

PARKER PAC TERMINAL

User Manual



Effective: April 2015

Document Number: 88-026690-01, Revision A

© 2015 Parker Hannifin Corporation
All Rights Reserved



Trademark Information

CoDeSys® is a registered trademark of 3S-Smart Software Solutions GmbH.

Windows® is a registered trademark of Microsoft® Corporation.

SD is a trademark or registered trademark of SD-3C, LLC in the United States, other countries or both.

Acronis® is a registered trademark of Acronis International GmbH.

Important User Information

Please read and follow all safety information for the Parker PAC Terminal, including the warning and caution statements in this guide, before installing or operating the system.

Safety Information



WARNING: The PAC Terminal is used to control electrical and mechanical components of motion control systems in industrial environments. To avoid serious injury or damage to equipment, test the motion system for safety under all potential conditions.



WARNING: The PAC Terminal is not fault-tolerant and is not designed or intended for any use in any systems, machines, or applications where failure or fault of any kind of the Products could reasonably be seen to lead to death or serious bodily injury of any person, or to severe physical or environmental damage (“High Risk Use”). You are not permitted to use, distribute, or sublicense the use of these Products in High Risk Use. High Risk Use is STRICTLY PROHIBITED.



WARNING: The PAC Terminal contains no user-serviceable parts. To avoid personal injury or damage to the product, do not attempt to open the case or to replace any internal components.



WARNING: USER RESPONSIBILITY- Failure or improper selection or improper use of the products described herein or related items can cause death, personal injury and property damage.

CONTENTS

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

CE Statement of Compliance



Product Type: PAC Terminal

The PAC Terminal complies with the protection requirements set up by the European Community (EC) Electromagnetic Compatibility (EMC) Directive 2004/108/EC as defined by the Product Specific Standard EN55022 and EN55024, which includes both emissions and immunity requirements and the power line emissions standards EN/IEC 61000-3-2, Limits for Harmonic Current Emissions and EN/IEC 61000-3-3, Limits of Voltage Fluctuations and Flicker in Low Voltage designated for Equipment used in Industrial Locations. In addition, compliance of the PAC Terminal is demonstrated by the application of the following standard:

- 2006/95/EC Low Voltage Directive when installed, operated, and maintained as intended
- 2004/108/EC Electromagnetic Compatibility when installed, operated, and maintained as intended
- IC ICES-003 FCC Part 15 Class A

Contents

Trademark Information.....	2
Important User Information.....	3
CE Statement of Compliance.....	5
Contents.....	6
About This Guide.....	8
CHAPTER 1: Product Overview.....	9
Brief Description.....	10
Features Overview.....	10
External Ports.....	11
LAN1/LAN2 Ports.....	11
USB0/USB1 Ports.....	12
Audio Port.....	12
Serial Ports COM1/COM2.....	12
SD Card.....	12
Solid State Drive.....	12
External Power Switch Connector.....	13
CHAPTER 2: Installation.....	15
Checking the Shipment.....	16
Installation Guidelines.....	17
Installation.....	20
Attaching Cables.....	22
CHAPTER 3: Software.....	25
Configuring the PAC Terminal Software.....	26
Enter Full Screen Mode.....	26
Exit Full Screen Mode.....	26
Change PAC Target IP Address.....	27
Network Settings.....	27
Set Computer Name.....	27
Calibrate Touchscreen.....	28
Restart System.....	28
Shutdown System.....	28
PAC Terminal Software – other features.....	29
Pop Up Keyboard.....	29
Desktop ICONS.....	29
CHAPTER 5: Troubleshooting.....	31
Troubleshooting Overview.....	32
LED Power Indicator.....	32
Ethernet Connection.....	32
Solid State Drive (SSD).....	34

F11 Disk Image Recovery Procedure.....	34
How to obtain Technical Assistance from Parker Hannifin.....	35
APPENDIX A: PAC Terminal Specifications	36
Environmental Specifications	37
Electrical Specifications.....	37
Agency Approvals	38
Physical Specifications.....	39

About This Guide

This installation guide is intended for those who are responsible for installing, configuring, and troubleshooting programmable logic devices and their associated software and accessories.

NOTE: Stay up-to-date with the latest version of this User Manual by downloading the most current copy from the web at <http://www.parkermotion.com/PACTerminal>.

Assumptions of Technical Experience

Parker Hannifin Corporation assumes you are qualified in the servicing of industrial control systems, and trained in recognizing hazards in products with hazardous energy levels. To install and troubleshoot the PAC Terminal, you should have a fundamental understanding of the following:

- Electronic concepts such as voltage, current, and switches
- Grounding techniques, wiring, and separation of data conductors and power
- Networking and data communications

Product Naming

This guide describes the following products:

- **Parker PAC Terminal:** This product is also described in this manual as the PAC Terminal

Notes, Cautions, and Warnings

This guide uses warnings, cautions, and notes throughout the text to draw your attention to information that is especially important or useful.



WARNING: A warning provides information about a potential for property damage, personal injury, or death.



CAUTION: A caution provides information intended to help prevent malfunction of the product or damage to the product hardware or software.

NOTE: A note provides information intended to help you make the best use of your product from Parker Hannifin Corporation.

CHAPTER 1:

Product Overview



Brief Description

The Parker PAC Terminal is a low cost product specifically designed to display visualization information over a network connection from a Parker PAC Controller. The first time that power is applied to the unit, the PAC Terminal will prompt for network configuration to communicate to a specific PAC Controller supporting either an Xpress HMI server or CoDeSys Webvisualization, depending on the Controller model. Once initially configured, the unit will automatically display the visualization information after booting, with no additional configuration required. Multiple PAC Terminals may be connected to a single PAC Controller.

The 7" PAC Terminal comes with a flat front panel touch screen and is a fanless design intended to operate in rugged industrial environments. It is powered by Intel ATOM Bay Trail N2807 (1.6GHz) CPU and contains 2GB of DDR3L 1600 MHz system memory. It supports 9~36V DC wide-ranging input power, a factory friendly resistive touchscreen and an IP65 compliant front panel.

Features Overview

- 7" Industrial Terminal
- 7" WVGA (800x480) Display
- Flat front panel resistive touch screen
- Fanless design
- Intel Bay Trail N2807 (1.6GHz) CPU
- Onboard 2GB DDR3L 1600 MHz
- 9~36VDC wide-ranging power input
- IP65 compliant front panel



Figure 1.1 Front View of PAC Terminal



Figure 1.2 Rear View of PAC Terminal

External Ports

DC power input and all external ports are located on the back of the PAC Terminal. The unit is designed to be mounted on an enclosure panel with included mounting clips and IP65 sealing gasket or, free standing using the VESA mounting holes located on the back of the Terminal. Refer to the following figure for port identification.

