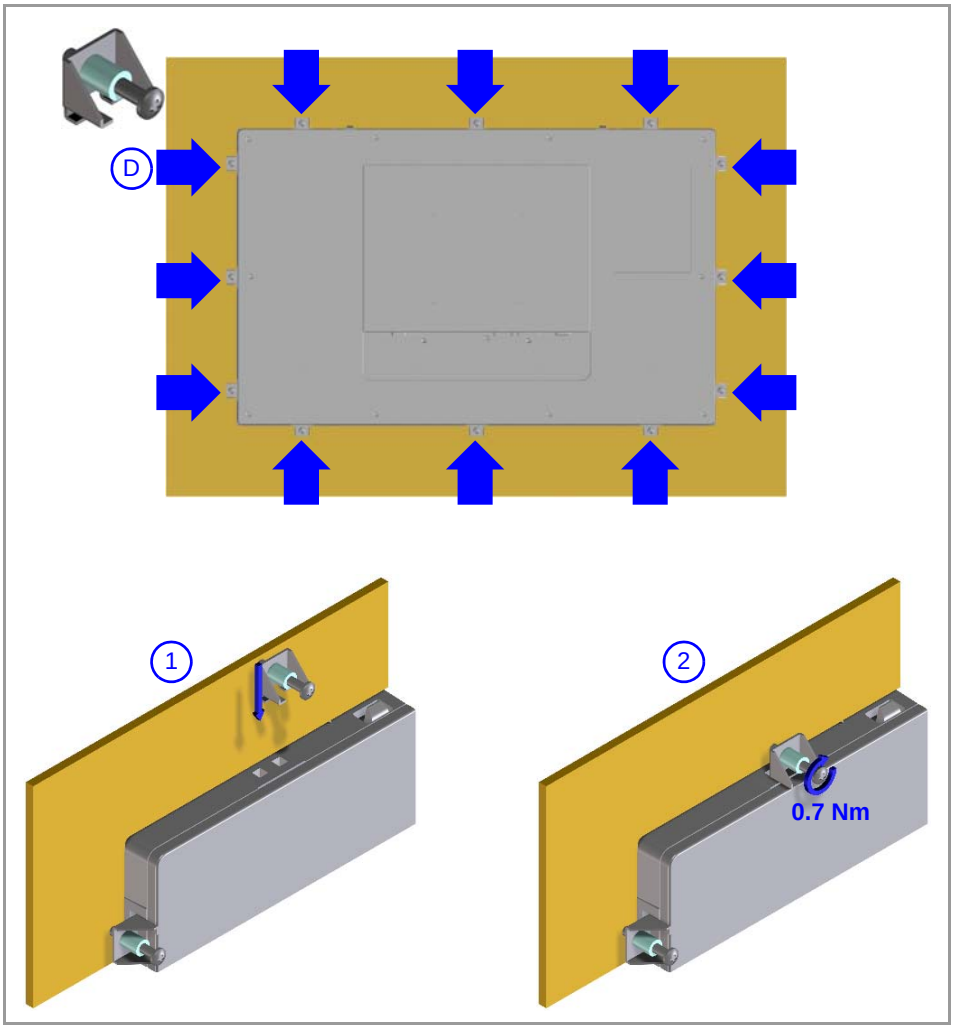
2 Adjust the two lower stop screws (C) to hold the PPC-21W at the correct height.



3 Rest the monitor inside the enclosure on the lower stop screws and push the top part until the pressure hooks support the monitor.

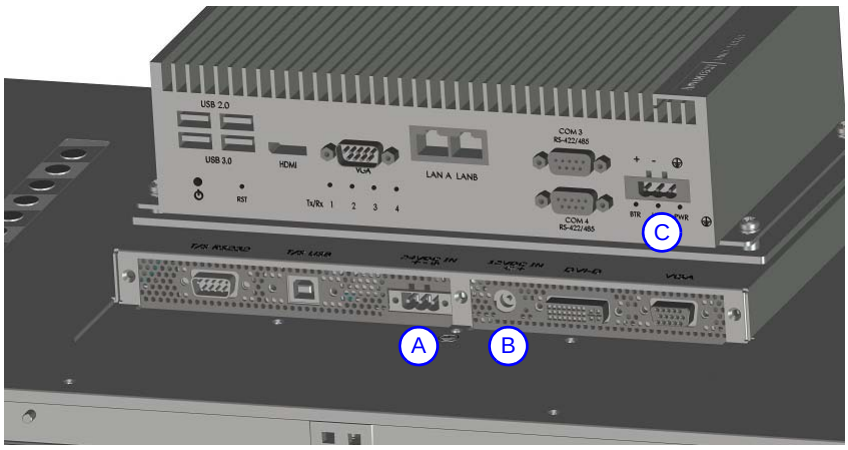


4 Fasten the PPC-21W at the rear, using all the attachment fixtures (D).



3.5 Voltage supply for the module.

The monitor and the panel PC require separate power supplies; it is necessary to power both modules.



(A) Monitor power: 24 V DC (recommended).
(B) Monitor power: 12 V DC (consult Fagor Automation).
(C) Panel PC power: 24 V DC.

The monitor has two different voltage power supply ports (24 and 12 V DC). Fagor Automation recommends using 24 V DC (Phoenix-type connector) to power the monitor. Consult Fagor Automation before using the 12 V DC option (DC jack connector).

Both monitor power suppliers (24 and 12 V DC) must never be connected at the same time.

Monitor power: 24 V DC.

Power the monitor with a 24 V DC ±10 % 1.5 A power supply.

Pin	Signal.	Function.
1	⏚	- - -.
2	11	0 V reference signal.
3	+24 V	Power supply.

Panel PC power: 24 V DC.

Power the panel PC with a 24 V DC ±20% 1.5 A power supply.

Pin	Signal.	Function.
1	⏚	Ground.
2	–	0 V reference signal.
3	+	Power supply.

Power supply cable characteristics.

Use generic 12 AWG (4 mm²) to 18 AWG (1 mm²) cable.

Consumption.

Consumption: 55 W (typical), 100 W (max.).

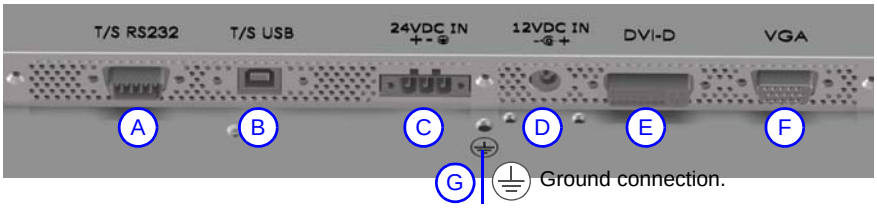
3.6 Hardware functionalities.

3.6.1 Rear keyboard.

The rear keyboard allows the monitor video signal (*"3.7 Configuring the video signal from the monitor."*) to be configured and to navigate through the OSD menu (*"3.9 OSD (On Screen Display) menu."*).

3.6.2 Monitor (lower end connectors).

Bottom view.



(A)	T/S RS-232	Non-functional on the PPC-21W.
(B)	T/S USB	Touch screen driver.
(C)	24 V DC IN	24 V DC supply input (recommended).
(D)	12 V DC IN	12 V DC supply input (not recommended).
(E)	DVI-D	Non-functional on the PPC-21W.
(F)	VGA	VGA video signal input.
(G)		Ground connection.

·T/S USB· Touch screen driver.

Connect the monitor's T/S USB (touch controller) output to a USB 2.0 port on the panel PC. Always use the cable supplied by Fagor for the unit.

·24 V DC IN· Supply input (recommended).

Option recommended by Fagor Automation to power the monitor.


1

Plug-in part 3-pole Phoenix-type connector (5.08 mm pitch). Rated current; 16 A.

Pin	Signal.	Function.
1	⏚	- - -.
2	11	0 V reference signal.
3	+24 V	Power supply.

Connector data.	
Number of poles.	3.
Pitch.	5.08 mm.
Connection technique.	Screw connection.
Minimum/maximum section.	0.2 / 4 mm².
Rated current In.	16 A.

Cable data.	
Length to be stripped.	7 mm.

See *"3.5 Voltage supply for the module."* on page 53.

·12 V DC IN· Supply input (not recommended).

DC jack connector for the external current adapter. See *"3.5 Voltage supply for the module."* on page 53.

Fagor Automation recommends 24 V DC power for the monitor. Consult Fagor Automation before using the 12 V DC option.

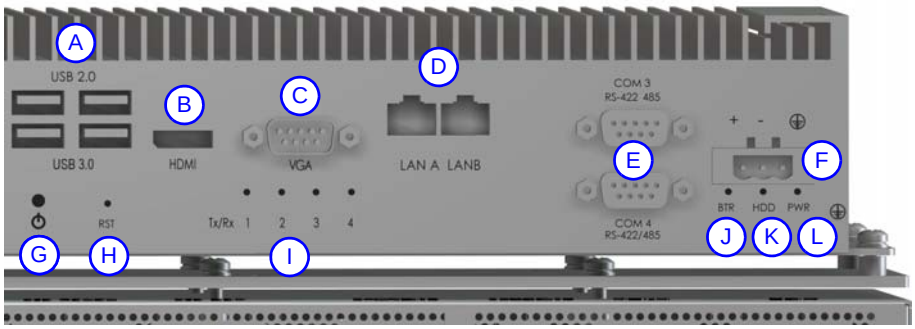
Both monitor power suppliers (24 and 12 V DC) must never be connected at the same time.

·VGA· VGA Video input.

Connect the panel PC's PCVGA output to the monitor's VGA input. Always use the cable supplied by Fagor for the unit.

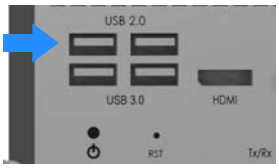
3.6.3 Panel PC (lower end connectors).

Bottom view.



(A)	USB 2.0 / USB 3.0	2 USB 2.0 Type-A ports. 2 USB 3.0 Type-A ports.
(B)	HDMI	HDMI connection to monitor.
(C)	VGA	VGA connection to monitor.
(D)	LAN A / LAN B	Ethernet.
(E)	COM3 / COM4	RS-422/485 serial line.
(F)		24 V DC electric power supply input.
(G)		Power button.
(H)	RST	Reset button.
(I)	Tx Rx 1 2 3 4	Transmission and reception LEDs.
(J)	BTR	Battery status LED.
(K)	HDD	Hard drive activity LED.
(L)	PWR	Power status LED.

