

# **SurePOS 500 Model XX3**

## **Technical System Reference**

**Version: 1.3**

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## Change History

Changes resulting in document revisions will be summarized in this table in reverse chronological sequence.

Version	Date	Change Description
1.0	1/28/04	Initial Draft
1.1	3/18/04	Revised copy with Engineering inputs, MSR programming interface
1.2	3/25/04	Updated System Block diagram, Presence sensor status, and ASIC control registers.
1.3	4/1/04	Update Video Memory

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## **i. Introduction**

The IBM 4840 SurePOS 500 Series Point of Sale System is designed to drive the POS transactions within your food service, hospitality, petroleum, and specialty retail providers worldwide.

### **SurePOS 500 – Model 563 (LEADERSHIP, MULTIMEDIA)**

The sleek leadership model of this family displays excellent visibility in bright light via a 12 inch or 15 inch dual-bulb touch screen that provides the widest viewing angle for training many people at once, wireless capability through a PC Card type-II slot, and a headphone jack for private, quiet training in active environments. An independent video adapter is available as an option to display a multimedia image on a second LCD for advertising or up selling. A presence sensor saves you money by automatically switching the display on and off based on the operator's proximity. Where stringing cable is not practical, a PC Card expansion slot enables the use of wireless capability.

### **SUREPOS 500- Model 553 (VALUE, MULTIMEDIA)**

If you need full-motion video, a wide viewing angle through a 12.1 inch single bulb active color LCD, wireless capability through a PC Card type-II slot, and a touch screen, the SurePOS 553 will more than meet your needs. It includes audio support/speakers as standard, as well as a headphone port and a microphone port.

### **SurePOS 500 - Model 543 (ENTRY, DUAL BULB)**

If you need full-function POS or combined POS/back-office terminal at an entry price point, the 543 is the right choice for you. It offers a dual-bulb active color LCD and the same processing power as the model 553, all at a lower total cost of ownership.

### **SurePOS 500 – Model 533 (ENTRY, SINGLE BULB)**

If you need full-function POS or combined POS/back-office terminal at an entry price point, the 543 is the right choice for you. It offers a dual-bulb active color LCD and the same processing power as the model 553, all at a lower total cost of ownership.

If you need full-function POS or combined POS/back-office terminal at an entry price point, the 533 is the right choice for you. It offers a single-bulb active color LCD and the same processing power as the model 553, all at a low total cost of ownership.

## ii. About this manual

This manual contains software and hardware information about the IBM SurePOS 500 Series. This manual is organized as follows:

- “Chapter 1. General description” on page 1 introduces the various models, the I/O devices that can be attached, and product features.
- Chapter 2. Supported devices, Operating system Supported, and POS Application Interfaces.
- “Chapter 3. System configuration and system board layout” on page 15 describes the system board and provides details about product features.
- “Chapter 4. Physical specifications” on page 19 provides detailed specifications and planning information.
- “Chapter 5. Description of Tower Logic components.”
- “Chapter 6. Power supply” on page 26 describes the features of the power supply.”
- “Chapter 7. LCD Panel Specification. “
- “Chapter 8. POS I/O Specifications. “
- “Appendix A. System Unit Operating Temperature and Humidity Ranges. “
- “Appendix B. Power Specifications. “
- “Appendix C. Standards Compliance.”
- “Appendix D. Memory Map, PCI Configuration, Interrupt / DMA assignments and I/O Ranges.”
- “Appendix E. ASIC PCI Function POS UARTS.”
- “Appendix F. Connectors”
- “Appendix G. Input/Output device commands” on page 49 commands and their usage for the SurePOS 500 Series I/O devices.
- “Appendix H. Notices” on page 65 provides legal notices, electronic emission notices, and trademark information.

## iii. Who should read this manual

This guide is intended for technical personnel who will plan, install, setup, and operate the point-of-sale terminal. These personnel will also carry out preliminary diagnostic procedures using the information in this manual, before making a service call.