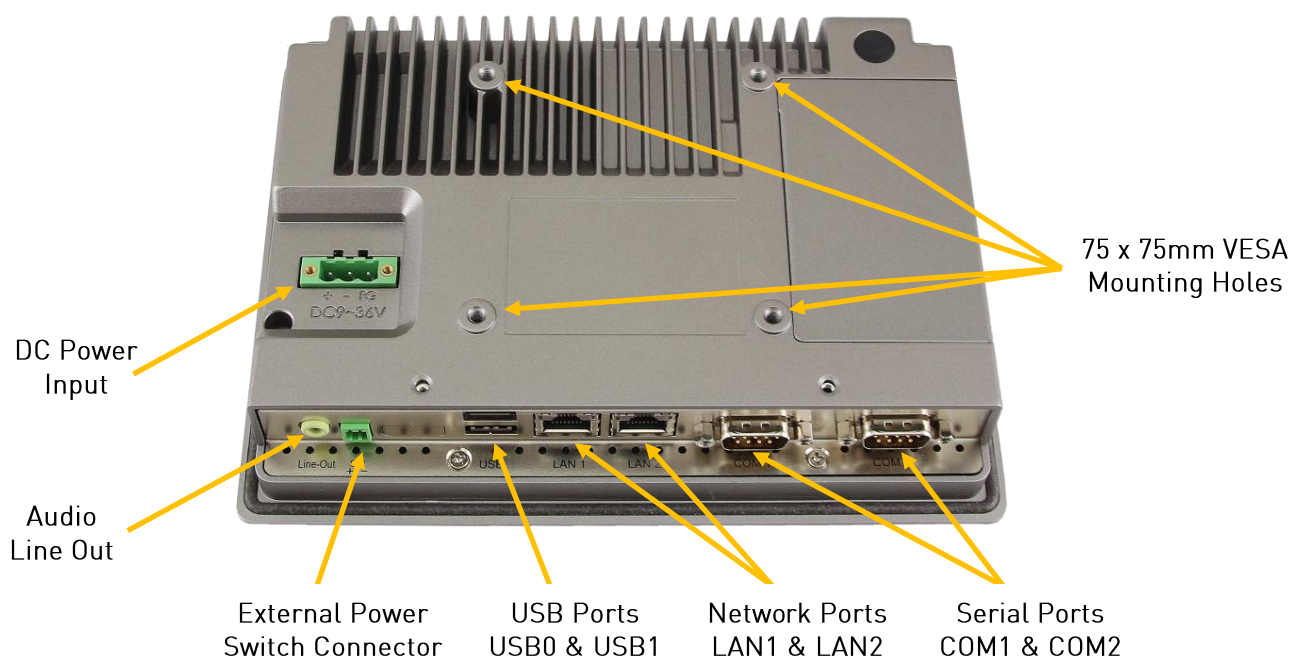
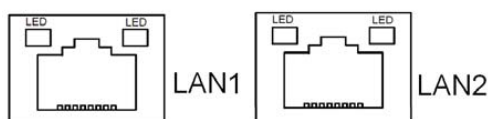


Figure 1.3 External Port Locations

The following sections describe the functionality of these ports.

LAN1/LAN2 Ports

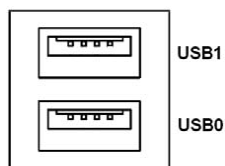
The PAC Terminal provides two standard RJ45 Ethernet ports with full duplex operation at 10/100/1000 Mb/s and half duplex operation at 10/100 Mb/s. Both ports provide auto Media Independent Interface (MDI) speed negotiation and auto MDI-X cable crossover (patch cables) support at all speeds. The RJ45 connectors provide ACTIVE (green) and LINK (green/amber) LED's respectively located at the left-hand and right-hand side of the Ethernet ports that indicate the activity and transmission speed of the LAN.



USB0/USB1 Ports

The PAC Terminal provides one USB 2.0 (USB1) and one USB 3.0 (USB0) compliant port to connect USB Flash drives, keyboards, mice, etc. USB0 is the USB 3.0 port and the connector is blue inside. Both ports are ESD protected and have over-current shutdown.

Each USB Type A Receptacle is Current limited to 1.5A.



Audio Port

The PAC Terminal provides one HD Audio port via a 3.5mm diameter jack. An internal Realtek ALC662 VD codec is used to provide high quality audio. Line Out can be connected to a headphone or amplifier.



Serial Ports COM1/COM2

The serial ports COM1 and COM2, although physically present, are not intended for use with the PAC Terminal.

SD Card

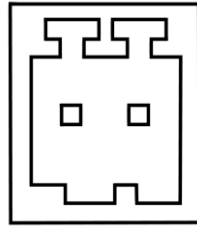
The PAC Terminal is equipped with a Secure Digital (SD) card slot that can support both SD and SDHC cards, up to 32GB's.

Solid State Drive

The PAC Terminal is equipped with a Solid State Drive (SSD) that can support up to 64GB SSD's. The standard PAC Terminal model is supplied with a 32GB SSD.

External Power Switch Connector

The external power switch connector can be used to remotely shut down the PAC Terminal by attaching a momentary switch to the connector supplied in the ship kit included with the unit. When used in conjunction with the Windows operating system, the PAC Terminal can be properly shut down by holding the external switch closed for approximately 10 seconds after closing Window's. Conversely, if the unit is already OFF, momentarily closing the switch for approximately 3 seconds will start the unit. Connection and use of this switch is optional and is not required for normal use of the product. It can be implemented if a remote power switch is desired in the specific installation.



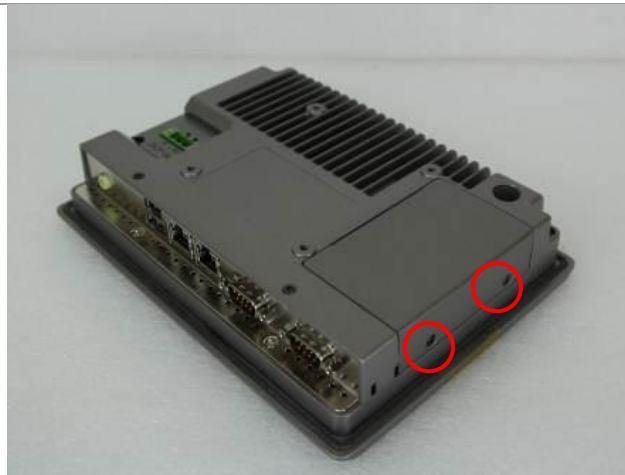
CAUTION: A single-pole momentary switch is required for this feature. Use of a two-position ON/OFF switch will not allow the unit to start as expected.

