

micros® Systems, Inc.

Keyboard Workstation 270 Setup Guide



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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: **September 2009**

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?

Why Read This Manual?

Purpose

This guide is intended for those who will be setting up, installing and operating the MICROS Keyboard Workstation 270 hardware. It is not specific to a particular software application.

How This Manual is Organized

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

Chapter 1 describes the workstation and each of its optional hardware and software components. The chapter also describes the hardware and software platform components and contains the KW270 Specifications

Chapter 2 covers the KW270 system unit hardware configuration. In addition to a System Board block diagram and technical description, other topics include how to remove the cover, identify the internal components, and perform basic hardware and option installation.

Chapter 3 provides information in the KW270 Installation and Operation. Installation is covered from the basic environmental considerations for placement of the unit and external power supply, to describing the I/O connectors and arranging the cabling.

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. Finally, using the optional battery backup system and observing the Battery and WiFi indicators is covered in detail.

Chapter 4 provides a basic troubleshooting chart. Other topics include how to use the KW270 Utility to 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.

Notation Conventions

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.



SHOCK HAZARD

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



STATIC SENSITIVE DEVICES

This symbol indicates that specific ESD handling procedures are required.

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Chapter 1

What is the Keyboard Workstation 270?

This chapter describes the KW270 System Unit, various optional accessories and discusses the various software components.

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What is the Keyboard Workstation 270?

The System

The System

The following section describes the hardware and software features of the KW270. The MICROS KW270 is a low-power diskless Windows CE workstation based on the Freescale Semiconductor i.MX27L Processor.

Designed for high volume applications in indoor and outdoor environments, it features a rugged membrane keyboard and supports a wide range of operating temperatures.

Figure 1-1 below points out the operator features.



Figure 1-1: Keyboard Workstation 270 Operator Features

Operator Display

The Operator Display is a TFT Color 14cm (5.7") LCD with a resolution of 320x240, and wide viewing angle (Vertical: 120 degrees, Horizontal: 140 degrees).

Just to the left of the Operator Display are the Bar Graph LED indicators for the optional Integrated Battery Backup and WiFi signal strength.

Optional Battery Condition Indicator

When the battery backup option is installed, this 5 segment LED indicates the remaining run time when running from the internal battery and displays the charge status during charging.

WiFi Signal Strength Indicator

If the WiFi option is installed, four LEDs are dedicated to displaying the signal strength, useful for determining locations where there is adequate signal coverage.

90 Key Keyboard

The keyboard matrix consists of 9 rows and 10 columns. Keystrokes are converted to a Windows HID (Human Interface Device) format by an on-board Micro Controller and passed to Windows CE.

Keyboard Cover

The water and UV resistant keyboard cover is held in place by three magnets but easily lifts for quick menu legend changes.

3-Track Magnetic Card Reader

The KW270 features a front-mounted 3-track Mag Stripe Reader.

Power Button

The Operator Power Button is located under the base to prevent accidental activation. It is used to turn the KW270 on or off when running from the AC Adapter or Battery Backup option.

Operator LED

The Green Operator LED illuminates when the unit is powered from the external AC adapter or internal battery.

What is the Keyboard Workstation 270?

The System

Rear Cover

Figure 1-2 displays a view of the unit featuring the standard 2x20 Customer Display, illuminated logo plate and Rear Cover with a future scanner option.



Figure 1-2: KW270 - Customer Display and Rear Cover

Below the customer display is the removable rear cover and backlit logo badge. Three LEDs mounted to the system board provide the illumination. The logo can be customized with customer logos and the brightness level can be controlled from the application software.

In the upper half of Figure 1-3, the covers have been removed to show the option locations. Connectivity for each option is provided by a pair of USB 2.0 connectors located directly behind the rear cover as shown in the lower half of the illustration.

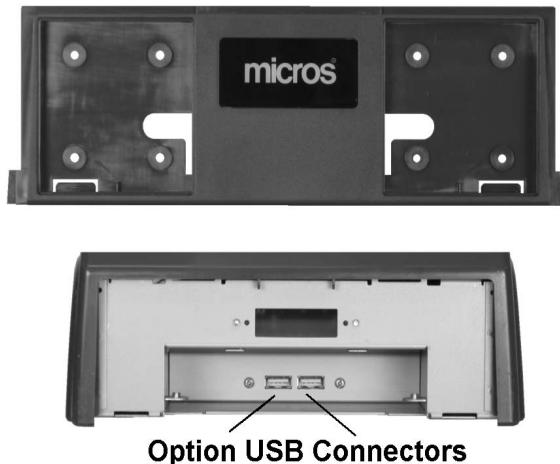


Figure 1-3: The Rear Cover Option Mounting and USB Connectivity

Figure 1-4 shows a view of the bottom of the chassis.

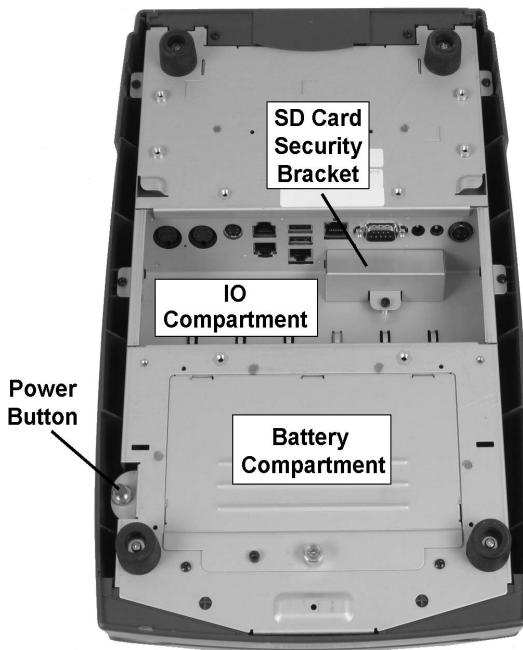


Figure 1-4: Workstation Features - Chassis

IO Compartment

The IO Compartment contains the IO connector panel and SD Security Card Bracket. The IO connector panel contains all external connectors. See the IO Connector section in Chapter 3, for details about each connector.

SD Card Security Bracket

This bracket protects the SD Memory Card and optional SDIO WiFi card. and is fastened with a hex screw. More information about the SD Memory card can be found in Chapter 3.

For more information about installing the SDIO WiFi Card option, refer to Chapter 2.

Battery Compartment

The compartment door is fastened with a thumbscrew and includes a hex security screw. Is designed to accommodate the Totex DR202i Lithium-Ion battery pack, P/N 700043-900.

To use the battery pack, the KW270 can be ordered as ‘Battery Ready’ with P/N 400500-010, or the Charging Board Upgrade Kit (P/N 000119-009) can be installed.

What is the Keyboard Workstation 270?

The System

Workstation Mounting Options

A number of mounting options are available for the KW270, as described in the following pages. Figure 1-5 displays the underside of the unit with various mounting holes in the chassis.

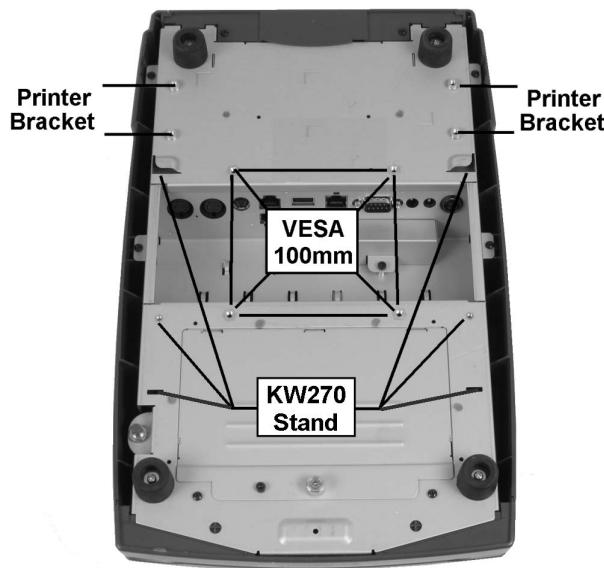


Figure 1-5: Workstation Mounting Options

VESA 100

The VESA 100 pattern facilitates virtually unlimited mounting options, based on customer requirements.

KW270 Stand

The KW270 Stand (P/N 400925-001) is a fixed stand intended for counter mounting. It is backwards compatible with some Tangent stands.



Figure 1-6: The KW270 Stand

Printer Brackets

Two Printer Brackets are available and can be mounted to either the left or right side of the unit. Figure 1-7 is an example of P/N 600526-055, designed for the Citizen Thermal Printer, P/N 700501-074. A bracket for the Epson TMP-60 Printer will be available in the near future with other options to follow.



Figure 1-7: KW270 Printer Bracket

Pole LCD Customer Display

In addition to the integrated 2x20 LCD, the IO Panel includes a 4-pin mini-DIN connector to support the pole mounted MICROS LCD Customer Display.

What is the Keyboard Workstation 270?

The System

The Pole LCD Customer Display can be located up to 5 feet from the workstation. The hole pattern in the base is compatible with MICROS Cash Drawers. The display is shown in Figure 1-8 below.



Figure 1-8: LCD Customer Display

Software Components

The KW270 is comprised of several software components, described below.

Boot Loader

The Boot Loader is split between an internal ROM (iROM) within the i.MX27L and a 128M NAND flash ‘glued’ to the System 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 i.MX27L Processor and System On-Chip.

Windows 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 MICROS 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 KW270, the Windows CE image resides in a hidden partition in the NAND Flash device mounted to the System Board.

POS Application

The KW270 is supported by Simphony Version 1.4.

Client Application Loader (CAL)

The CAL plays a key role in managing both the installation and ongoing maintenance of the Operating system, client software, and platform files.

The CAL consists of two parts. One part resides on the KW270, (CAL Client) and the second part resides on the system server (CAL Server). The CAL client is part of the platform software and resides in a folder called \MCRSCal.

The following pages provide an overview of the CALs features when setting up a new workstation and maintaining the workstation software on a day-to-day basis.

See the ‘Starting the KW270’ section in Chapter 3 for specific details about the CAL Client prompts and dialog boxes when setting up a new workstation.

New Installation

Through a registry setting, the CAL client starts just after the operating system starts. It checks the system registry and determines that the workstation is not yet configured. The updated CAL client provided in the KW270 presents new screens that require user input.

The CAL presents a password screen. After the password is entered (see Chapter 3 for details), the CAL will display the Date and Time Properties window to ensure the correct date, time and time zone are entered.

After the time and date are entered, the CAL presents the server screen. One new feature of the CAL is the ability to search for a property or server by name, URL, or IP address. Details can be found in the Chapter on Installation and Operation.

When the CAL server is selected, the installer is presented with a list of workstations, pre-programmed in the application's device database.

When the installer selects a property or workstation from the list, the workstation name and TCP/IP network configuration (DHCP or Static IP Address) are entered in the workstation's registry.

The CAL then transfers the application 'package' consisting of the Client Application and support files directly to the SD Memory Card installed in the STORE slot.

When the transfer is complete, the CAL invokes a restart. After the restart, the CAL again checks the registry settings and determines that an application is installed. It starts the application and uses the network configuration data to establish a connection.

Day-to-Day Operation

If the KW270 is powered off each day, or should AC power fail, the CAL client automatically restarts the application software after the workstation restarts.

As the KW270 operates on day-to-day basis, the CAL client remains in the background, periodically checking for updates to the application, operating system, hotfixes, or even a new version of the CAL client.

POS Application Update

An update to the POS application becomes available. The updated application files are staged on the system server. A configuration file residing on the server determines the specific files that will be updated. The CAL Client periodically checks with the CAL Server to see if updates are available and recognizes an updated application.

- If the CAL recognizes the update at boot time, it automatically downloads the updated application and/or support files, copies it over the old application, and starts it.

- If the CAL recognizes the update while the workstation is operating, it gives the user the choice of updating the application now or deferring to the next time the unit starts. If the operator chooses to complete the update now, the updated files are retrieved, and copied over the application on the SD Memory Card. Upon completion, the workstation is restarted.

Windows CE Image or Platform Update

During its routine check for updated applications on the system server, the CAL Client also checks for an update to the Operating System (OS) and or System Platform files. If an updated OS image or platform files become available, they are staged on the system server.

- The CAL copies the required files from the server to the SD Memory Card and executes a utility that updates the image if required, then reboots the workstation.

Personality Swap

An installed workstation becomes inoperative. A replacement workstation is installed, and the hardware peripherals transferred. The SD Memory Card is removed from the defective workstation and installed in the replacement workstation.

- An SD Memory Card removed from the defective workstation contains the POS application and support files, SAR totals files, and the persistent registry. The persistent registry contains configuration data including workstation name, TCP/IP network configuration, and other information. This allows another workstation to replace defective workstation without the need to restore an image.
- When the SD Memory Card is installed in the replacement workstation and the unit powered-up, the CAL starts, checks the registry settings, determines that an application is already installed, and takes no action other than starting the application that resides on the SD Memory Card.

KW270 Diagnostics Utility

Similar in scope to the Diagnostics Utility included with all MICROS workstations, KW270 DiagUtility features a complete diagnostics test suite formatted specifically for the QVGA Operator Display.

The KW270 DiagUtility (Diagutility.exe) resides in \BOOT\Utilities folder.

Starting and using the KW270 DiagUtility is documented in Chapter 4.

Memory and Storage Architecture

This section highlights the key features of the KW270 memory architecture and defines where each of the various software components are stored.

128M NAND Flash

In Windows CE the NAND Flash device appears as 'BOOT' in Windows. It is not expandable.

- The Windows CE image includes all platform software and resides in a hidden partition and includes a copy of the default system registry.
- The KW270 API is implemented as a DLL file and allows applications to access to hardware such as the cash drawers, mag stripe reader, and the Operator LCD and Customer Display options.
- The KW270 Drivers are a collection of ARM9 compatible platform specific DLL files that provide access to hardware such as the power button, and System Board EEPROM.

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 POS Application code as the workstation operates. RAM contents are lost if AC power is removed or the battery becomes fully discharged.

SD Memory Card

Installed in a slot called STORE, the SD Memory Card represents the removable component of the KW270 mass storage solution. Accessed from the IO panel, the device is factory populated and formatted, but contains no files when shipped. In My Devices, the card appears as 'STORE' and contains the following components.

- The application, support and possible totals files. The SD Memory Card is blank when a new unit is shipped from the factory or repair depot, the CAL copies these files when the unit is connected to properly configured server.
- The persistent registry. A CE based driver automatically loads the persistent registry from the SD Memory Card when the OS starts. During operation, the driver periodically copies the working registry from RAM to the SD Memory Card. This ensures the most recent version of the registry is always located on the non-volatile SD Memory Card.
- OS Update Image (NK.NB0). The OS update image will be present only if the CAL detects that a newer version of Windows CE has been staged on the system server and places it on the SD Memory Card.

If the OS image file (NK.NB0) is present, system utilities called by the CAL will copy it over the existing OS image. The CAL subsequently removes NK.NB0 from the SD Memory Card.

A 256M device is currently installed, but larger sizes, up to 2Gbytes are supported.

Summary

The on-board NAND Flash Memory provides a permanent means of storing the operating system, associated device drivers, and the MICROS specific platform files including the CAL client, and the KW270 DiagUtility.

The SD Memory Card contains the POS application and support files, a current copy of the registry, and optionally, application transaction data, or in other words, the workstation ‘personality’. The SD Memory Card is externally accessible, from the IO Panel (STORE) and this forms the basis for a ‘personality swap.’

Should a workstation fail, the SD Memory Card can be removed and installed in a replacement unit, giving it the same configuration as the inoperative workstation from which it was removed.

Even though the workstation is diskless in the classical sense, the non-volatile system board NAND Flash Memory and SD Memory Card preserve the application and registry settings that require a lifetime extending across system reboots. Through the CAL, updates to the OS, application, or platform files are staged on the POS server and automatically propagated to each workstation.

Power Management States

This section introduces the power management state nomenclature as it applies to the KW270. Not all Windows Embedded CE 6.0 power management states are supported. For example, **SUSPEND** is not supported.

References to power management states are specified in bold capital letters, e.g., **UNPLUGGED**, **OFF**, etc.

UNPLUGGED

- The AC adapter power cord is not connected to a wall outlet.
- The AC adapter power cord is not connected to a wall outlet and the unit is equipped with the integrated battery back-up option, but the battery is fully discharged.
- The LCD and all LEDs are off.

OFF

When the unit is **ON**, the Power Switch must be pressed and held for one second to enter the **OFF** state.

- The processor is not executing instructions. RAM contents are undefined.
- The LCD and all LEDs are off.

ON

Press and hold the Power Button to enter the **ON** state.

- The AC adapter power cord is connected to a wall outlet or the unit is operating from the integrated battery backup option.
- The processor is executing instructions. Windows Embedded CE 6.0 and the client application are operating. RAM contents are maintained.
- The Operator LED is solid Green, the Operator LCD is active.

Power State Retention

The KW270 retains the current power management state in the on-board power controller.

If the unit is **ON** and AC power fails, (and the battery backup system is not installed) the unit returns to **ON** when AC power is restored with no action required by the operator.

If the unit is **OFF** and AC Power fails, (and the battery backup system is not installed) the unit remains off when AC Power is restored.

If the unit is **ON**, but running from the internal battery the application will prompt the operator when the battery is nearly exhausted. The battery charge level can also be monitored by observing the Battery LEDs located to the left of the Operator LCD.

Specifications

The Keyboard Workstation 270 conforms to the following specifications.

Specification	Parameters
Processor	Freescale Semiconductor i.MX27L Multi-Media Applications Processor (266Mhz Core Speed)
Cache	16KB Instruction and 16KB Data (No L2 Cache)
Display	320x240 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 > 256MB SD Memory Card
Mag Stripe Reader	Front Mounted 3-Track ABA Compatible.
Customer Display(s)	Integrated 2x20 Transflective LCD Standard - Optional Remote 240x64 Monochrome STN LCD.
USB Ports	Three internal USB 2.0 ports for options. Two external USB 2.0 ports located on the IO panel.
LAN Interface	On-Board supports 10BaseT (IEEE 802.3) or 100BaseT (IEEE 802.3u) using twisted pair cabling. 802.11 WiFi options are available.
Serial Ports	1 DB9 RS232 Serial /w handshake, 2 Modular RS422/232 Serial, 1 RS232 Modular /w handshake.
Cash Drawers	2) MICROS Style /w 4-Pin DIN Connectors. Jumper selects +12V or +24V Solenoid Voltage.
Accessory Power Outlets	1) +9VDC @ 1.5A (For Optional Citizen Thermal Printer or other +9V Peripheral)) 1) +12CDC @ 2.5A (For Optional Epson TMP-60)
Input Power	63W Max (+15V @ 4.2A) External AC Adapter
Storage Temperature	Without Battery Pack -20°C (-4°F) to 80°C (176°F) With Battery Pack -5°C (23°F) to 30°C (86°F)
Operating Temperature	Without Battery Pack -10°C (14°F) to 65°C (149°F), 90% relative humidity non condensing at 65°C (149°F). With Battery Pack Charging: 0°C (32°F) to 45°C (113°F) Discharging: -10°C (14°F) to 60°C (140°F)

What is the Keyboard Workstation 270?

