

**micros<sup>®</sup>** Systems, Inc.

# Protege Customer Display System Setup Guide



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# Declarations

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## Printing History

New editions of this manual incorporate new and changed material since the previous edition. Minor corrections and updates may be incorporated into reprints of the current edition without changing the date or edition number.

1st Edition: **February 2011**

# *Preface*

In this preface, you'll find information about this manual. Refer to the preface if you have questions about the organization, conventions, or contents of this manual.

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## **Preface**

Why Read This Manual?

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## *Why Read This Manual?*

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### **Purpose**

This guide is intended for those who will be setting up, installing and operating the MICROS Protégé Customer Display System. It is an intelligent customer display system that connects to existing workstations with room for future expansion.

## *How This Manual is Organized*

This manual is divided into four chapters, briefly discussed below.

Chapter 1 describes the Protégé Customer Display System and its hardware and software components. The chapter also describes the hardware and software platform components and contains the Protégé Customer Display Specifications

Chapter 2 covers the Protégé hardware configuration. In addition to a System Board block diagram and technical description, other topics include how to remove the cover, and identify the internal components.

Chapter 3 provides information in the Protégé Installation and Operation. Installation is covered from the basic environmental considerations for placement of the unit and external power supply, to describing the cables required to connect the Protégé to the host workstation.

Operational aspects include how to start the unit and point out the prompts that appear as the unit starts. Next, the Client Application Loader (CAL) is used to connect to the system and obtain the application.

Chapter 4 provides a basic troubleshooting chart. Other topics include how to use the Protégé Diagnostics top perform basic diagnostics.

A Reference section consisting of Equipment Dimensions, FCC/DOC Statement, and Connector/Cable Diagrams can be found at the end of this manual.



### **SHOCK HAZARD**

No user serviceable parts inside.  
Refer servicing to qualified personnel.

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## *Notation Conventions*

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### **Symbols**



#### **NOTE**

This symbol brings special attention to a related item.

---



#### **WARNING**

This symbol indicates that specific handling instructions or procedures are required to prevent damage to the hardware or loss of data.

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#### **SHOCK HAZARD**

This symbol calls attention to a potential hazard that requires correct procedures in order to avoid personal injury.

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#### **STATIC SENSITIVE DEVICES**

This symbol indicates that specific ESD handling procedures are required.

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### **Document Design and Production**

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# Chapter 1

## *What is the Protégé?*

This chapter describes the Protégé Customer Display System, various optional accessories and discusses the various software components.

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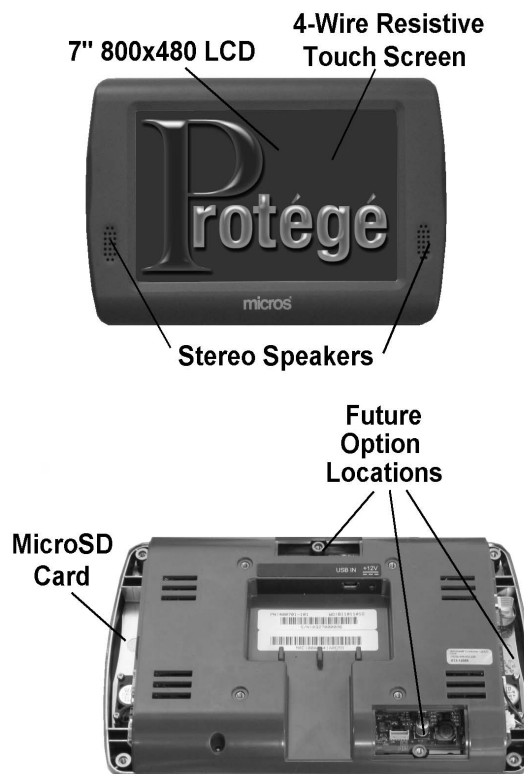
## *The System*

The MICROS Protégé Customer Display System is a customer facing 7" LCD, providing a greater level of detail than the traditional 2x20 VFD or the MICROS 240x64 graphical LCD.

The Protégé is an intelligent display, featuring a powerful microprocessor, RAM, LCD controller and internal storage. This design addresses the lack of dual independent display support in Microsoft Windows CE 6.0. The Protégé not only addresses these issues, but adds new capabilities including touch screen support and other future options.

The Protégé displays full transaction detail, allowing customers to confirm accuracy and improve speed of service in fast transaction environments. During idle times, the system can display customized visual content (e.g. sideshows), for use as a marketing and advertising tools.

The Protégé is equipped with a 7" 800x480 LCD touch screen, stereo speakers, internal microSD Card, and locations for future peripheral mounting.



*Figure 1-1: Protégé Display Features*

### ***7" 800x480 TFT LCD***

Wide VGA resolution of 800x480.

### ***Touch screen***

A 4-wire resistive touchscreen is standard on each unit. Resistive touch screens respond to pressure, and can be activated by a stylus, including gloved hands. The touch screen can be used to navigate the Windows CE 6.0 desktop or start and use the Protégé Diagnostics Utility and is available for future use by MICROS display applications.

### ***Internal Stereo Speakers***

1" speakers mounted to the left and right of display. The speakers function with windows multi-media sounds as well as video clips.

### ***MicroSD Card***

Displayed as 'STORE' in Windows Explorer and hidden from view behind a removable side panel is a microSD Card socket. The unit ships with a 512MB card standard and sizes up to 2GB are supported. The primary use of the card is to store the Windows Embedded CE registry hive as well as the display application storage.

### ***Future Peripheral Mounting***

Up to four removable rear covers allow access to future USB based peripherals.

### **Protégé Workstation and Application Support**

At release, the Protégé is supported by RES 4.8 MR5. Additional application support will be announced when available. The Protégé can be used with the MICROS WS4 LX, WS5, and WS5A. Platform updates are required for all existing workstations to support the Protégé. The RES Protégé Application is posted in the RES Members Area of the MICROS website. The table below summarizes the supported workstations.

<b>Workstation</b>	<b>Workstation Platform</b>	<b>RES Version</b>	<b>Notes:</b>
Workstation 4	Not Supported	N/A	Not Supported
Workstation 4 LX	GR2.0 (WIN CE 6.0 R3)	4.8 MR5	Pole Mount /w External AC Adapter only.
Workstation 5	GR2.0 (WIN CE 6.0 R3)	4.8 MR5	Integrated Rear and Remote Pole. Requires Adapter Cables.
Workstation 5A	GR1.3 (WIN CE 6.0 R3)	4.8 MR5	Integrated Rear and Remote Pole.
PCWS 2010	TBA		Coming soon, Pole Mount Only.
PCWS 2015	Upcoming		Coming soon - Integrated and Remote Pole.

*Figure 1-2: Protégé Hardware and Application Support*

### **Integrated Protégé Customer Display System**

The Protégé is available in integrated or pole mount versions.

The integrated version can be attached to the Low Profile or Adjustable Stand versions of the WS5, WS5A, and future PCWS 2015.



*Figure 1-3: Example of Protégé installed on WS5A Low Profile or on Adjustable Stand*

### **Pole Mount Protégé Customer Display**

The Pole Mount version of the Protégé can be used with WS5, WS5A and PCWS 2015 and the Workstation 4 LX, which does not support the integrated mounting bracket. The base can be installed on a cash drawer or counter surface.

Pole kits include an extended interface cable designed for use with a six inch pole. Shown in the Figure below is the six inch version mounted to a MICROS Cash Drawer.



*Figure 1-4: Protégé Pole Mount Version*



## *Software Components*

### **Boot Loader**

The Boot Loader is split between an internal ROM (iROM) within the iMX27 and a 128M NAND flash ‘glued’ to the main board.

It configures all system board hardware at the register level, and moves the operating system from NAND Flash to RAM.

The Boot Loader, similar to the BIOS in a PC, is specific to a given processor, in this case, the ARM compatible Freescale Semiconductor iMX27 Processor and System On-Chip.

### **Windows Embedded CE**

Windows Embedded CE 6.0 is a modular operating system sometimes found in hand-held and portable information appliance devices. Classified as an embedded operating system, Microsoft provides a tool called the Windows CE Platform Builder (CEPB), that allows MICROSOFT to custom build an operating system using only the modules and drivers required to support the hardware and application software. This results in an operating system where the cost, memory footprint and CPU requirements are substantially less than a traditional desktop operating system.

On the Protégé, the Windows CE image resides in a hidden partition in the NAND Flash device mounted to the System Board.

To support the Protégé Display System, the host workstation will require a CE Platform Update as well as the RES requirements listed in Figure 1-2. Support for Symphony is planned in the future.

### **Remote Network Driver Interface Specification (RNDIS)**

RNDIS is a Microsoft protocol that converts the USB interface between the host workstation and Protégé into a virtual Ethernet link. The RNDIS driver runs on both the host workstation and Protégé to provide interoperability between Microsoft Operating Systems.

The host workstation receives a copy of the RNDIS driver during the platform update. The RNDIS driver for the Protégé is included with the platform files shipped with the unit.

### **Order Confirmation Application**

The OCP Application (which includes a copy of PCAL Server for the host workstation) is staged on the properties RES Server.

Once staged on the RES Server the host workstation receives a copy of application and PCAL through a traditional CAL update. Once PCAL is installed on the host workstation, it transfers the Order Confirmation Application to the Protégé Display System.

### ***OCP Configurator Tool***

To simplify the customizing of the forms, MICROS provides a utility called OCP Configurator that allows the user to create new or modify existing forms. It can be installed on any PC running Windows XP or Windows 7. Forms are saved as .xml files, which are then downloaded via the CAL Server to PCAL Server on the host workstation.

The OCP Configurator and user documentation can be found on the RES area of the Member Services website.

### **Peripheral CAL (PCAL)**

PCAL is a new variant of the MICROS Client Application Loader designed specifically for intelligent peripherals such as the Protégé Customer Display System.

PCAL performs the same client/server functions as the traditional CAL, but between the host workstation and the Protégé Customer Display System. CAL Packages intended for the Protégé are staged in the appropriate folders on the system CAL server, and are then transferred to the host workstation's PCAL folders, located on the CF card. Finally, the PCAL server on the host workstation transfers the package to the Protégé PCAL client folders.

The Protégé is currently shipped with a standard CAL client. After PCAL is installed, it communicates exclusively with PCAL server on the host workstation.

### **Diagnostics Utility**

Similar in scope to the Diagnostics Utility included with any MICROS workstation the Protégé platform software includes a complete diagnostics test suite formatted specifically for the 7" LCD.

## *Memory and Storage Architecture*

This section highlights the key features of the Protégé memory architecture and defines where each of the various software components are stored.

### **128MB NAND Flash**

In Windows CE the 128Mb NAND Flash device appears as 'BOOT' in My Devices. NAND flash is soldered to the main board and is not expandable.

- The Windows Embedded CE image includes all platform software and resides in a hidden partition and includes a copy of the default system registry.
- The Protégé drivers are a collection of ARM9 compatible platform specific DLL files that provide access to hardware.

### **128MB Mobile DDR RAM - Working System RAM**

System or 'working' RAM is contained in a single low power 128M Mobile DDR SDRAM, mounted to the System Board. It is not expandable.