Installation/Removal of SSD Module

In the event that the SSD module needs replacement, follow these steps:

Step 1

Remove two screws to remove SSD access cover.



Step 2

To remove the SSD module and bracket, remove the screw as shown and then carefully pull SSD card to unplug it from the chassis.



Step 3

Reverse steps 1 and 2 above to replace the SSD module, bracket and cover into the chassis.



CHAPTER 2: **Installation**



Checking the Shipment

Upon receiving the PAC Terminal, remove all items from the packaging and confirm that you have received each item listed in the table below.

If you are missing an item, please call the factory. For contact information, see “Error! Reference source not found.” in the Troubleshooting chapter of this guide.

PAC Terminal Ship List	
Part Name	Parker Part Number
Parker PAC Terminal	PTI-007-1R2-40
12VDC Power Supply	N/A
DC Power Input Connector, 3-Pin (attached to Power Supply output)	57-05275
North American Power Cord	N/A
2 Pin Power Switch Connector	N/A
Parker Software License Agreement	A4-04291-102
Mounting Clips with Screws (Qty. 4)	N/A
Quick Start Sheet	88-026687-01
Acronis True Image 2015 License Sheet	88-026691-01
Driver CD	N/A
Stylus	N/A

Installation Safety Requirements

The PAC Terminal meets the requirements of the Electromagnetic Compliance (EMC) directive 2004/108/EC (EN55022 / EN55024) when installed according to the instructions provided in this chapter.



WARNING: The PAC Terminal connects to other mechanical and electrical components of your system. Be sure to test your system for safety under all potential conditions. Failure to do so may result in serious personal injury or damage to equipment.

- When using the PAC Terminal with a Parker PAC Controller, consider power interruptions or brownouts while developing the I/O programs to ensure that a defined state at restart excludes all dangerous conditions.
- Incorporate emergency disconnect circuits to ensure safe and effective machine shutoff.
- Comply with local and national safety regulations and precautions for the installation.
- Control elements are to be installed in such a way as to exclude unintended operation.
- Route control and communication cables in a manner that reduces EMI interference (inductive or capacitive) which would disturb system operation or functionality. For example, do not run communication and low-voltage cables in the same raceways with power lines, motor leads, etc.

Installation Guidelines

The following section provides installation guidelines to ensure the use of best practices regarding agency, thermal, safety, and EMI considerations.

Regulatory Installation Guidelines

The PAC Terminal is designed for use in industrial environments. It is to be installed in an industrial enclosure and factory wired according to National Electric Code (NEC) guidelines.

When installing the PAC Terminal, you can either use a 24VDC power circuit available in the control cabinet, a purchased power supply, or an optional Parker model PS-60W Class 2 power supply, purchased separately.

Thermal Guidelines

You can safely operate the PAC Terminal within the temperature specified in the Environmental Specifications in [Appendix A](#). However, when using a protective enclosure, remember that the temperature within an enclosure is generally higher than the external temperature. Read the following guidelines to fully understand temperature implications.

- Limit the PAC Terminal's exposure to adverse conditions, such as dust, oil, moisture, and corrosive vapors in order to minimize maintenance and repair costs.
- Choose an area for the PAC Terminal that is free from moisture or condensing humidity.

Heat builds up rapidly in enclosed environments, compromising the performance and life span of electrical equipment. If the PAC Terminal operates inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.

The PAC Terminal has been tested for use in 50 degrees Celsius (°C) ambient, still-air locations. This means that when installed, the ambient air surrounding the Terminal is not expected to exceed 50°C. An example of this type of installation would be the PAC Terminal mounted in a small, sealed industrial enclosure.

The most commonly overlooked aspect of this type of installation is that heat generated by the device, and other devices in the enclosure, becomes trapped and increases the ambient temperature immediately surrounding the PAC Terminal. This increase in temperature can sometimes exceed an additional 10 °C or more.

Although the thermal dynamics are not always linear, a temperature rise of 10 °C degrees inside the enclosure would imply that the environment outside the sealed enclosure could not exceed 40 °C , or the PAC Terminal would surpass its maximum operating temperature.

Therefore, do not install the PAC Terminal with its 50 °C operating temperature limit into a sealed enclosure without considering the effects of the internal heat buildup.

Since elevated operating temperatures can have an adverse effect on the life of electronics, it is wise to consider the internal thermal rise. Passive venting for thermal convection, internal air circulation fans, filtered exhaust fans with filtered inlets, air conditioners, and other products are available in the market to assist in reducing the heat buildup in the industrial enclosure.

There are many attractive industrial IP65, dust-tight fan/filter assemblies available today which allow the filter to be inexpensively replaced or cleaned as part of a periodic maintenance schedule. In some cases, simply increasing the size of the enclosure can have a significant, positive effect on the installation's thermal response.

Here are some points to consider when performing a site review:

- What is the expected maximum outside ambient temperature surrounding the industrial enclosure?
- Are there any additional heat-generating components inside the enclosure?
- What is the size of the enclosure? Larger enclosures dissipate more thermal energy than smaller ones.
- What kind of environment will the enclosure be installed in - clean, water-tight, dust tight? Can the enclosure be convection cooled or is active cooling required?

It is a wise investment to thermally plan the installation by anticipating and eliminating the heat build-up inside a sealed enclosure. Not only will this extend the life of the electronics, but it will also reduce costly equipment downtime.

Orientation and Clearance Guidelines

Select an enclosure that is large enough to allow free airflow in and around the PAC Terminal.

Allow a minimum of two inches between the inside of the enclosure and the top, bottom, and sides of the PAC Terminal. Verify that the surface of the enclosure on which the PAC Terminal is mounted is flat and free of raised or depressed areas.

Consider additional clearance below the PAC Terminal to allow efficient cable access and routing and to allow for insertion and removal of cables.

Mount the PAC Terminal in a vertical orientation to allow for proper ventilation.



WARNING: Failure to follow these guidelines may result in overheating the PAC Terminal.

Radiated Emissions Guidelines

The PAC Terminal has been tested to comply with international electromagnetic and emission standards (EN55022 and ICES-003 FCC Part 15 Class A). To reduce radiated emissions, ensure that there is a low impedance earth connection to the PAC Terminal, which can be accomplished by utilizing Pin-3 on the PAC Terminal 24VDC power input connector. This connection must be made with the shortest possible, heavy gage wire or braided cable. Low-resistance (<0.5 ohms) continuity should be verified with an ohmmeter for proper grounding. In addition, all communication cables should be shielded and grounded, preferably only on one end.