### iiii. Related publications

The following IBM publications are available from the IBM Retail Store Solutions Web site at [www.ibm.com/solutions/retail/store/](http://www.ibm.com/solutions/retail/store/)

From there, select **Support**, then, under Related Links, select **Publications**.

- *Safety Information – Read This First*, GA27–4004
- *SurePOS 500 Series Installation and Operation Guide*, GA27–4254
- *SurePOS 500 Series Hardware Service Guide*, GY27–0396
- *4610 SureMark Point-of-Sale Printers Hardware Service Manual*, GY27–0355
- *4610 SureMark Point-of-Sale Printers User's Guide*, GA27–4151
- *4820 SurePoint Solutions Installation and Service Guide*, GA27–4231
- *4820 SurePoint Solutions System Reference*, SY27–4249

### Driver and service diskette information

The following driver and diagnostic programs are available on the IBM Retail Store Solutions Web site at [www.ibm.com/solutions/retail/store/](http://www.ibm.com/solutions/retail/store/)  
SurePOS 500 Series Device Drivers

SurePOS 500 Series Service Diskette

At that site, select **Support**, then under Software select **Download Software Maintenance** and select **SurePOS 500 Series**.

## Chapter 1 Model Specifications

### Model Summary

Model	Processor	Dual Video	Presence Sensor	Speaker	Tablet	Memory	Mass Storage
4840- 533	2.0 GHZ Celeron	Option	No	No	12-in Single Bulb	128 Std 256,512,1G, 2GB	40 GB HDD 7200 RPM 512 MB Compact Flash
4840-543	2.0 GHZ Celeron	Option	No	Yes	12-in Dual Bulb	128 Std 256,512,1G, 2GB	40 GB HDD 7200 RPM
4840-553 PCCARD/AUDIO	2.0 GHZ Celeron	Option	No	Yes	12-in Single Bulb	128 Std 256,512,1G, 2GB	40 GB HDD 7200 RPM
4840-563 PCCARD/AUDIO	2.0 GHZ Celeron	Standard	Yes	Yes	12-in Dual Bulb 15-in	128 Std 256,512,1G, 2GB	40 GB HDD 7200 RPM



## Model Specifications

	4840-533	4840-543	4840-553	4840-563
<b>Processor</b>	Intel Celeron 2.0 GHz			
<b>PSB Speed</b>	400 MHz			
<b>Chipset</b>	Intel 845GV			
<b>BIOS</b>	Award-based			
<b>Main Memory</b>	128 MB 266 MHz DDR standard 2 slots (2 GB max)			
<b>Video</b>	Intel Extreme Graphics (8MB ) plus DVM (Max 64MB) (Note 1) Dual Video Adapter 32Mb (Note 2)			
<b>LCD</b>	800x600 12.1-in TFT (1 bulb)	800x600 12.1-in TFT (2 bulb)	800x600 12.1-in TFT (1 bulb)	800x600 12.1-in TFT (2 bulb) 1024x768 15-in. TFT
<b>Touch</b>	Infra-red			
<b>Audio</b>	n/a	n/aAC97 compliant Amplified Stereo Speakers	AC97 compliant Amplified stereo speakers	AC97 compliant amplified stereo speakers
<b>Mass Storage</b>	Ultra ATA/100 (Parallel) 512MB Compact Flash or 40 GB 3.5-in IDE HDD			
<b>LAN</b>	10/100BaseT Ethernet			
<b>Expansion</b>	n/a		PC Card - 1 Type II	PC Card - 1 Type II
<b>Presence Sensor</b>	No	No	No	Yes
<b>I/O Ports and Connectors</b>	2 StandardUSB (tablet) Mouse/Kybd (front/rear) 4 Standard USB (2 front/2 rear) 1 12V Powered USB (rear) 1 24V Powered USB (rear) 2 Cash Drawer 3 Unpowered RS232 1 Powered RS232 (External Customer Display) Headphone/Microphone (553/563premium model only) RJ45 LAN External Floppy External CRT Parallel Port			
<b>I/O Devices</b>	External Floppy External Floppy (USB) External CD ROM (USB) MSR (3-Track/JUCC) Integrated 2x20 Distributed 2x20 Distributed APA			
<b>Indicators</b>	Power HDD activity			
<b>Controls</b>	Power LCD Brightness			