- The RAM holds the runtime requirements of Windows CE and the Application code as the workstation operates. RAM contents are lost if power is removed.

### **MicroSD Memory Card**

Installed behind the right side end cap is the MicroSD card socket. A 512MB device will ship initially. In My Devices, the card appears as 'STORE.'

The Protégé uses the microSD card to store the Windows CE Registry, the application, customer specific images or multimedia files.

See Chapter 3 for more information on how to access the microSD Card.

## What is the Protégé?

### Specifications

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## *Specifications*

The Protégé Display System conforms to the following specifications.

Specification	Parameters
Processor	Freescale Semiconductor i.MX27 Multi-Media Applications Processor (266Mhz Core Speed)
Cache	16KB Instruction and 16KB Data (No L2 Cache)
Display	7" 800x480 Color TFT LCD
Backlight	White Light Emitting Diodes
Real Time Clock	Software compatible with DS1287 and MC146818. 100-year calendar with alarm features and century roll-over, includes 242 bytes of battery backed CMOS RAM.
Memory	> 128MB Mobile DDR SDRAM (266Mhz) > 128MB NAND Flash > 512MB microSD Memory Card Standard - 2GB max
Serial Ports	2 - Reserved for Future Options
USB Ports	1 - USB 2.0 On The Go (OTG) - Used for Host Interface 3 - USB 2.0 Reserved for future use.
Mag Stripe Reader	Future Option - Field Upgradable
Input Power	+12VDC @1A (Max)
Storage Temperature	-25°C (-13°F) to 80°C (176°F)
Operating Temperature	0°C (32°F) to 45°C (113°F), 90% Relative humidity max
Weight	Integrated Shipping weight 2.6 lb. (1.2 kg) Pole Shipping weight 3.9 lb. (3.9 kg)
Case Material	ABS Plastic
Physical Dimensions	Refer to Appendix A

## *Approvals*

The Protégé meets the following safety and environmental certifications.

Directive	Specification	Year	Expiration Date	Comments
SAFETY:	IEC/EN 60950-1	2005	Current	
EMC:	EN 55022 + A1	2006	Current	
	EN 61000-3-2	2006	Current	

Directive	Specification	Year	Expiration Date	Comments
	EN 61000-3-3+A1+A2	1995	Current	
	EN 55024+A1+A2	1998	Current	



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## Chapter 2

### *What's Inside?*

This chapter describes how to open the Protégé, provides a description of the main board componets and connectors, then shows how to reassemble the unit.

#### ***In this chapter***

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## *Disassembling the Protégé Display*

The following procedure describes how to disassemble the unit and access the IO panel connectors and internal components.

### **Protégé Mounting Bracket**

The Figure below shows examples of the Integrated and Pole Mount VESA 75 compatible brackets used on the Protégé as it enters production. The Pole mount version includes a 19" interface cable.



*Figure 2-1: Protégé Integrated (Left) and Pole Mount (Right) Brackets and Cables*

### **Removing the Protégé Display from the Integrated or Pole Mount**

1. Power Off the host workstation or disconnect the AC adapter from the AC source.
2. Disconnect the Protégé cables from the host Workstation.
3. Remove the Protégé from the Pole or Workstation
  - o If the Protégé is mounted to the workstation, remove the integrated bracket by sliding it out through the rear door cut-out.
  - o If the Protégé is attached to a Pole, loosen the 1.5mm set screw and remove pole bracket. Disconnect the Protégé from the Pole Cable.



## Removing the Protégé Cover

The following procedure describes how to open the Protégé cover.

1. Place the Protégé face down on your work surface.
2. Remove the (4) VESA 75 integrated or pole mount bracket screws.
  - o Removing the bracket exposes the IO area, cables and tie wrap.



*Figure 2-1: Accessing the IO Panel Area and Cables*

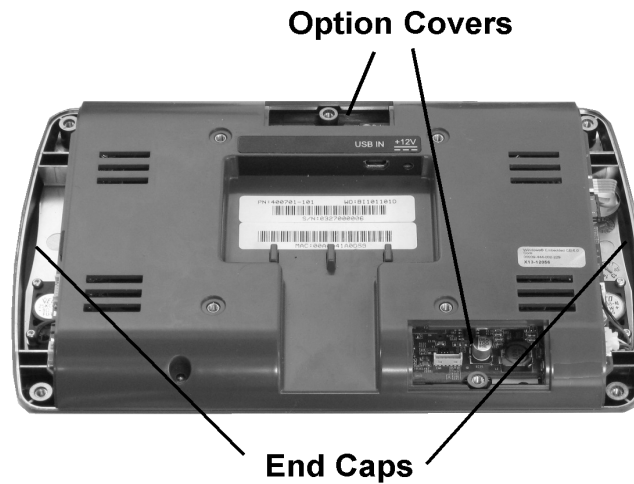
3. Clip the tie-wrap holding the cables in place.
4. Remove the cables from the 'USB IN' and '+12V' connectors.
5. Remove all case screws including two option covers. The Protégé case uses 2.5mm hex head screws.
  - o One 2.5mm hex wrench is supplied in the loose parts kit of each MICROS workstation, starting with the Workstation 4, to remove the CF Card Cover bracket. One 2.5mm hex wrench is also shipped with each Workstation 4LX, Workstation 5, Workstation 5A, and PCWS 2015.

## What's Inside?

### Disassembling the Protégé Display

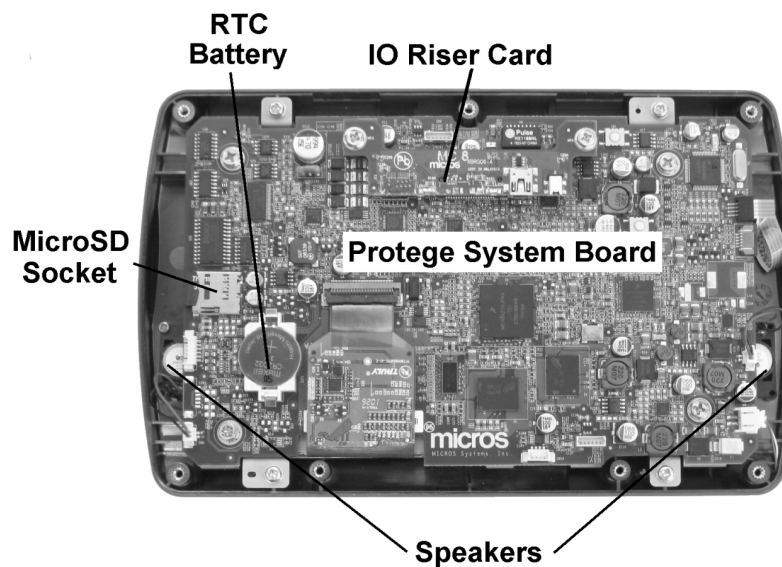
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6. Remove the end caps and option covers before removing the rear cover itself.



*Figure 2-2: Removing the MICROS Protégé Display Cover*

7. When removing the rear cover, you may need to shift it slightly to clear the IO Riser Card connectors.
  8. The cover may be held in place by the IO connectors. Lift on the ends, then pull forward to clear the IO connectors.
- Figure 2-3, below displays the main Protégé components.



*Figure 2-3: Protégé Components*

## System Board

This section provides detail on the Protégé System Board Revisions, Integrated Circuits, Connectors, and Jumpers.

### Protégé Display System Board Integrated Circuits - Revision C

Figure 2-4, displays the primary integrated circuits on the Protégé System Board Rev C.