Earth Grounding Guidelines

To minimize unwanted electrical interference, select a location away from equipment that produces intense electrical noise (motor drives, for example). Use good engineering practice and isolate input power to the unit and separate all data communication cables from AC power lines.



Important: Use the PAC Terminal ground terminal (Pin-3 on the 24VDC input power connector) to connect the unit to a suitable ground reference, such as earth ground or building steel. This ensures the unit is in compliance with immunity and emissions requirements necessary for proper operation.

Switching inductances from relays, contactors, solenoids, or switching magnets can produce significant surge voltages. It is necessary to reduce these inductive spikes to a minimum whenever possible, which may require diodes, Z-diodes, varistors, or RC elements. We recommend that you contact the manufacturer or supplier of the corresponding actuators relevant information regarding surge protection.

Installation

The PAC Terminal can be installed two ways; mounted to a flat panel or enclosure or to a VESA arm. Each recommended installation procedure follows.

Required Tools

Installing the PAC Terminal requires a small flat blade screwdriver (tip size 0.04mm x 2.5mm) for attaching the wiring to the power connector and a Phillips screwdriver to tighten the mounting clamps.

Basic Installation Steps – Panel Mounting

Perform the following steps to install the PAC Terminal in an enclosure or cabinet panel.

1. Verify that all of the PAC Terminal accessories are present against the items listed in the table at the beginning of this chapter, [Checking the Shipment](#).
2. Once a suitable mounting location has been selected, a mounting cutout must be created. Cut a rectangular hole in the enclosure using the Panel Mounting Cutout dimensions below. (See also [Physical Dimensions and Panel Cutout](#) in Appendix A) Be sure to follow the cutout dimensions precisely to ensure that the unit will seal properly against the enclosure surface. Also make sure that the cutout edges are free of burrs and smooth to allow for proper sealing of the perimeter gasket.

Panel Mounting Cutout Dimensions: 7.56 x 5.43 in (192 x 138 mm)

3. Slide the unit into the cutout and attach the four supplied mounting clamps, with their screws, to the sides of the unit in the slots provided; place two clamps at the top and one on each side. Tighten the mounting clips to **8.7 pound-inch (0.97 Newton-meter)**. Tighten the screws in a crosswise sequence to ensure a good seal and prevent damage.



WARNING: Use a torque wrench to tighten the clip mounting screws to ensure proper mounting strength and sealing capability and so that damage to the PAC Terminal chassis, mounting clips, or the customer enclosure does not occur. DO NOT OVER TIGHTEN THE MOUNTING SCREWS!

4. Connect Ethernet network cable. Refer to [Attaching Cables](#) later in this section.
5. Connect 24VDC power to the PAC Terminal by following the precautions described in [Connecting Power](#) later in this section.
6. Proceed to [Configuring the PAC Terminal Software](#), in Chapter 3.

Basic Installation Steps – VESA Mounting

The following steps give a high-level overview of the installation process. See the remainder of the chapter for additional details on completing each step.

1. Verify that all of the PAC Terminal accessories are present against the items listed in the table at the beginning of this chapter, [Checking the Shipment](#).
2. Use four M4 screws (not supplied) to mount the unit to an appropriate swing arm or wall/pole mounting bracket. The screw length required is dependent on the thickness of the VESA mounting bracket. The VESA mount spacing on the rear of the PAC Terminal is 75mm x 75mm. For the location of the VESA mounting holes, see: [Physical Dimensions and Panel Cutout](#) in Appendix A)



WARNING: Be sure to adhere to the load weight specifications supplied with the mounting arm or bracket. Note that the 7" PAC Terminal weighs 2.6 lbs (1.18 kg).

3. Connect Ethernet network cable. Refer to [Attaching Cables](#) later in this section.
4. Connect 24VDC power to the PAC Terminal by following the precautions described in [Connecting Power](#) later in this section.
5. Proceed to [Configuring the PAC Terminal Software](#), in Chapter 3.

Attaching Cables

Ethernet Communication Cables



WARNING: Do not install Ethernet communication cables in the same conduit or cable tray with AC power wiring, motor leads, or any other high potential switching currents.

To ensure reliable communications with the best performance possible, the cabling components used must conform to US standard EIA/TIA 568 (T568A or T568B) or European standard EN50173-1 Class D.

Category 5 (CAT5 or preferably CAT5e) cable is recommended for Ethernet communications. The maximum allowed channel length is 100 meters or 328 feet.

Either straight through or crossover (patch) cables may be used since the PAC Terminal will auto detect and adjust to the type of cables used.

The cable must not be kinked or bent too tightly (the bend radius should be no less than four times the outer diameter of the cable).

Either shielded or unshielded cables may be used. Consider using shielded cables in electrically noisy environments. All shielded cables must be grounded for safety and effectiveness and a continuous shield connection maintained from end to end. Ground loops may develop when there is more than one ground connection and the difference in common mode voltage potential at these ground connections can introduce noise into the cabling.

Connecting Ethernet Cables to the PAC Controller

To display the Xpress or Webvisualization project originating from the PAC Controller to the PAC Terminal, use an Ethernet cable from LAN1 or LAN2 on the PAC Terminal to X2 or X3 on the PAC Controller. By default, the connection should be between LAN1 and X2. But both products can be configured to use either of the Ethernet connections. To configure the LAN settings on the PAC Terminal, refer to the Network Settings section in [Chapter 3](#). To change the network settings for X2 or X3 in the PAC Controller, refer to the PAC Controller Installation Guide.

Connecting Power



Warning: The PAC Terminal has no power switch. It will start functioning as soon as 24VDC power is applied.

The PAC Terminal operates on nominal 24VDC power, or any voltage between 9 and 36VDC. Note that both the +24VDC and the 24VDC return is isolated from the Earth ground. Attach power as follows:

Pin Number	Marking	Description
Pin-1	(+)	+24VDC
Pin-2	(-)	0 VDC
Pin-3	(FG)	Earth Ground

The system input power rating to the PAC Terminal is:

- 9 to 36VDC, or nominal 24VDC @ 0.34A
- Recommended Wire gage for connection to the PAC Terminal: 0.20 - 1.0 mm² (IEC) / 26 – 16 AWG (UL), stripped to <10mm in length, solid or stranded wire

Connection Diagram

For convenience, the 24VDC input connector can be prewired and then plugged into the mating connector on the unit. Remember to tighten the two locking screws located on each side of the connector to prevent unintended disconnection.



CAUTION: To reduce issues associated with noise on the input DC power, keep the 24VDC wiring away from any AC interfering sources, such as motor leads or other devices, and keep the wiring as short as possible.