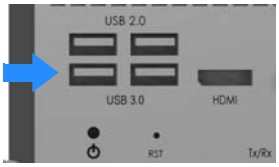
·USB 2.0· 2 USB 2.0 Type-A ports.



2 USB 2.0 Type-A ports, Plug & Play compatible. The USB interface is compliant with USB EHCI specification, rev. 2.0.

Connect the monitor's T/S USB (touch controller) output to one of these inputs. Always use the cable supplied by Fagor for the unit.

·USB 3.0· 2 USB 3.0 Type-A ports.



2 USB 3.0 Type-A ports, Plug & Play compatible. The USB interface is compliant with USB EHCI specification, rev 2.0.

·HDMI · HDMI output to monitor.

HDMI 1.4a output, supporting 3200 × 2000 video at 60 Hz and 24 bpp.

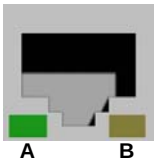
·VGA· VGA video output to monitor.

VGA video 1.4a output, supporting 1920 × 1200 video at 60 Hz and 24 bpp.

Connect the panel PC's PCVGA output to the monitor's VGA input. Always use the cable supplied by Fagor for the unit.

·LAN A / LAN B· Ethernet.

The PPC-21W has 4 RJ45 LAN ports, two at the lower end (LAN A / LAN B) and two at the upper end (LAN C / LAN D). All ports comply with the IEEE 802.3u 10 / 100Base-T CSMA/CD standard and are compliant with the IEEE 802.3ab 1000Base-T specification.



LED.	Meaning.
A (green)	Connection LED. The LED turns on when the PPC-21W is connected to the data network.
B (yellow)	Activity LED. The LED blinks when data is being received/transferred.

·COM3 / COM4· RS-422/485 serial line.

2 COM ports for RS-422/485 serial lines, 50 ~ 115.2 kbps.

Plug-in part 9-pin female SUB-D HD connector.

Pin.	RS-422 signal.	RS-485 signal.
1	TX-	Data-
2	TX+	Data+
3	RX+	NC
4	RX-	NC
5	11	11
6	NC	NC
7	NC	NC
8	NC	NC
9	NC	NC

The PPC-21W automatically detects the RS-422 or RS-485 signal. In RS-485 mode, the PPC-21W automatically detects the direction of the incoming data and, therefore, it can change the direction of transmission accordingly; no link signal is required (for example, RTS). This allows an RS-485 network to be created with only two cables. Additionally, prewritten software for half-duplex RS-232 environments can be maintained without the need to be edited.

24 V DC electric power supply input.

Plug-in part 3-pole Phoenix-type connector (5.08 mm pitch). Rated current; 16 A.

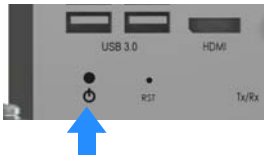
Pin	Signal.	Function.
1	⏚	- - -.
2	11	0 V reference signal.
3	+24 V	Power supply.

Connector data.	
Number of poles.	3.
Pitch.	5.08 mm.
Connection technique.	Screw connection.
Minimum/maximum section.	0.2 / 4 mm².
Rated current In.	16 A.

Cable data.	
Length to be stripped.	7 mm.

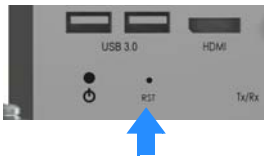
See *"3.5 Voltage supply for the module."* on page 53.

Power button.



Button to turn the panel PC on and off.

·RST· Reset button.

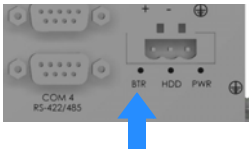


Button to activate the hardware reset function.

·Tx Rx· Transmission and reception LEDs.

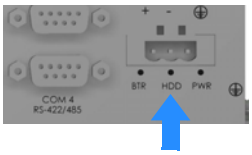
Data transmission and reception LEDs on the COM ports.

·BTR· Battery status LED.



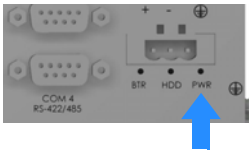
Battery status LED. The LED is off when the battery is working well and the LED turns on when the battery requires replacing.

·HDD· Hard drive activity LED.



Hard drive activity LED. The LED turns on when the hard drive is active, otherwise the LED is turned off.

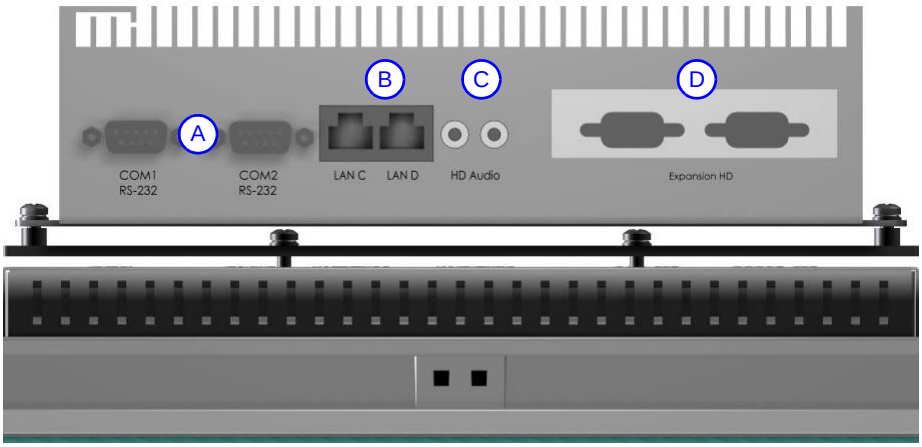
·PWR· Power status LED.



Power status LED. The LED turns on when the panel PC is powered.

3.6.4 Panel PC (top end connectors).

Bottom view.



(A)	COM1 / COM2	RS-232 serial line.
(B)	LAN C / LAN D	Ethernet.
(C)	HD Audio	High definition audio output.
(D)	HD Expansion.	n/a.

·COM1 / COM2· RS-232 serial line.

2 COM ports for RS-232 serial lines, 50 ~ 115.2 kbps.

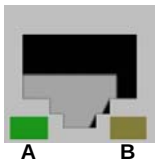
1 ... 5
6 ... 9

Plug-in part 9-pin female SUB-D HD connector.

Pin.	RS-232 signal
1	DCD
2	RxD
3	TxD
4	DTR
5	11
6	DSR
7	RTS
8	CTS
9	RI

·LAN A / LAN B· Ethernet.

The PPC-21W has 4 RJ45 LAN ports, two at the lower end (LAN A / LAN B) and two at the upper end (LAN C / LAN D). All ports comply with the IEEE 802.3u 10 / 100Base-T CSMA/CD standard and are compliant with the IEEE 802.3ab 1000Base-T specification.



A B

LED.	Meaning.
A (green)	Connection LED. The LED turns on when the PPC-21W is connected to the data network.
B (yellow)	Activity LED. The LED blinks when data is being received/transferred.

·HD Audio· High Definition audio output.

Two Jack connectors provide a 5.1 channel audio system.

3.7 Configuring the video signal from the monitor.

The buttons to configure the monitor video signal are on the back. This keyboard is also used for the OSD menu.

Power

Auto/Exit

Left

Right

Menu/Sel

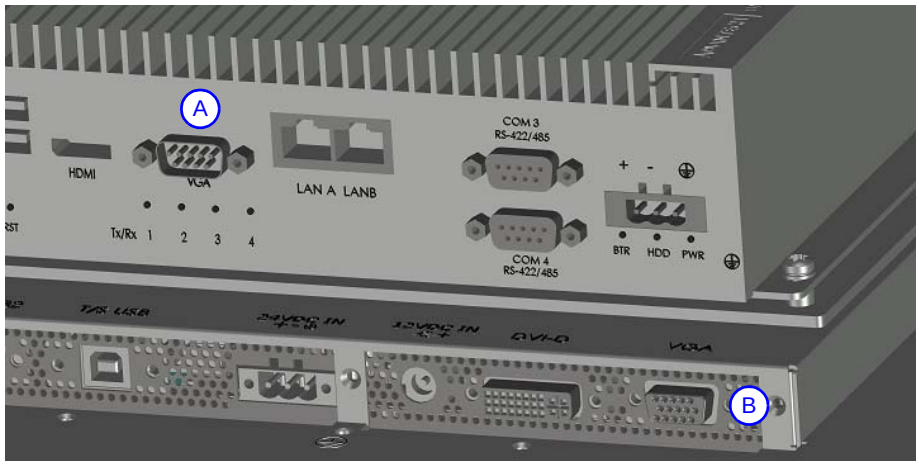
Source

Button.	Description.
	Turns the monitor on and off.
	Automatically adjusts the clock, phase, horizontal position and vertical position.
	Increases the brightness.
	Reduces the brightness.
	Activates the OSD menu.
	Changes the video input source.

3.8 Connection.

3.8.1 VGA video signal.

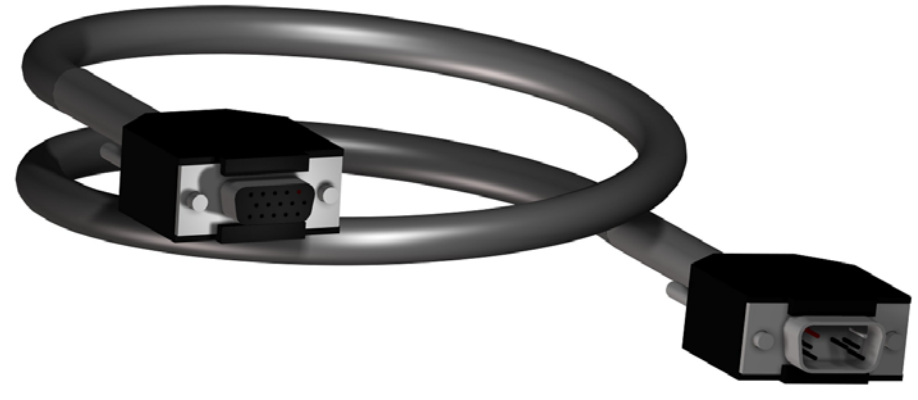
Connect the panel PC's PCVGA output to the monitor's VGA input.



(A) VGA video output on the panel PC.
(B) VGA Video input on the monitor.

Cable characteristics.