Approvals

Specification	Parameters
Weight	7.7lb. (3.5 kg) / Shipping weight 11lb. (5 kg)
Case Material	ABS Plastic
Physical Dimensions	Refer to Appendix A

Approvals

The KW270 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	
	EN 61000-3-3+A1+A2	1995	Current	
	EN 55024+A1+A2	1998	Current	

Chapter 2

What's Inside?

This chapter describes how to open the workstation, provides a description of the system board and peripheral boards, shows how to install options, then shows how to reassemble the unit.

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What's Inside?

Disassembling the Workstation

Disassembling the Workstation

The following procedure describes how to disassemble the unit and access the internal components



NOTE: Pre-Production Models

The following procedures and illustrations apply to pre-production versions of the CWS. As the unit enters production, minor changes will occur in the cabling, including the addition of Toroids to several interface cables.

Removing the Top and Rear Covers

The following procedure describes how to remove the workstation cover to access the system board and other internal components. Removing the Rear Cover is optional or it can be removed separately.

1. Remove all cables from the workstation before disassembly.
2. Place the workstation face down.

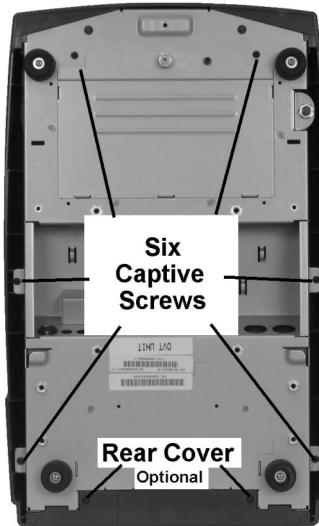


Figure 2-1: Removing the Top Cover

3. Loosen each of the six captive screw about three quarters. The rear cover does not need to be removed to open the top cover.

To remove the rear cover and install an option, loosen the pair of captive screws shown in the illustration.

4. Return the unit to the normal operating position.

5. Lift the cover up until it just clears the rear cover, then place it directly behind the base as shown below.

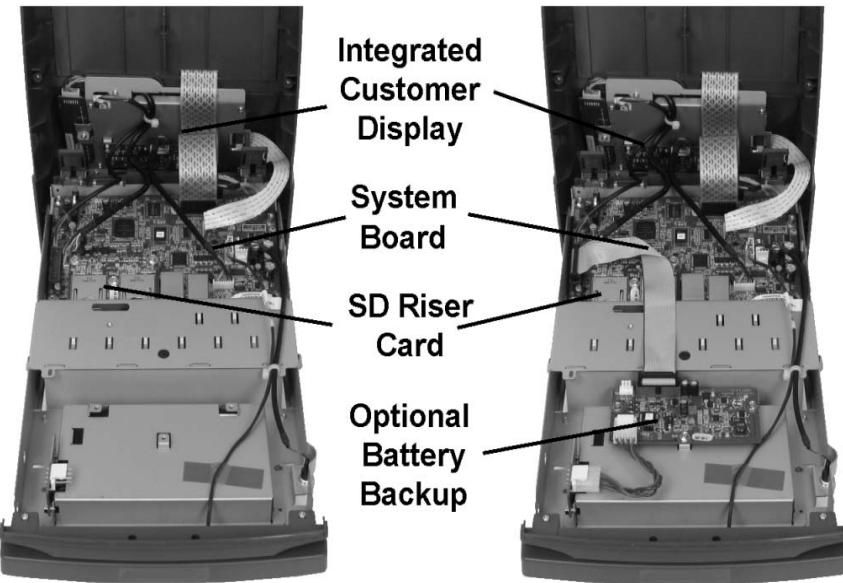


Figure 2-2: KW270 Cover Open

The unit shown in the left of Figure 2-2 is the base KW270 configuration without the battery charger option. The unit on the right adds the battery backup option. This includes the Battery Charger Board, two cables and the battery pack (sold separately), installed in a compartment accessed from the bottom of the unit.

To remove the Mag Card Reader Assembly, see page 2-8.

To install the Sagrad USB WiFi Card, see page 2-10.

To remove the system board cables, see the next page.

Removing the Top Cover Cables

Figure 2-3 below, shows the cables that must be removed from the system board to remove the top cover. The inset at right displays how to open the latch in order to remove the LCD Data Cable. The latch must be open to reinstall the cable.

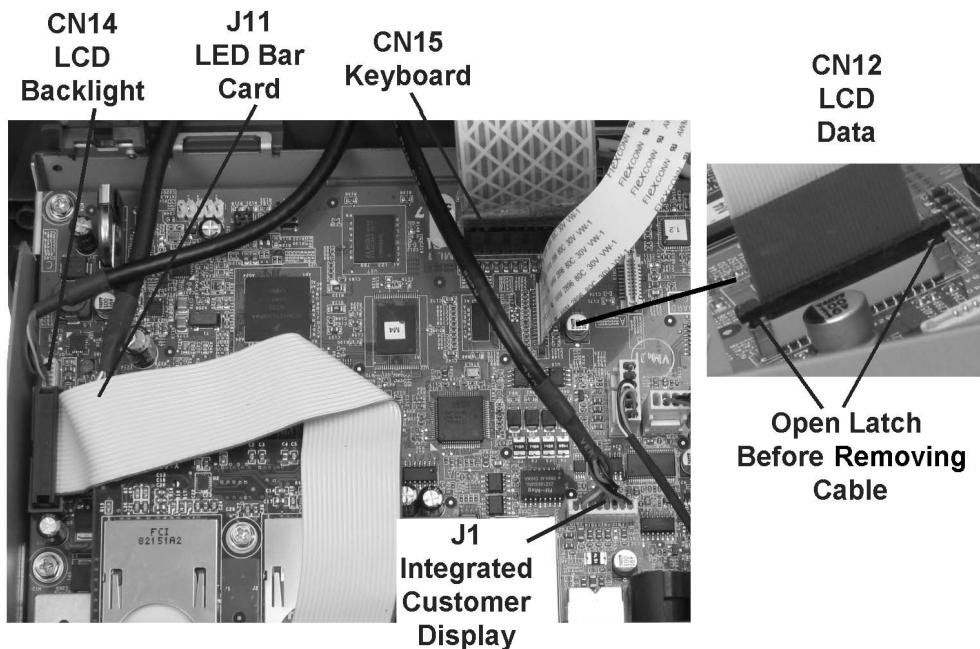


Figure 2-3: Removing the Top Cover Cables

6. Remove the following cables from the system board as shown in Figure 2-3.
 - o CN14 - LCD Backlight.
 - o J11 - LED Bar Card. This connector is located under the optional battery backup ribbon cable - if installed.
 - o CN15 - Keyboard. Note: This connector consists of two side by side 1x12 plugs.
 - o J1 - Integrated Customer Display Interface Board.
 - o CN12 - The inset shows the details of the connector latch. The connector should be in the 'raised' position before the cable is removed or inserted. Once the cable is installed push the latch down to secure the cable.

After all cables have been removed, the top cover can be set aside.

The following section describes the components located in the Top Cover.

All components are mounted to a pair of sheet metal brackets. Figure 2-4 shows a view of the Customer Display Interface Board, 2x20 Customer Display Board and cables.

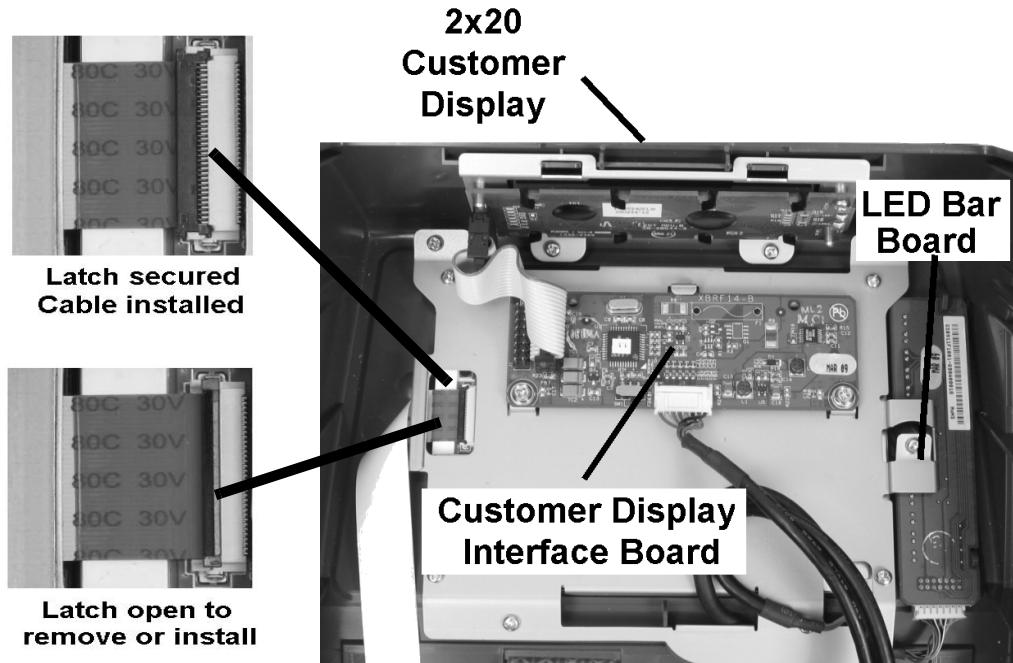


Figure 2-4: Top Cover Assembly Components

The inset on the left shows how to use the latching connector on the LCD when installing or removing the LCD cable.

Integrated Customer Display Interface Board - XBRF14

The Customer Display Interface Board and 2x20 LCD are part of the base unit. The interface board features an 8-bit micro controller, and EEPROM to maintain contrast settings across power cycles.

One of two 2x20 LCDs may be used, Optrex or EDT. Each uses a parallel interface, but with unique cable pin-outs and operating voltages. A slide switch located on the interface board selects the display type.

Refer to the next page for information on the switch setting.

What's Inside?

Disassembling the Workstation

Figure 2-5 shows the Customer Display Interface board and details the slide switch configuration for each supported 2x20 customer display.

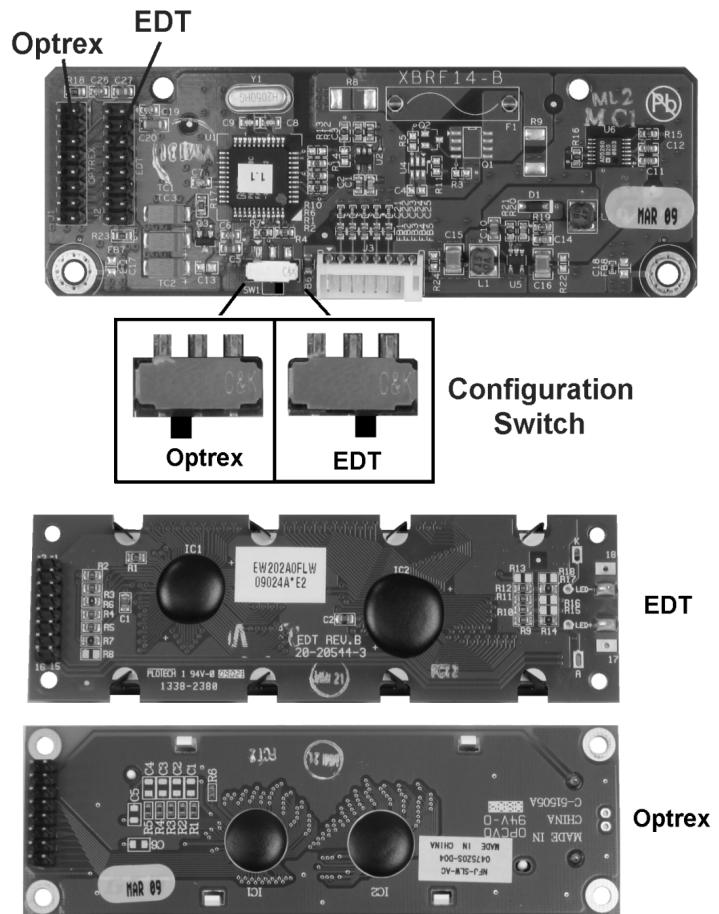


Figure 2-5: 2x20 Customer Display Configuration

LED Bar Board - XBRF10

The LED Bar Board is part of the base unit, attached to the Operator Display Bracket. It is shown in Figure 2-6, below.

The Board includes a pair of multi-color 5-segment bar graph LEDs dedicated to the battery backup and WiFi options. The LEDs are positioned to the left of the Operator Display.

One five segment LED is used to display the battery charge/discharge levels. The second five segment LED reports WiFi signal strength if that option is installed. The second five segment LED (WiFi) is masked by the Operator Display overlay to display a total of 4 LEDs, 1 orange and three Green.



Figure 2-6: The LED Bar Board

Mag Card Reader Remove and Replace

The Mag Card Reader FRU is supplied as complete assembly. This includes the mounting bracket, pre-mounted mag card reader and interface cable.

1. Remove the top cover and place it behind the base as described on page 2-4.
2. Refer to Figure 2-7, below. Remove the pair of screws that fasten the Mag Card Bracket to the chassis.

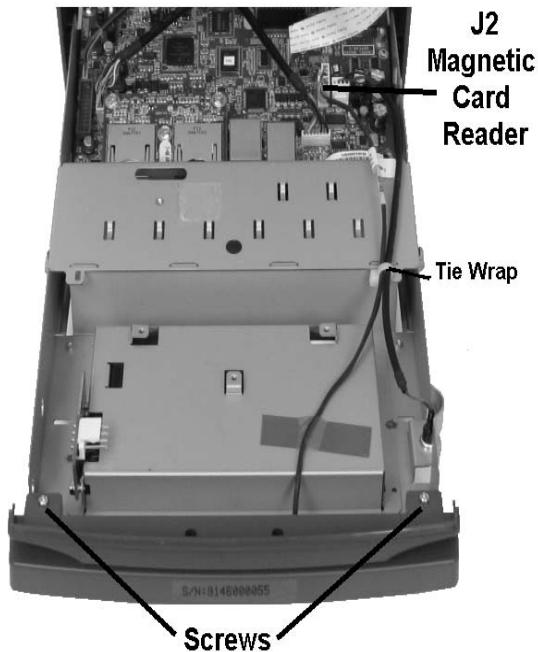


Figure 2-7: Removing the Magnetic Card Reader Assembly

3. Remove the mag card reader interface cable from J2.
4. When installing the replacement reader assembly, orient the cable in the strain relief as shown.

Installing Options

This section includes the procedures for installing options in the KW270.

Install the Battery Backup Option (MD0018-003)

The Battery Backup option is composed of an 11.1V, 7200mAH Li-Ion battery pack and battery charger board. The battery pack consists of nine rechargeable 18650 form factor Li-Ion cells arranged in a 3S3P (3 Serial - 3 Parallel) configuration.

The battery compartment is accessed from the underside of the workstation and designed specifically for the Totex DR202I Lithium-Ion battery pack. The compartment door includes cut-outs to use and view the built-in battery test function.

The battery pack complies with the Smart Battery Specification (SPS) 1.1, communicating with a micro-controller located on the charger board over the System Management Bus (SMBus). The charger board micro controller communicates the remaining charge percentage to the Windows CE battery API.

Instructions for installing the Battery Backup Kit can be found in MD0018-003, included with the kit.

Battery Installation/Removal (MD0018-001)

The battery pack is sold separately from the battery backup kit. Instructions for installing or removing the battery can be found in MD0018-001 (supplied with the battery), or Chapter 3.

Sagrad USB Wireless Card (MD0018-002)

The Sagrad SG901-1056 is based on a Ralink chipset and supports IEEE 802.11b/g protocols. The USB 2.0 host interface and power is provided via an internal 2x5 USB Header.

The device driver is ‘built-in’ to the Windows CE image.

Instructions for installing the Sagrad USB WiFi Radio can be found in MD0018-002, supplied with the kit.

Installing the Rear Cover Options

Up to two options can be installed on the KW270 Rear Cover. A pair of removable covers allow the options to be installed and the pair of USB connectors located on behind the cover provide the required connectivity.

RFID Reader Interface

Future Option - not available at product release.

2D Scanner

Future option - not available at product release.

Illuminated Logo

Positioned just behind the logo plate are three white LEDs mounted to the system board. Currently, a MICROS logo is installed.

What's Inside?

System Board

System Board

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

Integrated Circuits

Figure 2-8, displays the major integrated circuits on the System Board. Revision D.

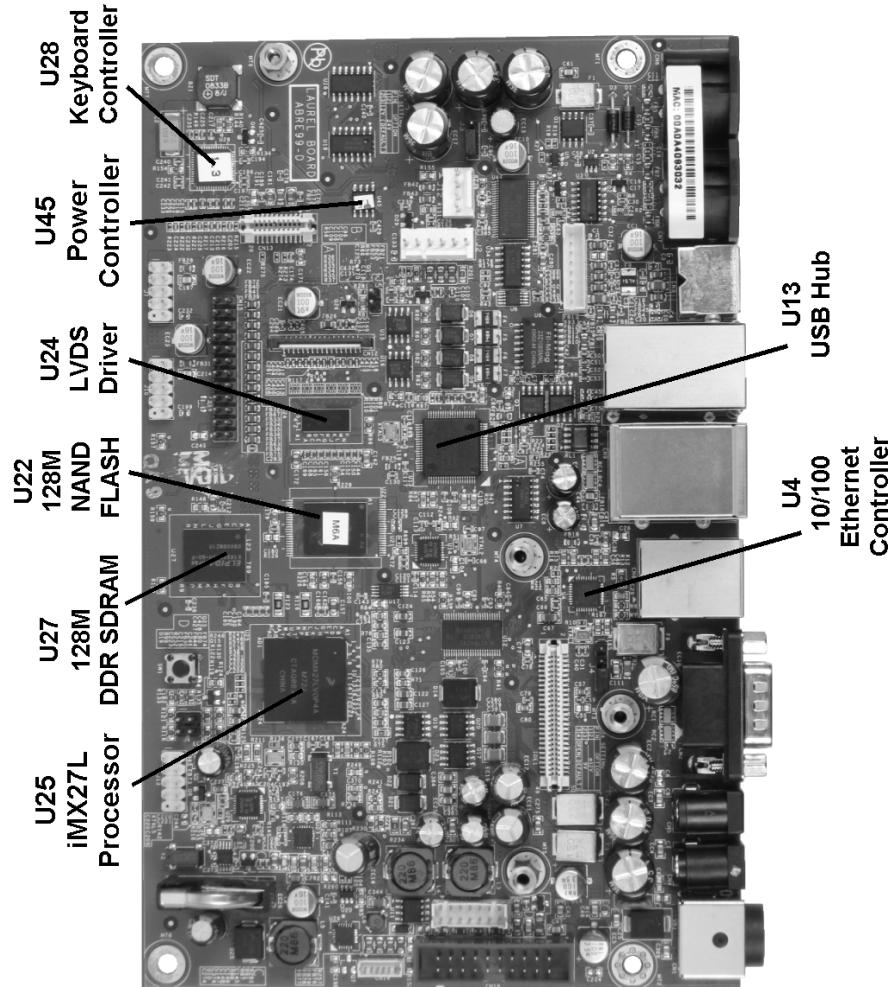


Figure 2-8: KW270 System Board - Integrated Circuits

Connectors

Figure 2-9 displays all KW270 System Board connectors.