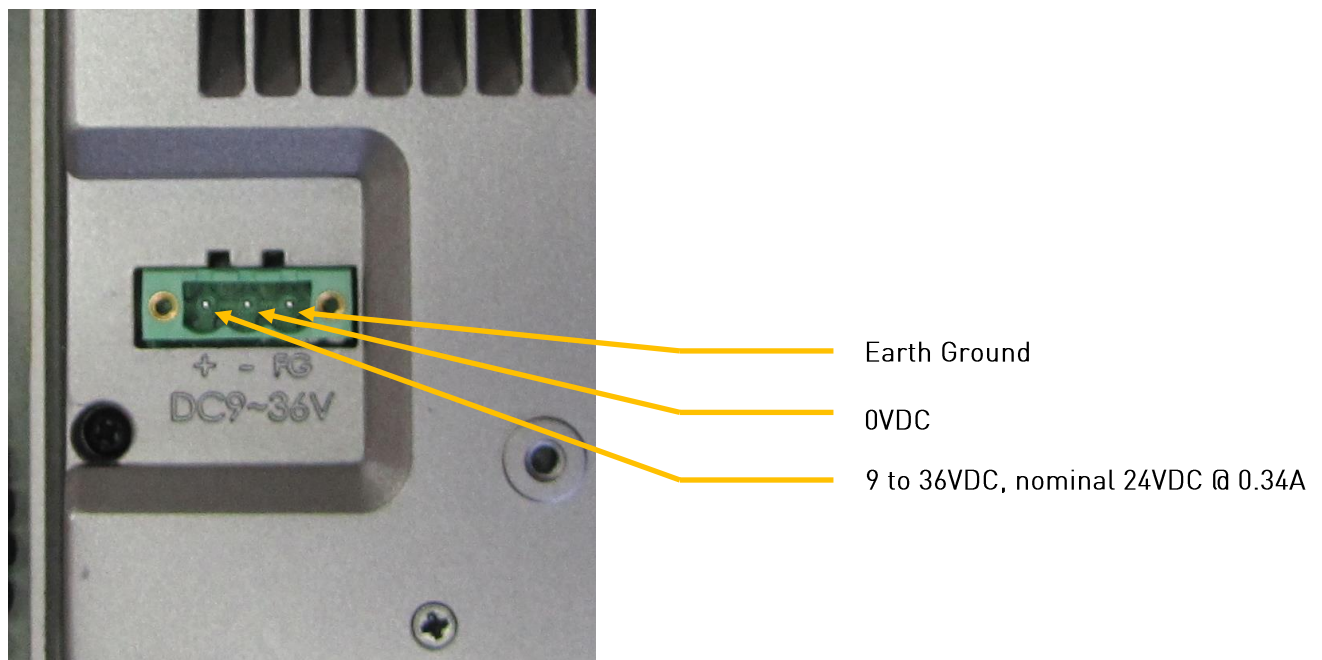


Fig 2.1 Input Power Connection Diagram

Installing an Optional AC Power Supply

The PAC Terminal operates on 24 VDC nominal input power. You can purchase an optional PS-60W Power Supply available from Parker to provide 24VDC input power if DC machine power is not available.

The optional Parker PS-60W power supply has the following ratings:

Parker PS-60W AC/DC Power Supply Specifications		
INPUT	AC Voltage, Nominal	115/230 VAC Auto Select
	AC Voltage Range	85-264 VAC
	Frequency Range	47-63 Hz
	Nominal Current	1.3A / 0.7A
	Inrush Current (max)	Typ. < 25A
OUTPUT	DC Voltage, Nominal	24VDC, (22.5 – 28.5VDC adj.)
	DC Current, Nominal	2.5A (60W)
	Overvoltage Protection	>30VDC, but <33VDC, auto recovery
GENERAL	Environmental Rating	IP20, Indoor Use Only, Pollution Degree 2
	Agency Certifications	Class 2 per UL 1310, CSA C22.2 No. 223 UL508, CSA C22.2 No. 107.1 CE Low Voltage Directive, IEC/EN60950-1, 2nd Edition RoHS Compliant
	Temperature, Storage	-25°C to +85°C
	Temperature, Operating	-10°C to +60°C Convection cooling, no forced air required
	Relative Humidity	<90% RH, non-condensing IEC 68-2-3, 68-2-3
	Overvoltage	Category II
	Protection/Safety	Protected against continuous short-circuit, overload, open-circuit. Protection Class 1 (IEC536), degree of protection IP20 (IEC 529) Safe low voltage: SELV (acc. EN60950)
	INSTALLATION	
	Fusing, Input	Internally Fused, External 10A slow acting fuse recommended
	Mounting	Snap-on system to DIN Rail EN 50022, 35 x 7.5 or 35 x 15
	Input Connections	16-10 AWG (1.5 – 6 mm ²) Solid Conductors 16 -12 AWG (0.5 – 4 mm ²) Flexible Conductors
	Output Connections	16-10 AWG (1.5 – 6 mm ²) Solid Conductors 16 -12 AWG (0.5 – 4 mm ²) Flexible Conductors
	Clearance, cooling	25mm above and below, 25mm left and right, 10mm front
	Dimensions H, W, D in. (mm)	4.88 x 1.97 x 4.55 (124 x 50 x 116mm)



CAUTION: Do not apply AC line input power directly to the PAC Terminal, or damage may occur.

Mounting the Optional PS-60W AC Power Supply

The optional PS-60W AC power supply is DIN rail mountable. To reduce issues associated with noisy DC power input, keep the 24VDC wiring away from any AC interfering sources such as motor leads or other devices. Refer to the PS-60W or the user-supplied power supply for information regarding topics such as mounting, AC power connections, or ratings.

CHAPTER 3: **Software**

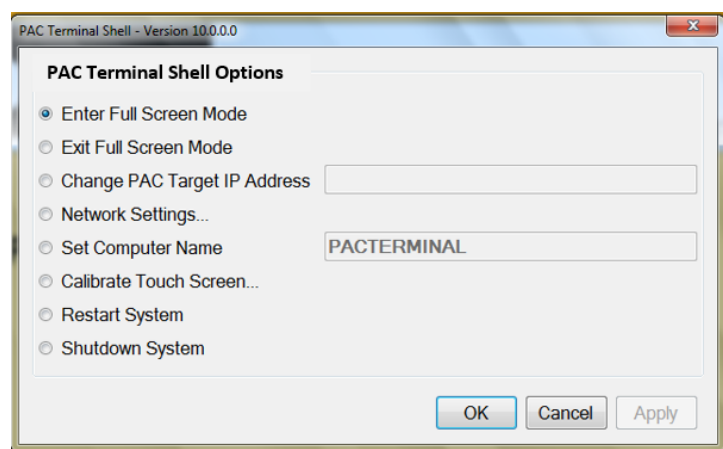


Configuring the PAC Terminal Software

When you power up the PAC Terminal for the first time, a default page will show up on the screen to help you set up the PAC Terminal for the first time. Once a target IP Address is set on the unit, this screen will not show up on the next power cycle.