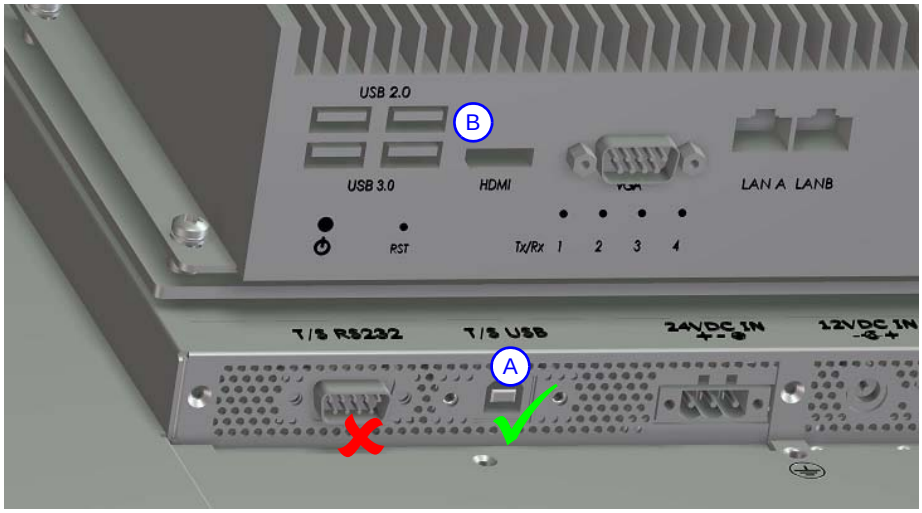
Fagor Automation supplies the necessary cable for the VGA connection between the panel PC and the monitor. Always use the cable supplied by Fagor for the unit.



3.8.2 Touch controller.

The monitor has two different outputs for the touch controller, RS232 and USB. Always use the monitor's T/S USB output to connect the touch control to the panel PC.

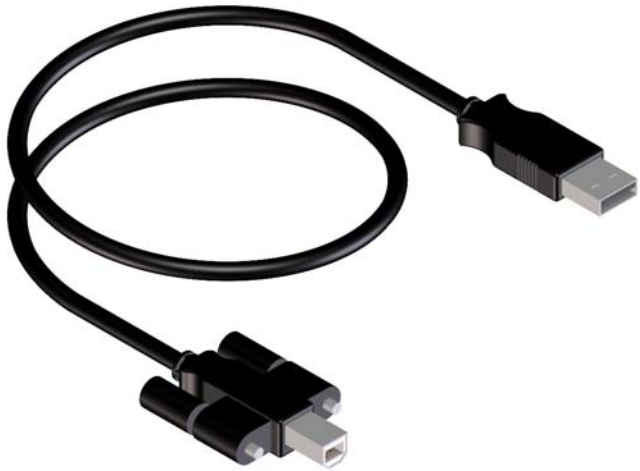
Connect the monitor's T/S USB (touch controller) output to a USB 2.0 port on the panel PC.



(A) The monitor's touch controller output.
(B) Generic USB 2.0 input on the panel PC.

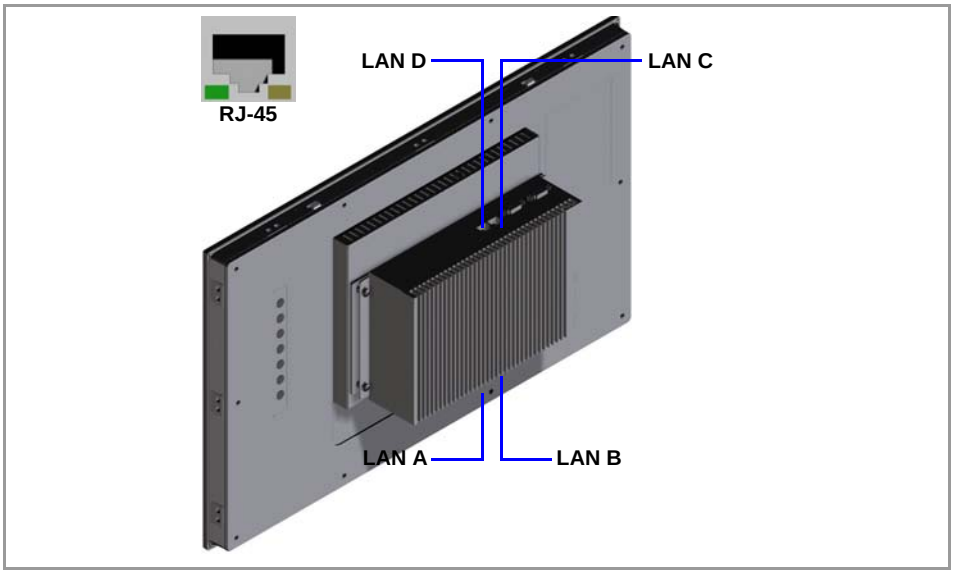
Cable characteristics.

Fagor Automation supplies the necessary cable for the touch controller. Always use the cable supplied by Fagor for the unit.



3.8.3 Ethernet (Fast Ethernet / Gigabit Ethernet).

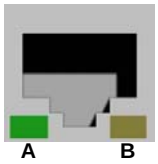
The PPC-21W has 4 RJ45 LAN ports, two at the lower end (LAN A / LAN B) and two at the upper end (LAN C / LAN D). All ports comply with the IEEE 802.3u 10 / 100Base-T CSMA/CD standard and are compliant with the IEEE 802.3ab 1000Base-T specification.



The PPC-21W can be configured as an additional node on a local network or it may be connected point-to-point to the CNC.

Connector.

All ports have two LEDs to indicate whether the PPC-21W is connected to the network (green LED) and if data are being transmitted (yellow LED).



LED.	Meaning.
A (green)	Connection LED. The LED turns on when the PPC-21W is connected to the data network.
B (yellow)	Activity LED. The LED blinks when data is being received/transferred.

Cable characteristics.

Use a specific Ethernet cable with the following characteristics.

Characteristic.	Description.
Type.	Standard shielded ethernet 10Base-T cable (10/100 MHz connection) or 1000Base-T (1000 MHz connection). Use a crossed cable to connect for the point to point connection to the CNC.
Impedance.	10/100 MHz connection Cat.5 (100 Ω - 120 Ω) or greater. 1000 MHz connection Cat.5e (100 Ω - 120 Ω) or greater.
Maximum length.	100 meters (328 ft).

Transmission speed.

The PPC-21W permits a connection at 10 MHz, 100 MHz or 1000 MHz; by default at 10 Mhz. Use a cable having the recommended characteristics to ensure a transmission at 100 MHz or 1000 MHz. Even so, since the transmission speed depends on the configuration of the network (number of nodes, their configuration, etc.) a 100 MHz or 1000 MHz transmission might not be stable. In these cases, we recommend to lower the transmission speed.

Element connection.

In order to ensure proper performance, the connection cable must be inserted all the way into the connectors so they're latched. This ensures that the cable is properly latched and does not come off due to vibration.

3.9 OSD (On Screen Display) menu.

The selected values are stored in the memory of the monitor after pressing the [Menu/Sel] button at the end of the wait time. The saved values are not lost when the monitor is turned off. However, the selected value will not be available if the monitor is turned off before the wait time has been completed. The wait time is approximately 5 seconds, and can be configured from the OSD menu.

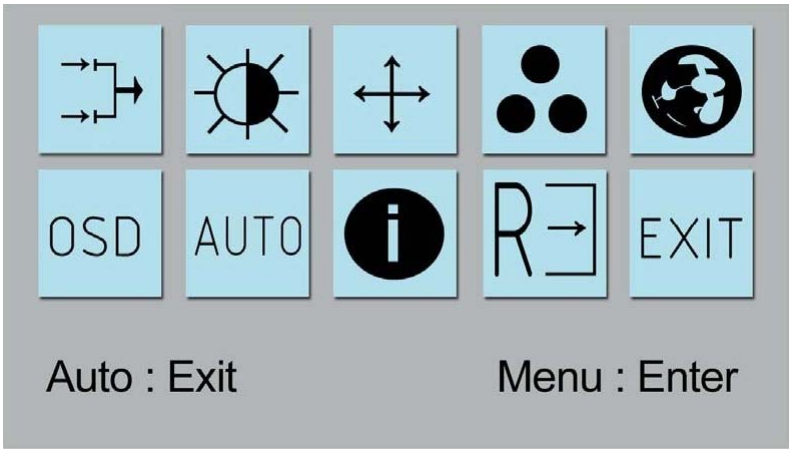
3.9.1 Using the rear keyboard with the OSD menu.

The keys on the rear of the monitor have the following functionality when the OSD menu is active.

Button.	Description.
	**Main OSD menu.** Turns the monitor on and off. **OSD sub-menu.** Turns the monitor on and off.
	**Main OSD menu.** Exits the OSD menu. **OSD sub-menu.** Returns to the previous menu.
	**Main OSD menu.** Moves the selector to the left. **OSD sub-menu.** Moves the selector to the left. Moves the selector up and down. Increases the value of the selected option.
	**Main OSD menu.** Moves the selector to the right. **OSD sub-menu.** Moves the selector to the right. Moves the selector up and down. Reduces the value of the selected option.
	**Main OSD menu.** Activates the OSD menu. **OSD sub-menu.** Confirms the selected option.
	**Main OSD menu.** Changes the video input source. **OSD sub-menu.** Not used.

3.9.2 OSD menu.

To display the OSD menu, press the MENU key on the back of the monitor.

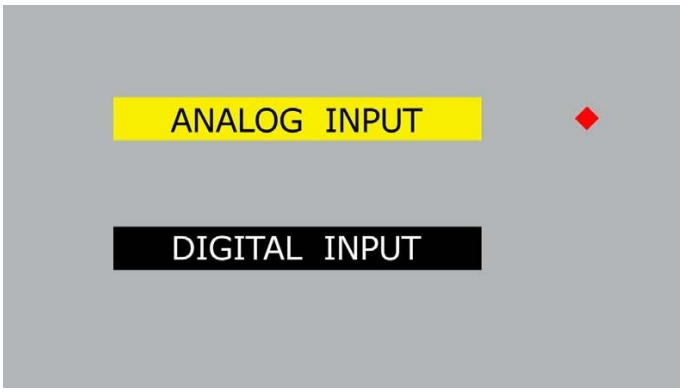


Icon.	Description.
	Video input.
	Contrast/Brightness.
	Geometry (for DVI input).
	Temperature color.
	Language.
	OSD configuration.
	Auto-configuration.
	Information.
	Restore.
	Exit.

