PANEL PC
PC100 Series
Operation Manual



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Package the unit in its original packaging container or, if unavailable, any suitable rigid container. If a substitute container is used, surround the unit with shock absorbing material; damage in shipment is not covered by the warranty. Include a letter with the unit describing the difficulty and designating a contact person. Send to the following address:

Maple Systems, Inc.
808 134th Street SW, Suite 120
Everett, WA 98204

Only Products that have been issued a Return Material Authorization (RMA) number from Maple Systems may be returned. All RMAs must be accompanied with a written purchase order for tracking purposes or, in the case of out-of-warranty repairs, for repair charges on a time and material basis.

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If noncompliance is verified and is not due to customer abuse or the other exceptions described with product warranty, Maple Systems will, at its option, repair or replace the Product returned to it, freight prepaid, which fail to comply with the foregoing warranty, provided Maple Systems is notified of such noncompliance within the one-year warranty period.

APPLICATIONS ASSISTANCE

This manual is designed to provide the necessary information for trouble-free installation and operation of your new Panel PC; however, if you need assistance, please call Maple Systems at 425-745-3229 or visit our web site at www.maplesystems.com

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Introduction - Welcome

Welcome to the Maple Systems' PC100 Series of Panel PCs. This powerful family of touchscreen Panel PCs can be configured with any Windows XP/2000-compatible HMI software, such as WebStudio, to connect to programmable logic controllers (PLCs) and motion controllers, providing the human-machine interface in industrial applications. This manual explains the installation and operation of the PC100 Series.

About Your Documentation

Conventions

In most cases, we will describe each method when the task is first discussed. The menu method is then used whenever the task is used in later procedures. Other conventions used in this book are listed in the following table.

Convention	Meaning
Bold	Characters that you must type exactly as they appear. For example, if you are directed to type **a:\setup**, you should type all the bold characters exactly as they are printed.
Italic	Placeholders for information you must provide. For example, if you are directed to type *filename*, you should type the actual name for a file instead of the word shown in italic type. Italics are also used to indicate a glossary term.
ALL CAPITALS	Directory names, file names, key names, and acronyms
KEY1+KEY2	A plus sign (+) between key names means to press and hold down the first key while you press the second key.
click	When referring to the touch screen, click means to tap icon onscreen once with either a finger or stylus. When referring to a computer with a mouse, click refers to clicking the left mouse button once.
Double-click	When referring to the touchscreen, this refers to quickly tapping an onscreen icon twice in rapid succession with either a finger or a styles. When discussing a computer with a mouse, refers to quickly clicking the primary mouse button (usually the left mouse button) twice.
Right-click	Refers to clicking the secondary mouse button (usually the right mouse button) once. Right-clicking usually opens shortcut menus.

The following terminology will be used when referring to computers and PCs:

Term	Meaning
Panel PC	Refers to the PC100 Series Panel PC
computer or PC	Refers to a desktop PC - not the PC100 Series Panel PC

The following table identifies symbols and margin icons.

Icon	Meaning
	Identifies a procedure.
	Indicates a reference to additional information.
	Indicates an important note.

What is a PC100 Series Panel PC?

The PC100 Series Panel PC is a fully functional computer that is built to withstand the harsh conditions found in industrial environments. Preloaded with Microsoft Windows XP the PC100 Series Panel PC can be configured for industrial automation using most XP-compatible operator interface or SCADA software, such as the industrial automation software, WebStudio.

PC100 Series models come with a variety of standard features. Advantages of the PC100 Series Panel PCs include:

- **Extremely rugged components:** The electrogalvanized steel chassis with aluminum bezel and fully sealed front panel allow PC100 Series Panel PCs to be placed in harsh industrial environments where heat, dust, water, steam and corrosive chemicals exist.
- **All-in-one platform:** The CPU, DRAM and even Windows XP are integrated. The PC100 Series Panel PC is a plug-and-play machine.
- **EMI protection:** The PC100 Series is CE-rated.
- **Excellent display characteristics:** Displays have high-brightness, high-contrast and high-resolution TFT displays with wide viewing angles, 16 million colors, and touchscreens.
- **Powerful communications capability:** The PC100 Series provides serial ports, Ethernet port, USB ports and audio input/output. Compact flash is also available.
- **Windows XP Support:** The PC100 Series offers platform support for Windows XP Professional. The Windows XP operating system allows the user to develop application software or use a number of available third-party applications.