The PAC Terminal is designed to be a closed system with connections only to the PAC. Other third party software could affect the performance of the PAC Terminal and is not recommended to be installed on the PAC Terminal.

To configure the PAC Terminal, hit F10 on the keyboard at any time. This will launch the PAC Terminal Shell dialog box like the one shown below with options for different configurations. There is a software keyboard installed in the PAC Terminal and it can be activated by pressing the keyboard ICON on the left hand side of the screen. Or you can connect a USB Keyboard and mouse to the PAC Terminal USB connections. To help identify that the F10 key will open the PAC Terminal Shell, the developer could add a message in a Troubleshooting screen in their Xpress project with a note to the technician.



Enter Full Screen Mode

Selecting this option and hitting OK will run the PAC Terminal Application in Full Screen Mode. This will show your Xpress or Webvisualization project using the full screen of the PAC Terminal

Exit Full Screen Mode

Selecting this option and hitting OK will exit the full screen mode for the PAC Terminal Application. This will allow you to access the desktop of the PAC Terminal to perform other functions.

Change PAC Target IP Address

Selecting this option will allow you to enter the IP Address of the target PAC Controller that is connected to the PAC Terminal. The default address of the X2 connector on the PAC is **192.168.10.50** but check with your system administrator if the PAC Controller IP Address has changed. If your PAC Controller has the Xpress HMI option, then entering the PAC IP Address here and selecting OK will display your Xpress project that is running on the PAC. If your PAC has the Webvisualization option, entering `http://` IP Address followed by `:8080/webvisu.htm`" (for example `http://192.168.10.50:8080/webvisu.htm`) and selecting OK will display your Webvisualization project that is running on the PAC. The next time you power cycle the PAC Terminal, it will automatically connect to the target IP Address and run your visualization project at full screen.

Network Settings...

Selecting this option will open the Network Settings folder to allow you to change the Network settings of LAN1 or LAN2 of the PAC Terminal. The default IP Address of LAN1 is 192.168.10.20 and LAN2 is Dynamic Host Configuration Protocol (DHCP). The default Subnet Mask of the LAN1 is 255.255.0.0. When changing the Network settings, be sure the settings align with the PAC so they can connect to each other.

To change the IP Address and Subnet Mask on LAN1, follow these steps:

1. Select "Network Settings..." in the PAC Terminal Shell.
2. Select "OK"
3. Double click on the LAN1 ICON in the Network Settings Folder
4. Select "Properties"
5. Highlight the "Internet Protocol Version 4(TCP/IPv4)
6. Select "Properties"
7. Change the IP Address and Subnet Mask to your required settings.
8. Select "OK"
9. Select "OK"
10. Select "Close"
11. Close the Network Settings folder

If you need to change your proxy settings, exit the full screen mode of the PAC Terminal Shell to get to the Windows desktop. Select the Start button in the lower left hand corner of the toolbar. Select Control Panel, then Internet Options. Select the Connections tab and then the LAN Settings button. Make your Proxy Server changes and then select OK. Close down the open windows.

Return to the PAC Terminal Shell by hitting the F10 key.

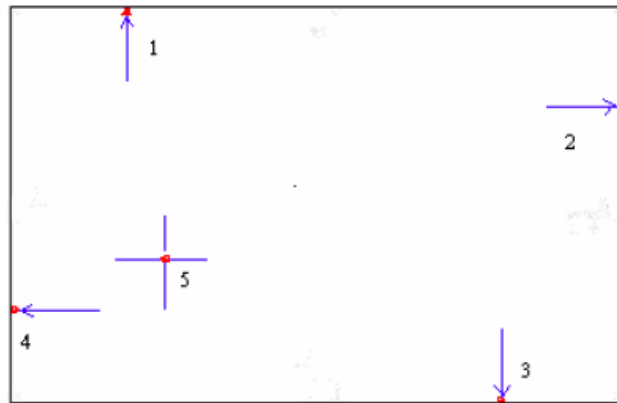
Set Computer Name

Selecting this option will allow you to change the machine name of your computer. The default name from the factory is PACTERMINAL.

Calibrate Touchscreen

Selecting this option and hitting OK will run the touchscreen calibration window.

At the start of this procedure, arrows will appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip the procedure, do not press the touchscreen for a few seconds to allow the software to timeout or press 'ESC' using an attached keyboard.



Restart System

Selecting this option and selecting OK will restart the PAC Terminal.

Shutdown System

Selecting this option and selecting OK will shut down the PAC Terminal.

PAC Terminal Software – other features

Pop Up Keyboard

The PAC Terminal includes a software pop up keyboard. There is the Keyboard ICON on the left hand side of the window that can be pressed at any time to bring up this keyboard. The keyboard will also automatically appear when you are in a user entry box.

If you would like turn off the keyboard, from the desktop, right click on the keyboard ICON in the system tray and select Turn Off. To disable it from always showing up on the screen, right click on the keyboard ICON in the system tray and uncheck the Floating Window for On-Screen Keyboard.

The Software keyboard can be modified using the software installed on the PAC Terminal. This could be beneficial if you would like to change the color or remove the F10 key that opens the Shell options. From the desktop, right click on the keyboard ICON in the system tray. Select Edit Keyboard Type. Select the F10 key. To change the color, select the Picture button, and then adjust the color accordingly. To delete the F10 key, select the key and then select the delete button up on the tool bar. Be sure to save your changes before exiting the program.

The changes to the software keyboard will be saved even after a power cycle. Removing the F10 key on software keyboard will not affect how the F10 key will work on a USB keyboard when plugged into the PAC Terminal. So if you remove the F10 button on the software keyboard, you can plug in a USB keyboard and hit F10 to bring up the PAC Terminal Shell. This is beneficial if you would like to hide the F10 key from the operator, but still have it accessible for a technician.

But, disabling or changing the functionality of the F10 key on the software keyboard will also change the functionality on the USB keyboard. So it is not recommended to disable or change the functionality of the F10 key because then you will never be able to enter the shell to make changes.

Desktop ICONS

The PAC Terminal includes several ICONS on the desktop to run helpful applications:

- **PAC Terminal** – This will run the PAC Terminal application to host your Xpress or Webvisualization project. This project also runs automatically on each power cycle.
- **Hot Virtual Keyboard** – This will run the Pop up Keyboard. If you right click on this ICON, you can view or change the properties.
- **Network Settings** – This is a quick link to the Network Settings folder. See the Network Settings section earlier in this user guide.
- **Touch Screen** – This program allows you to view and change the Touch Screen properties.