	Volume (with speaker kit)
<b>OS</b>	DOS 2000, Windows ( 2000, XP, XPe), Linux
<b>Power Supply</b>	130W/200 W max
<b>Mounting</b>	<ul style="list-style-type: none"> <li>– Free Standing (with and without foot)</li> <li>– Free Standing on cash drawer (std or compact)</li> <li>– Integration Trays: SST/kybd counter, 4610 counter, Std/compact cash drawer</li> <li>– Wall Mount</li> </ul>
<b>Security</b>	Power On Password Bolt down/Tray Mounting

#### Notes:

##### 1. Dynamic Video Memory Technology (DVMT) and Pre-Allocated Video Memory

With the appropriate Windows video driver the Extreme Graphics video controller, 845GV, is allocated a variable UMA memory size. This is based on the real time requirements of the application software. For non-Windows operating systems where the DVMT driver is not available, a second 'pre-allocated' and fixed UMA memory size defined. This pre-allocated memory is set to 8Mb and is not related to or combined with the DMVT UMA memory size. The pre-allocated memory is always available and is consuming 8Mb system memory. If a Windows operating system is in use with Intel's DVMT driver loaded, an additional memory size is allocated (consumed) from system memory. The maximum DVMT memory size allocated will be 64MB. The total system memory consumed for on-board video controller usage is the total of pre-allocated and DMVT memory could total 72MB (8MB + 64MB).

2. Dual Video adapter memory requirement- this optional factory installed feature utilizes 32Mb of UMA memory as video memory. The combined video memory usage of the base 845GV video chipset utilizing DVMT technology and the second video adapter requires the system memory be configured at 256Mb. This is to insure sufficient memory for Operating System, Application, and video usage.

## Factory Select Feature

Mass Storage	40GB HDD or 512 MB Compact Flash (Model 533)
Memory	128MB, 256MB, 512 MB, 1GB, 2 GB
LCD	12-in or 15-in (Model 563 only)
Dual Video	All Models Factory install feature code

## Optional Features

Unless otherwise stated, all features are designated as customer set up and plant/field.

Order Code	Feature	P/N	Comments
	128 MB DDR Memory		Field Install
	256 MB DDR Memory		Field Install
	512 MB DDR Memory		Field Install
	1 GB DDR Memory		Field Install
	2 GB DDR Memory		Field Install
	Mounting Foot		New P/N, 4820 mounting
	Integrated 2x20 Customer Display		New P/N
	Distributed 2x20 Customer Display		Existing P/N
	Distributed APA Customer Display		Existing P/N
	3-Track MSR		New P/N
	JUCC MSR		New P/N
	Integration Tray for Printer/Kybd		New
	Counter Integration Kit (SST/kybd)		New
	Standard CD Integration Kit (4610/kybd)		New
	Compact CD Integration Tray (kybd)		New
	Cash Drawer (standard, compact)		Existing P/N
	Compact A/N POS Keyboard		Existing P/N
	Y-cable, CANPOS/Mouse		Existing P/N? right angle?
	External USB CD ROM		New P/N
	External USB Floppy Drive		New P/N
	External Floppy (existing)		Existing P/N
	Serial Cable, RJ45 to DB9, 0.7m		Existing P/N
	Serial Cable, RJ45 to DB9, 2.0m		Existing P/N
	4820 Attachment Kit		Existing P/N(updated)
	4610-TF6/7 Power Cable, 0.7m		New P/N
	4610-TF6/7 Power Cable, 2.0m		New P/N

## Ship Group

The following items are included with the unit:

- Cat 5 Ethernet Cable (4.3m), P/N 42L0098
- Serial Cable, RJ45 to DB9 (0.7m), P/N 03R7887

The following items are picked packed per order at IBM Distribution Center:

- Warranty Sheet
- Installation, Operations, and Planning (optional with specify code)
- Regulatory and Safety Messages Booklet (GA27-4004)
- Power cord selected by country code

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## Chapter 2 Supported Devices

The following industry standard devices have been tested for use with [SurePOS 500-XX3](#) subject to operating restrictions defined in the Operating System support section. Other industry devices may be supported using standard interfaces, however, no testing has been done to insure functionality in all aspects.