Video input.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

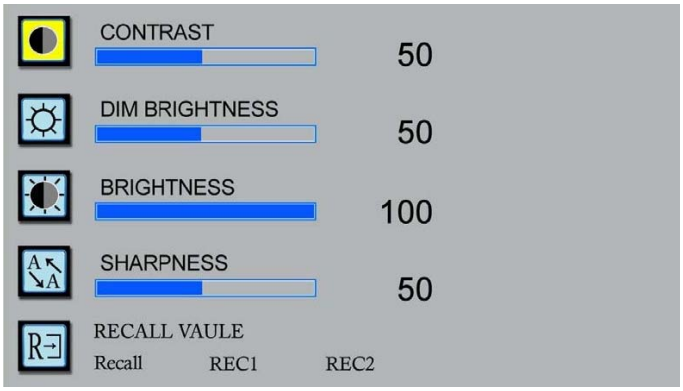
OSD sub-menu.



Contrast/Brightness.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.

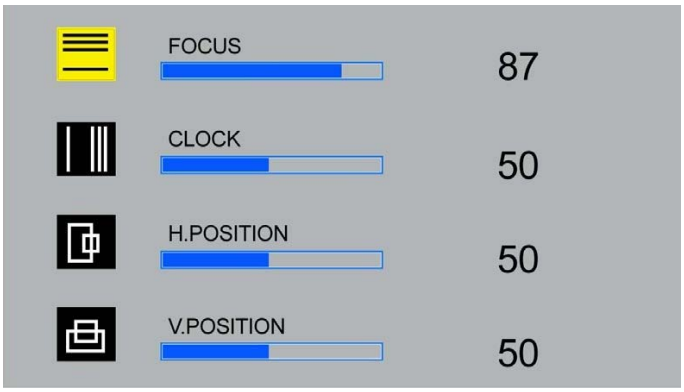


Recall Value	Meaning.
Recall	Recalls the default values.
REC1	Recalls saved settings 1.
REC2	Recalls saved settings 2.

Geometry (for DVI input).

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

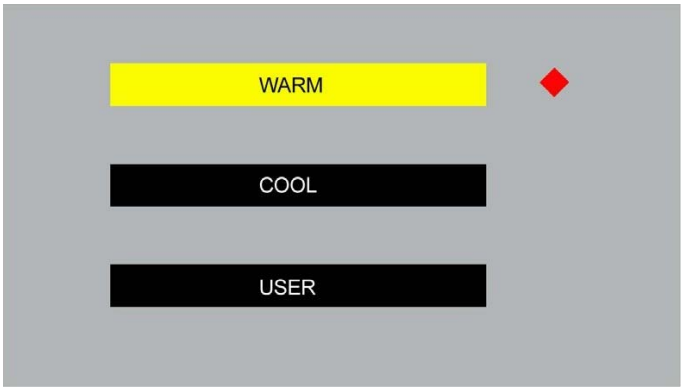
OSD sub-menu.



Temperature color.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.



Language.

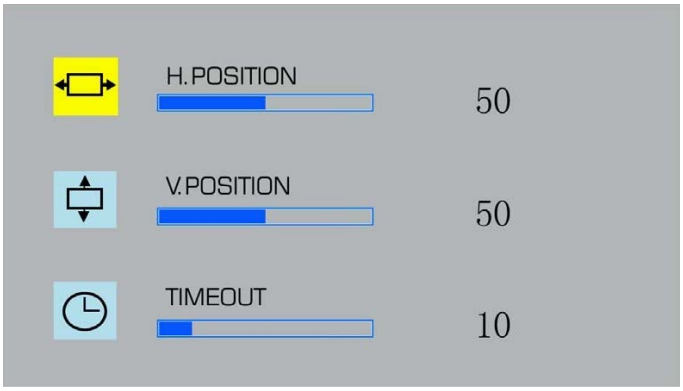
Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.

OSD configuration.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

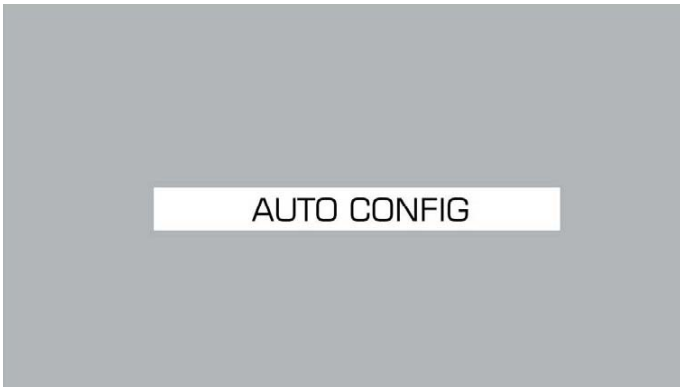
OSD sub-menu.



Auto-configuration.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.



Information.

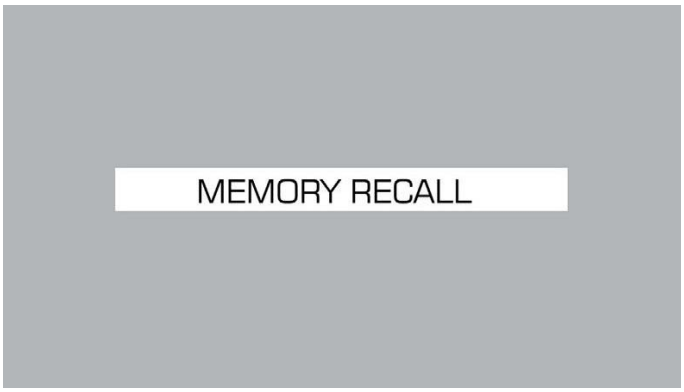
Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

OSD sub-menu.

Restore.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

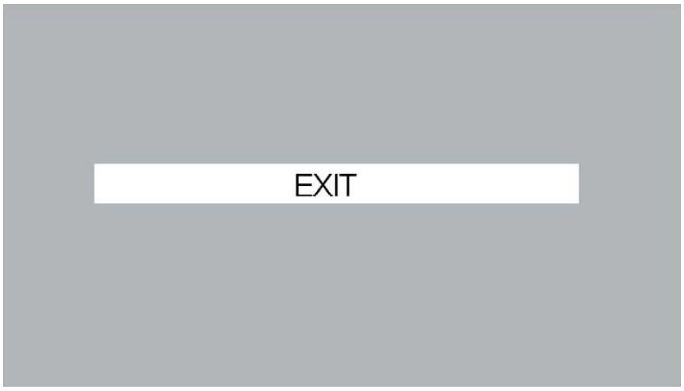
OSD sub-menu.



Exit.

Select this menu icon using the [Left] and [Right] keys and press the [Menu/Sel] key to confirm the selection.

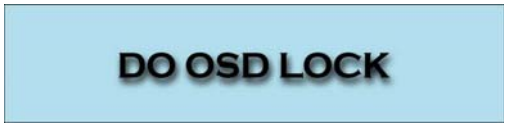
OSD sub-menu.



3.9.3 Locks and unlocks the OSD menu.

Locks the OSD menu.

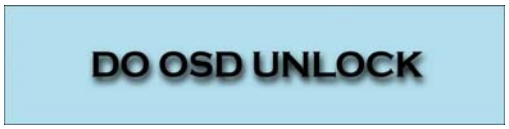
Press the [Left]+[Right] keys and the following message will appear on screen.



Do not release the keys until the screen indicates that the operation has been completed.

Unlocking the OSD menu.

Press the [Left]+[Right] keys and the following message will appear on screen.



Do not release the keys until the screen indicates that the operation has been completed.

Note: All images of the OSD menu are property of Advantech Co., Ltd.

3.

PPC-21W.

FAGOR AUTOMATION

CNC 8070

(REF: 1709)

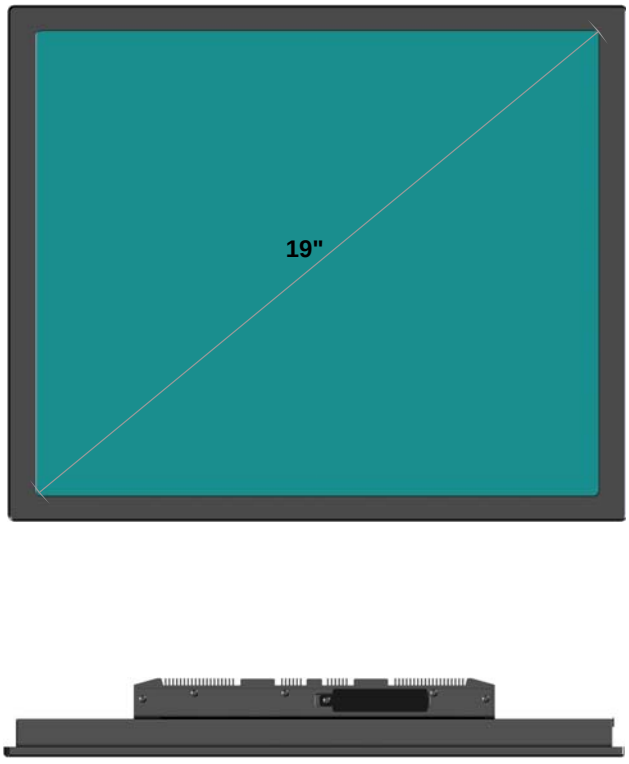
4 PPC-19.

Panel PC with 19 multi-touch monitor to control, operate and monitor the CNC via an ethernet connection. The PPC-19 allows the user to operate the CNC using the touch screen or a USB keyboard (for example, the HORIZONTAL KEYB 2.0 + TRACKHPAD). In both cases, the user can work with the PPC in just the same way as if being in front of the CNC screen.

The PPC may be a standalone monitor or workstation (for example, with a modular central unit) or it may be a second monitor or workstation (for example, with an integrated central unit).

Module.	Description.
PPC-19-☐-☐-☐☐-☐☐	Panel PC with a 19" (1280 × 1024) capacitive, multi-touch, 24-bit color, 4:3 aspect ratio monitor (10-point).

The CNC to which the PPC-19 will be connected must have the connection enabled through the remote desktop (with RDP protocol support) as well as a functional Ethernet connection with the correct parameters set. The FagorConnect application, which can be installed on the Panel PC, makes it possible to simplify the configuration of the connection between a Panel PC and the CNC.