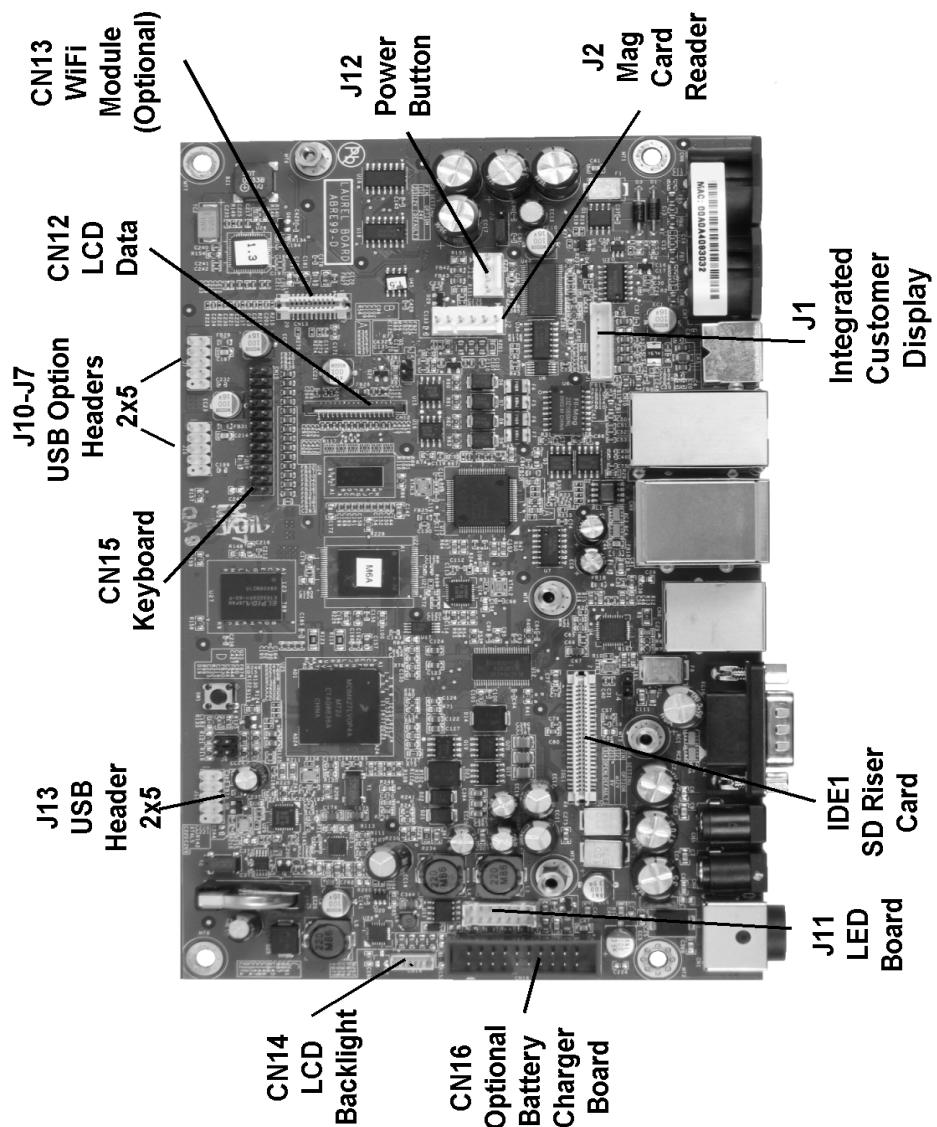


Figure 2-9: KW270 System Board - Connectors

What's Inside?

System Board

Jumpers and Switches

Figure 2-10 points out all system board jumpers, switches and miscellaneous items

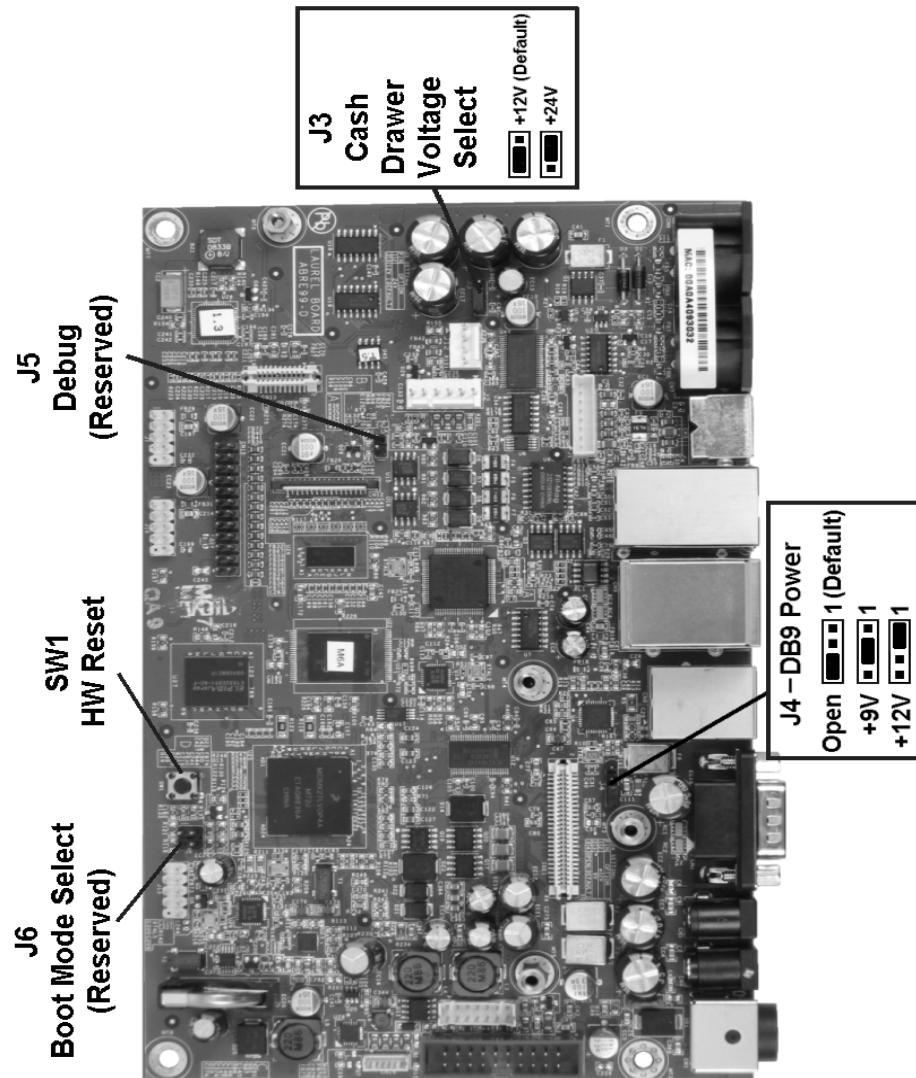


Figure 2-10: KW270 System Board Jumpers and Switches

Workstation Block Diagram

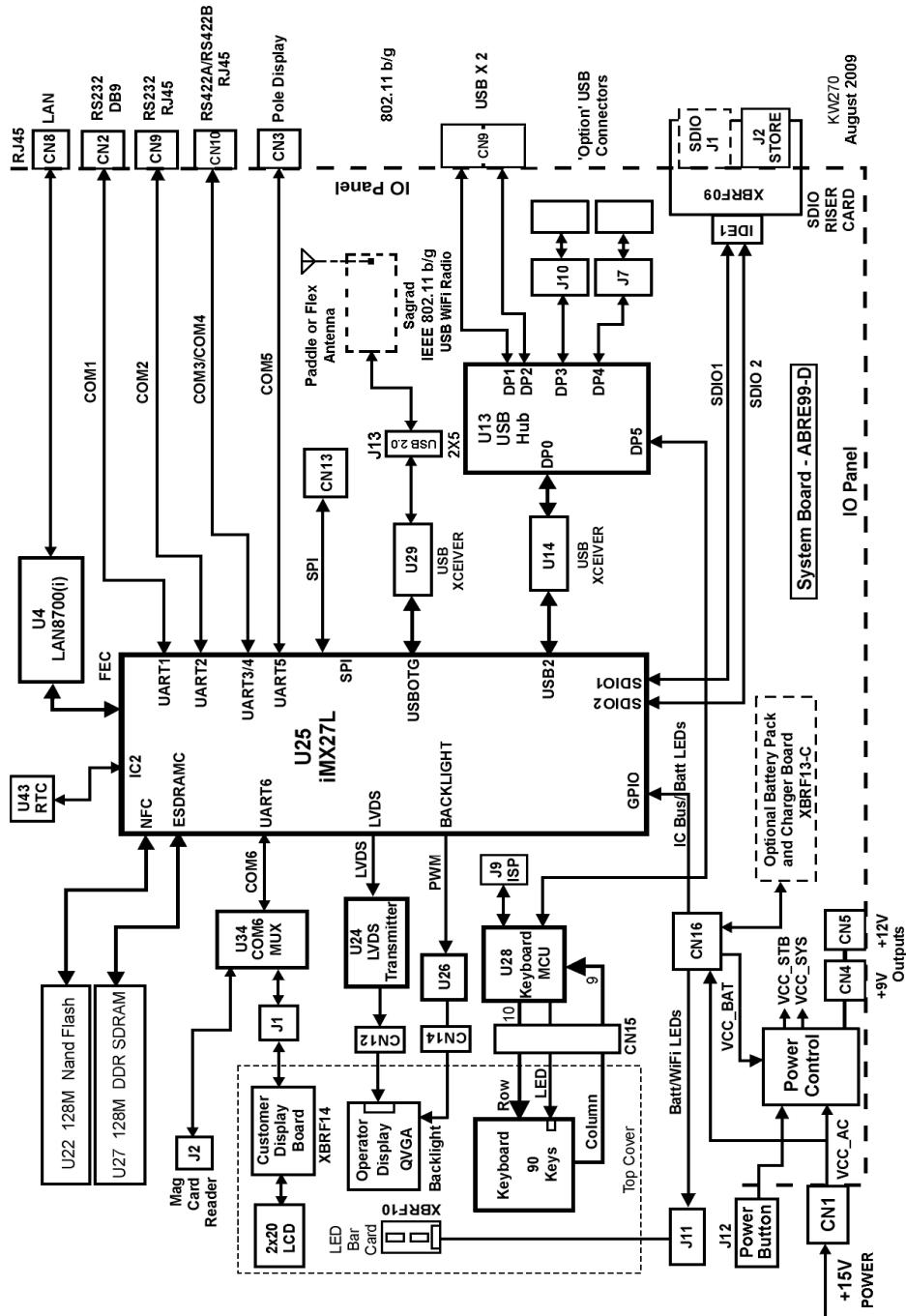


Figure 2-11: KW270 System Block Diagram

The following pages provide description of the processor and on-board peripherals shown in Figure 2-11.

The iMX27L Multimedia Applications Processor

The iMX27L 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 (example: DPTC, power gating, and clock gating) Built on 90 nm technology and dual Vt, the iMX27L provides the optimal performance vs. power requirements.

The iMX27L supports connections to various external memory types such as DDR SDRAM, and NAND Flash.

Connectivity to peripherals are provided by six high-speed UARTs, 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 (AMBAtm) system-on-chip multi-master bus interface.
- ARM Interrupt Controller
- Clock Control Module (CLKCTL)
- AHB to IP bus interfaces (AIPIs)
- The Multi-Layer 6 x 3 AHB Crossbar Switch

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, U27.

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 iMX27L 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, U22.

LCD Controller and Backlight Control

The iMX27L 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 SLCD 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 memory to the display device so that the processor may concentrate on image rendering. In a typical scenario, the image is rendered in main memory. The processor triggers the LCDC 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.

Backlight Control is provided by a dedicated Pulse Width Modulation circuit within the LCDC. The KW270 API drives the PWM circuit. The PWM output drives U26, which in turn drives the White LED Backlights through CN14.

What's Inside?

System Board

USB Ports

The iMX27L provides three USB Ports. Each port functions at TTL Levels and conforms to the USB 2.0 Transceiver Macrocell Interface (UTMI).

Figure 2-12, below display a block diagram of the workstation USB ports.

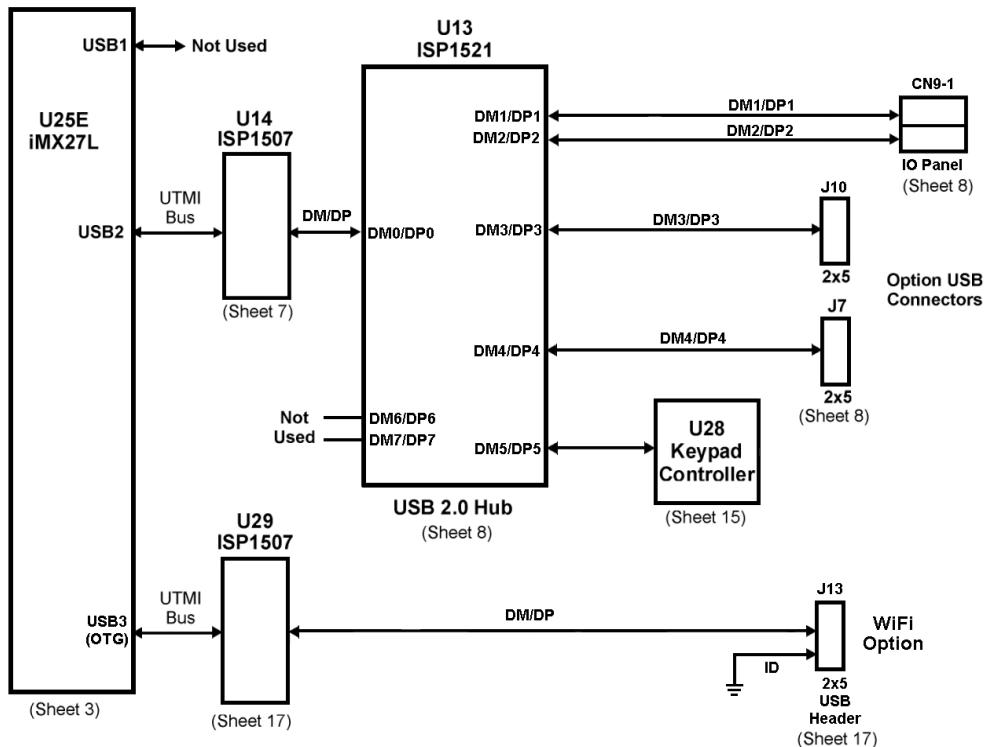


Figure 2-12: KW270 USB Port Assignments

USB1 is a Full Speed/Low Speed host - not implemented on the System Board.

USB2 is a High Speed/Full Speed/Low Speed host. The TTL level outputs are routed to Transceiver U14. The USB output from U14 is fed to the upstream port input of USB Hub U13. The outputs of the USB hub are assigned as follows.

- DM1/DP1 is assigned to IO Panel connector CN9-1 (upper) for general purpose usage.
- DM2/DP2 is assigned to IO Panel connector CN9-1 (lower) for general purpose usage.
- DM3/DP3 is assigned to 2x5 header J10.
- DM4/DP4 is assigned to 2x5 header J7.

- o A cable assembly routes the USB signals from J7 and J10 to the recessed USB connectors, located behind the Rear Cover.
- DM5/DP5 is assigned to the keyboard controller micro U28.

USB3 is a High Speed/Full Speed/Low Speed host with OTG (On The Go) capability,. However this port is currently implemented as standard USB 2.0 interface and fed to on-board 2x5 connector J13.

J13 is used to connect the current Sagrad USB WiFi Option.

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
- SDIO Card Specification Version 1.0

Three SD ports are provided by the iMX27L, two of which are dedicated to the SD Riser Card. The SD1 and SD2 ports are routed to the SDIO Riser Card socket IDE1. The SD3 port is not used.

The KW270 requires dedicated sockets for the SD Memory Card and SDIO Cards. On the IO Panel these are labeled STORE (for the SD Memory Card) and OPTION (For optional SDIO Cards).

What's Inside?

System Board

Serial Ports

The iMX27L contains six UARTs. Each UART module is capable of standard RS232 non-return-to-zero (NRZ) encoding.

The UART transmits and receives characters that are either 7 or 8 bits in length (programmable). To transmit, data is written from the peripheral data bus to a 32-byte transmitter FIFO (TxFIFO). This data is passed to the shift register and shifted out serially to the TX pin. To receive, serial data appears at the receiver pin (RX) and stored in a 32-half word deep receiver FIFO (RxFIFO). The received data is retrieved from the RxFIFO and placed on the peripheral data bus. Figure 2-13, below displays the KW270 COM Port assignments.

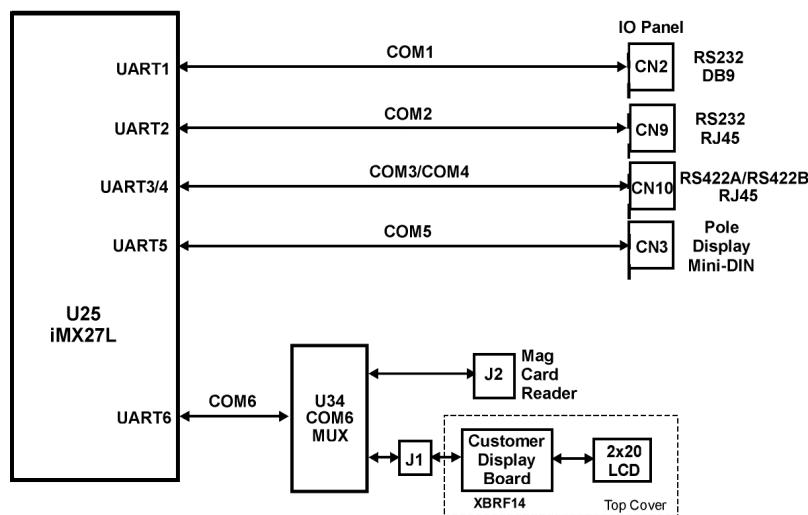


Figure 2-13: KW270 COM Port Assignments

- UART 1 is assigned to COM1, the DSUB9 port.
- UART 2 is assigned to COM2, a full featured modular RS232 Port.
- UART 3 is assigned to COM3, the RS422A Port.
- UART4 is assigned to COM4, the RS422B Port.
- UART 5 is assigned to COM5, the pole display port.
- UART 6 is assigned to COM6. Through multiplexer U34, COM6 is shared between the Magnetic Card Reader and 2x20 LCD Customer Display Interfaces.