Port	Device	Hot Plug Support (note 1)
RS232	<ul style="list-style-type: none"><li>– 4610-TF6/TF7 Single Station Thermal Printer</li><li>– 4610-TG3, TG4, TG5</li></ul>	No
CRT (Video)	<ul style="list-style-type: none"><li>– 4820-4FD/4FT (MSR option supported)</li><li>– USB Crystal (if in plan)</li></ul>	No
USB	<ul style="list-style-type: none"><li>– 4610-GB3 (Macarena Fiscal USB)</li><li>– 4610-TG3/TG4/TG5</li><li>– IBM USB Floppy Drive, P/N 05K9276</li><li>– IBM USB Keyboard, P/N 10K3849 (OBI P/N)</li><li>– IBM Memory Key P/N 22P9025</li><li>– IBM 4685-S01/L0H Handheld Scanner</li></ul>	Yes - USB not supported on DOS
Parallel	<ul style="list-style-type: none"><li>– MicroSolutions BackPack CD ROM</li></ul>	No
Keyboard/Mouse	<ul style="list-style-type: none"><li>– IBM PS/2 Keyboard</li><li>– IBM Mouse (required Y-cable)</li><li>– Compact Retail A/N Keyboard (note 3)</li></ul>	Yes
PC Card (PCMCIA)	<ul style="list-style-type: none"><li>– Symbol Spectrum 24</li><li>– CardPlus PCMCIA CD ROM</li><li>– SanDisk Solid State File (not bootable)</li></ul>	Yes (n/a DOS)
Headphone/Mic	<ul style="list-style-type: none"><li>– IBM P/N 30H2203 or equivalent</li></ul>	Yes
<b>Notes:</b> <ul style="list-style-type: none"><li>1. Assumes device natively supports hot plugging and can be hot plugged with any operating system</li><li>2. CANPOS MSR option mutually exclusive with SurePOS 500 MSR option</li></ul>		

## Operating System Support

SurePOS 500-XX3 supports the following operating systems. Unless otherwise noted, all national language variations are supported. Operating Systems which can be remote loaded are noted.

Operating System	Support	
DOS 2000 (Note 1)	Yes	
Windows 2000 XP/Xpe	Yes Yes	
Linux (note 2)	Yes	
Notes: 1. DOS Full screen modes not supported 2. IBM Retail Environment for SuSe Linux 3. Windows DBCS versions (Japanese/Korean/Chinese) supported		

## System Software

### POS Application Interface Drivers

POS Application drivers may be more restrictive on operating system support. Refer to the OPOS/JavaPOS specifications for supported operating systems.