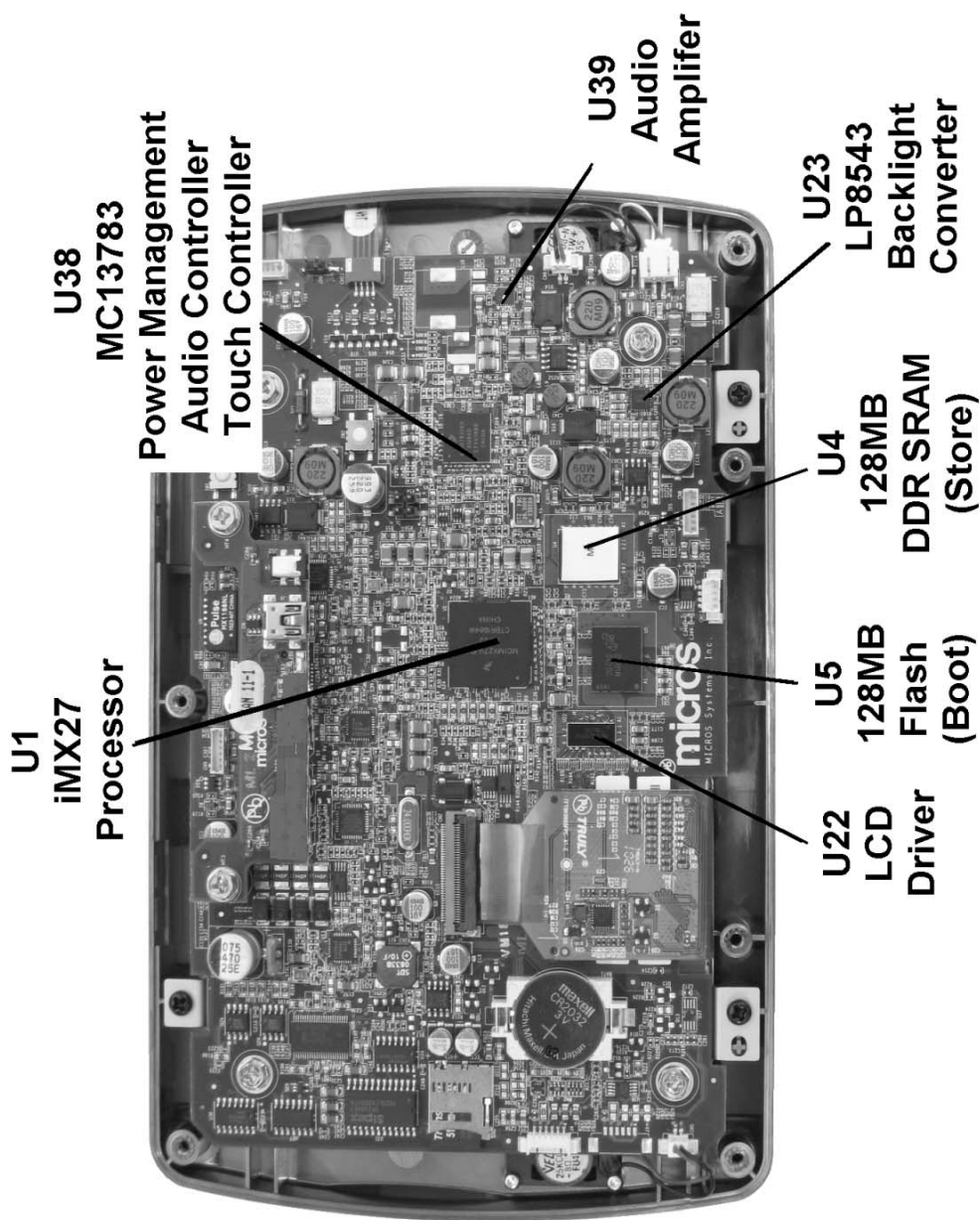
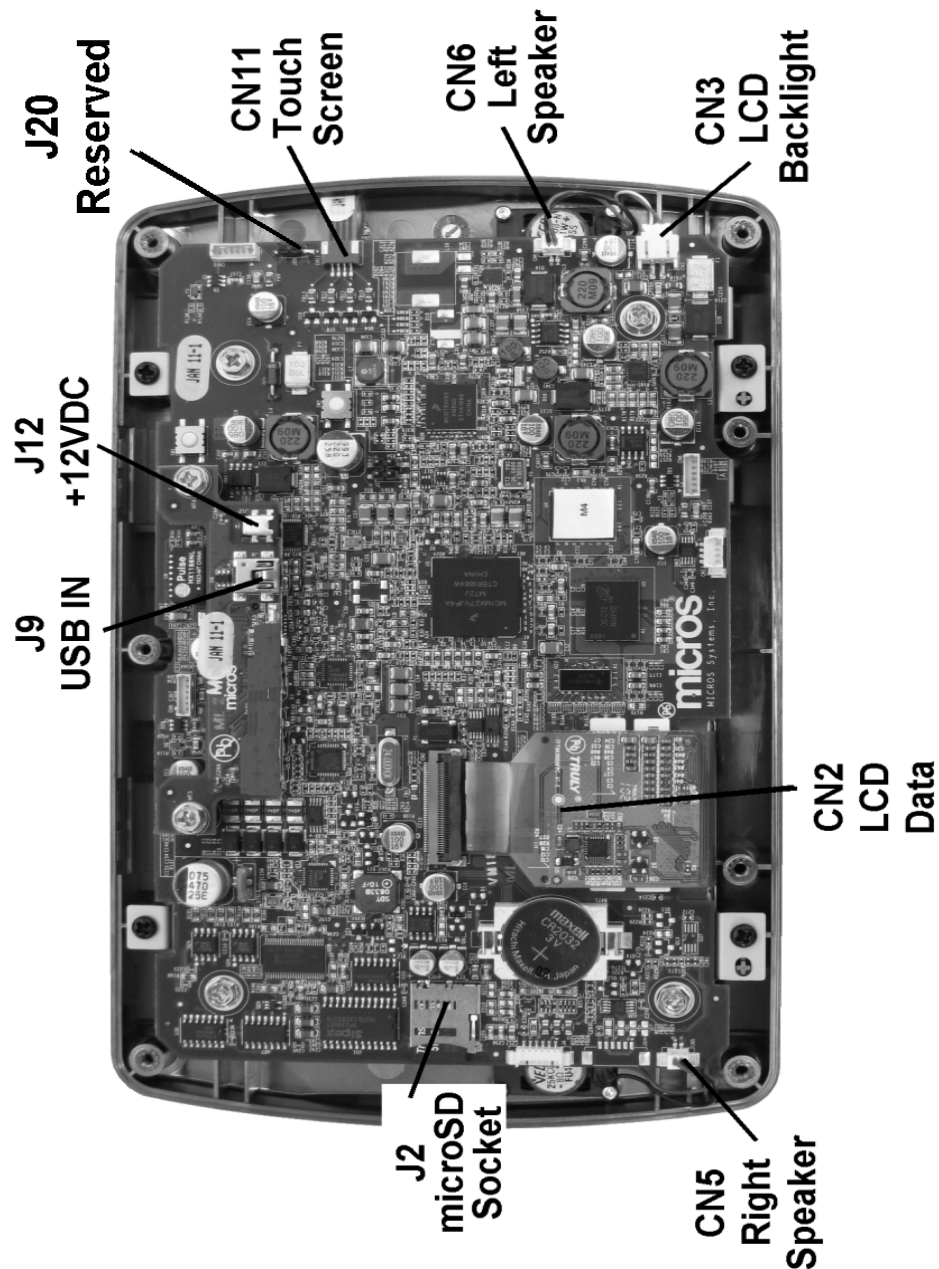


Figure 2-4: Protégé Display Revision C System Board Integrated Circuits

## Protégé System Board Connectors and Jumpers - Revision C

Figure 2-5 displays the Protégé system board connectors.



*Figure 2-5: Protégé Display - Main Board Rev C Connectors and Jumpers*



## *Technical Overview*

The following pages provide an overview of the Protégé System Board components and operation.

### **The iMX27 Multimedia Applications Processor**

The iMX27 processor features the advanced and power-efficient ARM926EJ-S core operating at 266Mhz, and optimized for minimal power consumption using the most advanced techniques for power saving. Based on 90nm technology, the iMX27 provides optimal performance vs. power requirements.

The iMX27 supports connections to various external memory types such as DDR SDRAM, and NAND Flash.

Connectivity to peripherals are provided by six serial ports, two high speed USB 2.0 interfaces, two SDIO interfaces and two CSPI bus interfaces, all of which are detailed below.

Advanced power management

- Dynamic process and power domains
- Multiple clock and power domains
- Independent gating of power domains

### **ARM9 Platform Features**

- ARM926EJ-S operates at 266Mhz with a core voltage of 1.2V. It is member of the ARM9 family of general purpose microprocessors targeted at multi-tasking applications. It provide the following features.
- 16K instruction cache and 16K data cache.
- High performance ARM 32-bit RISC engine
- Advanced Micro controller Bus Architecture (AMBA<sup>™</sup>) system-on-chip multi-master bus interface.
- ARM Interrupt Controller
- Clock Control Module (CLKCTL)
- AHB to IP bus interfaces (AIPs)
- The Multi-Layer 6 x 3 AHB Crossbar Switch

### **Enhanced Multi Media Accelerator Light (eMMA\_Lt)**

iMX27 supports on-the-fly video processing that reduces system processor and memory load. It consists of independent video pre-processor (PrP) and post-processor (PP) modules. The video codec is included as a separate module.

The PrP and PP modules are capable of accessing system memory independently, and bus mastering the AMBA bus to access system memory without CPU intervention. Can be used for generic Pre and Post Processing functions such as scaling, resizing, and color space conversions.

These modules work together to provide video acceleration, and to off-load the CPU from computational intensive tasks.

***Features:***

MPEG-4 part II simple profile encoding/decoding

H.264/AVC baseline profile encoding/decoding

H.263 P3 encoding/decoding

**Memory Interface**

***Enhanced Synchronous Dynamic RAM Controller (ESDRAMC)***

The ESDRAMC provides interface and control for synchronous DRAM memories. Both single data rate and double data rate memories are supported.

The system board contains a single 'board-down' 128M Mobile DDR SRAM, U5.

***NAND Flash Controller (NFC)***

NAND Flash controller is composed of various logic control modules and a 2K internal RAM buffer. It provides a glue-less interface to both 8-bit and 16-bit NAND flash devices with page sizes of 512 bytes or 2 Kilobytes. The addressing scheme enables the NFC to address flash devices of almost limitless capacity.

The 2Kbyte RAM buffer of the NAND Flash is used as the boot RAM during a cold reset (if the iMX27 is configured for a boot to be carried out from the NAND flash device). After the boot procedure completes, the RAM is available as buffer RAM. In addition, the NFC provides an X16 or X32-bit interface to the AHB bus on the chip side, and an X8/X16 interface to the NAND Flash device on the external side.

The system board contains a single 128M NAND flash device, U4. It appears as 'BOOT' in Windows Explorer.

**LCD Controller and Backlight Control**

The iMX27 LCD Controller provides an interface for external gray-scale or color LCD panels. This includes passive matrix color (passive color or CSTN), and active-matrix color (active color or TFT) LCD Panel.

The SLCDC transfers data from the display memory buffer to the external LCD Panel. DMA is used to transfer the data transparently with minimal software intervention. DMA bus utilization is both controllable and deterministic.

The LCD Controller handles the transfer of data from display memory to the display device, allowing the processor to concentrate on image rendering. In a typical scenario, the image is rendered in main memory. The processor triggers the LCD to transfer the image to the display device. DMA is used to optimize this transfer. After the transfer is complete, an interrupt is generated and the CPU renders the next frame, etc.

The Protégé Customer Display uses a 7" wide LCD from Truly. Native resolution is 800x480.

### **Backlight Control**

Backlight Control is provided by U23, a LP8543 PWM Converter located on the system board. The API drives the PWM circuit. The output of the PWM converter drives backlight connector CN3.

### **USB Ports**

The iMX27 provides three USB Ports, including one with On The Go (OTG) functionality. Each port functions at TTL Levels and conforms to the USB 2.0 Transceiver Macrocell Interface (UTMI).

The Protégé Customer Display utilizes the USB OTG Interface to form the primary communications link between Protégé OCD and host workstation.

### **Secure Digital Host Controller (SDHC)**

The Secure Digital Host Controller controls the Secure Digital Memory Card and Secure Digital IO Card (SDIO), by sending commands and data to the card and performing data accesses to/from the card. The SD Card Host Controller is fully compatible with the following standards:

- MMC System Specification Version 3.0
- SD Memory Card Specification Version 1.0 (2GB Max). J2 is not compatible with microSD High Capacity cards larger than 2GB.
- SDIO Card Specification Version 1.0

The Protégé OCD uses one SD Host Controller port to support the microSD card socket J2.



### **Configurable Serial Peripheral Interface (CSPI)**

The iMX27 provides three configurable serial peripheral bus interface (CSPI) modules. Each provides a full-duplex synchronous serial interface, sometimes called a four-wire serial interface. Two of these channels are used to form an interface between the iMX27 CPU and the Power Management, Audio and Touch controller, described below.

The CSPI3 interface is not used.

The SPI bus is a 'defacto' standard not governed by industrial or international standards bodies.

### **MC13783 Power Management/Audio/Touch Controller**

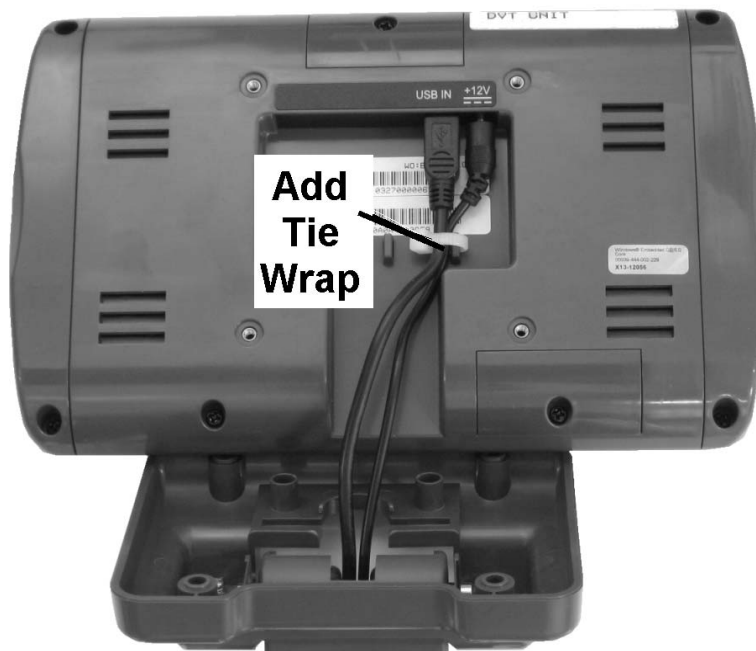
The CSPI1 and CSPI2 interfaces described above are used as communications channels between the iMX27 and U38, the MC13783

Touchscreen/Audio/Power management controller register set. The iMX27 manages the MC13783 resources and monitors its operation through this interface.