There are currently two standard models in the PC100 Series:

Model	Display Size	Resolution	LCD Type	Brightness (cdm^2)	Touchscreen	Ethernet	USB
PC110C/CF	10.4"	800x600	16 M color SVGA TFT	250	Yes	Yes	Yes

Windows XP Basics

PC100 Series Panel PCs come preloaded with Windows XP Professional. Windows XP Professional is a real-time operating system for use in business and industrial PCs. With a complete operating system and features including support for Windows Server domains and dual processors, Windows XP is a stable and fast graphical user interface operating system that provides the security and reliability needed in business settings. Some basic benefits of Windows XP Professional include:

- Secure networking
- Enhanced real-time processing
- High-speed performance
- Multimedia and Web browsing capabilities
- Connectivity with PCs, Servers, PLCs, and other devices

List of Features

The PC100 Series comes in a variety of configurations, and has a whole host of features that make it the ideal open-platform Panel PC for every application:

- Two Ethernet ports for networking or Internet
- USB Ports
- Serial ports for RS232, RS422 or RS485
- Built-in 512 MB RAM
- 80 GB Hard Disk Space
- Intel® Celeron® M processor
- High-brightness, high-contrast touchscreens
- CompactFlash™ port
- Audio in/out
- Preloaded with Windows XP
- Anodized aluminum enclosure with electrogalvanized steel chassis
- Sealed front panels

Chapter 1 - Installation Instructions

Before You Begin

Please read the following for proper handling of your new Panel PC.

Unpacking the Unit

Carefully unpack the Panel PC. Please read any instructions or cautions that appear on the shipping container. Check all material in the container against the enclosed packing list. Maple Systems, Inc. will not accept responsibility for shortages against the packing list unless notified within 30 days. The equipment and its accessories were inspected and tested by Maple Systems before shipment; all of the equipment should be in good working order. Examine the equipment carefully; if any shipping damage is evident, notify the carrier immediately. You are responsible for claim negotiations with the carrier. Save the shipping container and packing material in case the equipment needs to be stored, returned to Maple Systems, or transported for any reason.

Managing Electrostatic Discharge

It is best NOT to remove the rear enclosure of the Panel PC. When the rear part of the enclosure is removed, the circuitry inside is exposed to possible damage by electrostatic discharge during handling. Minimize the possibility of electrostatic discharge by:

- Discharging personal static by grounding yourself prior to handling the computer
- Handling the computer at a static-free grounded workstation
- Connecting the frame ground (⏚) connector of the computer to a clean earth ground
- Placing the computer in an anti-static bag during transport

CE Compliance

The PC100 Series Panel PCs have been tested to conform to European CE requirements per Council Directive 89/336/EEC. The European Union created these requirements to ensure conformity among products traded in those countries. Specifically, the PC100 Series Panel PCs meet or exceed the noise emissions and immunity requirements as set forth in the EN50081 (Emissions) and EN50082 (Immunity) standards. These products are designed to withstand electrical noise in harsh industrial environments. They also conform to requirements that limit electrical emissions; however, this does not guarantee that the products will be totally immune from possible malfunction in cases where severe electrical noise occurs. Therefore, we strongly recommend that you follow the guidelines outlined in this chapter for proper wire routing and grounding to insure the proper operation of the PC100 Series Panel PC.

NEMA Rating

The PC100 Series Panel PCs are rated for NEMA 4 (indoor). This means that when the Panel PC is properly mounted to a panel or other enclosure, the front enclosure of the Panel PC will provide protection to the inside of the panel from splashing water, windblown dust, or hose-directed water. The Panel PC must be installed according to the instructions in this chapter to be properly sealed.

FCC Class A Rating

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with this user's manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Environmental Considerations

The PC100 Series is designed to operate in temperatures from 0-40° C. It is intended for indoor installations and not designed for outdoor applications. Avoid installing the PC100 Series in environments with severe mechanical vibration or shocks. Do not install the computer in enclosures with rapid temperature variations or high humidity. Either will cause condensation of water inside the device and eventual damage to the computer.

Safety Precautions

Please observe the following precautions when installing the PC100 Series Panel PCs. Failure to comply with these restrictions could result in loss of life, serious personal injury, or equipment damage.

	**Warning:** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to manufacturer instructions.
	**Warning:** Some of the internal parts of the system may have high electrical voltage. We strongly recommend that qualified engineers open and/or disassemble the unit.
	**Warning:** Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
	**Warning:** Keep this equipment away from humidity.
	**Warning:** The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
	**Warning:** Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
	**Warning:** Position the power cord so that people cannot step on it. Do not place anything over the power cord.