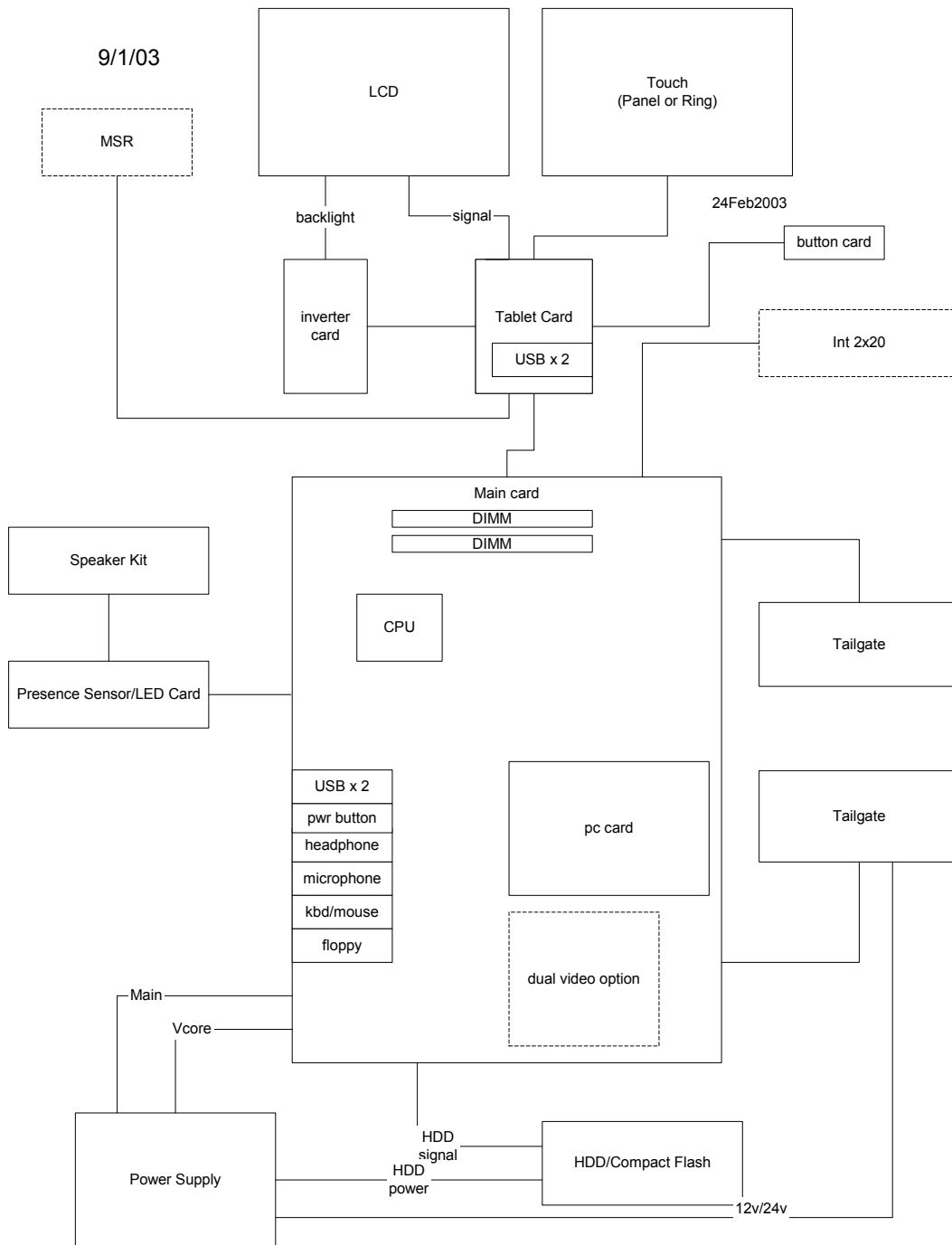
Operating System	POS Application Interface Extensions (MSRs, Customer Displays, Cash Drawer, Tone, Presence Sensor)
DOS	Direct Com port interface
Windows	OPOS 1.7.0 JavaPOS 1.7.0
IBM Retail Environment for SuSe Linux	JavaPOS 1.7.0

## Maintenance Package

There is a DOS-based diagnostic package used to perform error detection/fault isolation activities.