CHAPTER 5: **Troubleshooting**



Troubleshooting Overview

After installation, if the PAC Terminal does not function properly, use the guidelines and procedures in this chapter to troubleshoot. These guidelines also apply to troubleshooting a malfunction during normal operation of the PAC Terminal.

General Troubleshooting Procedures

Use the following list as a guideline for troubleshooting. The remaining sections of this chapter provide procedures for each of the guidelines in the list.

1. Check the front LED for power, it should be green.
2. Confirm that a network cable is connected between the PAC Terminal and the PAC Controller or Intranet.
3. Confirm that there is network activity on the Ethernet Status LED's. The left LED (ACTIVITY) should be blinking green.
4. Verify that the proper network settings and that the IP address is set properly. This can be the root cause of many connection problems.
5. If no connection or network activity is still apparent, try restoring the image on the internal SSD by following the [procedure](#) below.
6. Call Parker Hannifin for Technical Support for guidance in resolving your issue, see [How to Obtain Technical Assistance from Parker Hannifin](#).
7. Check the FAQs at <http://www.parkermotion.com/PACTerminal>.

LED Power Indicator

- The Power LED on the front surface of the unit will be green when power is applied.

Ethernet Connection

Perform the following steps to resolve Ethernet network problems:

1. Verify that you are using the [correct type of cable](#): Ethernet straight through, or cross over/patch
2. Review Ethernet Status LED's (see next step)

Ethernet Status LED's

The Ethernet status LED's are located on both Ethernet connectors. If there is no Link activity, ensure that the cables are securely connected.

The left LED (ACTIVITY) on connectors LAN 1 and LAN 2 indicates ACTIVE status and signifies if there is network activity:

- Off – no network activity
- Green (blinking) - indicates network activity

The right LED (LINK) on connectors LAN 1 and LAN 2 indicates LINK status and identifies the speed of the connection:

- Off – 10 Mb/s connection speed
- Green – 100 Mb/s connection speed
- Amber – 1000 Mb/s connection speed

If the PAC Terminal is unable to connect to the PAC Controller, perform the following:

- Verify the correct IP address of the PAC Controller has been entered in the Target IP Address in the PAC Terminal Shell via F10 on the keyboard
 - If the PAC Controller has the Xpress HMI option, the default IP Address on the X2 port of the PAC Controller is **192.168.10.50**.
 - If the PAC Controller has the Webvisualization option, the default entry for the Target IP Address is **http://192.168.10.50:8080/project.htm**
- Attempt to connect the PAC through a browser with the PAC Configuration Tool using the same IP Address that is used on the PAC Terminal
- Ping the PAC IP address through the command prompt
- If you do not know the IP Address of the PAC Controller, press the push button on the PAC Controller to log the IP address to the SD card. Using an SD card reader, open the "IP Addresses.log" file to verify the IP address of the PAC.
- Examine the Config Tool Log in the PAC (under About the PAC) to verify the last IP address change
- Verify the cable connections; default connection would be LAN1 on the PAC Terminal to X2 on the PAC Controller
- Verify the RJ45 LED indicators to see if there is any activity

Screen Saver not Working

The PAC Terminal is designed to disable the screen saver options within Windows. Changing the screen saver or power saver settings will not enable these options.

Solid State Drive (SSD)

The PAC Terminal comes with an internal 32GB Solid State Drive (SSD) Card installed. The SSD comes from the factory loaded with the Operating System, a hidden partition containing a copy of the factory disk image and other necessary files to run the PAC Terminal. Do not remove or modify any files on the SSD unless instructed to do so in the documentation. This card is used as a fixed drive and provides non-volatile memory storage. Although this card is removable, it must be installed in the PAC Terminal at power up and cannot be removed while the Terminal is powered on.

If you are having difficulties powering up the PAC Terminal or experiencing functional or performance issues, it could be due to problems associated with the SSD hardware or the installed image. If the SSD is suspected to be defective, the PAC Terminal must be returned to the factory for repair (See [How to Obtain Technical Assistance from Parker Hannifin](#)) however, it is first recommended that you try to recover the original factory software image from a hidden partition on the SSD to see if the problems are resolved before returning the unit for repair. The following procedure will guide you through the restoration procedure.

F11 Disk Image Recovery Procedure

The PAC Terminal includes the ability to restore the software to the original state when it left the Parker factory. This may be required if your Windows operating system is corrupted or if you need to revert back to the original state of the PAC Terminal. When restoring the software, it is best to have a USB keyboard and mouse plugged into the PAC terminal. To restore the PAC Terminal follow these steps:

1. Cycle Power on the PAC.
2. During the boot process hit the F11 key a few times when you see the message "Press F11 to run Acronis Startup Recovery Manager"
3. Hit Cancel when you see the message "Enter Linux kernel command line"
4. When you are in the Acronis True Image screen select the top option titled "Recover – Restore to factory settings,"
5. Select Yes when it asks if you are sure you want to proceed with the restoration.

The restoration should then run on its own. Restoring the PAC Terminal software could take approximately 15 minutes to complete. After the restoration is complete, it will automatically shut down the PAC Terminal. You will need to re-apply power to restart the unit.

How to obtain Technical Assistance from Parker Hannifin

Contact Information for Technical Assistance

Contact your local automation technology center (ATC) or distributor.

North America

Parker Hannifin
Electromechanical Automation North America
5500 Business Park Drive
Rohnert Park, CA 94928
Telephone: (707) 584-7558
Fax: (707) 584-8029
Email: emn_support@parker.com
Internet: <http://www.parkermotion.com>

Europe

Parker Hannifin
Electromechanical Automation Europe
Robert-Bosch-Strasse 22
77656 Offenburg (Germany)
Telephone: +49 (0781) 509-0
Fax: +49 (0781) 509-98176
Email: Em-motion@parker.com
Internet: www.parker-automation.com

APPENDIX A: PAC Terminal Specifications

Environmental Specifications

Environmental Specifications Table

Category	Specifications
Operating Temperature	32°F to 122°F (0 to 50°C) Ambient (air temperature surrounding the Terminal), Indoor Use Only
Storage Temperature	-4 to 140°F [-20 to +60°C]
Relative Humidity	10% to 90% @ 40°C, non-condensing
Altitude	10,000 Feet
Shock Rating	15g peak; 11ms (operating)
Vibration	5-500Hz: 1 Grms random, swept sine (operating) 1, 4, 16, 40, 80, 200Hz: 0.52 Grms, random (non-operating)
Environmental Design	IP65 Compliant Front Panel
RoHS	RoHS Compliant