The KW270 Field Service Guide provides more detail about each COM port configuration.

Configurable Serial Peripheral Interface (CSPI)

The iMX27L provides three CSPI interface modules. Each provides a full-duplex synchronous serial interface, often called a four-wire serial interface.

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

CSPI1 and CSPI2 can be configured as a master or slave and includes three chip selects to support multiple peripherals.

The CSPI1 signals are routed to CN13, the optional WiFi Module Card Socket.

The CSPI2 interface is not used.

The CSPI3 interface is not used.

Keyboard Interface

The Keyboard controller MCU provides a row and column matrix for 90 keys.

The controller detects the row and column location where the key press occurs and stores this value like a standard keyboard. Communications with the operating system is through a standard USB Human Interface Device (HID).

Ethernet Interface

The Fast Ethernet Controller (FEC) performs the full set IEEE 802.3 media access control and channel functions. The FEC supports connection and functionality for the 10/100 Mbps media independent interface. U4, the external transceiver is required to complete the interface to the media, in this case, 10/100BaseT.

What's Inside?

Reassembling the KW270

Reassembling the KW270

The following procedure describes how to reassemble the KW270.

Procedure:

1. Position the top cover assembly just behind the base, and refer to Figure 2-14, below.
2. Connect the following top cover cables to the System Board.

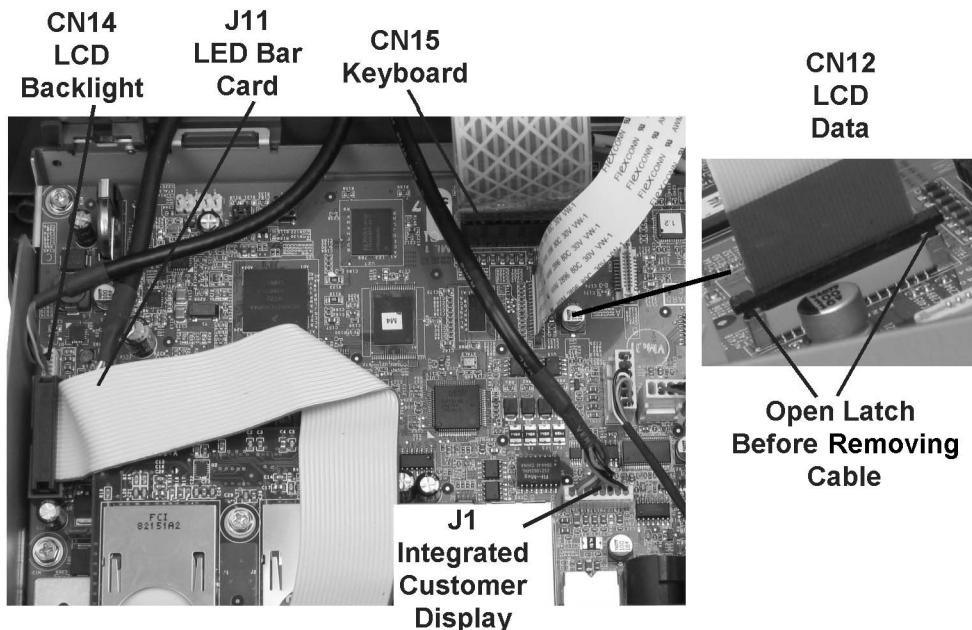


Figure 2-14: Connecting the System Board Cables

- o CN14 - LCD Backlight.
- o J11 - LED Bar Card. The connector is located under the optional battery backup ribbon cable.
- o CN15 - Keyboard. The cable consists of two side-by-side 1x12 connectors.
- o J1 - Integrated Customer Display Interface Board.
- o CN12 - The inset shows the connector latch details. The latch must be in the raised position to insert the cable.

3. Position the top cover over the rear cover as shown in Figure 2-15 below, then slide the top cover on.



Figure 2-15: Installing the Top Cover

4. Place the unit face down and fasten the six captive screws that hold the cover in place.

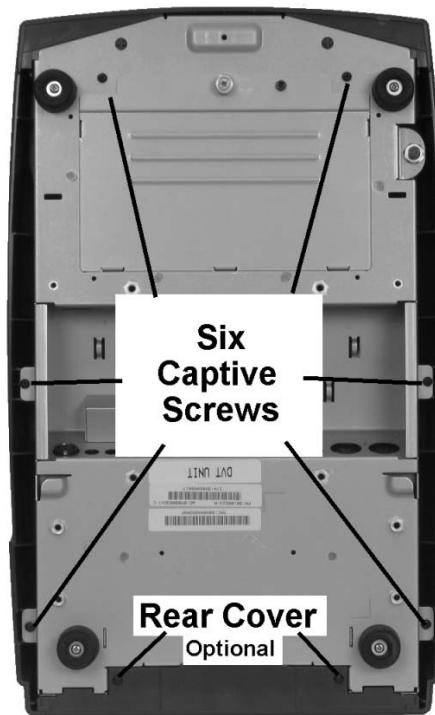


Figure 2-16: Securing the Top Cover to the Chassis

Chapter 3

Installing and Operating the KW270

This chapter describes the environmental requirements for the workstation, describes the IO Panel, and covers the basic operational procedures.

In this chapter

Care and Handling	3-2
The IO Panel	3-5
Installation	3-9
Operation	3-11

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 KW270 can operate in temperatures between -10°C (14°F) and 65°C (149°F). A constant humidity between 40% and 90% is required for proper operation of the equipment.

When the optional battery backup system is installed, refer to the Specifications page in Chapter 1 for more information about operating temperature.

AC Power and Data Cabling Requirements

AC Power cabling, Ethernet and MICROS IDN data cabling should be installed in accordance with the appropriate MICROS Site Preparation Guide.

Cleaning the KW270 Display, Cabinet, and Magnetic Stripe Reader

Recommendations for cleaning the Cabinet, Magnetic Stripe Reader and LCD cover are described below.



SHOCK HAZARD

Before performing preventive maintenance or cleaning the workstation, use the power button to turn the unit off.

LCD Cover

The Operator Display overlay can be cleaned using a cleaner and cloth intended for use on LCD screens. 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.

Magnetic Card Reader

Depending on how much they are used, magnetic card readers may require periodic cleaning. MICROS recommends cleaning the heads as often as once a day if the reader is subjected to heavy usage.

Cleaning kits are available from a variety of sources including MICROS P/N 600439-003 and P/N 600439-004. Be sure to follow the instructions supplied with the cleaning kits.

The IO Panel

Figure 3-1 shows the KW270 IO Panel Connectors.

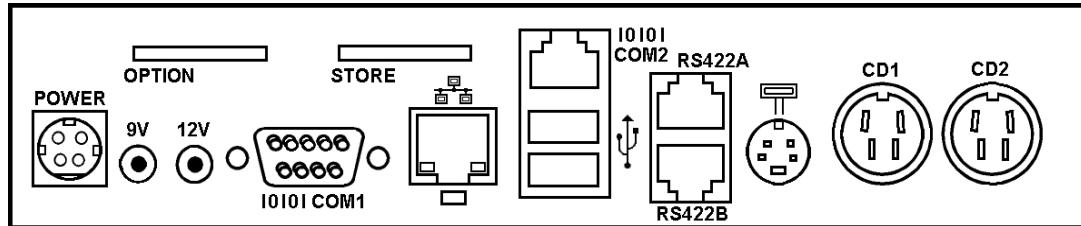


Figure 3-1: Keyboard Workstation 270 Input/Output Panel

This section describes each connector located on the IO panel and suggests possible uses.

From left to right in the illustration...

OPTION

The OPTION slot is optimized for SDIO Cards, and reserved for the optional SDIO Wireless Card. This slot conforms to SDIO Card Specification Version 1.0.

However, a second SD Memory Card can be installed in the OPTION slot and will appear in My Devices as 'STORE2'

STORE

The STORE slot is reserved for a factory installed SD Memory Card. This card performs the same role as the Compact Flash card in other MICROS Windows Embedded CE workstations including the KWS4, WS4 LX, and WS5. It contains the Windows Embedded CE 6.0 registry, the application files, and optionally SAR totals.

The STORE slot conforms to SD Memory Card Specification Version 1.0, supporting SD Memory Cards up to 2GB in size. However, a 256MB card is adequate to support the current requirements.

The STORE slot is not compatible with SDHC Memory Cards larger than 2GB.

Some important facts about the SD Memory Card as used in the KW270 can be found on the next page.

- *The SD Memory Card must be located in STORE slot, or the KW270 will not start. If the SD Card is not installed, or installed in the OPTION slot, the workstation will hang at the white MICRO\$ screen and the operating system will not start.*

This is because at boot time, the operating system retrieves the registry files from the SD Card in the STORE slot.

- *The SD Memory Card is keyed - it can only be inserted in one direction and must be fully inserted in the STORE slot.*

The SD Memory Card measures 24mm x 32mm x 2.1mm. The asymmetrical shape helps to prevent it from being inserted incorrectly. The illustration below shows the proper orientation of the card. Make sure the card is fully inserted in the socket as shown in the center of the illustration.

- *Never remove or insert the SD Memory Card while the power is ON. Use the Power Button to power the unit OFF before inserting or removing the SD Memory Card.*

Since the application and persistent registry reside on STORE, removing or inserting it while power is ON could cause data loss and/or file corruption.

- *To remove the card, power OFF and push once to release, then pull the card out of the socket.*

Figure 3-2 below, demonstrates how to orient the SD Memory Card before insertion.

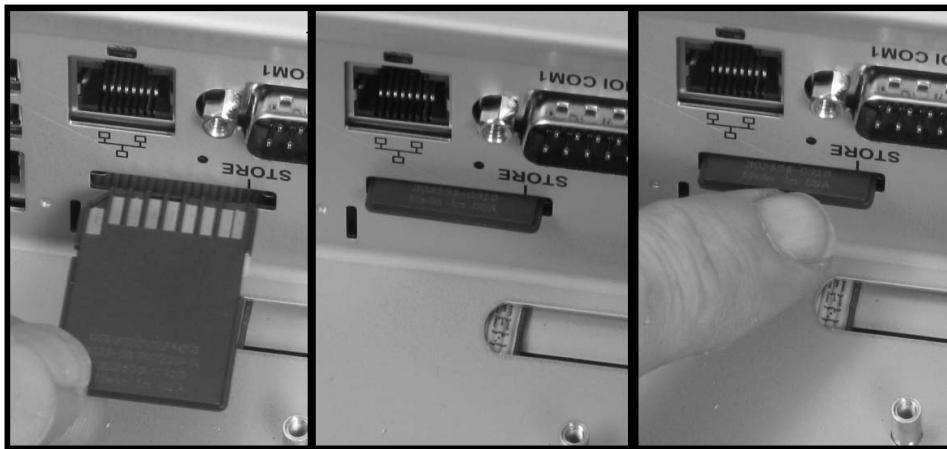


Figure 3-2: Inserting and Removing the SD Memory Card

POWER

The KW270 requires an external +15VDC, 65W power supply, supplied with the unit. The power connector is a locking type, and similar to the power supply used on the KWS4. The KWS4 power supply outputs +12V, which is sufficient to operate the workstation, but does not provide enough power to charge the optional battery pack.

9V and 12V - DC Outputs

This pair of power connectors supply +9V at 2A, and +12V at 2A, intended for powering the Epson and Citizen Thermal Printer options.

IOIOI RS232 (COM1)

This industry standard DB9 male connector can be used for serial printer or other peripheral. The port is backed by an 16550A UART with a 16-byte receive buffer. A System Board jumper can be used to supply +9V or +12V to the Ring Indicator Pin. See Chapter 3. The KW270 ships with the jumper disabled.

■■■ 10/100 Ethernet

The KW270 includes a 10/100 Ethernet Controller with a UTP modular connector. The modular connector features an integrated isolation transformer as well as a link status and network activity indicators. The interface is fully IEEE 802.3 compliant.

IOIOI RS232 (COM2)

Full featured modular RS-232 Port. Use Cable P/N 300319-103 to convert this port to a DB9M connector.

↔ USB

The USB interface is USB 2.0 compatible.

RS422A and RS422B

This pair of multi-purpose modular ports can be configured through the application as either a four-wire full-duplex RS422 port capable of supporting LCC communications or MICROS IDN printing devices. Each port can also be configured as a RS232 port (/w no handshaking) for supported peripherals.



WARNING:

Do not insert a 6-Pin modular plug into the 8-Pin RS422-A and RS422-B connectors. The 6-Pin plug can push pins 1 and 8 of the connector (used by the RS232 Interface) out of position. Should you wish to use the RS232 Interface at a later time, it may not function. Always use cable P/N 300319-001 to connect an IDN printer to the workstation.



Customer Display

This connector supports the MICROS LCD Customer Display.

CD1 and CD2

The Cash Drawer connectors support standard and low profile MICROS cash drawers with DIN style connectors. In addition, a system board jumper can be set to support cash drawers with +24V solenoids. See Chapter 3 for the jumper configuration.

Installation

This section describes how to install the AC adapter, and discusses the recommended method of cabling the workstation.

Installing the AC Adapter

This section describes how to connect the AC adapter to the KW270.



POWER SUPPLY SHOCK HAZARD

If the AC adapter is exposed to moisture a shock hazard exists. The unit is sealed, but not rated for outdoor use. If installed in an outdoor environment, to minimize the risk of electric shock, the AC adapter must be kept dry by protecting it from liquid spills, rain, or snow.

1. Make certain you are using the KW270 AC adapter. Check the label to ensure the output is +15V.
2. With the AC cable disconnected from the AC adapter, connect the DC output cable to the DIN connector labeled 'Power.' Figure 3-3 displays two examples of using the supplied tie-wraps to secure the power cable to an IO compartment cleat.

When operating from the optional battery pack, it is acceptable for the AC adapter to remain connected to the POWER connector even if the AC cable is not connected.

Cabling the KW270

3. Connect each peripheral cable to the appropriate I/O connector. Use the five (5) tie wraps supplied in the loose parts kit to secure cables as required. Two examples are shown on the following page (Figure 3-3.).

Installing and Operating the KW270 Installation

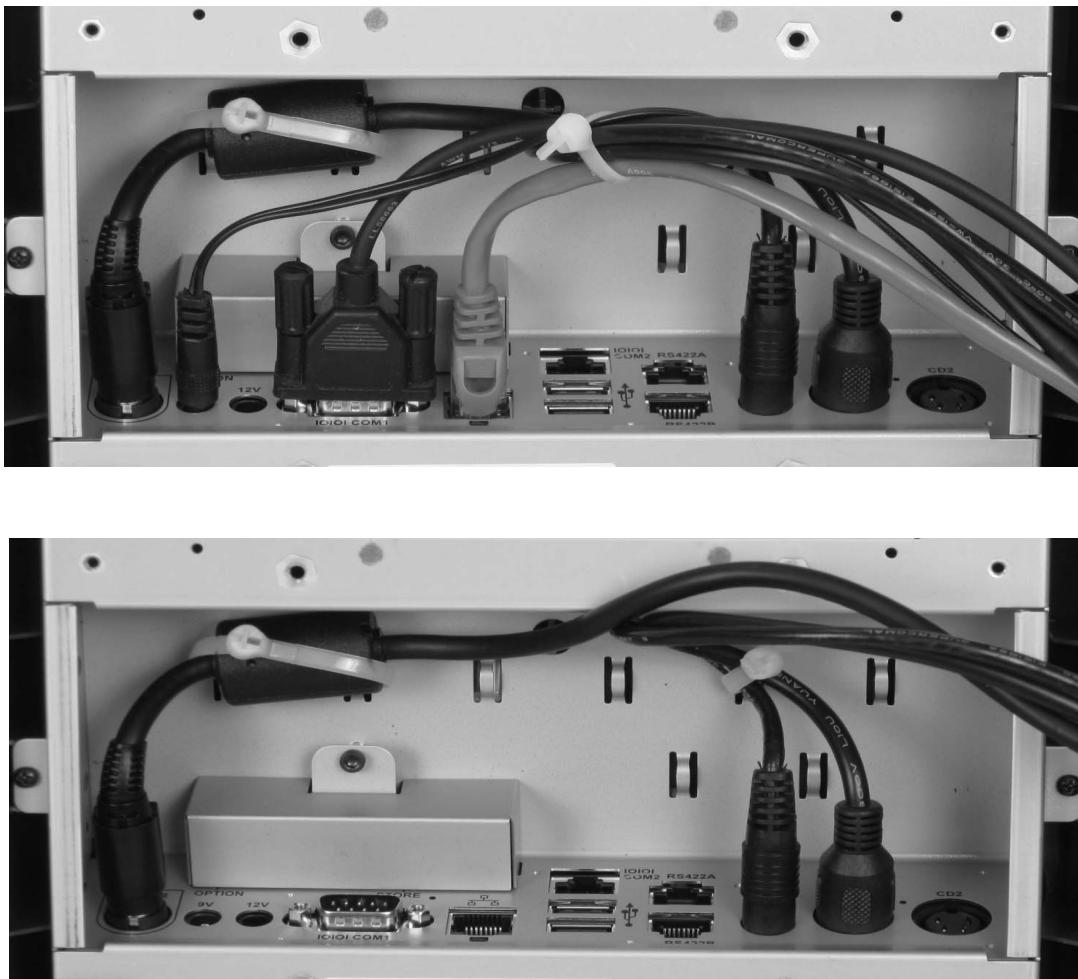


Figure 3-3: Examples Of Cabling the KW270

Operation

This section presents operational procedures for the KW270 including how to use the power button to transition the unit between the **OFF**, and **ON**. The **SUSPEND** state is not supported.

Figure 3-4 points out the primary operator features of the KW270.



Figure 3-4: KW270 Operator Features

Power Button

The power button is used to transition the KW270 between the **ON** and **OFF** power management states.

Operator LCD

The Operator LCD is a 5.7" (14cm) QVGA with a resolution of 320x240.

The KW270 DiagUtility partitions the display into 8 lines, with up to 40 characters per line. The application is customized for this display.

Battery and WiFi LED Indicators

To the left of the Operator LCD is a pair of Bar LEDs used to indicate battery power and WiFi signal strength when those options are installed.

Operator LED

The Green Operator LED is located at the lower right corner of the keyboard. It is on when the unit is operating from the AC adapter or the internal battery pack.

Internal Beeper

A Beeper located on the system board provides information to the operator about the Workstation status.

Starting the KW270

This procedure shows how to start the workstation from the **OFF** state and describes the prompts and messages that may appear on the Operator Display when the unit is new and no application installed.