	**Warning:** If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
	**Warning:** Never pour any liquid into an opening. This could cause fire or electrical shock.
	**Warning:** Never open the equipment. For safety reasons, the equipment should be opened only by a qualified service technician.
	**Warning:** If any of the following situations arise, get the equipment checked by qualified service personnel • The power cord or plug is damaged • Liquid has penetrated into the equipment. • The equipment has been exposed to moisture. • The equipment does not work well, or you cannot get it to work according to the installation reference guide. • The equipment has been dropped and damaged. • The equipment has obvious signs of breakage.
	DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW - 20°C (-4° F) OR ABOVE 60°C (140° F). IT MAY DAMAGE THE EQUIPMENT.

In addition, please observe all of the following safety precautions:

Read these instructions carefully.

- Keep this manual for later reference.
- For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- All cautions and warnings on the equipment should be noted

Control Panel Grounding

The control panel should be connected to a good, high-integrity earth ground both for safety considerations and shielding purposes. Maple Systems cannot overemphasize the importance of good grounding. If you fail to use good grounding procedures during installation, sporadic malfunction of the computer may occur:

- Connect the Panel PC's chassis ground terminal to a reliable earth ground with a low-resistance path.
- Route all earth ground wires that lead from the Panel PC, the PLC, the power supply, and the line filter to a central earth ground point such as a barrier strip. This will ensure that no ground current from one device influences the operation of the other devices.
- Connect the Panel PC chassis ground terminal to the control panel door using a heavy-gauge short braided cable or ground wire to minimize resistance.
- Connect the power cable's shield wire to the Panel PC's chassis ground terminal.
- Connect the control panel to earth ground using a copper grounding rod close to the Panel PC and control panel.

Hinged doors on control panels do not provide a long-term electrical connection to the rest of the enclosure. Corrosion develops over time and prevents good electrical contract. For this reason, a separate wire braid should be installed from the hinged control panel to the rest of the enclosure.

For a more in-depth overview of ground wiring techniques, refer to technical note #1027, "OIT Ground Wiring and Electrical Noise Reduction," which you can find in the Support Center under Technical Notes on our website.

Connect Panel PC Chassis Ground to Control Panel

To reduce the possibility of electrical interference, connect the chassis ground terminal of the Panel PC to a clean earth ground. If the control panel is metal, make sure it is properly grounded. Then connect a *short* heavy-gauge wire (#18 AWG) from the chassis ground terminal of the computer to a mounting bolt on the control panel door. The mounting bolt must have good electrical contact to the control panel; scrape away any paint that may be covering the panel to provide a good connection.

If the control panel is made of a non-conductive material, it is essential that you connect the chassis ground terminal of the Panel PC to a clean earth ground point located close to the panel.

Power Supply Selection

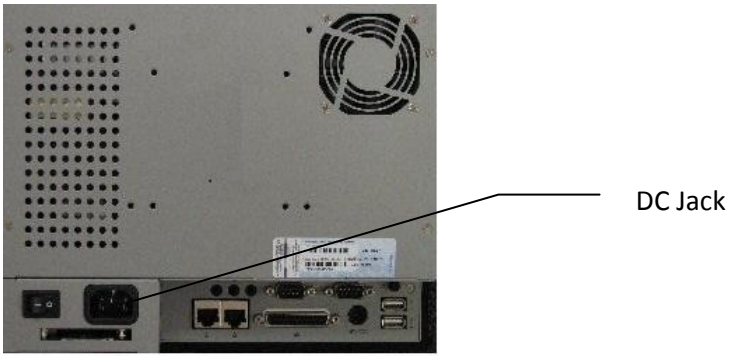
The power supply used to power the Panel PC has the following requirements:

- 80 Watt DC 24V power supply adapter

The power cable for the Panel PC should be 18AWG, 2-conductor wire with a shield drain wire and protective shield (foil or braid). The shield drain wire must be connected to earth ground at both ends of the cable. Please refer to the "Connect the Panel PC to Power" section for more information.

A power line filter installed at the AC input to the Panel PC power supply is highly recommended as a safeguard against conducted RF noise, which is often present on factory power lines. The wires connecting the output of the power line filter to the power supply should be kept as short as possible to minimize any additional noise pickup. The case of the power line filter should be connected to a quiet earth ground. The power line filter should have a current rating of at least 3 Amps with common mode and differential mode attenuation.

Do not use the power supply used to provide power to the computer to power switching relays, solenoids, or other active devices.