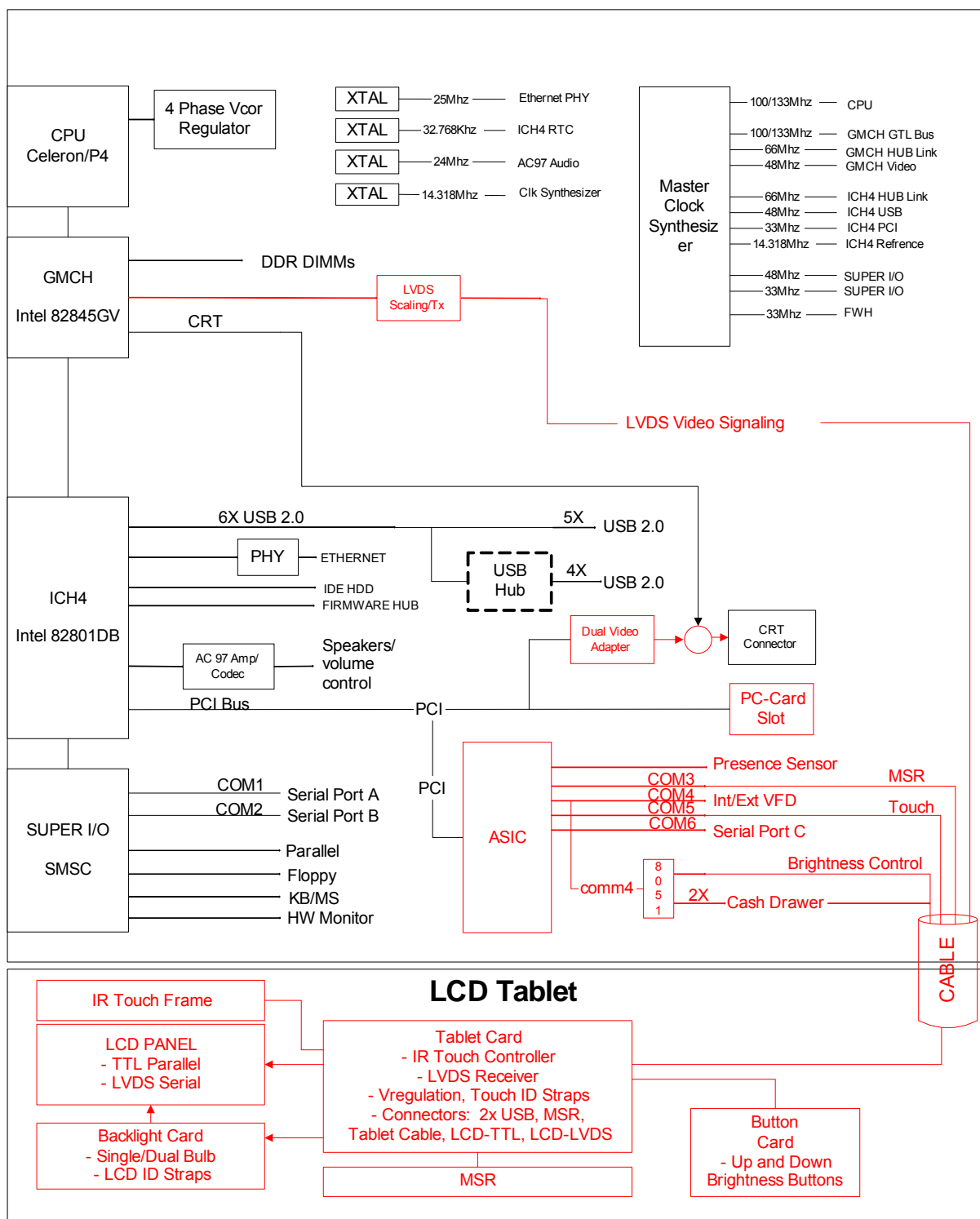
## **Chapter 3 Architectural Overview**

## System Block Diagram





## **Main Board Block Diagram**



**I/O Port Summary**

1. USB1 (Side Fore)

2. USB2 (Side Aft)

3. USB3 (Tablet Right)

4. USB4 (Tablet Left)

5. USB5 (Hub)

**Serial:**

1. COM1 (Tailgate port A)

2. COM2 (Tailgate port A)

3. COM3 (Tablet, Tablet)

4. COM4 (Int/Ext VFD port)

5. COM5 (Tablet, Touch)

**\* Note:** One CRT Connector on Tailgate is multiplexed between Dual Video Adapter and On-board Video

## Chapter 4 Physical Characteristics

### Dimensions

Height (mm)	Counter 15"	Counter 12"	Wallmount 12"	Wallmount 15"
Tablet at 15 Degrees	408	379	N/A	N/A
Tablet Max	410	384	N/A	N/A
Front Cable Routing Plate	Add 14 ?	Add 14 ?	N/A	N/A
Width (mm)				
Tablet	383	321	321	383
Tablet w/ MSR	426	364	364	426
Base	212	212	217 ?	217 ?
Depth (mm)				
Base	221	221	N/A	N/A
Base w/ Cable Plate	TBD	TBD	N/A	N/A
Total Front to Rear Tablet at 15 Degrees	268	264	250 ?	252 ?
Total Front to Rear Tablet at 60 Degrees	338	325	tbd 311 ?	tbd 320 ?