Procedure:

1. Refer to pages 3-9 and 3-10 to connect the AC adapter to the POWER input of the workstation. Connect the AC adapter cable to an AC outlet. If the battery backup option is installed, the battery will charge.
If you are not sure the battery pack is installed, examine the battery compartment cover. If the battery pack is installed, you can press the built-in battery check button to determine the battery charge level.
To operate the workstation from the battery pack, remove the AC Adapter cable from the POWER input or remove the AC cable from the AC Adapter.
2. Press the power button for one second, then release it.
 - If the Operator LCD briefly flashes white and then turns blank when you press the power button, this is an indication that the battery pack option is installed, but the battery is fully discharged. Be sure the AC adapter is connected as described in Step 1 to charge the battery pack.
 - The Operator LED at the lower right corner of the keyboard should be Green.
 - The start-up screen with MICROS logo and white background appears on the Operator Display. The Bootloader Version is displayed at the lower right corner.

Battery Charge Indicator LEDs

- If the battery backup option is installed, the Battery Charge LEDs indicate the battery charge level. If the battery backup option is not installed, or the battery pack itself is not installed, the Battery Charge LEDs remain off.



Figure 3-5: Start Up Screen with Battery and WiFi LEDs

WiFi Signal Strength Indicator

- At start-up, the WiFi Signal Strength LEDs illuminate and then turn off, even if the WiFi option is not installed. A total of four LEDs should appear as shown above. If the WiFi option is installed, the indicators show signal strength after the operating system starts. If the WiFi option is not installed, the WiFi LEDs remain off.
- After about 30 seconds, the operating system starts, followed by the MICROS Client Application Loader.
 - If the operating system does not start after about 30 seconds, make sure an SD Memory Card is installed in the OPTION slot (See Figure 3-2).
- 3. If the workstation already contains an application, it will automatically start. If no application is installed, the CAL starts and displays a start-up screen and version number.

Using the Client Application Loader (CAL)

4. The version of the CAL included with the KW270 presents the password screen shown in Figure 3-6, below under the following conditions.
 - The workstation is new 'out-of-the-box', or the WipeStore utility has been used to delete the persistent registry and erase the entire SD Memory Card.
 - Started the CAL using the 'Re-Configure CAL' shortcut.



Figure 3-6: CAL Password Entry Screen

The CAL now requires a password to continue under most conditions. Apply the following formula to the six-digit number that appears at the upper left box.

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

5. Calculate the password, enter it with the number keypad then press [Enter]. In this example, the password is 14 ($0 \times 8 + 0 + 6 = 14$).
6. Next, the Windows CE Time and Date Properties window appears. Check each field to determine if it is appropriate. If the Time and Date Properties are correct, press [Enter] to proceed.

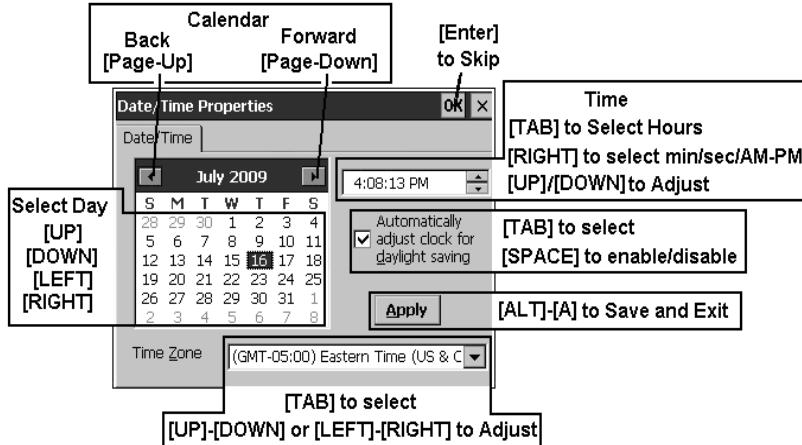


Figure 3-7: Entering the Time and Date Properties

- After the password entry and Date and Time check, the CAL proceeds to conduct a search for CAL servers.

7. Select the CAL Server. If the server is displayed, press [TAB], then use [UP]/[DOWN] to select. When the server name is complete, press [Enter] to proceed.

Using the Search Feature

- Type the name of the server, location, or property you are searching for or select from the list if available.
- The [Search] button finds an exact match and any characters concatenated to the match. For example, a search for 'm' will find m, m1234, m1235, mm, mmm... etc.
- The [Next] button continues processing with the current selection.

If the server name you are searching for does not appear, leave the current selection blank and press [Next] to go back to the configuration menu and run the Auto Discovery Configuration again.

8. Select the Property. If the property is displayed, press [TAB], then use [UP]/[DOWN] to select. If the property name is correct, press [Enter] to proceed.
9. Select the WS Identity. The [AVAILABLE WORKSTION LIST] button is in focus, press [Enter] to display the workstation list and search edit-text box. To configure a workstation Static IP Address, see below. Press [TAB] to focus the edit box and press [TAB] again to focus the [SEARCH] button. Pressing [TAB] a third time brings the list into focus - use the [UP]/[DOWN] keys to select, then [TAB] to the [SAVE] button and press [ENTER].

Configuring a Static IP Address

The CAL Defaults to DHCP operation. To enter a Static IP Address, [TAB] to the 'Automatic DHCP Selection' and press [SPACE] to remove the Checkbox. Press [TAB] to move to the 'IPAddr.' field and enter the Static IP Address. Press [TAB] to move to the 'NetMask' field and [TAB] again to move to the 'Gateway:' fields and enter the IP Addresses as required. When complete, press [ALT]-[S] to save and exit the WS Identity Screen.

CAL Keyboard Hot Keys

The following hot keys are available from the keyboard when the CAL is running.

- [Ctrl]+[Shift]+[R] - Reconfigure CAL
- [Ctrl]+[Shift]+[D] - Run DiagUtility
- [Ctrl]+[Shift]+[L] - Run Loader CAL
- [Ctrl]+[Shift]+[E] - CMD (Open Command Window)
- [Ctrl]+[Shift]+[ESC] - Exit CAL
- [Ctrl]+[Shift]+[S] - Auto start

Using the Optional Integrated Battery Backup

This section provides additional information on using the battery backup option. Topics include the ambient temperature requirements when charging and discharging the battery, and recommendations for long term storage of the battery pack.

Operating the KW270 from the Battery Pack

- The KW270 automatically switches to battery operation when the AC power is removed from the unit.
- When discharging the battery pack, the operating temperature should be between -10°C (14°F) and 60°C (140°F).
- The remaining battery charge is displayed by the battery LEDs to the left of the operator display.

AC Not Connected - Battery Pack Discharging									
	GOOD > 65%		GOOD < 66% > 43%		GOOD < 44% > 21%		LOW < 22% > 7%		VERY LOW > 8%
		R = Red	A = Amber	G = Green		O = Off			

Figure 3-8: Battery Pack Discharge Indicator

Battery charge status is also displayed on the log-in and transaction screens of the application, as shown on the next page.

Figure 3-9 below displays a screen capture of the Simphony application with the remaining battery percentage displayed in the lower right corner of the screen. When the battery pack capacity drops below 20%, a warning message similar to that shown in the lower half of the illustration will appear.

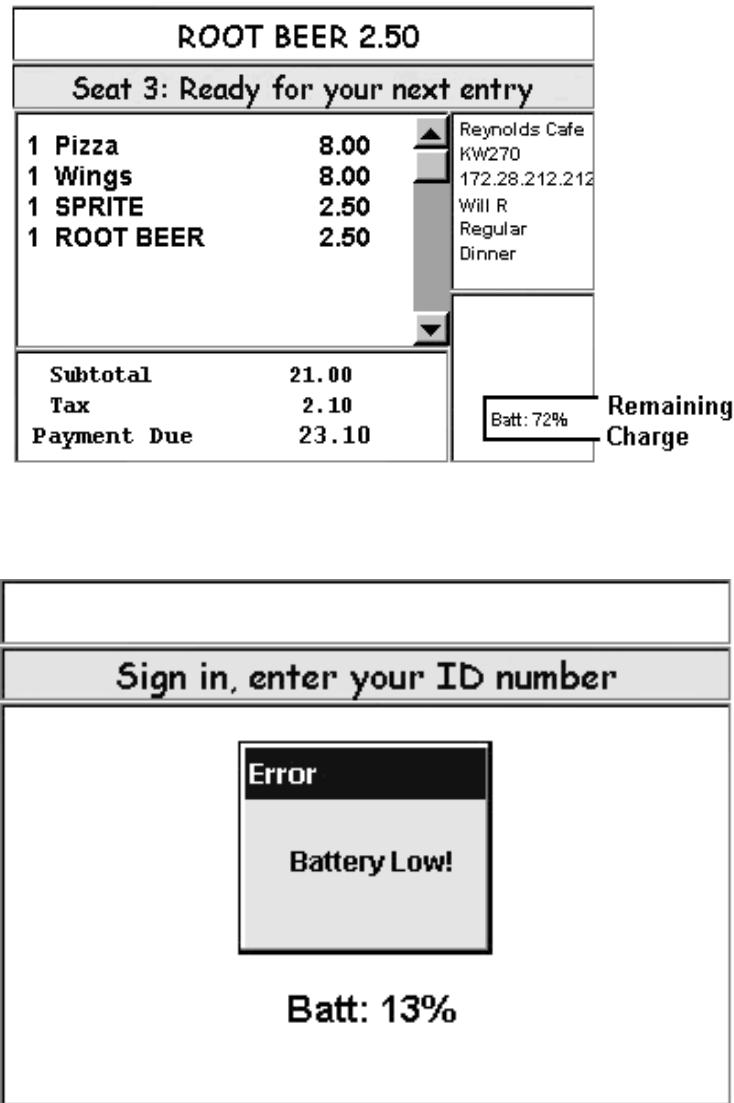


Figure 3-9: Monitoring the Battery Pack Capacity from the Application

Charging the Battery Pack

- To charge the KW270 battery pack, connect the AC Adapter to the IO Panel POWER power input, then connect the AC adapter to an AC outlet.



CAUTION

Be sure to use the AC Adapter supplied with the KW270. It is rated at +15VDC, 63W. The power connector is a locking type, and similar to the KWS4. If the KWS4 AC Adapter (+12V, 45W) is connected to the KW270, the unit will operate, but the battery pack will not charge.

- When charging the battery pack, the temperature should be between 0°C (32°F) and 45°C (113°F) with a relative humidity of less than 80%
- If the unit is **ON**, the Charge Status is displayed by the battery LEDs to the left of the operator display or the application screens.

AC Connected - Battery Pack Charging									
	VERY LOW < 13%		LOW > 12% < 33%		GOOD > 32% < 55%		GOOD > 54% < 77%		GOOD > 76%
R = Red A = Amber G = Green O = Off									

Figure 3-10: LED Battery Charge Indicator

- If the unit is **OFF**, the LEDs do not illuminate, but the battery pack is charged.
- When the battery pack is fully charged, charging automatically stops.

Battery Pack Storage Considerations

Lithium-Ion battery pack capacity will degrade over time. The mechanisms for capacity loss do not require that the battery be charged or discharged; the capacity will decrease even without cycling.

The capacity loss is reduced when the battery is stored at lower temperatures, and increases at higher temperatures.

- If the battery pack will not be used for less than thirty days, the ideal storage temperature is between -10°C (14°F) and 35°C (95°F).
- If the battery pack will not be used for less than 1 year, the ideal storage temperature is between -5°C (23°F) and 30°C (86°F).

In all cases, the battery pack should be removed from the workstation and stored in an environment with low humidity, free from corrosive gases, for the shortest possible time.

When stored at 20°C (68°F) or less, the battery should have a minimum shelf life of six months. Should the storage temperature exceed 20°C over the 6 month period, the shelf life of the battery can be reduced and we recommend that the battery be recharged periodically or every sixty days.

Extended storage with exposure to temperatures greater than 45°C (113°F) will degrade battery performance and overall life. If the battery is stored at temperatures exceeding 45°C for six months, capacity loss can be as great as 10%.

Battery Pack Warnings - Risk of fire, explosion, or burns

- Do not reverse the positive (+) and negative (-) terminals.
- Do not disassemble the battery pack.
- Charge or discharge the battery pack only in the KW270.
- Do not place the battery pack in temperatures over 100°C (212°F). Examples include fire, direct sunlight, or in a closed vehicle in extremely hot weather.
- Do not discard the battery pack in a fire.
- Do not subject the battery pack to mechanical shock.

If the battery pack gives off an odor, generates heat, becomes discolored or deformed, or in any way appears abnormal during discharging, use or storage, immediately remove it from the device or charger and stop using it.

Installing and Removing the Battery Pack

Before installing the battery pack, we recommend powering down the workstation with the Power Button. The AC Adapter can remain connected. If the power button is not used, when the battery is installed, the workstation will power up if the previous power state was **ON**.

To avoid the unit powering up when the battery pack is inserted, always turn the workstation to **OFF** with the power button before removing and inserting the battery.

The upper half of Figure 3-11 shows the thumb and security screw for compartment door. The lower half of the Figure shows how to orient the battery pack when installing the compartment.

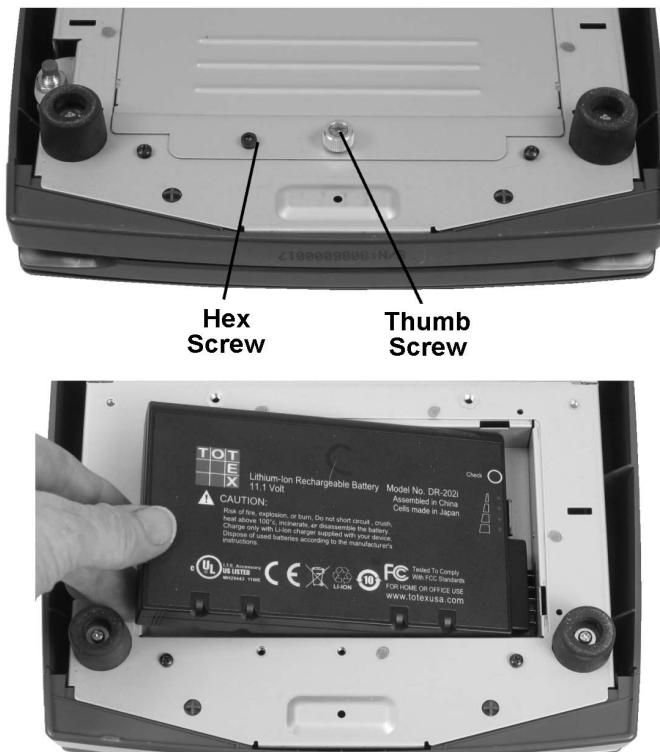


Figure 3-11: Installing the KW270 Li-Ion Battery Pack

To remove the battery pack from the compartment, use the pull strap fastened to the battery pack. Figure 3-12 below, shows the pull strap location.

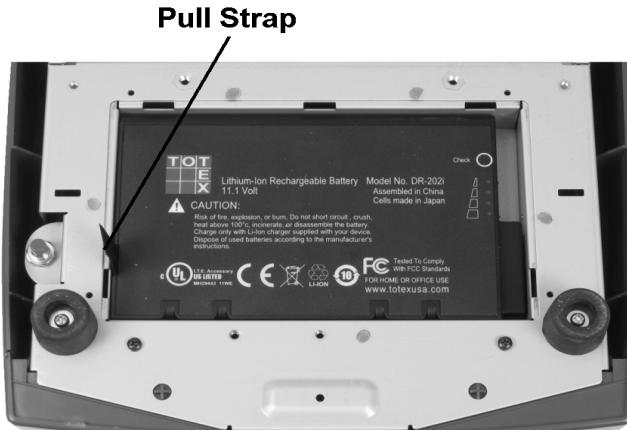


Figure 3-12: Pull Strap for Removing the Battery Pack

Replace the Battery Compartment Door.

Figure 3-13, below is an illustration of a future modification to the battery compartment door that allows access to the battery pack check button and LED indicators.

Pressing the check button displays the battery charge level. The greater number of LEDs illuminated, the greater the charge level.

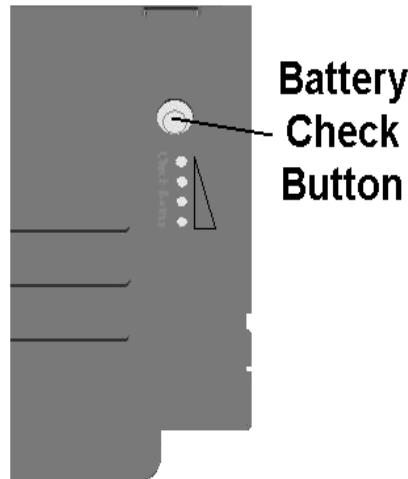


Figure 3-13: Battery Check Button.

1 LED	2 LEDs	3 LEDs	4 LEDs
0% - 25%	26% - 50%	51% - 75%	67% - 100%

Using the WiFi Signal Strength LEDs

If the WiFi option is installed, the WiFi LEDs display the relative signal strength. The LEDs can be used to determine if there is adequate signal strength at a given location. If the KW270 is mobile, the LEDs will indicate if you are moving out of the coverage area.

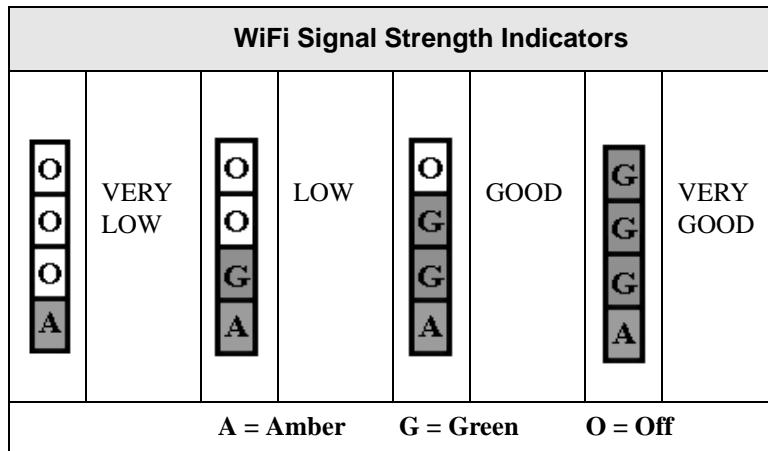


Figure 3-14: WiFi Signal Strength LEDs

KW270 Backlight Configuration

The default backlight settings for battery and AC operation can be modified by the operator. See Running the DiagUtility in Chapter 4 for more information.

The user interface sized to fit the KW270 QVGA LCD. A USB mouse is supported. The Display Time-out Settings window with the default settings for battery or AC operation is shown below.