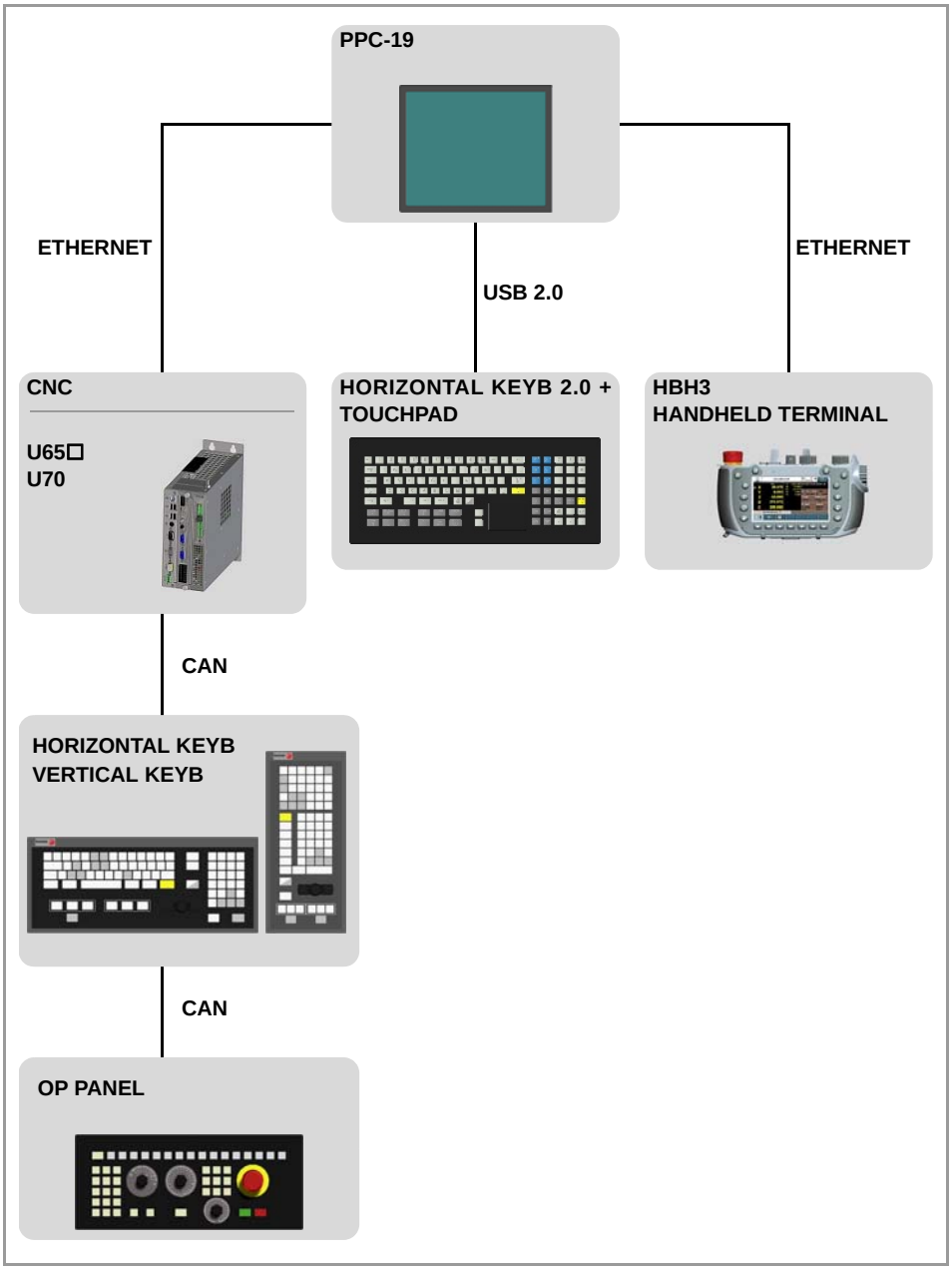


4.1 Specifications.

Type.	Description.
General.	• 19" monitor (1280 × 1024 px), capacitive multi-touch (10 points). • SO: Windows 7. • Dimensions (width x height x depth) - 480 × 400 × 60.40 mm. - 18.90" × 15.75" × 2.37". • Weight: 7.6 kg (16.75 lb)
Regulation.	• Monitor: CE, FCC Class A.
Ambient.	• Storage temperature: -40 ~ 85 °C (-40 ~ 180 °F). • Working temperature: -25 ~ 70 °C (-13 ~ 158 °F). • Relative humidity: 20 ~ 90 % RH (without condensation). • Vibration: 5 ~ 500 Hz, 1 G (CF/SDD/SD), 0.5 G (HDD) (operating). • Degree of protection: IP65 (front), IP20 (rear). IEC 60529.
Power supply.	• Supply voltage: 12 ~ 24 V DC. • Consumption (12 V DC): 23 W (minimum); 43 W (maximum). • Consumption (24 V DC): 23 W (minimum); 45 W (maximum).
LCD.	• Type: TFT-LCD. • Screen: Capacitive multi-touch (10-point). • Size: 19" (aspect ratio 4:3). • Resolution: 1280 x 1024 pixels. • Brightness: 350 cd/m². • Contrast ratio: 1000:1.
Connectivity.	• 2 RS232 / RS422 / RS485 serial lines. • 2 RJ45 LAN ports (10/100/1000 Mbps). • 3 USB 2.0 ports • 1 USB 3.0 ports • 1 DVI-I output. • 1 antenna input for WiFi/3G Solution.

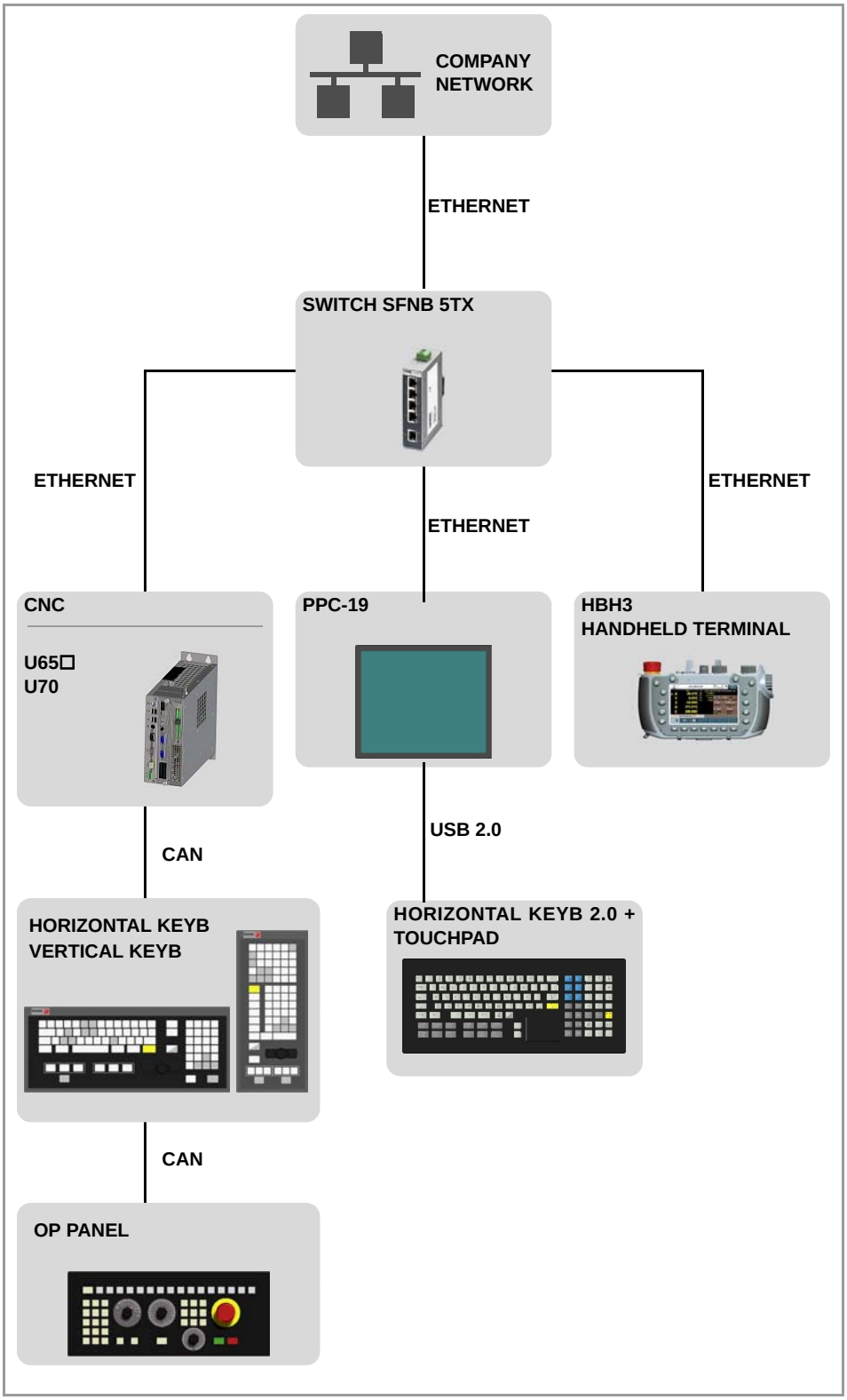
4.2 General diagram.