Each CSPI port is configured to utilize 32-bit serial data words, using 1 read/write bit, 6 address bits, 1 null bit, and 24 data bits.

#### *Reassembling the Protégé Display*

1. Install the rear cover first, then install the end caps and option covers. Be sure to install all screws.
2. Make sure the power and USB cables are routed through the mounting bracket before connecting them to the USB IN and +12V inputs as shown in the Figure below.
3. Add a tie wrap to secure the cables to the cable cleats.
4. Install the VESA bracket with the Integrated or Pole mount and install the four screws.



*Figure 2-7: Securing the Interface Cables*

5. See Chapter 3 for more information about installing the Protégé on the Workstation 5A and other supported workstations.

---

## Chapter 3

# *Installing and Operating the Protégé Customer Display System*

This chapter describes the environmental requirements for the Protégé Customer Display, the platform requirements and hardware installation procedures for supported MICROS workstations, then goes on to cover the basic operational procedures.

### ***In this chapter***

---

Care and Handling .....	3-2
Installation .....	3-4
Operation .....	3-16

---

## *Care and Handling*

Tips for placing the unit in an environmentally sound location and instructions for cleaning the workstation cabinet are presented in this section.

---

### **Equipment Placement**

Following are some considerations for placement of the unit and related peripheral equipment.

#### **Location**

- Appendix A contains dimensional data for the workstation and peripheral devices. Before you decide on the space each piece of equipment will occupy, take measurements and compare them to ours.
- Locate all equipment so that it is accessible to service personnel.
- Tile is the recommended floor surface for areas surrounding the equipment. If the floor covering adjacent to the equipment is carpeted, an anti-static grade of carpeting is recommended.
- If the carpeting surrounding the area housing the equipment is not composed of anti-static material, the use of static discharge mats is recommended. An anti-static mat incorporates a grounding clip with a cable that can be attached to earth ground.

#### **Proximity to Foreign Materials**

Spilled liquids can cause damage to the circuits in MICROS equipment.

- Do not place equipment near food preparation areas, glass racks, or water stations.

Another source of potential hazards to the equipment are foreign objects, including paper clips, staples, and any other metallic objects.

- Safeguards should be taken to prevent the accidental dropping of such materials into the equipment.

#### **Noise Induction**

In addition to the AC Power Requirements outlined in chapter 3 of the appropriate Site Preparation Guide, other sources of electromagnetic interference must be eliminated to ensure trouble-free operation of the equipment.

- Noise radiating from AC power lines throughout the site can be absorbed by MICROS AC power and communications lines and induced into the equipment. Consequently, no exposed cable dedicated to the MICROS equipment should be run in the vicinity of any AC power lines.

- Devices that emit RF energy, such as cordless phones, and walkie-talkies should be kept at least 8 inches from the equipment or cable during operation.

### **Electrostatic Discharge (ESD)**

The occurrence of electrostatic discharge (ESD) usually takes the form of a discharge from the operator's hand to cash drawers, the workstation, the magnetic stripe card reader or other peripherals.

ESD is more common in dry climates during the winter, and less common in moist climates. The workstation has excellent built-in immunity to ESD in most environments. However, tile or anti-static carpet is recommended in areas near the workstation.

### **Temperature and Humidity**

The Protégé can operate in temperatures between -0°C (32°F) and 45°C (113°F).

A constant humidity between 40% and 90% is required for proper operation of the equipment.

### **AC Power and Data Cabling Requirements**

AC Power cabling to the AC adapter should be installed in accordance with the appropriate MICROS Site Preparation Guide.

### **Cleaning the Display, Cabinet and Touchscreen**

Recommendations for cleaning the Cabinet and LCD are described below.



#### ***SHOCK HAZARD***

Before performing preventive maintenance or cleaning the unit, turn the unit off by turning off the host workstation.

---

#### ***Touchscreen***

The touchscreen overlay can be cleaned using any common household cleaner applied with a clean cotton cloth. Always spray the cloth with the cleaner first, then use the cloth to clean the overlay.

#### ***Cabinet***

Always use a chamois or clean lint-free cloth to clean the cabinet and screen surface. Do not use chemical, alcohol, or petroleum based cleaners that are not recommended for plastics.

## *Installation*

Installation consists of physically installing the Protégé on the host workstation, obtaining the appropriate Windows CE platform updates, then obtaining and installing the PCAL and the Protégé Application.

### **Protégé Display System Installation**

Installation of the Protégé Pole Mount Kit.

Protégé installation on the WS4 LX (WS4 not supported).

Protégé installation on the integrated or pole WS5.

Protégé installation on the integrated or pole WS5A.

Protégé installation on the integrated or pole PCWS 2015. (Platform support TBA).

### **Platform Updates**

To support the Protégé Customer Display System, the host workstation must be running the following Windows CE platform:

- Workstation 4 - not supported
- Workstation 4 LX - GR2.0 (Windows CE 6.0 R3)
- Workstation 5 - GR2.0 (Windows CE 6.0 R3)
- Workstation 5A - GR1.3 (Windows CE 6.0 R3)
- PCWS 2010 - TBA
- PCWS 2015 - TBA

Platform updates for the host workstation can be downloaded from the appropriate page on the MICROS HSG Portal. In addition to updates for Windows CE 6.0 R3 and hotfixes, the platform update includes a copy of the Remote Network Driver Interface Specification (RNDIS). It is a Microsoft proprietary protocol that converts the USB interface between the host workstation and Protégé into a virtual Ethernet link.

### **Protégé Application and PCAL**

Similar to a MICROS workstation, the Protégé Display System is designed to run multiple applications and requires an application download.

Currently, the display application is supported by RES 4.8 MR5. The RES Application and user documentation are posted in the RES Members Area of the MICROS website.

This package first installs PCAL on the host workstation through a traditional CAL update and starts it. PCAL transfers the application from the host workstation to the Protégé.

## Installing the Pole Mount Protégé

The Pole Mount Protégé is shipped pre-assembled with 19" interface cable and bracket, 6" Pole, base and nut.

1. Attach the base to a cash drawer, or using the base of the pole as a template, attach to the counter surface. Appendix A provides details of the base hole patterns.
2. Route the Protégé Display cable through the pole and connect to the workstation as described in the following pages.
  - *Note: the Protégé Customer Display System uses 1x8-pin connectors on all cables and is not compatible with the LCD Customer Display cables, which use a 1x6 connector.*
3. Attach the Protégé to the pole. When the display is in the desired position, tighten the 1.5mm set screw.

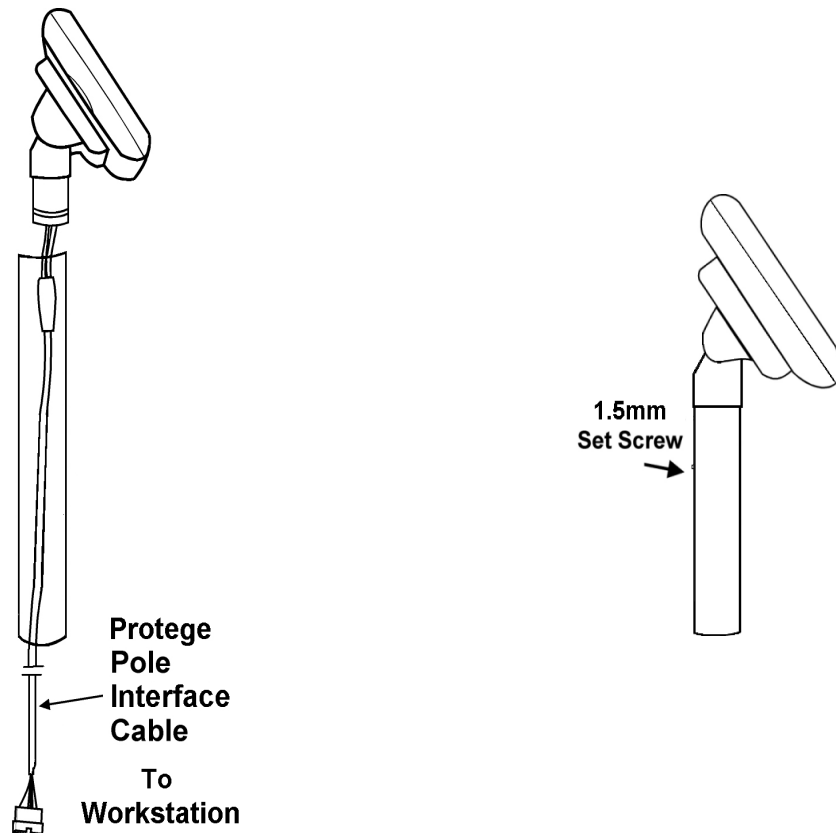


Figure 3-1: Attaching the Protégé Customer Display System to the Pole

4. To connect the Protégé Pole cable to a Workstation 5, see page 3-8. To connect the Protégé Pole cable to Workstation 5A, see page 3-15.

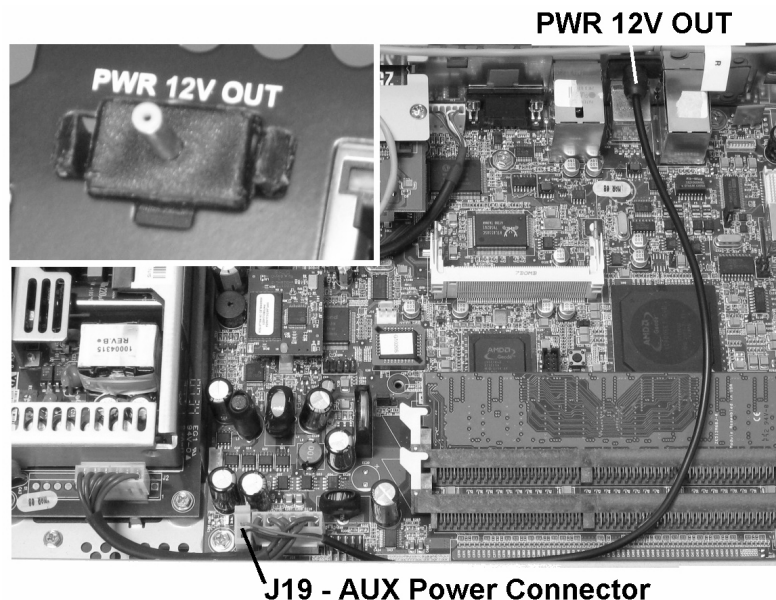
## **Installing the Protégé on the Workstation 5 and Workstation 4 LX**

This section describes how to install and connect the Integrated or Pole Mount Protégé to the WS5 or WS4 LX. Depending on the kit, the power to operate the Protégé can be obtained from the Workstation 5, or external AC Adapter. The Workstation 4 LX must use the pole mount and external AC Adapter.