Cable Routing and Noise Immunity

Follow these guidelines when routing cable to the Panel PC:

- Always route the computer communication cable and the power cable away from any AC voltage or rapidly switching DC control lines.
- Never bundle the computer cables together with 120VAC power wires or with relay wiring.
- Try to keep at least 8 inches (20 cm) of separation between the Panel PC cables and other power wiring. If voltages greater than 120VAC are used in the system, greater separation is required.
- If the Panel PC cables must come near AC wiring, make sure they cross at 90 degrees.
- Run AC power wires in a separate grounded conduit to reduce electrical noise interference.
- Keep the cable lengths for the computer as short as possible. Do not coil excess cable and place it next to
- AC powered equipment.
- Cover any equipment used in the enclosure that operates at high frequency or high current levels with a grounded metal shield.

Installation

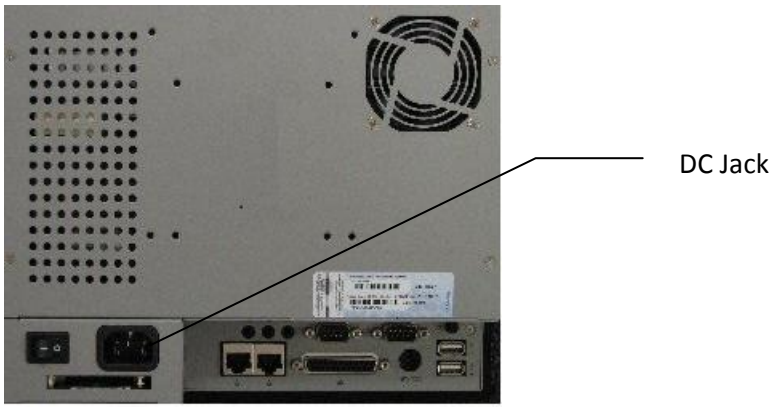
It is necessary to follow all installation procedures described in this chapter for electrical noise immunity and CE compliance.

Your Maple Systems Panel PC is designed to connect easily to your PLC. External rear connectors provide quick connections for power, communications and programming wiring.

There are two serial port connections on the rear of the touchscreen computer. COM1 is fixed for RS-232, while COM2 is selectable for RS-232, RS-422, RS-485.

Connect the Panel PC to Power

The PC110C has a DC jack for connection of a DC power adapter.



Panel Preparation

A metal panel or mounting surface with a minimum thickness of 15 gauge (0.059 inch/3.3 mm) if cold-rolled steel or hardened steel, or 10 gauge (0.101 inch/2.6 mm) if aluminum alloy (6061-T6 preferred) is required. Thinner panels or surfaces may bow between the mounting clamps and not form a seal with the gasket.

The area of the panel or mounting surface where the gasket comes into contact must be flat and free of scratches, pits, and other features that prevent the gasket from sealing properly. If the panel or mounting surface is not uniform, thick, flat, stiff, or smooth enough, then a sealant such as silicone may be required.

WARNING
The touchscreen computer requires a stiff, flat, smooth mounting surface free of blemishes to seal properly to NEMA 4.