Electrical Specifications

Electrical Specifications Table

Category	Specifications
System	
CPU	Onboard Intel Bay Trail N2807 (2.16GHz)
Chipset	SoC
Memory	Onboard 2GB DDR 3L 1600 MHz
I/O Ports	
USB	1 x USB 2.0 type A 1 x USB 3.0 type A
Serial/Parallel	1 x RS-232 DB-9 (COM2) 1 x DB-9 RS-232/422/485 (Default RS-232) (COM1)
Audio	1 x Audio Line Out
LAN	2 x GbE LAN RJ45
Power	1 x 3-pin DC Power input terminal 1 x 2-pin connector for power on/off button
Storage Device	
Storage	1 x SD card slot, up to 32GB 1 x 1.8in SATA SDD bay, up to 64GB
Expansion	
Expansion Slot	1 x Internal Mini-PCIe slot full size
Display	
Display Type	7in TFT LCD
Max. Resolution	800 x 480 (WVGA)
Max. Color	262K
Luminance [cd/m²]	350
Contrast Ratio	400 : 1
Viewing angle	140(H)/110(V)
Backlight Lifetime	40,000 hrs

Touch Screen – Resistive Touch	
TS Controller	PenMount 6000 on Board
Interface	USB
Light Transmission [%]	Over 80%
Power	
Power Input	9~36VDC
Operating System	
OS Support	Windows Embedded Standard 7E (WES7E)

Agency Approvals

The PAC Terminal was tested in accordance with Technical Standard: EMC Directive 2004/108/EC (EN55022 / EN55024) and Technical Standard: FCC Part 15 Class A IC ICES-003 for Information Technology Equipment.

European Community Approvals Table

Test	Specification
Harmonic Current Emissions	EN 61000-3-2:2006 + A1:2009 + A2:2009
Voltage Fluctuations and Flicker	EN 61000-3-3:2013
Electrostatic Discharge Immunity	IEC 61000-4-2:2008
Radiated Electromagnetic Field Immunity	IEC 61000-4-3:2006 + A1:2007 + A2:2010
Electrical Fast Transient Burst Immunity	IEC 61000-4-4:2012
Surge Immunity	IEC 61000-4-5:2005
Radio Frequency Common Mode Immunity	IEC 61000-4-6:2008
Power Frequency Magnetic Field Immunity	IEC 61000-4-8:2009
Voltage Interrupts Immunity	IEC 61000-4-11:2004
Radiated & Conducted Emissions	EN 55022:2010 / AC:2011 (CLASS A)
Protection Degree IP65 (Front Panel Only)	IEC 60529:2001 (IP6X & IPX5)

Physical Specifications

Physical Specifications Table

Category	Specification
Dimensions W x H x D	7.95in W x 5.87in H x 1.57in D [202.0mm x 149.0mm x 40.0mm]
Cutout Dimensions W x H	7.56in W x 5.43in H [192.0mm x 138.0mm]
VESA Mounting	75mm x 75mm
Weight	2.6 lbs (1.18 kg)

Physical Dimensions and Panel Cutout

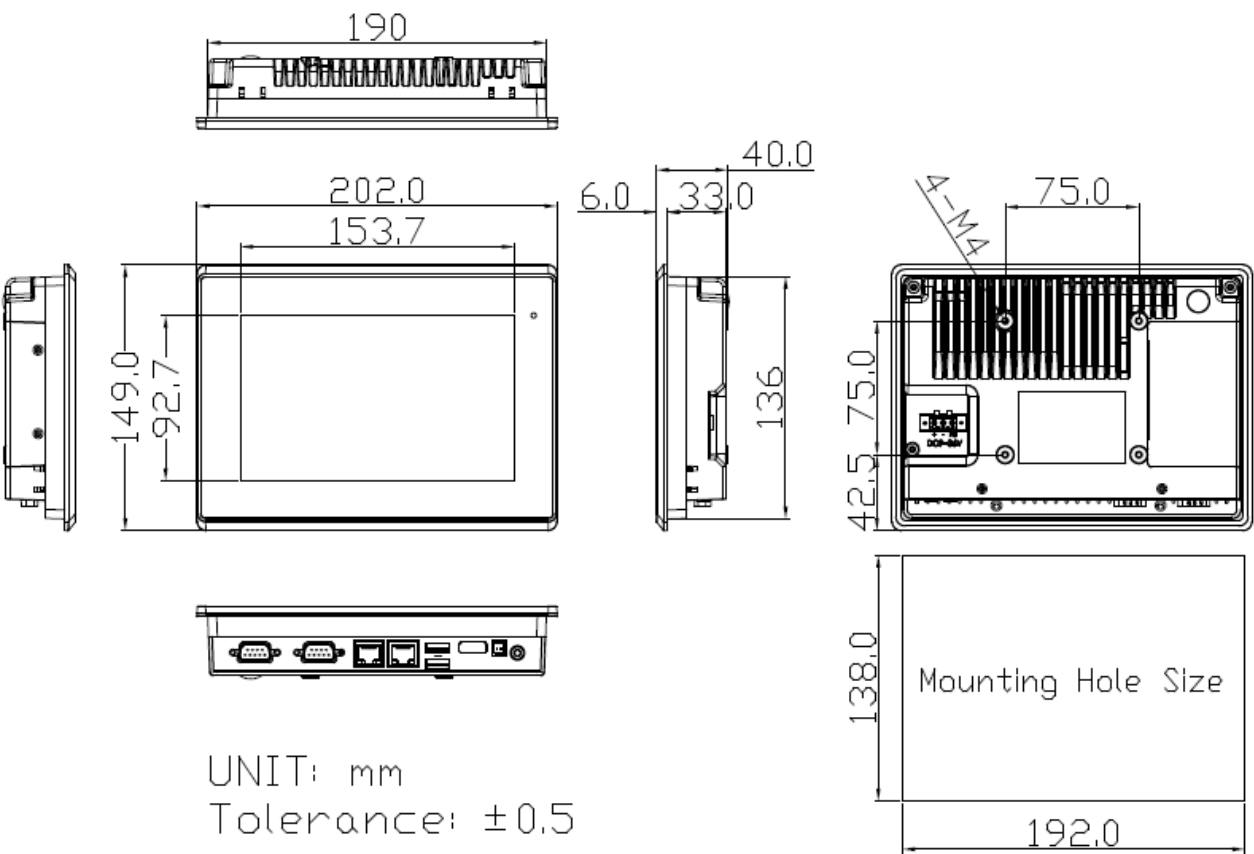


Figure A.1: Physical Dimensions and Panel Cutout