4.2.1 Point-to-point connection with the CNC.



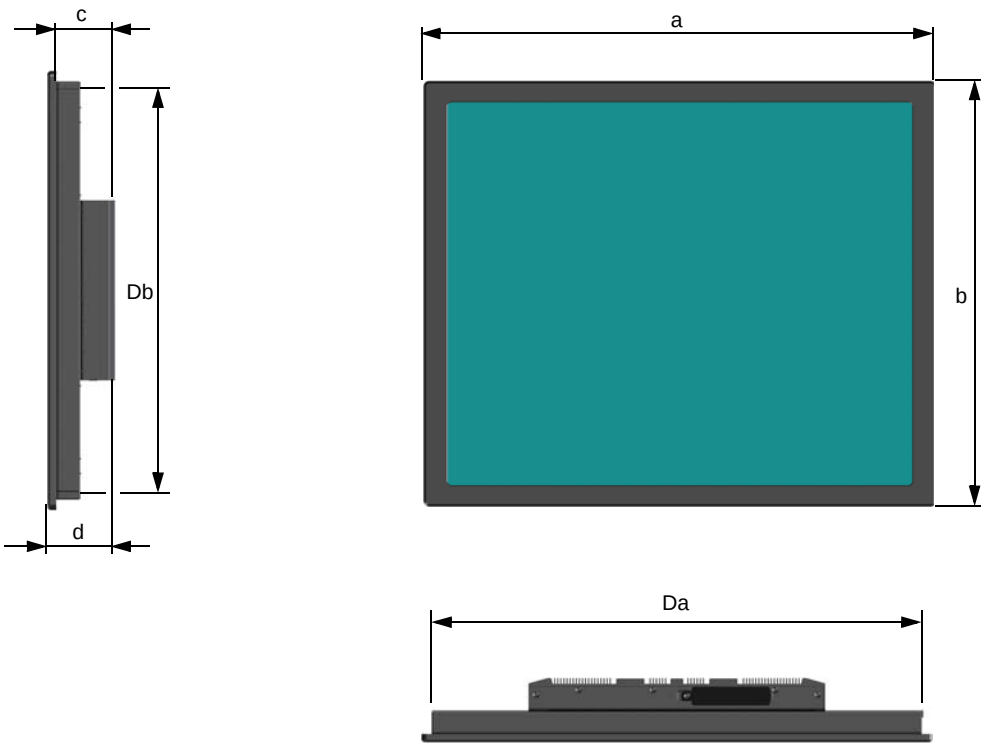
Connection.	Description.
USB 2.0	Connection of a USB keyboard to the PPC-19. Maximum length; 800 mm (2.62 feet).
Ethernet.	Connection of the PPC-19 to the CNC. Maximum length; 100 m (328 feet).
CAN	Connection of keyboards and operator panels. Maximum length of bus; 500 m (1640 ft) for CANopen bus.

4.2.2 Connecting to an Ethernet network through a switch.



Connection.	Description.
USB 2.0	Connection of a USB keyboard to the PPC-19. Maximum length; 800 mm (2.62 feet).
Ethernet.	Connecting the elements to the switch Maximum length; 100 m (328 feet).
CAN	Connection of keyboards and operator panels. Maximum length of bus; 500 m (1640 ft) for CANopen bus.

4.3 Dimensions.



	mm	inch
a	480	18.90
b	400	15.75
c	52.60	2.07
d	60.40	2.37

	mm	inch
Da	461	18.15
Db	381	15

4.4 Enclosure and mounting of the module.

4.4.1 Ambient characteristics of the enclosure.

The enclosure must ensure that the temperature inside does not exceed 55 C (131 ºF) while the device is in operating mode, with an ambient temperature of 45 ºC (113 ºF).

4.4.2 Enclosure design.

The enclosure must meet the following requirements:

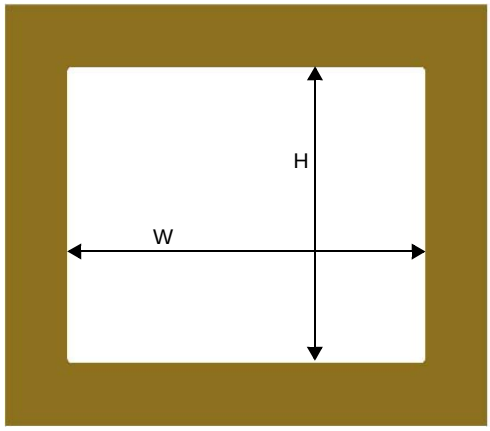
- The degree of protection of the enclosure must be IP54, according to standard IEC 60529.
- The enclosure must have enough surface area to evacuate by convection the heat generated inside.
- The enclosure must respect the minimum distances recommended between the enclosure walls and the central unit to let the air flow and improve heat dissipation.
- In the connector area, reserve a space that allows the cables to be connected, respecting their radius of curvature.
- The angle of the PPC-19, with regard to the vertical position, should not be greater than 30°.
- Keep the enclosure clean.

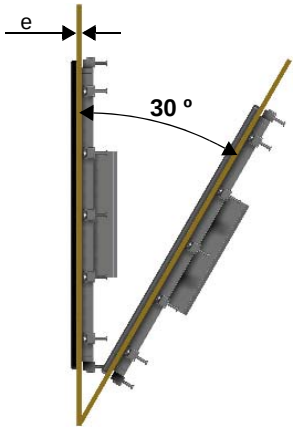
To meet the previous requirements, Fagor recommends the following.

- The enclosure must not have any ventilation holes, because they could let dust or other substances in.
- To improve heat dissipation, install an internal fan inside the enclosure for air circulation.

Before building an enclosure with glass fiber u another poor heat dissipating material, contact Fagor Automation.

Dimensions of the cut off part and the enclosure.

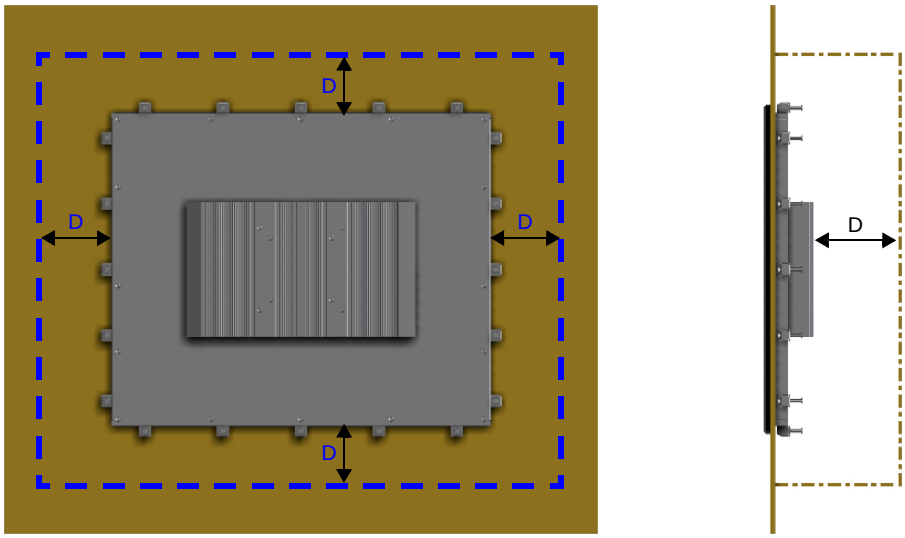




	mm	inch
W	463±1.0	18.22±0.040
H	383±1.0	15.07±0.040

	mm	inch
e	< 7.8	< 0.03

Minimum distances recommended to the enclosure walls.



	mm	inch
D (*)	50	1.97

(*) Minimum recommended distance.

Dissipated power inside the enclosure.

To calculate the total surface area the enclosure must have to dissipate the heat inside, we must consider the dissipated power for all the elements that generate heat inside the enclosure. For example, the power supply, fan, etc.

Hardware.	Dissipated power.
PPC-19	• 12 V DC: 23 W (minimum); 43 W (maximum). • 12 V DC: 23 W (minimum); 45 W (maximum).

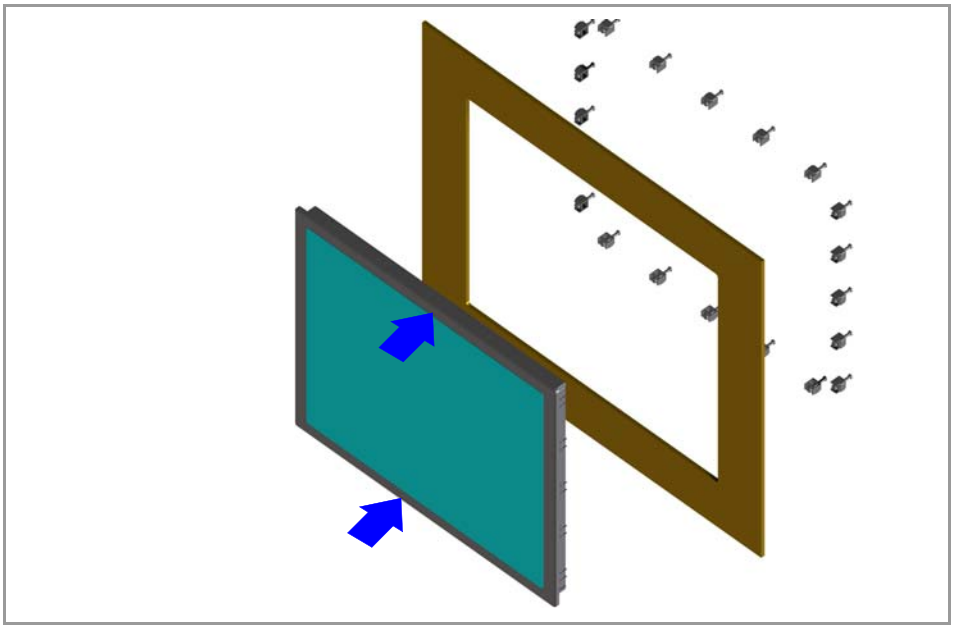
4.4.3 Securing the module.

The module must be installed in a proper enclosure that may be located on the machine or on an external support. To insert the unit into the enclosure, it must have a big enough hole to allow to insert it easily, without obstacles and without forcing the unit.