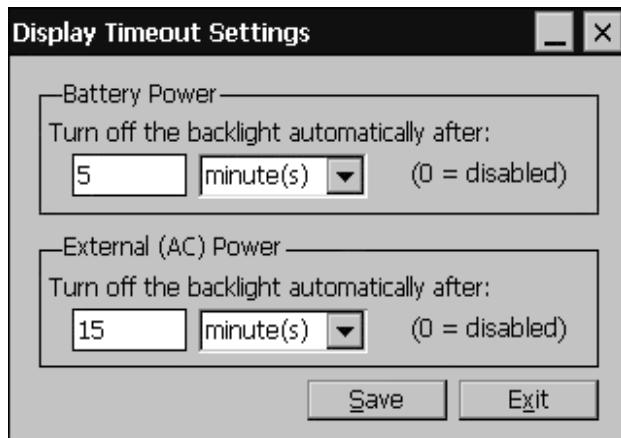


Figure 3-15: Configuring the KW270 Backlight

- Use the [Tab] key to move between each field.
- To set the time, enter the time from the keyboard. Enter 0 in the 'Battery Power' and 'External (AC) Power' fields if you want the backlight to remain on.
- To select between seconds, minutes or hours, use the [LEFT] or [RIGHT] keys.
- To Save and Exit, press [ALT]-[S].

To exit without saving press [ALT]-[x].

Using the Magnetic Stripe Card Reader

The Integrated 3-Track Magnetic Stripe Reader is located at the front of the unit.

- The card orientation is embossed on the card reader cover.
- Orient the card with the mag stripe facing away from you as shown.
- The reader head is located at the center of the reader slot.

Insert the card into the reader slot to the left or right of the center then slide the towards the center . near the Operator Display then pull it down through the slot past the reader head.

Tips for using Magnetic Cards

Magnetic cards should always be kept dry, and away from magnets or sharp objects that could damage the encoded information on the magnetic stripe. If the card is damp or wet, or appears damaged in any way, DO NOT insert into the reader.

If the unit does not read the mag cards consistently, the reader head may be dirty or contaminated. Cleaning kits are available from a number of sources including MICROS by using P/N 600439-003 or 600439-004.

Chapter 4

KW270 Diagnostics

This chapter includes diagnostics information on the KW270. This includes a basic troubleshooting chart as well as using the DiagUtility and other utilities.

In this chapter

Basic Troubleshooting	4-2
KW270 DiagUtility.....	4-3

Basic Troubleshooting

This section provides a brief troubleshooting guide for common problems encountered when installing or operating the KW270.

Problem	Possible Cause	Solution
When Power Button is pressed. Unit does not start Operator LCD is blank. All LEDs are Off	AC Adapter not connected. Battery pack not installed.	Be sure the AC power cable from the external power adapter is connected to a wall outlet or surge protector. The output cable from the 15V AC adapter must be connected to the 'POWER' input of the KW270 IO Panel.
When Power Button is pressed Unit does not start. Operator Display and LEDs flash briefly, then blank.	Battery pack installed, but fully discharged. AC Adapter not connected.	Connect KW270 (+15V) AC Adapter to POWER input to charge battery pack.
When Power Button is pressed, Operator LCD displays White screen /w MICROS logo, but after ~30 seconds, operating system does not start.	SD Memory Card not installed in the STORE slot, or SD Card not recognized.	Power Off and install SD Memory Card in STORE. See Page 3-6.
Battery pack will not charge.	Incorrect AC Adapter or defective AC Adapter.	The +15V KW270 AC adapter must be connected. Do not use the KWS4 AC adapter.
KW270 does not connect to LAN.	Network Patch cable not connected.	Install appropriate patch cable between workstation and wall jack.
System cannot read mag cards.	Mag card read head dirty or contaminated. Mag card reader defective.	Refer to Chapter 3. Use mag card cleaning kit on reader. Replace mag stripe reader.

KW270 DiagUtility

The KW270 DiagUtility combines System Information, Diagnostics and Utilities in a single menu. The Menus are formatted to fit the QVGA LCD.

Starting the KW270 DiagUtility

The KW270 DiagUtility can be executed by connecting a USB mouse, or through the Keyboard.

1. To start the KW270 DiagUtility from the desktop, see the illustration below. You can use the keyboard to select My Devices and navigate to the **BOOT\Utilities** folder and start the DiagUtility. This sequence is illustrated in Figure 4-1, below.

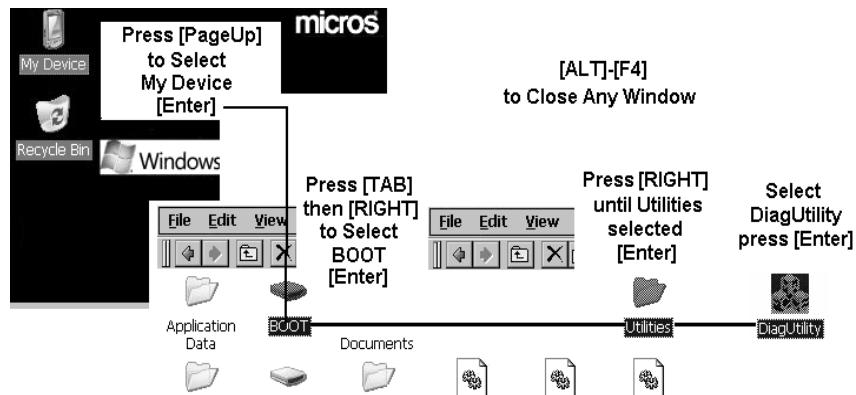


Figure 4-1: Starting the DiagUtility from the Keyboard

The KW270 Diagnostics Version 2.x Main Menu is shown in Figure 4-2, below. To make a selection, enter the number to the left of the name.

Diagnostic Version 2.8 Main Menu
1)System Info 8)System Utilities
2)LCD Display Test
3)Keyboard Test
4)COM Port Test
5)MSR Test
6)Cash Drawer Test
7)CWS Buzzer Test

Figure 4-2: KW270 Diagnostics Utility Main Menu

1) System Information

The System Info screen provides information about the KW270 hardware and software platform. Figure 4-3, below displays a summary of all menus available from System Information. Use the number keys to select the information you wish to view.

System Information													
1)HW Info													
2)Driver Info													
3)SW Config Info													
4)Counters Info	<table border="1"> <tr> <td> - Micros Build Ver : 2.0</td><td> - CWS Driver : 1.4</td></tr> <tr> <td> - WinCE Ver : 6.0.0</td><td> - EEPROM Driver : 1.0</td></tr> <tr> <td> - Cal Version : 10.1.3.95</td><td> - ISP Driver : 1.1</td></tr> <tr> <td> - IP Addr -Dynamic : 172.28.213.24</td><td> - Power Driver : 1.1</td></tr> <tr> <td></td><td> - CWS Beep Driver : 1.1</td></tr> <tr> <td></td><td> - CWS LED Driver : 1.1</td></tr> </table>	- Micros Build Ver : 2.0	- CWS Driver : 1.4	- WinCE Ver : 6.0.0	- EEPROM Driver : 1.0	- Cal Version : 10.1.3.95	- ISP Driver : 1.1	- IP Addr -Dynamic : 172.28.213.24	- Power Driver : 1.1		- CWS Beep Driver : 1.1		- CWS LED Driver : 1.1
- Micros Build Ver : 2.0	- CWS Driver : 1.4												
- WinCE Ver : 6.0.0	- EEPROM Driver : 1.0												
- Cal Version : 10.1.3.95	- ISP Driver : 1.1												
- IP Addr -Dynamic : 172.28.213.24	- Power Driver : 1.1												
	- CWS Beep Driver : 1.1												
	- CWS LED Driver : 1.1												

- CD 1 Open : 1	Hardware Rev : D
- CD 2 Open : 5	BootLoader Ver : 1.7
- Bad MSR Swipes : 0	MB Ser : GS0923E9901-RD0C00117
- MSR Swipes : 3	Mac Address : 00a0a409304c
- Track 1 Present : 3	Keyboard FW : 1.5
- Track 2 Present : 3	Rear Disp FW : 1.4
- Track 3 Present : 3	[Page Down]
	Charger FW Ver : 1.7 or NA
	BOOT Size : 81654784 Bytes
	STORE Size : 255721472 Bytes
	RAM Avail : 53473280 Bytes

Figure 4-3: KW270 System Info Screen - Summary

All driver and firmware versions shown above are part of the GR1.1 Platform Software, valid at the time of release.

1) Hardware Info

The Hardware Info screen displays the System Board Hardware Revision, Bootloader Version, and System Board Serial Number. Firmware versions for the Keyboard, Rear Display, and Charger Board are also displayed. Note: if the battery backup option is not installed, the 'Charger FW Ver' field will display 'NA'.

2) Driver Info

The Driver Info screen displays platform driver versions. The platform drivers are a collection of dll files located in the \BOOT folder. The Driver Versions shown reflect the GR 1.0 Platform at release.

3) SW Config Info

The SW Config screen displays the MICRO Build Version, WinCE Version, the CAL Version, and the static or DHCP IP address assigned to the workstation.

4) Counters Info

The Counters Info screen tracks Cash Drawer and Mag Stripe Reader Activity. Note that the activity counters are stored in the Windows CE Registry. Using the Wipe Store utility will reset all counters to zero.

2) LCD Display Test Menu

The LCD Display Test menu provides functions testing of the Operator LCD, 2x20 LCD Customer Display, and Pole LCD Customer Display. All selections from the LCD Test Menu are summarized in the Figure 4-4 below.

LCD Display Test Menu
1)CWS Rear Display Test
2)Pole Display Test
3)Operator Display Test

Figure 4-4: LCD Display Test Menu

Each selection is covered in more detail in the following sections.

1) CWS Rear Display Test

All Rear Display Tests are shown in the Figure 4-5 below.

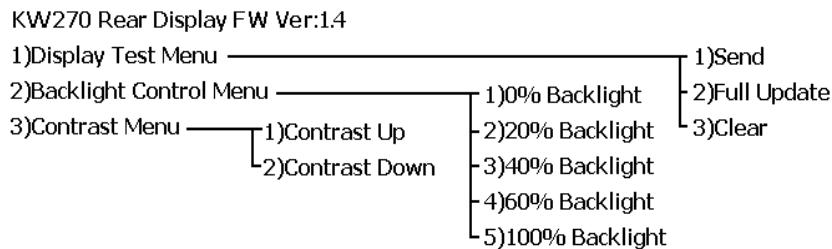


Figure 4-5: CWS Display Test Summary

2) Pole Display Test

The Pole Display Test is designed to exercise all graphics features of the MICROS LCD Customer Display, as shown in Figure 4-6, below.

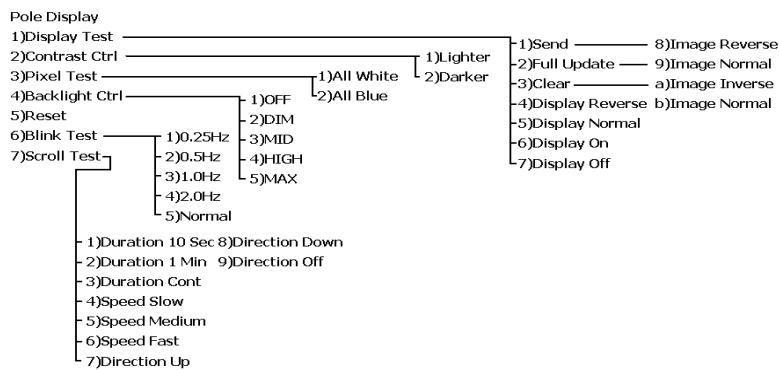


Figure 4-6: Pole Display Test Summary

3) Operator Display Test

The Operator Display test lets you check the backlight brightness and display basic colors in order to look for hot or cold pixels. All tests are shown in Figure 4-7 below.

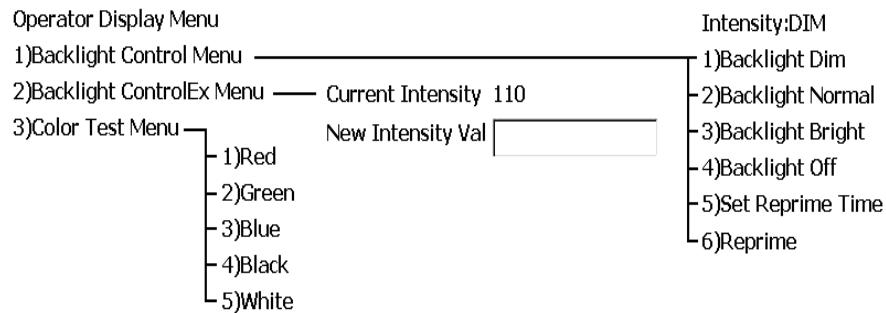


Figure 4-7: Operator LCD Test Summary

3) Keyboard Test

The Keyboard test displays characters and scan codes as you enter them from the KW270 keyboard. Figure 4-8, below is an example of this screen. Press [ESC] twice to exit the Keyboard Test.

Keyboard Test

Key Symbol: **Left Control**

Key Scancode: **1310721**

Figure 4-8: Keyboard Test Display

4) COM Port Test

The COM Port Test Menu consolidates IDN Port Loopback and Printer testing as well as RS232 Port and Printer Ports. The COM Port Test also includes an RS232 test that allows the user to set the COM Port parameters.



NOTE

Do not insert a 6-Pin modular plug into the 8-Pin RS422-A or RS422-B connectors. The 6-pin plug can push the outside pins (used by the RS232 Interface) out of position. Should you attempt to use the RS232 Interface at a later time, it may not function. Always use an 8-Pin modular cable to connect IDN printers to the workstation.

A summary of the COM port test menu is shown in Figure 4-9, below.

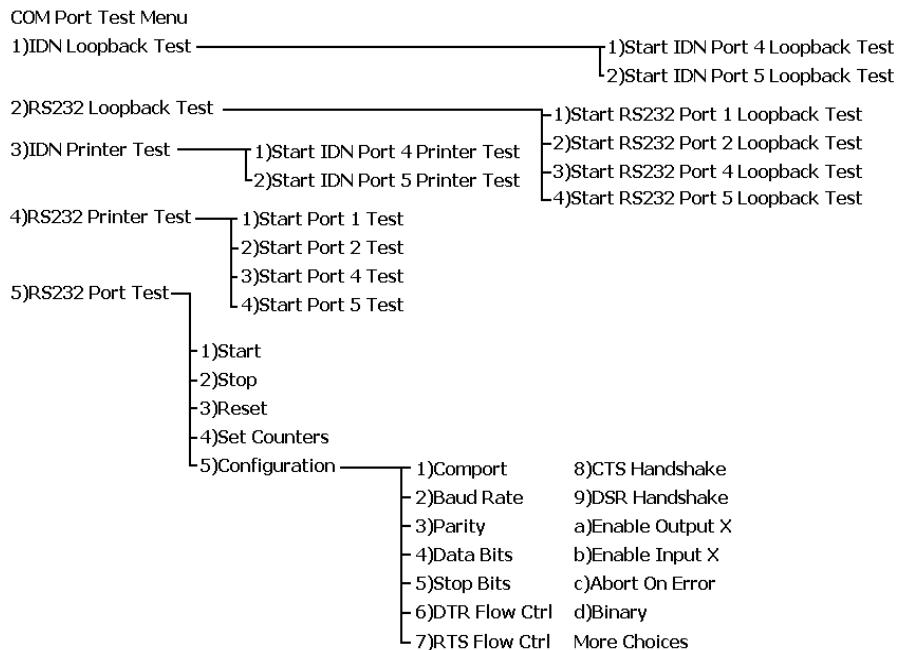


Figure 4-9: COM Port Test Summary

- The COM1 DB9 RS232 loop back test requires P/N 200152-006.
- The IDN Port 4 and 5 and RS232 Port 4 and 5 tests require loopback connector P/N: 200152-004 (Black body).
- The RS232 COM2 Loopback test requires loopback connector P/N: 200152-010 (Orange body)

5) MSR Test Menu

The MSR Test Menu provides several Magtek and Special mode tests and lets you select all or individual tracks to test. The test menu is shown in the Figure 4-10 below.

MSR Test Menu

- 1)Magtek Track 123**
- 2)Magtek Track 1**
- 3)Magtek Track 2**
- 4)Magtek Track 3**
- 5)Special 2 Track**
- 6)Special 3 Track**
- 7)Reset**

Figure 4-10: Mag Stripe Reader Test Menu

Figure 4-11 below is an example of using the Magtek Track 123 selection and swiping a MICROS 3-Track Diagnostics Card (Blue color) through the reader.

Magtek Track 1 & 2 & 3 Enabled

```
%*,.0123456789^MICROS TEST
CARD?;:<>0123456789?+*,.987
654321^TRACK 3 ?
```

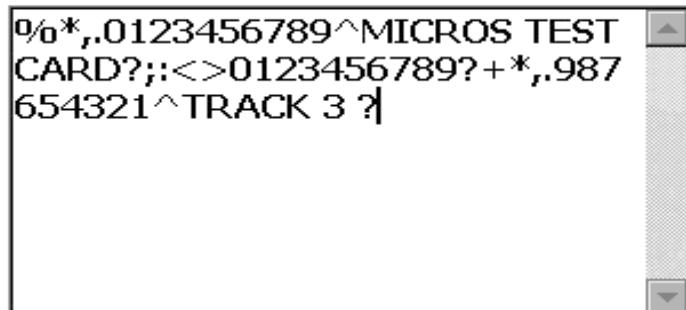


Figure 4-11: Example of the Magtek Track 123 Test

6) Cash Drawer Test

When you select the Cash Drawer Test the following screen appears.

Password Verification Menu
Key 183516
Password

Figure 4-12: Cash Drawer Test Password

Apply the following formula to the six-digit number in the ‘Key’ field:

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

For the example above - $1 \times 8 + 5 + 6 = 19$.

Enter the result in the Password field and press enter. The Cash Drawer Test menu appears, shown in Figure 4-13 below.

CashDrawer Menu	Status
1)Open CashDrawer	1 Closed
2)Open CashDrawer	2 Open

Figure 4-13: Cash Drawer Test

When Cash Drawer is connected, the ‘Status’ Field should display ‘Closed’ as shown in the example above.

7) CWS Buzzer Test

The Buzzer test provides a simple test of the system board beeper, or using the configuration menu, the number of beeps, duration and interval can be programmed. Figure 4-14, below displays the Buzzer Test menu including the configuration menu.

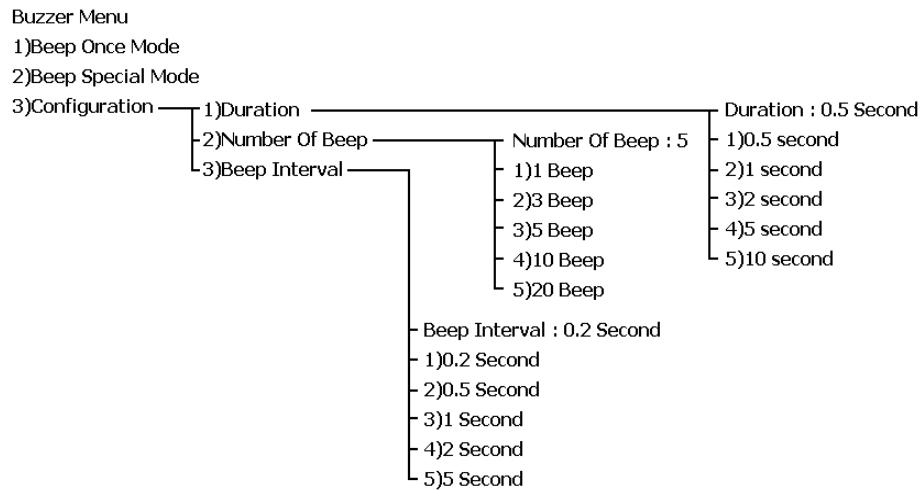


Figure 4-14: System Board Beeper Test Menu

8) System Utilities

The System Utilities selection accesses the Windows CE Backlight Control, System Date and Time, and the Wipe Store Utility as shown in Figure 4-15, below.