### **Installing the Workstation 5 Internal Power Cable**

The following procedure describes how to install the internal power cable supplied with kit P/N 000170-020.

1. Power off the WS5, and remove all cables from IO panel.
2. Remove the top cover, then remove the LCD/touchscreen assembly cables from system board and set it aside.
3. Refer to Figure 3-2, below to install the cable.



*Figure 3-2: Installing the WS5 Internal Power Cable*

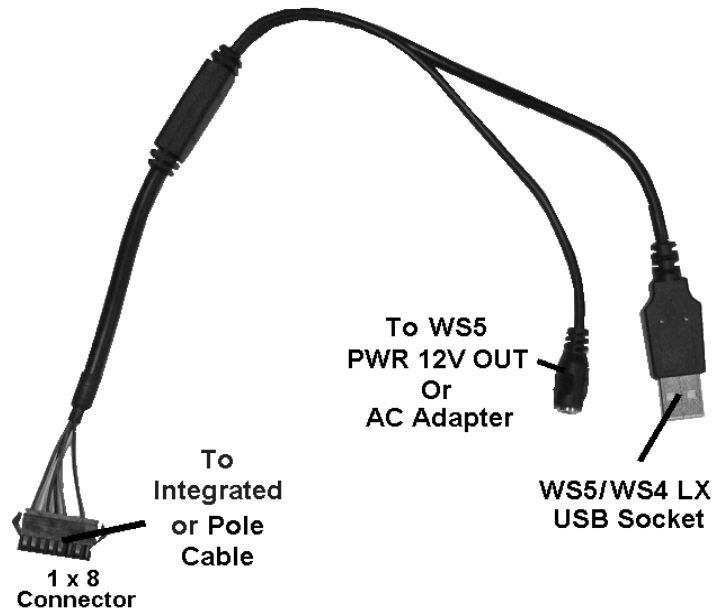
4. Using a screw driver, punch out the “PWR 12V OUT” knock-out from IO panel.
5. Connect the 2-Pin connector to J19 (located to the left of power supply connector J16) on the System Board. Force the other end of the cable into the IO Panel knock-out until it locks into place. The inset at the upper left of Figure above shows the completed installation.
6. Reassemble the WS5.
7. Proceed to the WS5 Integrated or Pole installation procedure.



### WS5/WS4 LX to Protégé Interface and Power Cable

Both the WS5 Adapter kit (000170-020), and WS4LX/WS5 Adapter Kit (000127-040) include the 'Y' cable shown in Figure 3-3.

It connects to the WS4LX or WS5 IO Panel to the integrated or pole mount Protégé. It is used to connect the WS4 LX or WS5 directly to the integrated or pole mount Protégé.



*Figure 3-3: Protégé Display WS5 and WS4 LX Interface/Power Cable*

On the following pages, the various Workstation 5 configurations and Workstation 4 LX using this interface cable are detailed.

### WS5 to Integrated Protégé - Workstation or External AC Adapter

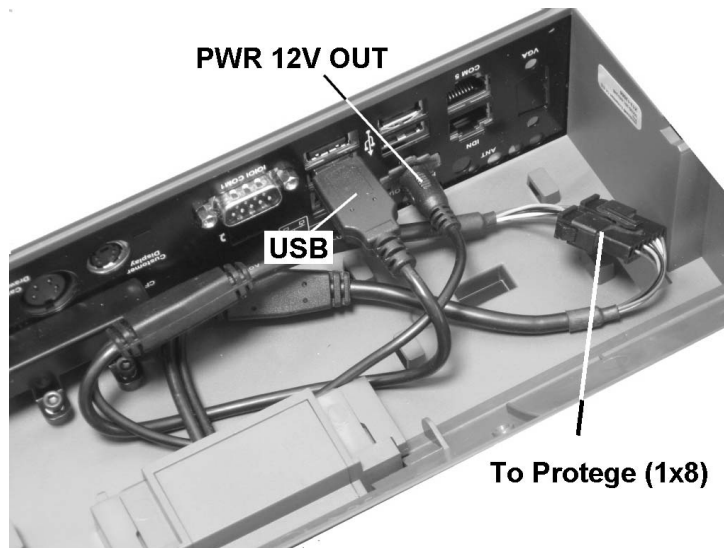
This procedure describes how to install and connect the integrated Protégé to the WS5 when using the internal power cable or external AC Adapter.

1. Power off the workstation, remove cables, place the unit on its face to access the IO panel.
2. Remove the MICROS logo plate from the IO Door cut-out.
3. Orient the Protégé with the speakers facing the bottom of the workstation, then insert in the IO door cut-out. Slide the Protégé and Bracket into place until the clips lock into place.
4. Connect the Protégé interface cable to the Workstation 5 Interface cable.

#### **Internal Power Option**

- Connect the 1x8 connector to the Protégé 1x8 connector.

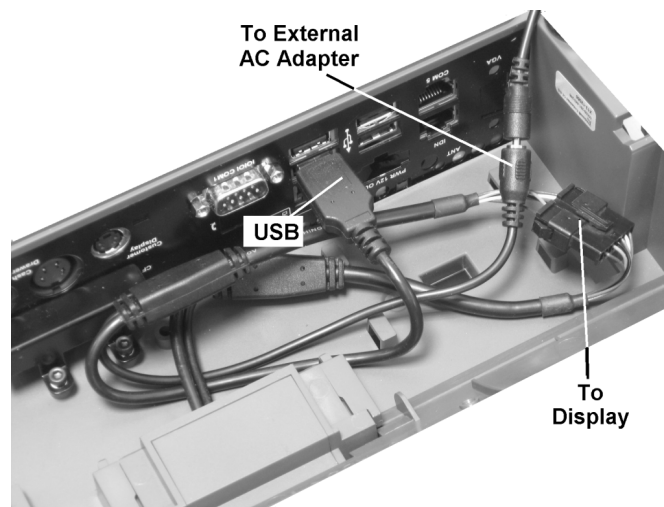
- Connect the USB Type A connector to an available IO Port USB socket. Connect the female power connector to the “PWR 12V OUT” jack.



*Figure 3-4: Integrated Protégé to Workstation 5 - Internal Power*

#### **External AC Adapter**

- Same as above, but connect the external AC adapter to the power socket as shown.



*Figure 3-5: Integrated Protégé to Workstation 5 - External Power*

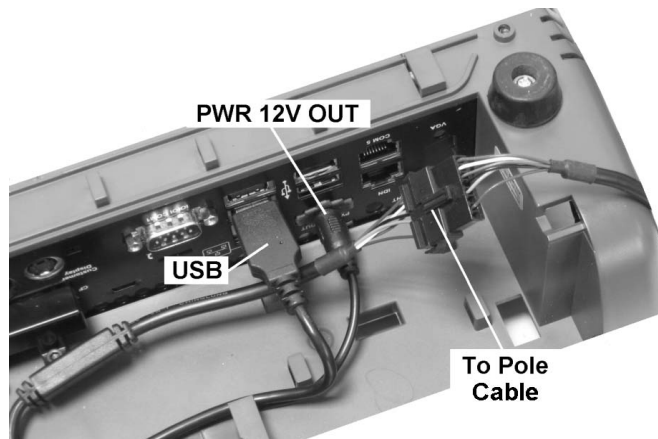
### **WS5 to Pole Mount Protégé - Workstation Power or External AC Adapter**

This procedure describes how to connect the Pole Mount Protégé to the WS5 when the power source is the host workstation or external AC Adapter.

1. Install the Protégé and run the Protégé Pole Cable to the workstation as described in Figure 3-1 on page 3-7.
2. Power off the workstation and install the interface cable.

#### ***Internal Power***

- Attach the 1x8 connector to the Protégé Pole Cable.
- Connect the USB Type A connector to an available IO Panel USB connector.
- Connect the female power connector to the “PWR 12V OUT” jack. Figure 3-6.

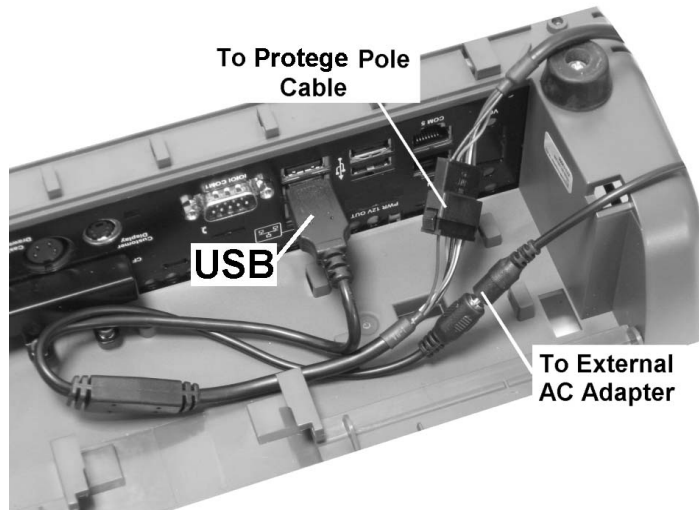


*Figure 3-6: Pole Mount Protégé Display to Workstation 5 - Internal Power Option*

To install the Protégé with an external AC adapter, see the next page.

#### ***External AC Adapter***

- Attach the Protégé 1x8 connector to the Protégé Pole Cable connector.
- Connect the USB Type A connector to an available IO Panel USB connector.
- Connect the female power connector to the pin plug from the external AC Adapter. Connect the AC Adapter to an AC Power Source. Figure 3-7.

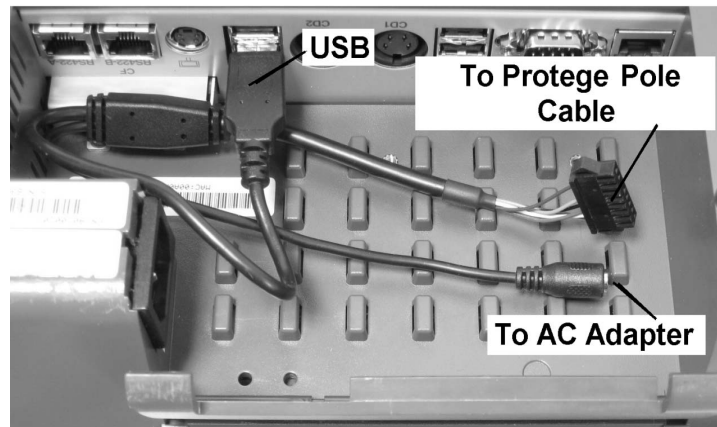


*Figure 3-7: Pole Mount Protégé to Workstation 5 - External AC Adapter*

## Installing the Protégé on the Workstation 4 LX

This section describes how to install and connect the pole mount Protégé Display to the Workstation 4 LX, using kit 000127-040. This configuration uses the same interface cable as the Workstation 5, but receives power from an external AC adapter. The integrated mount and internal power options are not available for the WS4 LX.

1. Install the Protégé Display and run the Protégé Pole Cable to the workstation as described in Figure 3-1 on page 3-7.
2. Power off the workstation and install the interface cable.
  - Connect the USB Type A connector to an available IO Panel USB connector.
  - Attach the 1x8 connector to the Protégé Pole Cable connector.
  - Connect the female power connector to the pin plug from the external AC Adapter. Connect the AC Adapter to an AC Power Source. Figure 3-8, below.