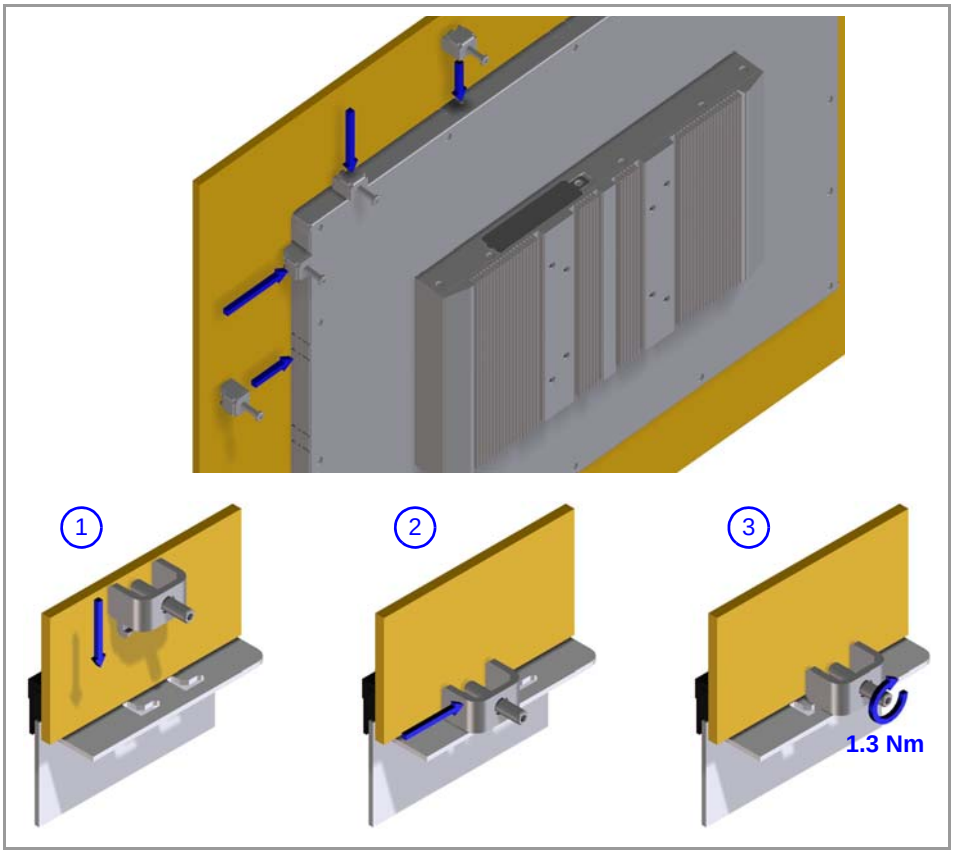
The module is mounted from inside the enclosure. Once the unit has been inserted into the enclosure, secure it from the inside with the tension jacks. To properly secure it, use all the tension jacks on the back of the unit.

Mounting the equipment.

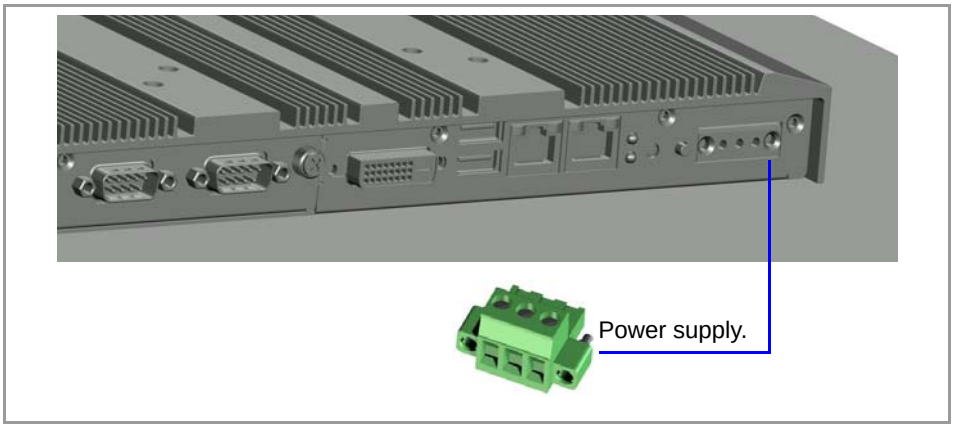
1 Installing the monitor in the enclosure.



2 Fasten the monitor on the rear, using all the fastening hooks.



4.5 Voltage supply for the module.



Monitor power: 12 ~ 24 V DC.

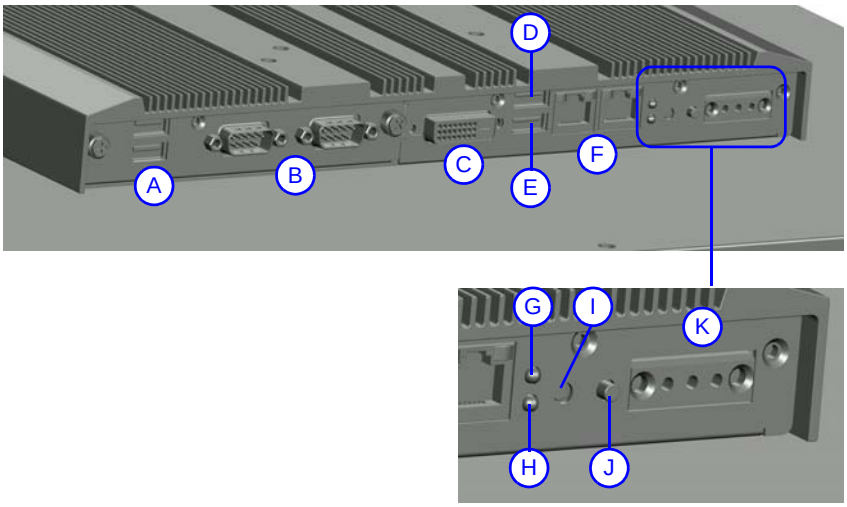
Power the monitor with a 12 ~ 24 V DC power supply.

Pin	Signal.	Function.
1	⏚	- - -.
2	V-	0 V reference signal.
3	V+	Power supply.

Consumption.

- Consumption (12 V DC): 23 W (minimum); 43 W (maximum).
- Consumption (24 V DC): 23 W (minimum); 45 W (maximum).

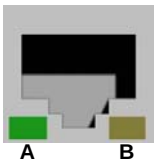
4.6 Hardware functionality. Connectors.



Connector.		Description.
A	USB 2.0	2 USB 2.0 Type-A ports.
B	RS-232/422/485	2 RS-232/422/485 serial lines.
C	DVI-D	Video signal output.
D	USB 2.0	1 USB 2.0 Type-A ports.
E	USB 3.0	1 USB 3.0 Type-A ports.
F	LAN	2 RJ45 LAN ports (10/100/1000 Mbps).
G	HDD Led	Hard drive activity LED (red LED).
H	Power Led	Power status LED (green LED)
I	Reset.	Reset button.
J	On.	Button to turn the panel PPC-19 on and off.
K	24 V DC IN	12 ~ 24 V DC electric power supply input.

·LAN· Ethernet.

2 RJ45 LAN ports (10/100/1000 Mbps).



LED.	Meaning.
A (green)	Connection LED. The LED turns on when the PPC-19 is connected to the data network.
B (yellow)	Activity LED. The LED blinks when data is being received/transferred.

·HDD Led· Hard drive activity LED.

Hard drive activity LED (red LED). The LED turns on when the hard drive is active, otherwise the LED is turned off.

·Power Led· Power status LED.

Power status LED (green LED). The LED turns on when the panel PC is powered, otherwise the LED is turned off.

·24 V DC IN· Supply input (recommended).

Option recommended by Fagor Automation to power the monitor.

Plug-in part 3-pole Phoenix-type connector (5.08 mm pitch). Rated current; 16 A.

Pin	Signal.	Function.
1	⏚	- - -.
2	11	0 V reference signal.
3	+24 V	Power supply.

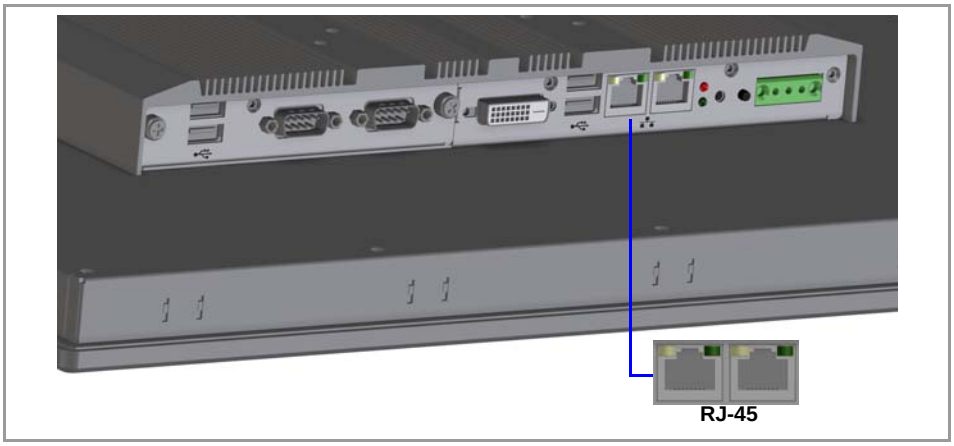
Connector data.	
Number of poles.	3.
Pitch.	5.08 mm.
Connection technique.	Screw connection.
Minimum/maximum section.	0.2 / 4 mm².
Rated current In.	16 A.

Cable data.	
Length to be stripped.	7 mm.

See *"4.5 Voltage supply for the module."* on page 81.

4.7 Connection.

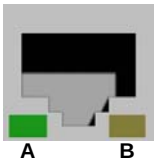
4.7.1 Ethernet (Fast Ethernet / Gigabit Ethernet).



The PPC-19 can be configured as an additional node on a local network or it may be connected point-to-point to the CNC.

Connector.

All ports have two LEDs to indicate whether the PPC-19 is connected to the network (green LED) and if data are being transmitted (yellow LED).



LED.	Meaning.
A (green)	Connection LED. The LED turns on when the PPC-19 is connected to the data network.
B (yellow)	Activity LED. The LED blinks when data is being received/transferred.

Cable characteristics.

Use a specific Ethernet cable with the following characteristics.

Characteristic.	Description.
Type.	Standard shielded ethernet 10Base-T cable (10/100 MHz connection) or 1000Base-T (1000 MHz connection). Use a crossed cable to connect for the point to point connection to the CNC.
Impedance.	10/100 MHz connection Cat.5 (100 Ω - 120 Ω) or greater. 1000 MHz connection Cat.5e (100 Ω - 120 Ω) or greater.
Maximum length.	100 meters (328 ft).

Transmission speed.

The PPC-19 permits a connection at 10 MHz, 100 MHz or 1000 MHz; by default at 10 Mhz. Use a cable having the recommended characteristics to ensure a transmission at 100 MHz or 1000 MHz. Even so, since the transmission speed depends on the configuration of the network (number of nodes, their configuration, etc.) a 100 MHz or 1000 MHz transmission might not be stable. In these cases, we recommend to lower the transmission speed.

Element connection.

In order to ensure proper performance, the connection cable must be inserted all the way into the connectors so they're latched. This ensures that the cable is properly latched and does not come off due to vibration.