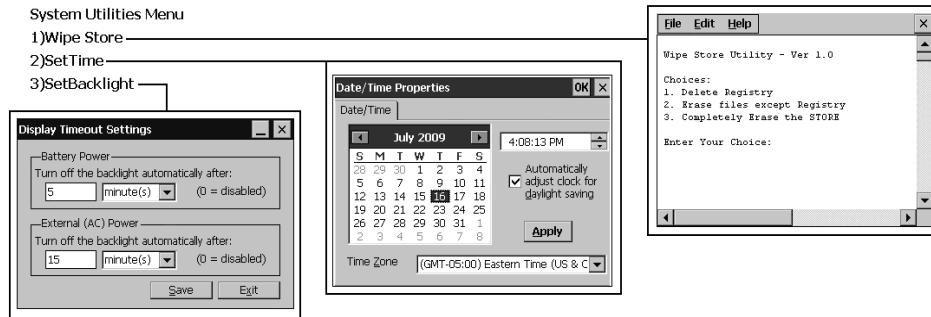


Figure 4-15: System Utilities Summary

1) Wipe Store

The Wipe Store selection calls WipeStore.exe, located in the \BOOT\Utilities folder. After each selection, the workstation powers OFF. Press [Shift]+[Alt]+[f] to abort and exit WipeStore.

- o Selecting 1) deletes the persistent registry files from the SD Memory Card located in the STORE slot.
- o Selecting 2) deletes all files located on STORE with the exception of the persistent registry files.
- o Selecting 3) deletes all files from STORE, but does not format.

2) SetTime

The SetTime selection displays the Windows CE Date and Time Properties window. Figure 4-16, below shows how to use the default keyboard to adjust the date and time, if required. Press [Esc] or [Enter] to exit. .

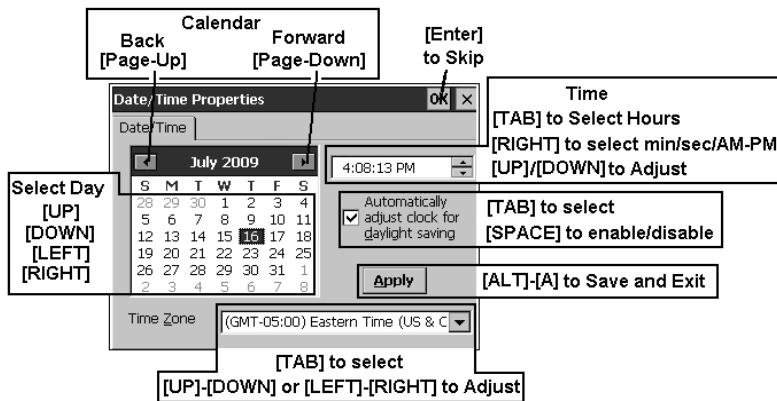


Figure 4-16: Using the Keyboard to Adjust the Date and Time

3) SetBacklight

The Set Backlight selection displays the Display Timeout Settings window shown in Figure 4-17, below. The window is divided into the ‘Battery Power’ and the ‘External (AC) Power’ You can change the default settings, or enter ‘0’ in each field to keep the backlight turned on all the time.

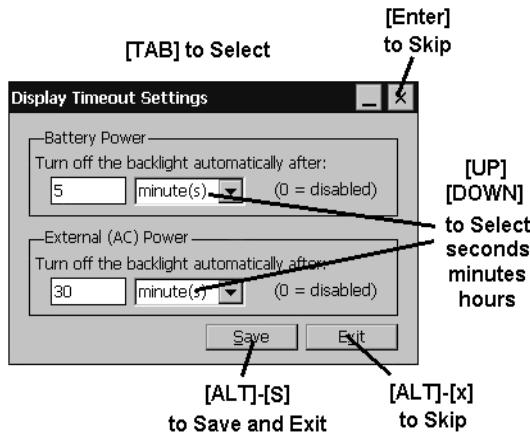


Figure 4-17: Display Timeout Settings Window

Platform Files

The following is an overview of the KW270 Platform Files located in the \BOOT folder.

- *CWS.DLL*

This file contains the KW270 Application Programming Interface (API). The POS application calls this driver to perform platform specific operations such as opening the cash drawer and data writing to the Operator LCD or Customer Display, or retrieving mag stripe card data.

- *CWSBeep.dll*

This file controls the system board beeper while the operating system is running.

- *CWSLED.dll*

This file averages the WiFi LEDs located to the left of the Operator LCD. WiFiMon.exe (part of the CE Image) displays signal strength and CWSLED.DLL smooths or averages the LED outputs.

- *CWSPower.dll*

This driver accesses Power Management controller U45 to determine the last power state.

- *E2Prom.dll*

This driver provides access to the System Board EEPROM that is used to store information such as the System Board serial number.

- *Platform.dat*

Contains the CAL Client Platform Version.

- *ISPDrv.dll*

This file manages firmware updates to the optional LCD Customer Display if required. The same file is used on the WS4, WS4LX and WS5.

- *LaurelBkgndImage.jpg*

The Windows Embedded CE 6.0 desktop wall paper includes the current software platform release info.

- *MSRConfig*

The MSRConfig file contains a single line: 'Magtek_CR=0.' The KW270 API reads this file at power up and does not send a Carriage Return after each track of Mag Stripe Card data. Editing this file and changing the statement to 'Magtek_CR=1' will cause the API to send a Carriage Return after each mag stripe track.

Utilities Folder

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

- *CENotepad.exe*
General Purpose text editor for the KW270.
- *DiagUtility.exe*
The KW270 Diagnostics Utility. See the section called ‘Running the KW270 Diagnostics Utility.
- *RegEditARM.exe*
This utility is used by the CAL to save and restore registry entries during platform and application downloads and updates.
- *SetBacklight.exe*
Custom KW270 utility for configuring the backlight settings when operating from the internal battery or external AC adapter.
SetBacklight.exe can be executed directly by double clicking the filename with a mouse or starting the Diagnostics Utility and selecting 8) System Utilities, then 3) SetBacklight.
- *EBOOT_UPDATE.exe, flash.exe, NK_UPDATE.exe, and XLDR_UPDATE.exe*
A collection of files for booting the workstation and performing platform updates.
- *WipeStore.exe*
WipeStore performs the same functions as the Wipe Compact Flash (WCF) Utility found in the Windows CE based KWS4, WS4/WS4 LX and WS5. It can delete the persistent registry files from the SD Memory Card, all other files or both. WipeStore.exe can be executed directly by double clicking the filename with a mouse or starting the Diagnostics Utility and selecting 8) System Utilities, then 1) Wipe Store.

Appendix A

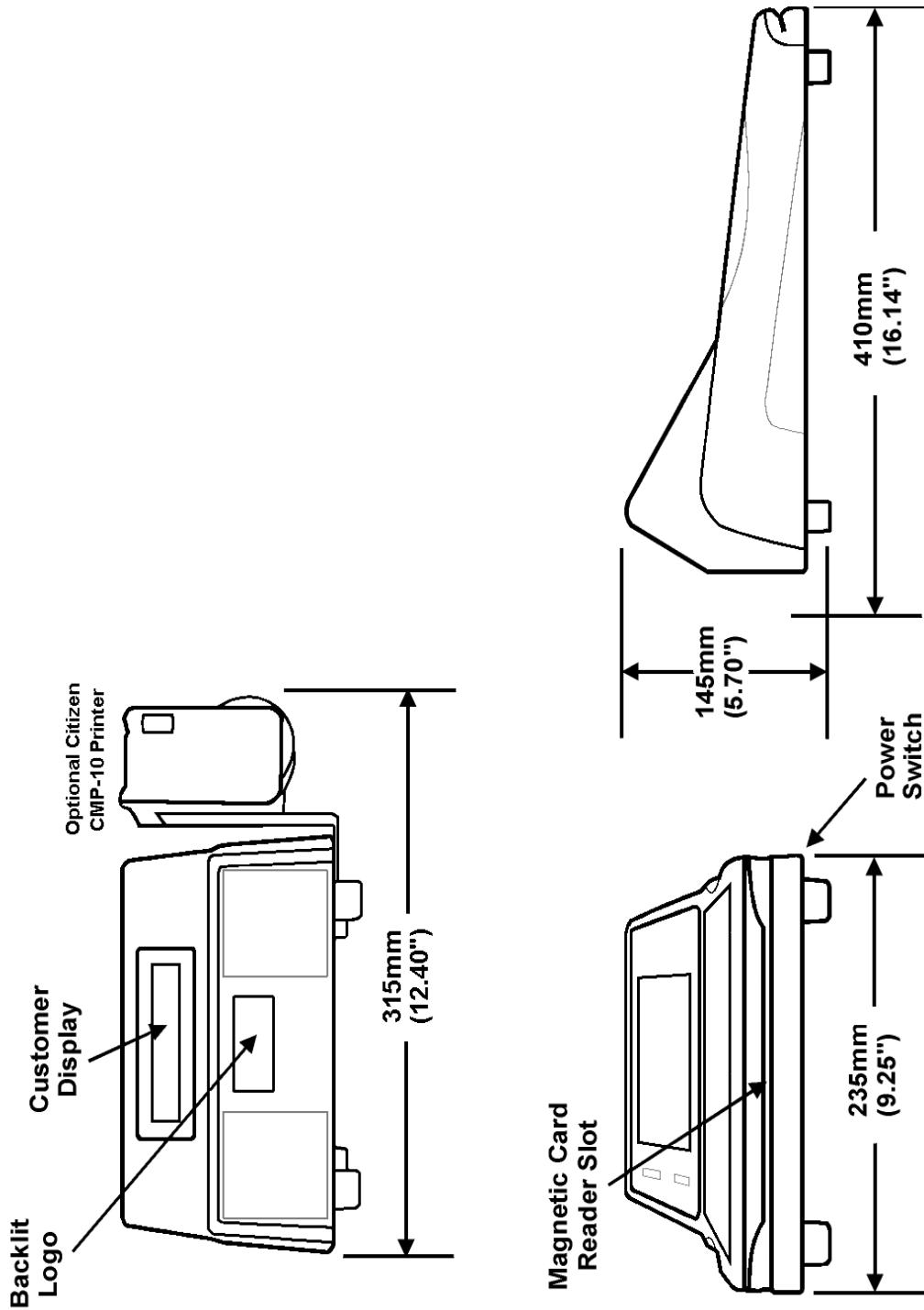
Equipment Dimensions

In this appendix

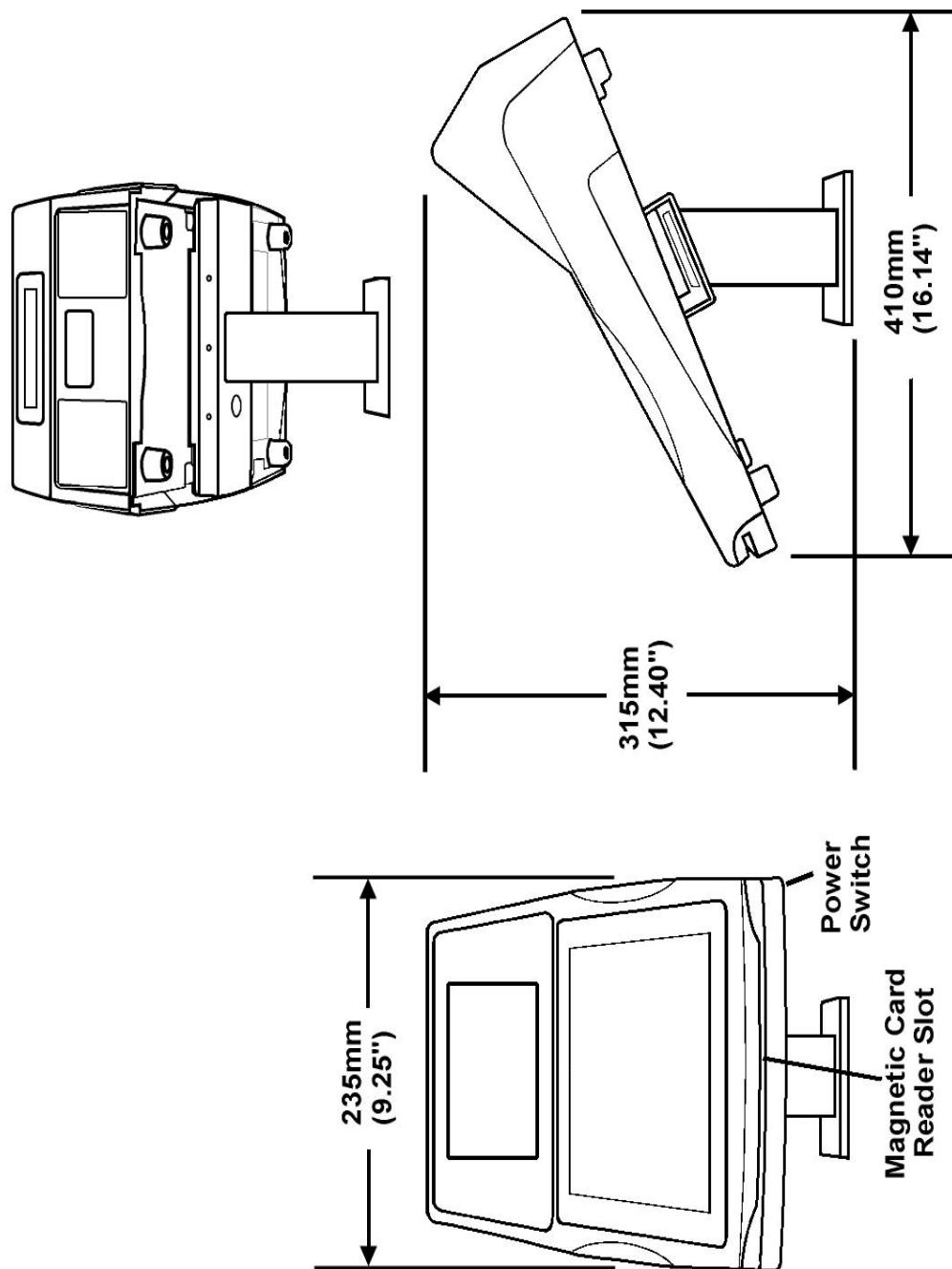
KW270 - Low Profile	A-2
KW270 - On Stand	A-3
LCD Customer Display	A-4
Cash Drawer	A-5

Equipment Dimensions
KW270 - Low Profile

KW270 - Low Profile

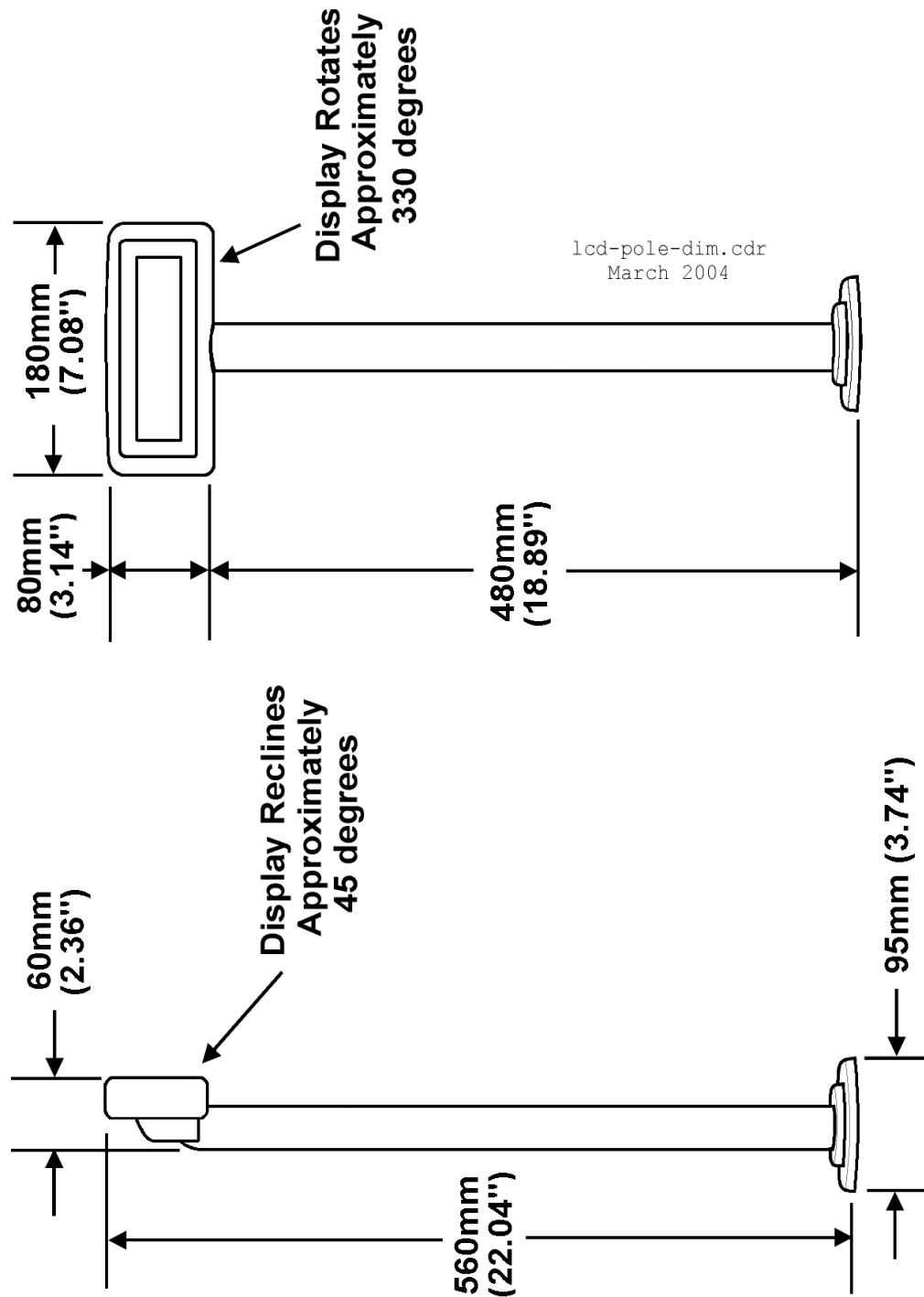


KW270 - On Stand



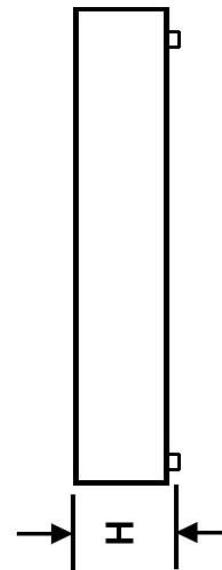
Equipment Dimensions
LCD Customer Display

LCD Customer Display

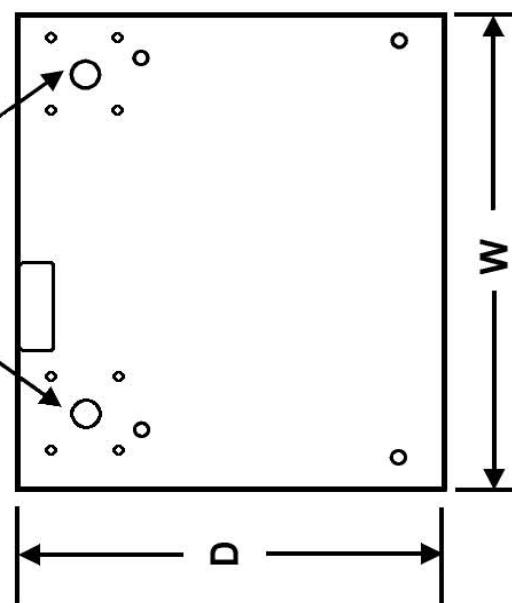


Cash Drawer

MICROS P/N	W	D	H
400018-026	18.0"	16.71"	4.17"
400018-027	457.2 mm	424.4 mm	106 mm
400018-027	18.0"	16.71"	4.17"
400018-028	457.2 mm	424.4 mm	106 mm
400018-028	18.8"	20.0"	4.17"
400018-029	477.5 mm	508mm	106 mm
400018-029	18.8"	20.0"	4.17"
400018-033	477.5 mm	508mm	106 mm
400018-033	13.0 "	16.71"	4.17"
	330 mm	424.4 mm	106 mm



Pole Display
Mounting Holes
8-32 x 1/2"



Equipment Dimensions

Cash Drawer

Appendix B

Connector and Cable Diagrams

On the pages that follow, you will find diagrams of the KW270 IO Panel connectors, system board connectors, and hook-up cable schematics. A description of how each cable or connector is used is provided.