*Figure 3-8: Pole Mount Protégé to Workstation 4 LX*

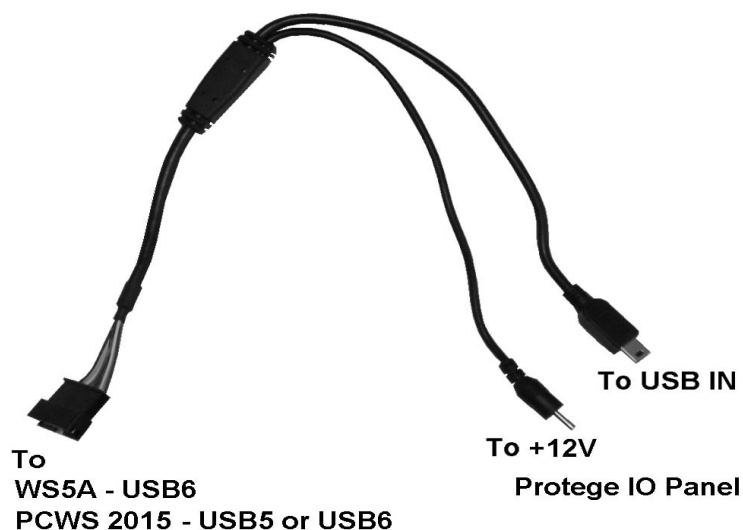
---

## **Installing the Protégé Display on the Workstation 5A and PCWS 2015**

This section describes how to install and connect the integrated or pole mount Protégé Customer Display to the Workstation 5A and future PCWS 2015.

### **Workstation 5A Protégé Interface and Power Cable**

The Protégé Display Interface cable shown in the Figure below is pre-installed in the Integrated version. The Pole Mount Protégé is shipped with the same cable extended to approximately 19". When connected to the WS5A or PCWS 2015, the Protégé receives power and USB data directly from the workstation.



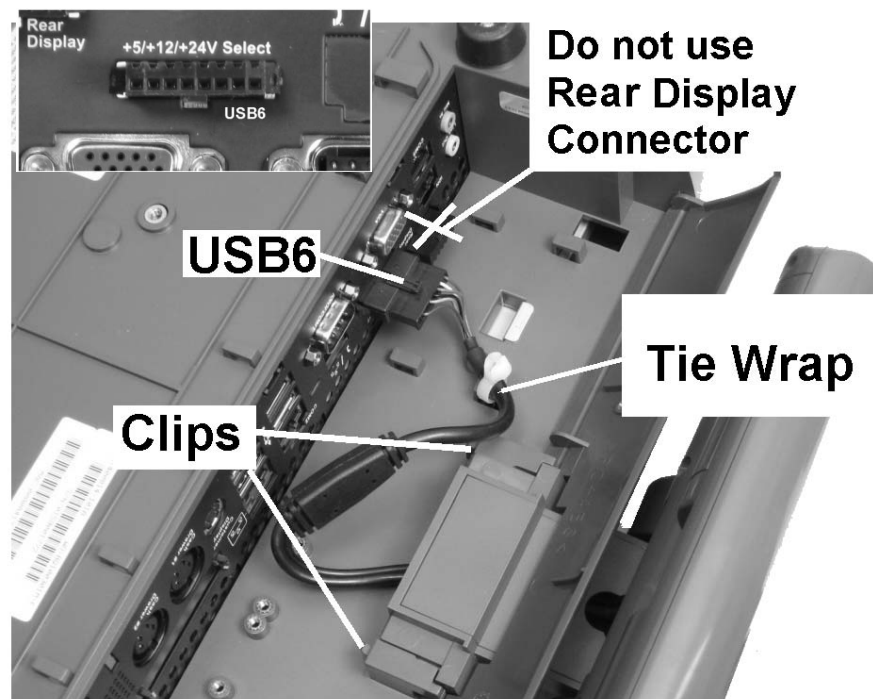
*Figure 3-9: Protégé Interface/Power Cable*

On the following pages, the various Workstation 5A configurations using this interface cable are detailed.

### Workstation 5A to Integrated Protégé

This procedure describes how to install the Protégé on the Workstation 5A.

1. Power off the workstation, remove cables, place the unit face down to access the IO panel.
2. Remove the MICROS logo plate from the IO Door.
3. Figure 3-10, below. Orient the Protégé with the speakers facing the bottom of the workstation, then insert in the IO door cut-out. Slide the Protégé and bracket into place until the clips lock into place.
4. Attach the 1x8 connector to USB6. The USB6 connector detail is shown in the upper left of the figure below.



*Figure 3-10: Attaching the Integrated Protégé to the Workstation 5A*

## Workstation 5A to Pole Mount Protégé

This procedure describes how to connect the Pole Mount Protégé to the Workstation 5A.

1. Install the Pole Mount Protégé and run the cable to the WS5A as previously described.
2. Connect Pole Mount Protégé cable to the WS5A USB6 connector, shown in Figure 3-11, below.



*Figure 3-11: USB6 - Protégé Pole Mount Connection to WS5A*

## PCWS 2015 to Integrated Protégé

This procedure describes how to install the Protégé on the future PCWS 2015, when available.

1. Power off the workstation, remove cables, place the unit face down to access the IO panel.
2. Remove the MICROS logo plate from the IO Door.
3. Refer to Figure 3-10 on page 3-15 and install the Protégé.
4. Orient the Protégé with the speakers facing the bottom of the workstation, then insert in the IO door cut-out. Slide the Protégé and bracket into place until the clips lock into place.



Figure 3-12: Protégé connected to COM6 on the PCWS 2015



## Configuration

The table below shows the workstation Platform Software required to support the Protégé. Platform software updates can be found on the individual workstation page of the HSG Portal.

Workstation	Workstation Platform	RES Version	Notes:
Workstation 4	Not Supported	N/A	Not Supported
Workstation 4 LX	GR2.0 (WIN CE 6.0 R3)	4.8 MR5	Pole Mount /w External AC Adapter only.
Workstation 5	GR2.0 (WIN CE 6.0 R3)	4.8 MR5	Integrated Rear and Remote Pole. Requires Adapter Cables.
Workstation 5A	GR1.3 (WIN CE 6.0 R3)	4.8 MR5	Integrated Rear and Remote Pole.
PCWS 2010	TBA		Coming soon, Pole Mount Only.
PCWS 2015	Upcoming		Coming soon - Integrated and Remote Pole.

*Figure 3-13: Protégé Hardware and Application Support*

After the required platform updates have been performed on the host workstation, PCAL and the Protégé Display application are staged on the RES Server. The RES Protégé Application, documentation and PCAL are posted in the RES Members Area of the MICROS website.

Executing RESProtégéSupportInstaller(Vx.x.x.).exe on the RES Server copies the PCAL Server and OCPDisplayInstaller in the appropriate CAL sever folders on the RES Server.

Start the CAL client on the host workstation to point to the RES CAL Server.

The PCAL Server and OCPDisplayInstaller packages are transferred and installed on the host workstation.

Start the CAL client on the Protégé and point to the host workstations PCAL Server.

The OCPDisplay application will transfer to the Protégé. When the transfer is complete, the application starts.

### IP Configuration

The Protégé is supplied with pre-configured static IP Addresses in the range 192.168.32.5 and subnet values.

## Operation

### Starting the Protégé

The Protégé has no external controls. When receiving power from the host workstation, the Protégé will power on and off in response to the Workstation power button.

One exception is the WS4LX/WS5 Kit P/N 000127-040, supplied with an AC adapter. When powered from an external AC Power Supply, both the Protégé and host workstation could be powered from a switched AC power strip.

### Protégé Start Up Screen

When the Protégé starts, it displays the splash screen /w micros logo shown in Figure 3-14, below. The Bootloader Version is displayed on the splash screen.



*Figure 3-14: Protégé Boot Splash Screen*

The Boot Splash screen appears for about 20 seconds. The Protégé beeps once, the bootloader screen clears and the Windows CE Desktop appears briefly before the PCAL client starts. If the OCPDisplay application installed, it starts. If this is a new installation of you have used the reconfigure PCAL shortcut. In some cases the PCAL may require a password to continue. Apply the following formula to the six-digit number that appears at the upper left box.

$$\text{Password} = \text{Digit 1} \times \text{Digit 2} + \text{Digit 4} + \text{Digit 6}$$

Calculate the password, enter it with the number keypad then press [NEXT>>] to continue. In this example, the password is 14 ( $0 \times 8 + 0 + 6 = 14$ ).

Select the PCAL Server. This will be the name of the host Workstation the Protégé is connected to.

## Touchscreen

The built-in touch screen is sufficient to perform normal maintenance of the device including running the Diagnostics Utility. However, a USB Service Cable will be available to allow connection of a standard USB mouse, keyboard, or USB thumb drive to the Protégé.

The Figure below shows the USB service cable attached to the Protégé. It connects to a on-board USB header exposed when the appropriate access panel is removed.



*Figure 3-15: Protégé USB Service Cable*

## *Accessing the MicroSD Memory Card*

The Protégé includes a microSD Memory Card socket, located inside the casework, behind the right end cap. A 2.5mm hex head wrench is required.

- *The microSD Memory Card is keyed - it can only be inserted in one direction and must be fully inserted into its socket.*

The microSD Memory Card has an asymmetrical shape to help prevent it from being inserted incorrectly.

- *The microSD Card must be installed or the Protégé will not start, and never remove or insert the microSD Memory Card while the power is ON.*

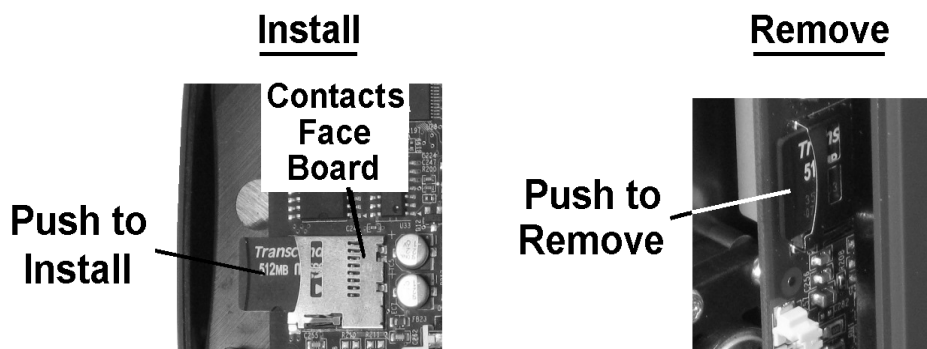
The Protégé application and persistent registry reside on the microSD card. Removing or installing the card with the power on can cause data loss and/or file corruption.

- To access the card, remove the right end cap (as you face the Protégé screen).

Figure 3-16 shows how to remove or insert the card. The socket is a 'Push-to-Install, Push-to-Remove' type.

- To install the card, (left side of Figure 3-16), make sure the card contacts are facing the circuit board, then slide the card into the socket until it locks in place.
- To remove the card, (right side of Figure 3-16), push to release, then pull the card out of the socket.