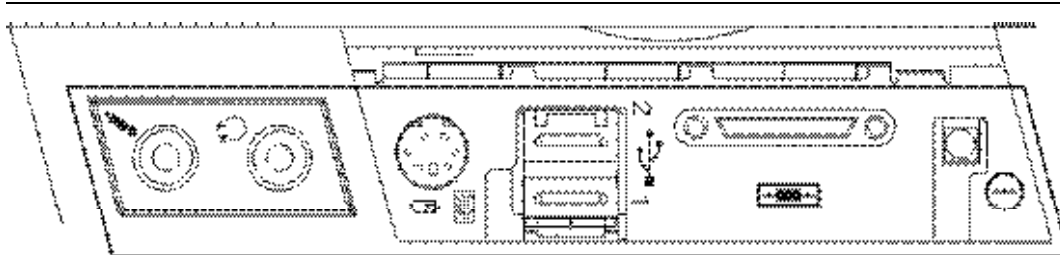
### Weights

Tower + 12-in Tablet	9.5 kg (23 lbs)
Tower + 15-in Tablet System Unit, 15-in.	11.7 kg (24.5 lbs)
Integrated 2x20 Display	0.21 kg (0.38 lbs)
Distributed 2x20 Display	0.55 kg (1.2 lbs)
Distributed APA Display	0.73 kg (1.6 lbs)
MSR (3 track or JUCC)	0.16 kg (0.41 lbs)