In this appendix

IO Panel Connectors	B-2
Hook-up Cables	B-7

IO Panel Connectors

The following connectors are located on the KW270 IO Panel.

RS422-A (COM3) and RS422-B (COM4)

These connectors are wired identically and assigned to COM3 and COM4 respectively. Port usage is determined by application software settings and can be RS422 or RS232. The pin assignments of each configuration are detailed in the following pages.

RS422 - IDN Printers

This configuration is used to drive printers with IDN modules. Figure B-1 shows the RS422 configuration.

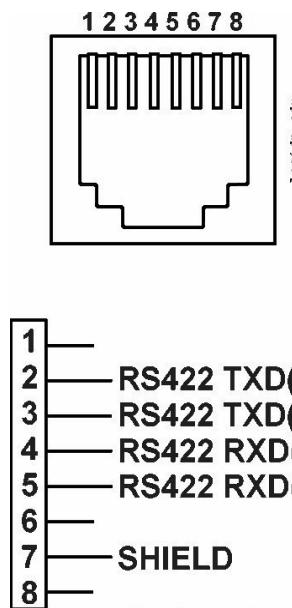


Figure B-1: RS422A or RS422B Ports Configured for IDN Printing



NOTE:

Do not insert a 6-Pin modular plug into the 8-Pin RS422A and RS422B connectors. The 6-Pin plug can push pins 1 and 8 of out of position. These pins are used by the RS232 Interface (See Figure B-2). Should you wish to use the RS232 Interface at a later time, it may not function. Always use cable P/N 300319-001 (non-shielded), 300319-036 (shielded), or 300319-120 (shielded) to connect an IDN printer to the workstation.

RS232

The RS422A (COM3) and RS422B (COM4) ports also support a basic RS232 interface as supported by the application. This configuration is shown in below.

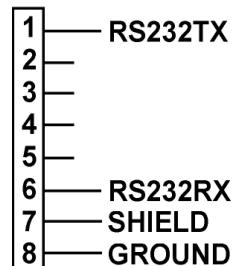
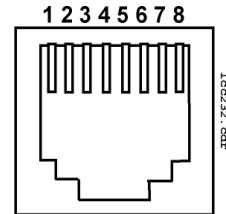


Figure B-2: RS422-A or RS422-B Port Configured for RS232

Modular RS232 COM Port

The KW270 IO Panel includes a single modular RS232 Port labeled COM2. This port is identical to the modular RS232 ports found on the WS5 and PCWS 2010. The pin diagram is shown in the illustration below.

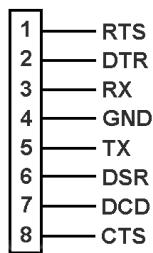
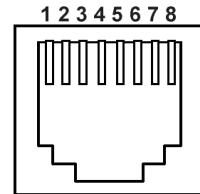
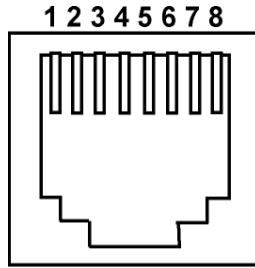


Figure B-3: COM2 Modular RS232 Port Diagram

10/100 Ethernet Connector

The pin-out for the 10/100 Ethernet port is shown in Figure B-4, below.

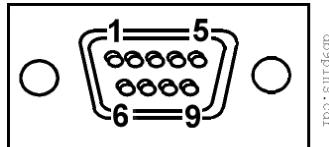


- 1 - TXD+
- 2 - TXD-
- 3 - RXD+
- 4 - NC
- 5 - NC
- 6 - RXD-
- 7 - NC
- 8 - NC

Figure B-4: 10/100 Ethernet Connector Diagram

RS232 DB9M Connector

A single DB9M RS232 connector assigned to COM1 is provided on the IO Panel. The pin-out is shown below.



- 1 - DCD
- 2 - RXD
- 3 - TXD
- 4 - DTR
- 5 - GND
- 6 - DSR
- 7 - RTS
- 8 - CTS
- 9 - NC +9V or +12V
Selectable with
J3

Figure B-5: DB9 Powered RS232 Connector Diagram

Cash Drawer 1 and 2 Connectors

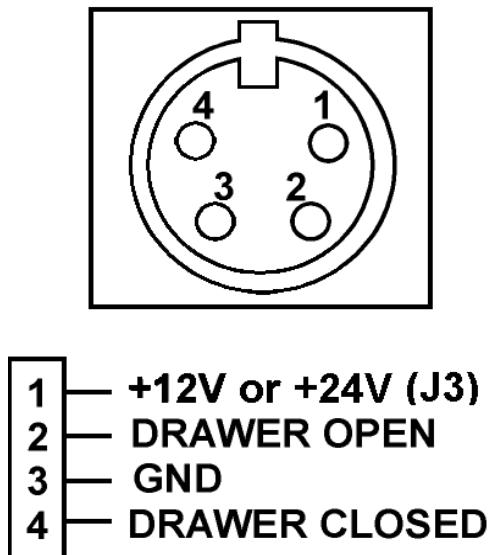


Figure B-6: Cash Drawer Connector Diagram

Pole Display Connector

This port, shown in Figure B-7 is located on the KW270 IO Panel. It is capable of driving the LCD Pole Customer Display.

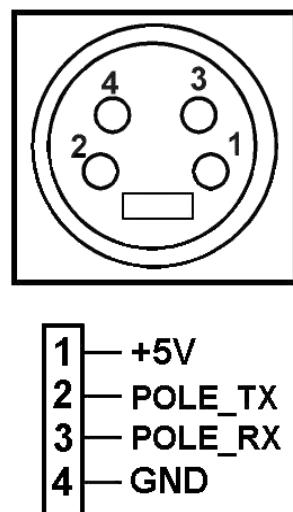


Figure B-7: Customer Display Connector Diagram

POWER Input

Figure B-8 shows a pin-diagram of the AC Adapter cable connector that connects to the IO Panel POWER Input.

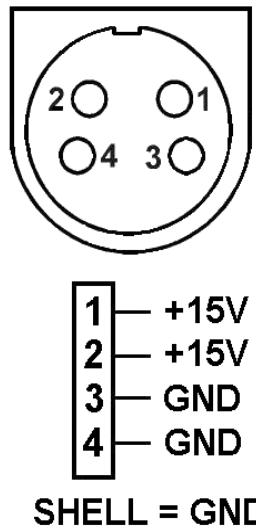
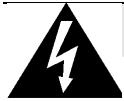


Figure B-8: KW270 Power Input Cable Connector



POWER SUPPLY SHOCK HAZARD

If the KW270 external power supply is exposed to moisture a shock hazard exists. The unit is sealed, but rated for indoor use only. If installed in an outdoor environment, to minimize the risk of electric shock, the external power supply must be kept dry by protecting it from liquid spills, rain, or snow.

Hook-up Cables

The following pages show wiring diagrams of various hook-up cables that may be used with the KW270.

RS232 from the RS422A and RS422B Ports

Figure B-9 shows a cable that includes the RS232 signals from RS422A and RS422B ports to a DB9 male connector. This cable is available from MICROS by ordering P/N 300319-102. This cable is compatible with the WS4, WS4LX, WS5 and PCWS 2010.

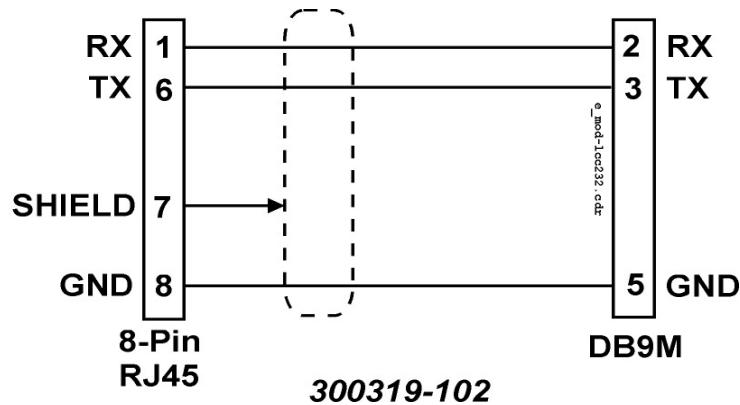


Figure B-9: Modular LCC/RS232 to DB9 Male Connector

Figure B-10 shows a cable diagram that adapts the RS422A and RS422B ports to a DB25 connector.

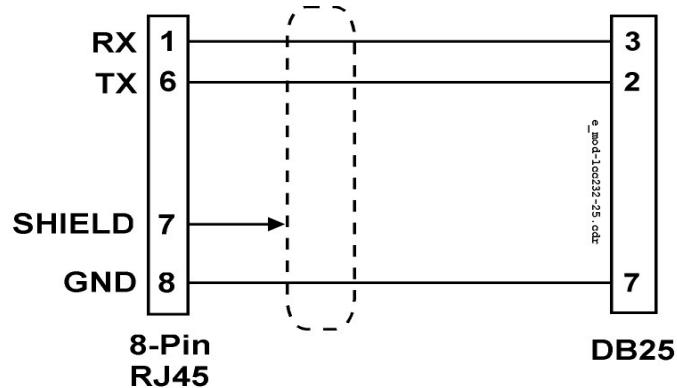


Figure B-10: Modular LCC/RS232 to DB25 Connector

COM2 RS232 Modular Connector

Figure B-11 displays a cable diagram that adapts the COM2 modular port to a DB9 male connector. This cable is available from MICROS by ordering P/N 300319-103. This cable can also be used on the WS5 and PCWS 2010.

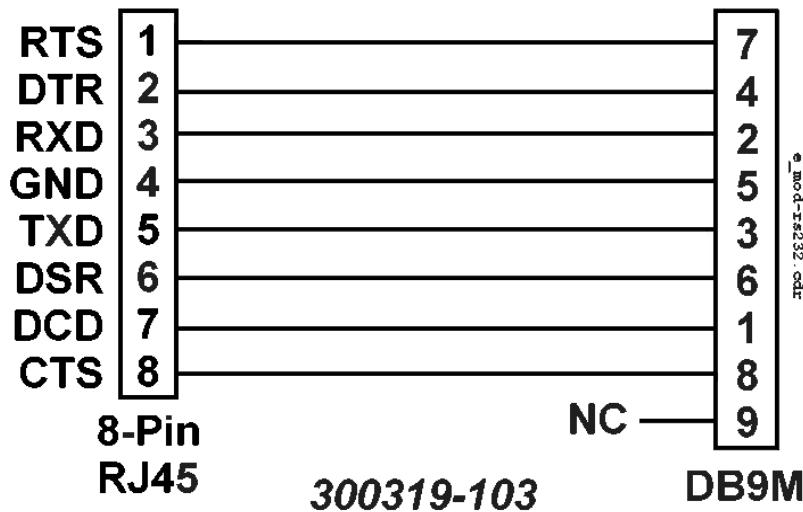


Figure B-11: Modular COM2 Port to DB9M Connector

Figure B-12 displays a cable diagram that adapts the COM2 modular port to a DB25 connector.

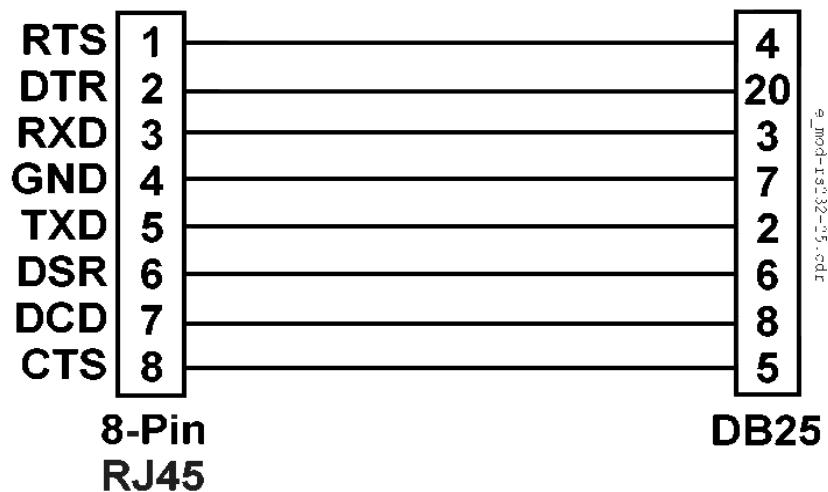
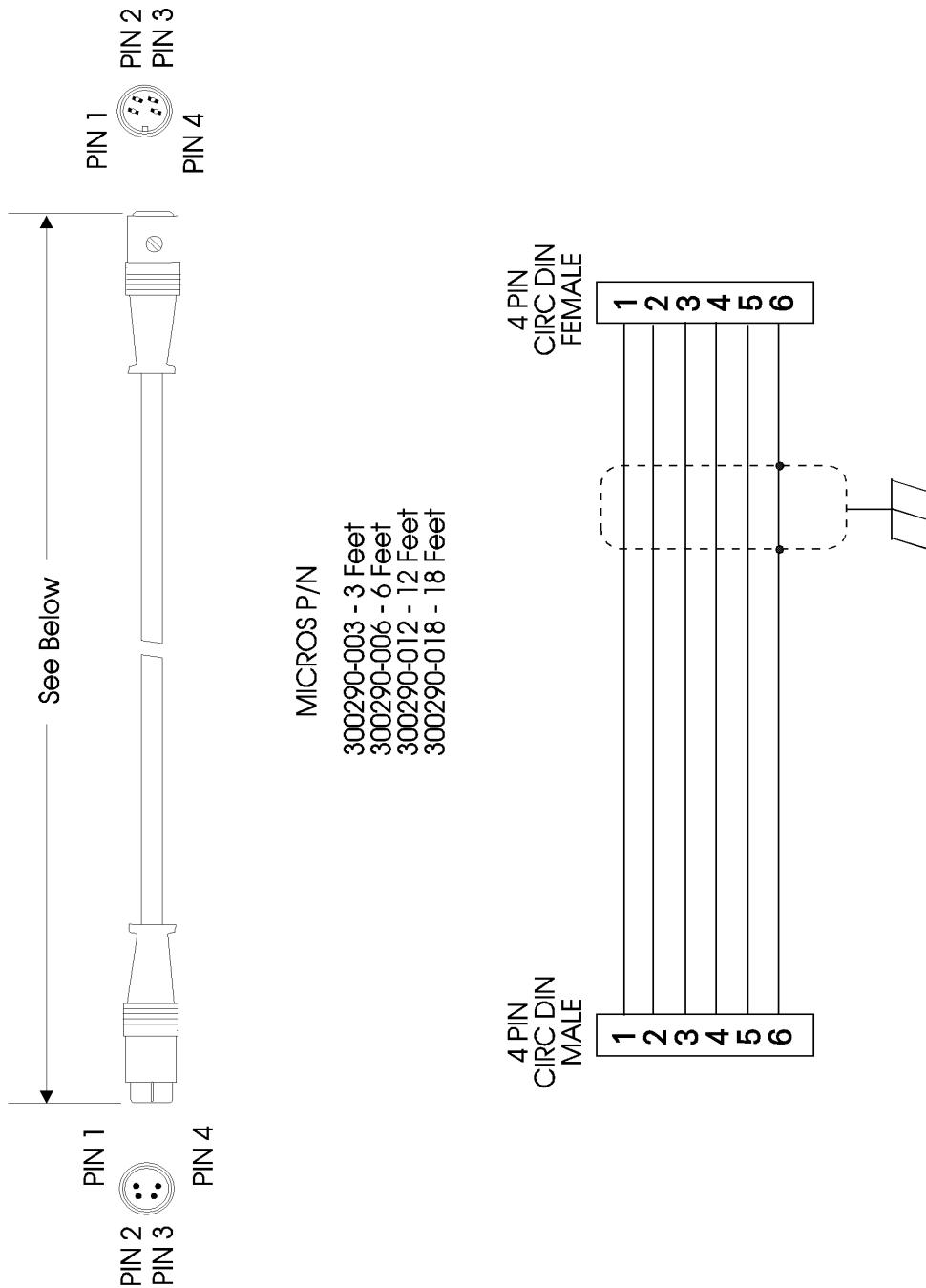


Figure B-12: Modular COM2 Port to DB25M Connector

Cash Drawer Extension Cable



Connector and Cable Diagrams

Hook-up Cables

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.

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 agréées par la partie responsable pour la conformité de l'installation, pourraient annuler l'autorisation de l'exploitation par l'utilisateur du materiel installé. Il est obligatoire d'utiliser pour la communication ou la réalisation d'interfaces un cable blindé, afin d'être en conformité avec les limites légales d'émission.