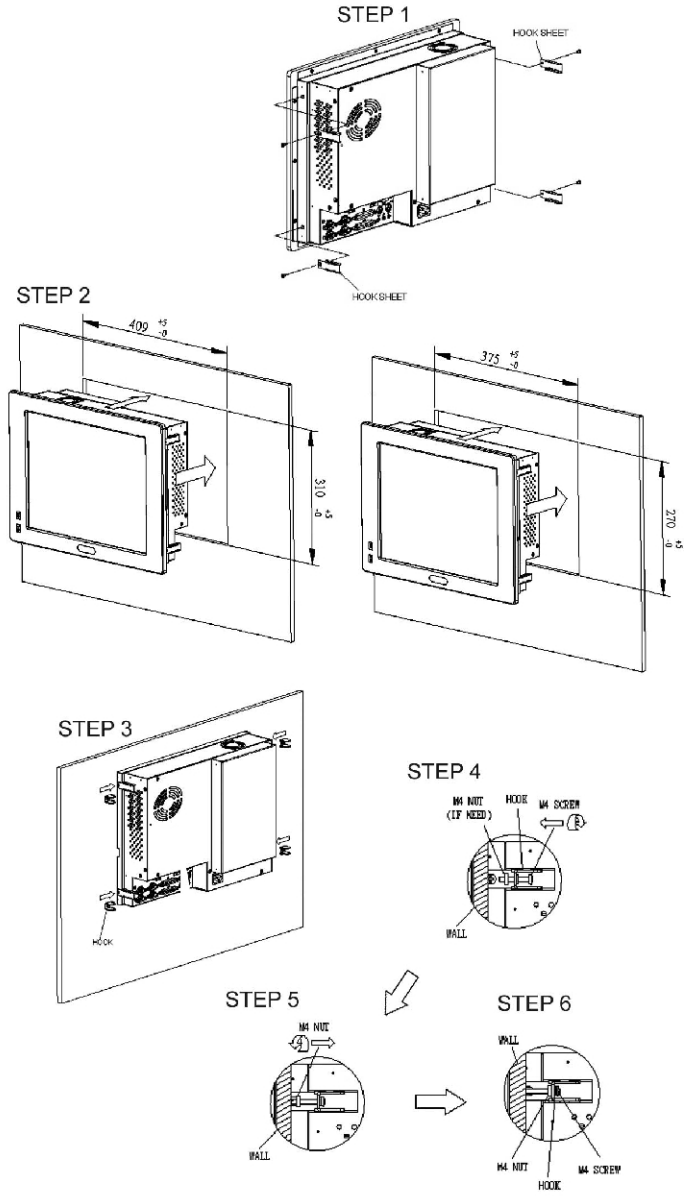
Clean and deburr the panel cutout before the touchscreen computer is installed.

Mount the Panel PC to the Panel

The PC100 Series Panel PC can be mounted flush to the panel.

Panel/Wall Mounting Instructions

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Step 1: Lock the Hook Sheet.
Step 2: Place the Panel PC in the hole.
Step 3: Put the hooks on the hook sheet.
Step 4: Lock the hooks by M4 screws and M4 nuts.
Step 5: Rotate the M4 screws to tight on the wall.
Step 6: Reverse the M4 nuts to tighten.



CAUTION: Do not over-tighten the screws beyond snugness, or you may damage the housing.



REINSTALLATION: Because the gasket will take a "set" to the panel, be sure to reinstall the touchscreen computer to the same panel cutout when a NEMA 4 seal is required. For best results, also replace the gasket itself.

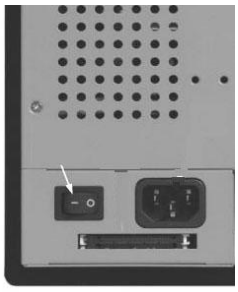
Chapter 2 - System Features

Enclosure

On/Off Switch

Each PC100 Series Panel PC ON/OFF switch is a toggle located on the unit. Locations for each unit are pictured below. On the toggle switch, - indicates ON and O indicates OFF.

PC110C



Microprocessor and Memory

Standard models of the PC100 Series Panel PCs come with the following microprocessors.

Model	Microprocessor
PC110C	Intel® Celeron ® M 1.5 GHz
PC110CF	Intel® Celeron ® M ULV 1.0 GHz

Hard Drive

All PC100 Series Panel PC standard models have 80 Gigabyte hard drives.

Display and Touchscreen

All PC100 Series Panel PCs come with touchscreen displays as standard equipment. Other display specifications follow:

Model	Type	Colors	Resolution	Brightness	Viewing Angle (T/B/L/R)
PC110C/CF	SVGA TFT LCD	16 M colors	800 x 600	250 cd/m^2	65°/65°/55°/55°

All displays have brightness control, which can be adjusted by means of a brightness control potentiometer on the back of the panel.

Keyboard Input

A keyboard can be plugged into one of the PC100 Series Panel PC's keyboard/mouse ports, or USB keyboard and mouse may be plugged into a USB Port. Additionally, Windows XP Professional allows for use of a soft keyboard that can be displayed on the touchscreen display.

Soft Keyboard

If you choose to use the soft keyboard, there is a soft keyboard utility available through Windows XP.

To access the soft keyboard…

1. From Windows, select Start-All Programs-Accessories-Accessibility-On screen keyboard.



2. The soft keyboard appears onscreen. Use either a mouse or the touchscreen to use the keyboard.



LEDs

Two status LEDs are on the front bezel of the PC100 Series Panel PCs. On the PC110C, the status LED is located along the bottom of the bezel. The PC110C also has an additional status LED that indicates Ethernet status.



Hard Drive LED 

The hard drive LED blinks when the hard drive is in use, indicating that memory on the hard drive is being accessed.

Power LED 

The Power LED lights when the Panel PC is powered on.