Figure 3-16 below, demonstrates how to orient the microSD Memory Card before insertion.



*Figure 3-16: Inserting and Removing the microSD Card*

---

## Chapter 4

# *Protégé Diagnostics*

This chapter includes diagnostics information on the Protégé Customer Display System. This includes a basic troubleshooting chart as well as using the DiagUtility and other utilities.

### ***In this chapter***

---

Basic Troubleshooting .....	4-2
Protégé Diagnostics Utility .....	4-3

---

## *Basic Troubleshooting*

This section provides a brief troubleshooting guide for common problems encountered when installing or operating the Protégé Display.

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Protégé is off. No Display	Protégé relies power from host workstation or external AC supply.  Host workstation must be powered, connected to Protégé and required updates installed.	Be sure Protégé is connected to a host workstation or external power source.  Workstation 4 LX <ul style="list-style-type: none"><li>o External AC Adapter</li></ul> Workstation 5 <ul style="list-style-type: none"><li>o +12V Aux Power</li><li>o External AC Adapter</li></ul> Workstation 5A <ul style="list-style-type: none"><li>o USB6</li></ul> PCWS 2015 <ul style="list-style-type: none"><li>o USB5 or USB6</li></ul>
When host workstation power button is pressed, Protégé displays White screen and MICROS logo, but after ~30 seconds, operating system does not start.	MicroSD card not installed, not seated in its socket, or defective.	Install or re-seat microSD card in its socket. Push one time to release. microSD Card is located behind right side plastic end cap.

## *Protégé Diagnostics Utility*

The Protégé DiagUtility combines System Information, Diagnostics and Utilities in a single menu.

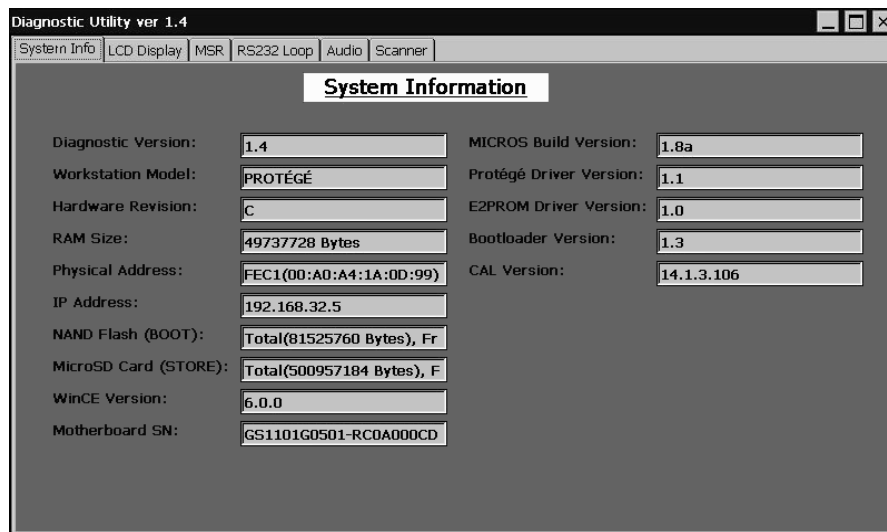
### **Starting the Protégé Diagnostics Utility**

1. From the Windows CE Desktop tap 'My Computer' twice.
2. Tap the BOOT folder twice, then utilities.
3. Tap DiagUtility.exe twice to start it.

The DiagUtility Version 1.4 starts and displays the System Information screen shown below.

### **System Information**

The System Info screen provides information about the Protégé hardware and software platform.



*Figure 4-1: Protégé Diagnostics System Information Screen Version 1.4*

All driver and firmware versions shown above are part of the GR1.0 Platform Software, valid at the time of release.

## **Platform Files**

The following is a brief overview of the Protégé Platform Files located in the \BOOT folder.

- *Protégé.dll*  
This file contains the Protégé API.
- *Platform.dat*  
Contains the CAL Client Platform Version.
- *ProtegeBkgndImage.jpg*  
The Windows Embedded CE 6.0 desktop wall paper includes the current software platform release info.

## **Utilities Folder**

The following is an overview of the Utilities files located in the \BOOT\Utilities folder.

- *DiagUtility.exe*  
The Protégé Diagnostics Utility. See the section called 'Running the Protégé Diagnostics Utility.
- *RegEditARMV4I.exe and RegUtiliyARM4VI.exe*  
Command Line and GUI versions of the Windows CE 6.0 Registry Editor. The command line version is used by the CAL.
- *Center.wav, Left.wav, Right.wav* - Windows sound files used in the Audio Test
- *EBOOT\_UPDATE.exe, flash.exe, NK\_UPDATE.exe, and XLDR\_UPDATE.exe*  
A collection of files used by the CAL to perform platform updates.
- *WipeStore.exe*  
WipeStore performs the same functions as the Wipe Compact Flash (WCF) Utility found in MICROS Windows CE based workstations. See the next page for more information.



## **System Utilities**

The System Utilities selection accesses the Windows CE Backlight Control, System Date and Time, and the Wipe Store Utility.

### ***WipeStore***

Running WipeStore.exe provides three selections.

#### 1) Delete Registry

This selection detetes the registry hive from the microSD Card.

#### 2) Erase files expect Registry

This selection deletes all files from the microSD card except the registry hive.

#### 3) Competely Erase the STORE

The selection deletes all files from the micoSD card including the registry hive.

After each selection, the Protégé powers OFF.