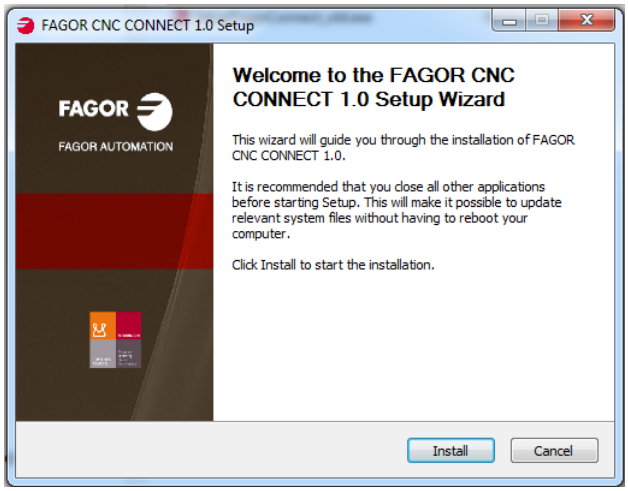
5 FAGORCONNECT APPLICATION.

The FagorConnect application makes it possible to simplify the configuration of the connection between a Panel PC and the CNC. This application can be installed on "Fagor" PC panels or on any PC that will communicate with the CNC; on the other hand, it cannot be installed on the CNC.

The CNC to which the PC panel will be connected must have the connection enabled through the remote desktop (with RDP protocol support) as well as a functional Ethernet connection with the correct parameters set. This connection is available on the 8065 and 8070 CNCs (both Basic and Power) with Windows Embedded Standard 7 OS.

5.1 Installing the application.

To install the application, execute the file: SetupFagorConnect.exe. The welcome window will appear on screen with some advice for the installation process. Press the "Install" button to start the installation and follow the instructions that appear on screen.



- To install the application on a Fagor Panel PC, it must be in administrator mode (with the disk unprotected). See *"5.4 Work modes."* on page 88.
- The application can be installed in any folder. The installation processes does not modify the register. By default, application is installed in the following folders:
  - Windows XP
    C:\Program files\Fagor Automation\FagorConnect.
  - Windows 7 (64 bits)
    C:\Program files (x86)\Fagor Automation\FagorConnect.
- The installation process creates a shortcut to the application in the Windows "Startup" menu, so that the application starts up automatically when the Panel PC is turned on.
- It is not necessary to restart the Panel PC after the installation.
- The application is only available in English.

5.2 The FagorConnect application.

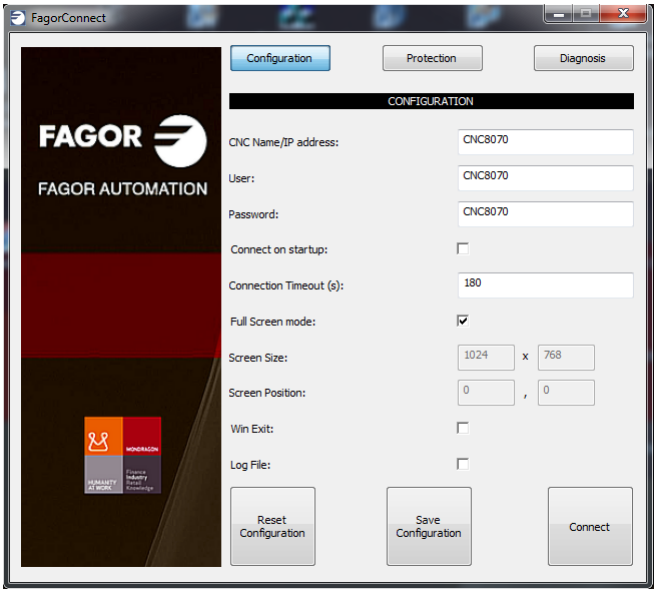
The main objective of the application is to connect the Panel PC to the CNC through the remote Desktop as soon as the application starts and in a way that is transparent to the user. After establishing the connection, the Panel PC will display the same information as the CNC, so that the user can work with the Panel PC just as if it were a screen connected to the CNC.

Once the application parameters have been configured and saved, it is not necessary to enter any additional information or take any other action. The application will display the message "Connecting..." while it tries to connect to the CNC (via TCP/IP). The dwell time and the IP address of the CNC are defined in the FagorConnect.ini configuration file and can be modified from the application.

- After the dwell time, if the application has not been able to establish the connection to the CNC, it will display the error message: "Connection could not be established." After pressing the "OK" button, the main application screen appears.
- If the application establishes the connection with the CNC, it will launch the remote desktop application and will send the following parameters:
  - Name or IP address of the CNC.
  - Username and password of the CNC.
  - The option to share Panel PC memory devices with the CNC (including USBs).
  - Size of the remote Desktop window.

5.3 Configure the application.

The "Configuration" button at the top shows the window to configure the connection to the CNC.



When the application starts, it displays the current configuration saved in the FagorConnect.ini file. The configuration is saved in this file when the "Save Configuration" or "Connect" buttons are pressed; it is not saved automatically when the application is closed. The FagorConnect.ini file is saved between shutdowns, regardless of the Panel PC mode (user mode or administrator mode).

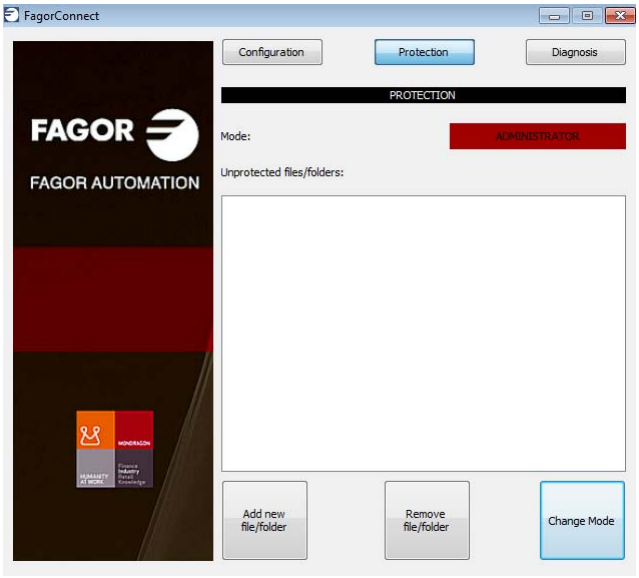
The "Reset Configuration" button resets the default values of the parameters. The application will request confirmation to perform this action.

Main window parameters:

Parameter.	**Meaning.**
CNC Name / IP address.	Name or IP address of the CNC to which you wish to connect the Panel PC. By default, it is CNC8070.
User.	Username for connection to the CNC. By default, it is CNC8070.
Password.	Password to validate the connection to the CNC. By default, it is CNC8070.
Connect On Startup.	Establish the connection to the CNC when starting FagorConnect. By default; No.
Timeout.	Maximum time to attempt to establish the connection with the CNC. By default; 180 seconds.
Full Screen.	Open the Remote Desktop application in full screen mode. By default; Yes.
Screen Size.	Size of the Remote Desktop window (only when the Full Screen parameter is set to "No"). The maximum and minimum values are 1920×1080 and 1024×768. By default: 1024×768 pixels.
Screen Position.	Position of the Remote Desktop window (only when the Full Screen parameter is set to "No"). By default: 0.0 pixels.
Win Exit	Not used.
Log file	Not used.

5.4 Work modes.

The "Protection" button at the top shows the window to select the operating mode of the Panel PC (user mode or administrator mode). These operating modes are not available when the FagorConnect application is installed on a PC.



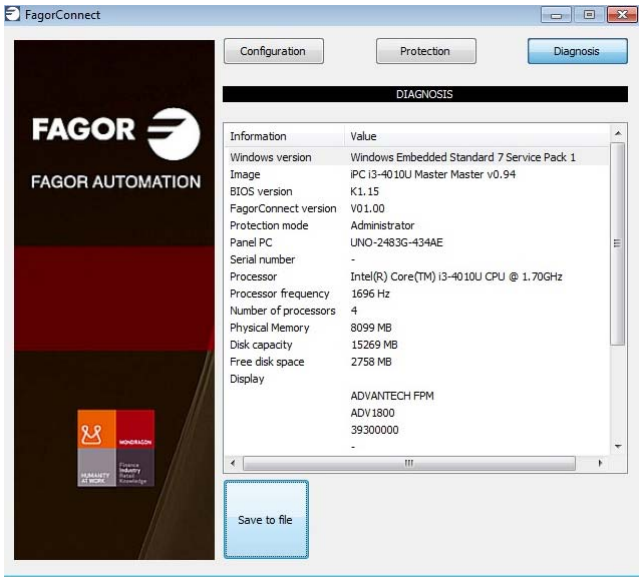
The Panel PC can be in User mode or Administrator mode. To change the operating mode, press the "Change Mode" button. The application will request confirmation to change the operating mode, which will require you to log out of the Remote Desktop and restart the Panel PC.

- In administrator mode, the entire hard drive is unprotected; the user can perform any operation, such as install a version of FagorConnect, install third-party applications, configure TCP/IP parameters, etc.
- In user mode, the entire hard drive is write protected, except for the following files and folders.
  - $Recycler.bin
    Recycling bin.
  - C:\Public
    Network shared folder.
  - C:\Program Files (x86)\Fagor Automation\FagorConnect\FagorConnect.ini
    Configuration file for the FagorConnect application.
  - C:\Program Files (x86)\Fagor Automation\FagorConnect\FagorConnect.rdp
    Configuration file for the remote desktop connection.

In administrator mode, the buttons "Add new file/folder" and "Remove file/folder" allow you to add and remove files/folders in the protected files/folders list. The user mode does not allow you to change the list of protected files/folders. The three files and folders indicated above cannot be deleted from the list.

5.5 Diagnosis.

The "Diagnosis" button at the top shows information about the Panel PC itself.



The "Save to file" button allows you to save the information in a file.

5.6 Accessing Panel PC resources from the CNC.

The Panel PC is configured to export its resources so that the CNC can see your hard drive and any possible pen drives that are connected. In order for programs from any of these storage devices to be quickly executed, it is necessary to configure them from the CNC as network units. This operation is completed from the Windows file explorer on the CNC.

File explorer > Tools > Map network drive

5.

FAGORCONNECT APPLICATION.

FAGOR AUTOMATION

CNC 8070

(REF: 1709)

User notes:

User notes:

User notes:

FAGOR

FAGOR AUTOMATION

Fagor Automation S. Coop.
Bº San Andrés, 19 - Apdo. 144
E-20500 Arrasate-Mondragón, Spain
Tel: +34 943 719 200
+34 943 039 800
Fax: +34 943 791 712
E-mail: info@fagorautomation.es
www.fagorautomation.com