Mouse Input

Navigation on the PC100 Series Panel PC can be accomplished either via the touchscreen or via attachment of a mouse. Two options are available for attaching a mouse - by either using the mouse port or attaching a USB mouse. Any Windows-compatible mouse device can be plugged into one of the Panel PC's keyboard/mouse ports, or a USB mouse can be plugged into one of the Panel PC's USB ports. Because PC100 Series Panel PCs are pre-loaded with Windows XP, most mouse devices are plug and play.

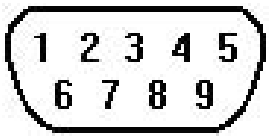
Serial Ports

The PC110C has two DE9 connectors for serial devices. COM1 is fixed for RS-232. COM2 is selectable for RS232/422/485. The pinouts for each port are below.

Restrict cable length to less than 500 feet (150m) for RS422/RS485 devices and less than 50 feet (15m) for RS232 devices in order to avoid communication problems.

COM1 [RS232*]*

Pinout



Pin #	Symbol	Function
1	DCD	Data Carrier Detect
2	RxD	Received Data
3	TxD	Transmitted Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Ready to send output
8	CTS	Clear to send
9	Not Used	

COM2 [RS232/422/485]

Pinout



Pin #	RS232	RS422	RS485
1	DCD	Tx-	Tx-
2	RxD	Tx+	Tx+
3	TxD	Rx+	Rx+
4	DTR	Rx-	Rx-
5	GND	GND	GND
6	DSR	RTS-	Not used
7	RTS	RTS+	Not used
8	CTS	CTS+	Not used
9	Not Used	Not used	Not used

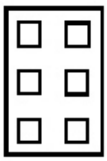
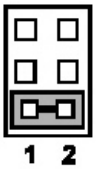
Configuring for RS232, RS422 or RS485

COM2 is configurable as RS232, RS422 or RS485 by configuring jumpers. To do this, jumper pins must be configured at JP3 for the PC110C.

Configuring Jumpers

Jumpers consist of two or three metal pins with a plastic base mounted on the card. Using a jumper cap, it is possible to connect the pins. Hardware is set up by opening or closing jumper pins.

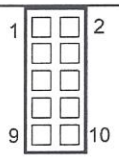
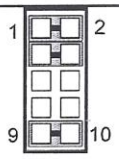
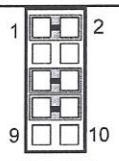
Jumper	Definition	Representation in Diagram
	2 pin jumper	
	3 pin jumper	

Jumper	Definition	Representation in Diagram
	jumper block	
	jumper cap	
	2 pin jumper closed (enabled)	
	3 pin jumper 2-3 pin closed (enabled)	
	Jumper Block 1-2 pin closed (enabled)	

Setting COM2 jumpers on PC110C for RS232, RS422 or RS485

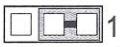
JP12 : RS-232/422/485 (COM2) Selection
COM2 is selectable for RS-232, 422, 485 function.

The jumper settings are as follows :

SELECTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
RS-232 (default)	Open	 JP12
RS-422	1-2, 3-4, 9-10	 JP12
RS-485	1-2, 5-6, 7-8	 JP12

JP15 : RS-232/422/485 (COM2) Selection
COM2 is selectable for RS-232, 422, 485 function.

The jumper settings are as follows :

SELECTION	JUMPER SETTING (pin closed)	JUMPER ILLUSTRATION
Auto 485 (default)	1-2	 JP15
No Auto 485	2-3	 JP15

Ethernet Port

Two 10/100/1000 Mbps Ethernet ports are available for connection to a network, switch or router, allowing high speed networking communications options.

USB Ports

All PC100 Series Panel PCs have USB ports for connection of USB devices, including USB mouse, keyboard, printer, video and other devices with a USB connector. The PC110 has two USB 2.0 host ports.

Parallel Printer Port

Any Windows XP-compatible printer may be attached via the parallel printer port. It may be necessary to download drivers for printers. Check your printer manufacturer's instruction.

Compact Flash Port

The PC110C has built-in Type II CompactFlash™ port for use with a CompactFlash card.

Audio Ports

It is possible to record and play audio files on all PC100 Series Panel PCs with the audio ports.

Mic In

Record Windows XP compatible sound files by attaching a microphone to the Mic In audio port, available on all PC100 Series models.

Line In

Audio Line In is available for attachment of compatible sound-playing devices such as CD and MP3 players.

Line Out

Play Windows-compatible sound files by attaching speakers to Line-Out audio ports, available on all models.



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