---

## *Appendix A*

# *Equipment Dimensions*

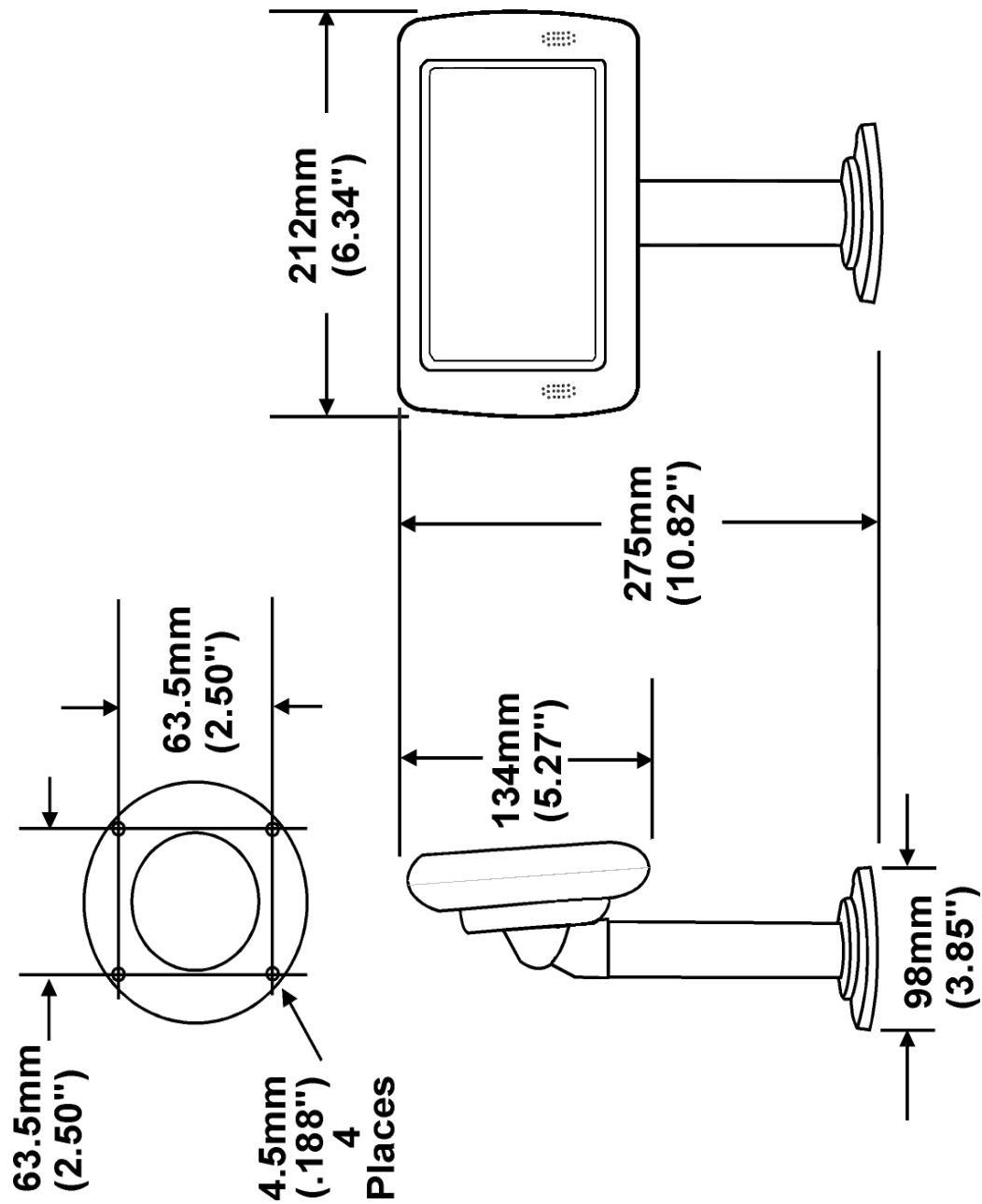
### ***In this appendix***

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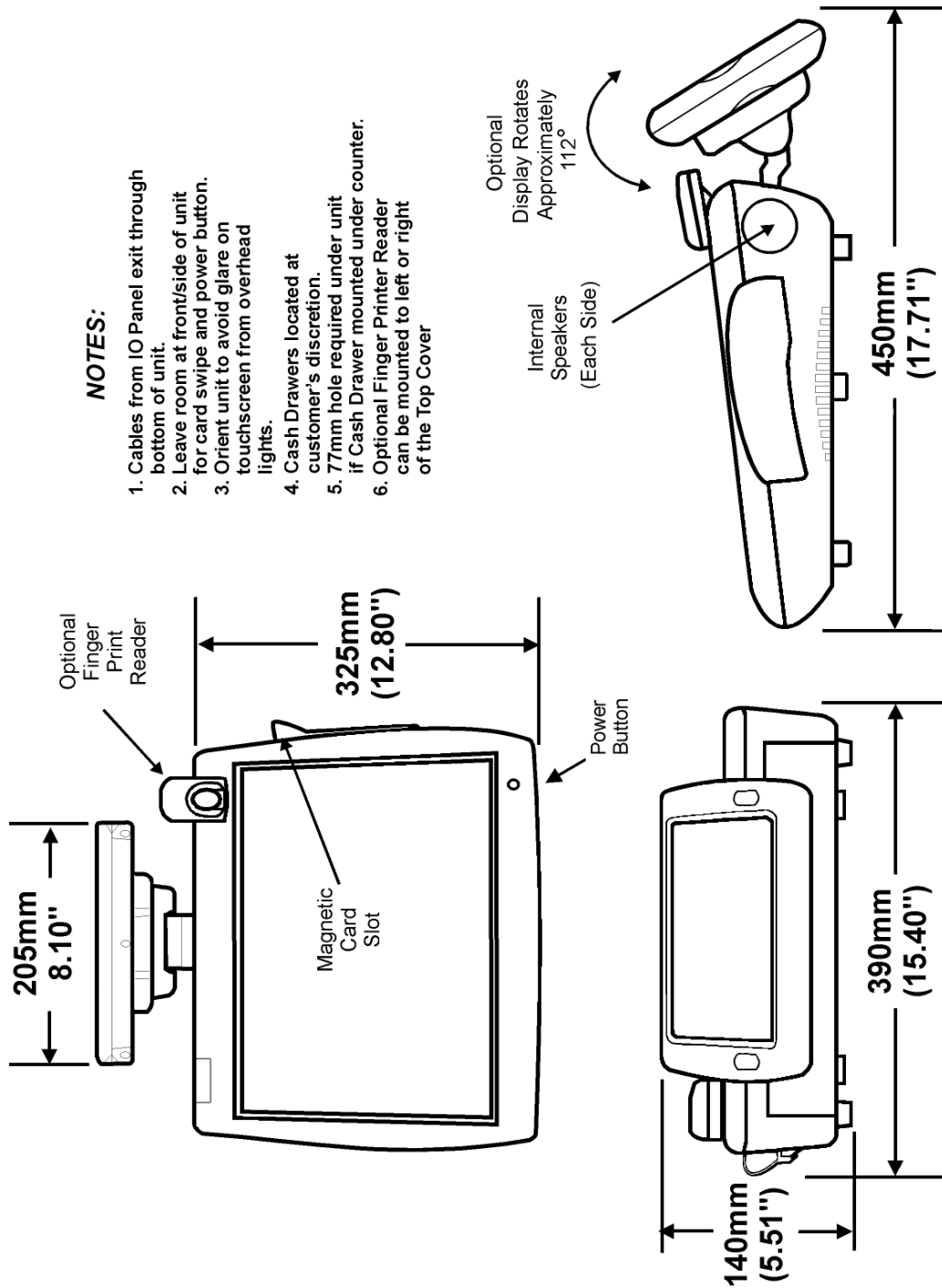
Protégé on 6" Pole .....	A-2
Protégé on Workstation 5/5A Low Profile.....	A-3
Protégé on Workstation 5/5A Adjustable Stand .....	A-4
Protégé on Workstation 5/5A Adjustable Pole Stand .....	A-5

---

*Protégé on 6" Pole*



## Protégé on Workstation 5/5A Low Profile



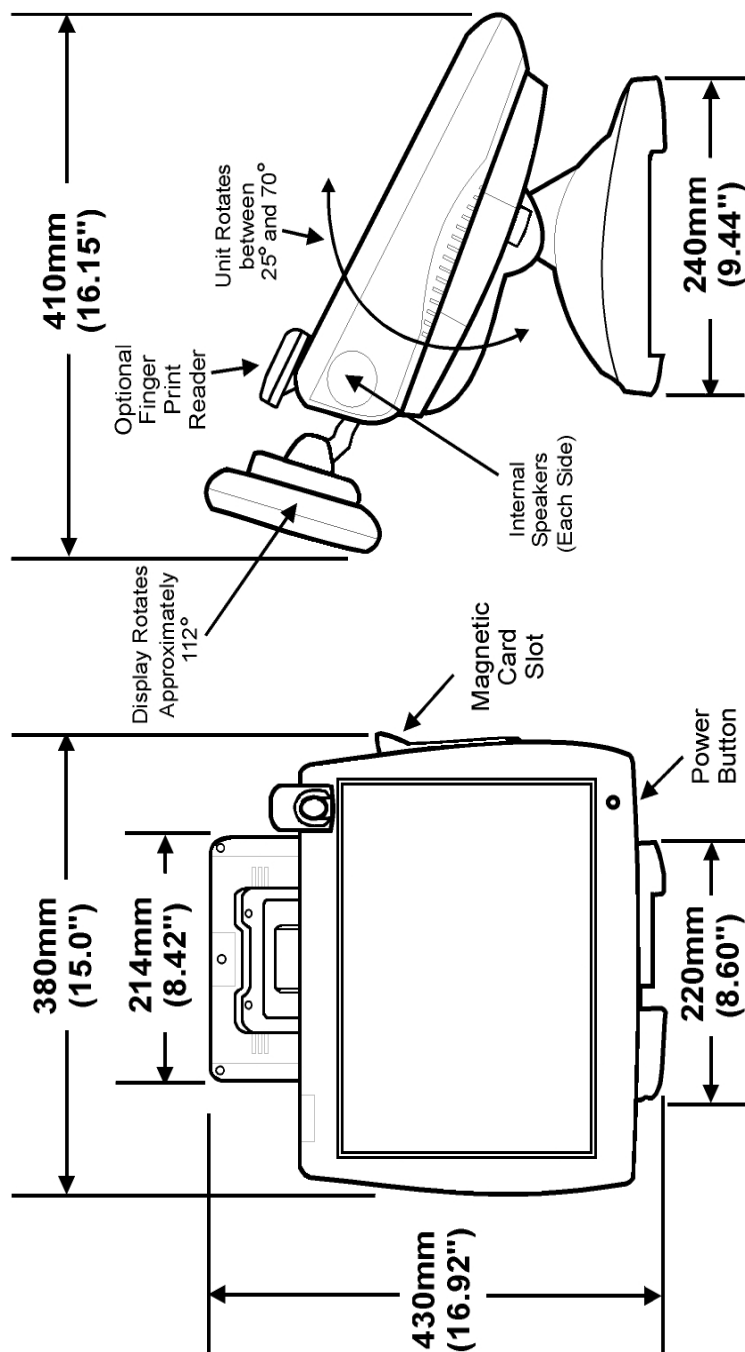
## Equipment Dimensions

### Protégé on Workstation 5/5A Adjustable Stand

#### *Protégé on Workstation 5/5A Adjustable Stand*

##### NOTES:

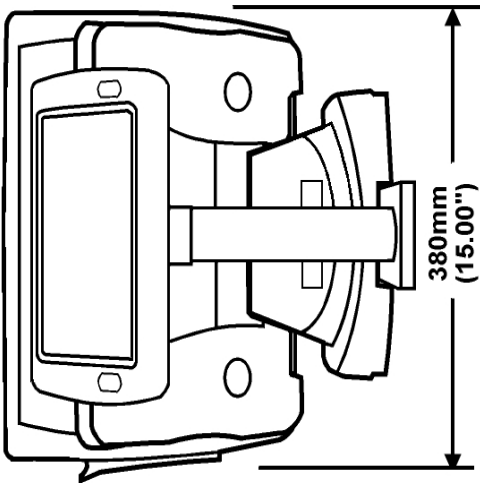
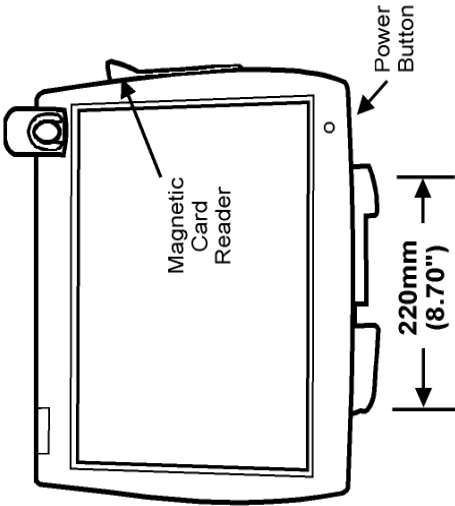
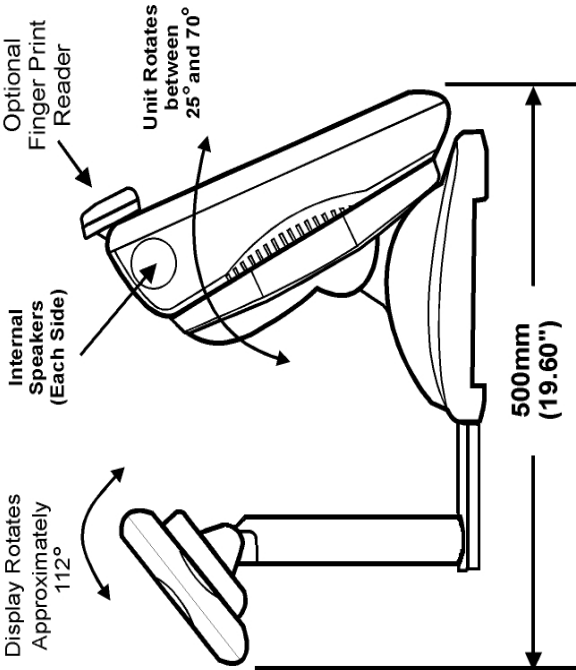
1. Cables from IO Panel routed through cable slot to exit stand
2. Leave room at front/side of unit for card swipe and power button.
3. Orient unit to avoid glare on touchscreen from overhead lights.
4. Cash Drawers located at customer's discretion.
5. 77mm hole required under unit if Cash Drawer mounted under counter.
6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover



Protégé on Workstation 5/5A Adjustable Pole Stand

NOTES:

- 1. Cables from IO Panel routed through cable slot to exit stand
- 2. Leave room at front/side of unit for card swipe and power button.
- 3. Orient unit to avoid glare on touchscreen from overhead lights.
- 4. Cash Drawers located at customer's discretion.
- 5. 77mm hole required under unit if Cash Drawer mounted under counter.
- 6. Optional Finger Printer Reader can be mounted to left or right of the Top Cover



## **Equipment Dimensions**

Protégé on Workstation 5/5A Adjustable Pole Stand

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# *Connector and Cable Diagrams*

On the pages that follow, you will find diagrams of the Protégé IO Panel connectors and hook-up cable schematics. A description of how each cable or connector is used is provided.

### ***In this appendix***

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IO Panel Connectors .....	B-2
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## *IO Panel Connectors*

Details and pin-outs of the Protégé Customer Display System connectors will appear in the second edition.

## *Hook-up Cables*

The second edition will provide details and pin-out diagrams of all cables used for the Protégé Customer Display System.



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## *Appendix C*

### *FCC/DOC Statement*

#### **Federal Communications Commission Radio Frequency Interference Statement**

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

If this equipment appears to cause interference the user could consult the installer/dealer or an experienced radio television technician.

A booklet prepared by the Federal Communications Commission entitled "How to Identify and Resolve Radio - TV Interference Problems" may be useful. This booklet may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. with stock number #004-000-00345-4.

***Caution***

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded interface cables must be used in order to comply with the emission limits.

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**Canadian Department of Communications Statement**

This digital apparatus does not exceed the Class A/Class B (whichever applies) limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A/de Classe B (selon le cas) prescrites dans Le Règlement sur le Brouillage Radioélectrique Idicté par le Ministère des Communications du Canada.

***Attention:***

Tous changement ou modification, non expressément agréés par la partie responsable pour la conformité de l'installation, pourraient annuler l'autorisation de l'exploitation par l'utilisateur du matériel installé. Il est obligatoire d'utiliser pour la communication ou la réalisation d'interfaces un câble blindé, afin d'être en conformité avec les limites légales d'émission.

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