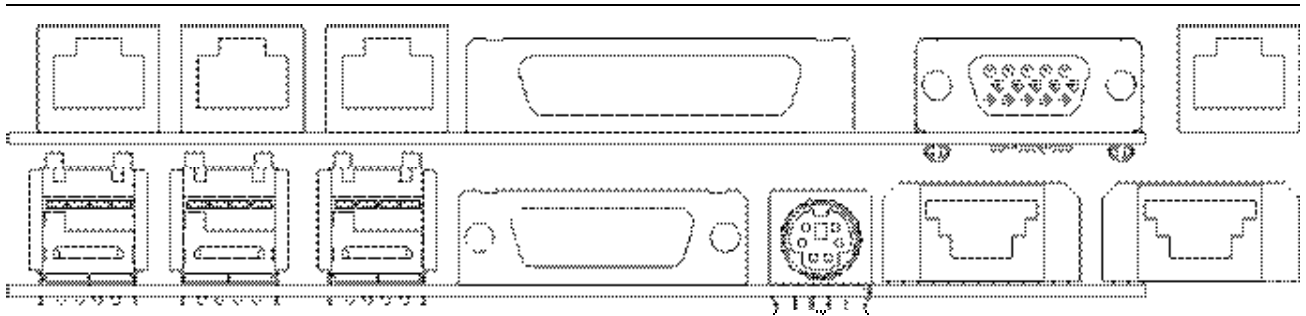
## Ports, Controls and Indicators

### Port Location and Marking

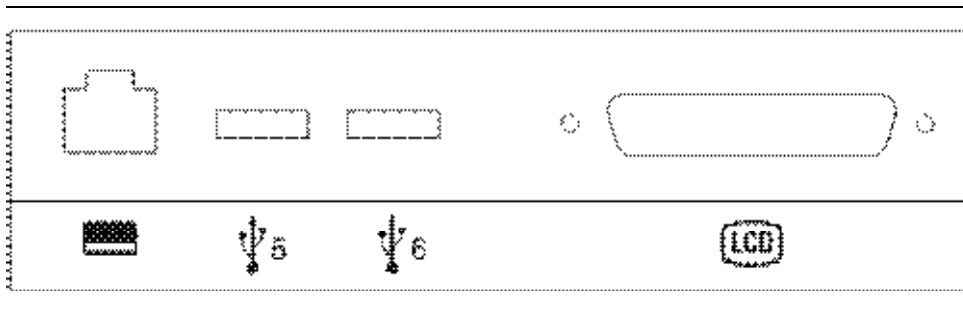
#### *Front Access Area (rotated)*



#### *Rear Tailgate*



### **DISPLAY**



## Indicators

Function	Color	Location	State
Power	Green	Tower Front	Off - System Off Blinking - Standby/during POST On - Operational
HDD	Yellow	Tower Front	Off - NO activity Blinking - HDD activity
Ethernet	Green	Rear (Ethernet connector)	Left LED States – Off - 10 Mb mode – On - 100 Mbit Right LED States – Off - No link – On - Good Link

## User Control

Function	Color	Actuation	Location	Operation
Power	White	Momentary	Behind access door on tower	Toggles state between OFF and ON
Brightness	Blue	Momentary	Tablet	2 buttons, bright up/down

## Chapter 5 Tower Logic

### Processor

- Intel mPGA478 Pentium 4 Socket
- 400/533MHz PSB (100/133 MHz external bus clock)
- 1.8GHz - 2.8GHz Processor speeds

Processor support is limited to Pentium 4 2.4 GHz by thermal and power supply considerations.

### 8245GV Memory Controller Hub, (GMCH)

- System Memory Controller
  - PC2100 (DDR266) (PC1600 (DDR200) not supported)
  - Non-ECC, unbuffered DIMMs
  - 2GB total memory; 2 DIMM sockets
    - No double sided, x16 DDR sdram supported
  - Supported DIMM sizes: 128MB, 256MB, 512 MB, 1 GB
- Integrated Extreme Graphics 3D Controller
  - 256 bit engine
  - 64 MB maximum UMA video memory
  - Synchronous LCD/CRT support
  - LVDS Panel support

Video Support Implementation Notes:

1. Without the optional second video adapter, internal LCD and external monitor resolutions and refresh rates will be the same. With the second video adapter feature, internal LCD and external monitor resolutions and refresh rates can be independent of each other..

## **I/O Controller Hub, Intel ICH4**

- PCI Bus Controller, Rev 2.2, 33MHz
- 10/100 Ethernet MAC
- IDE Controller, ATA 100/66/33
- USB 2.0 EHCI Universal Host controller
- AC 97 2.3 Audio Link
- Interrupt Controller
- Power Management Logic, ACPI 2.0
- Firmware Hub Interface
- DMA Controller
- Real Time Clock/CMOS RAM

## **Optional Second Video Adapter**

SurePOS 500-XX3 provides a dual video adapter to allow for true multi-monitor support on the internal LCD and externally attached monitor. This allows different screens and independent touch on both monitors. This is supported on all Windows operating systems.

The daughter card consists of the following elements:

- nvidia GeForce2 MX
- local video memory

The daughter card provides the following functions:

- 64-bit graphics engine
- 32 MB video memory (capable of 8 MB) ?
- 60, 75, XX Hz refresh rates
- SVGA CRT output (replaces onboard video out)
- Supports Windows 98 and 2000 Dual Display
- Supported color depths/resolutions:

Notes:

1. There are jumpers installed in production on the main card when the optional second video adapter not ordered. If the second video adapter is installed and you wish to provide a mirrored output on the SVGA port - the video card would have to be removed and these jumpers added to the planar board.

### **Audio (Models 553 and 563)**

In combination with the south bridge, the audio subsystem provides business quality stereo sound for multimedia and voice capable applications. The subsystem includes a headphone and microphone jack and external speaker assembly.

The audio subsystems provides the following functions:

- Audio Codec 97 Revision 2.3 compliant Audio
- Full duplex capability

The audio subsystem consists of the following elements:

- Realtek Codec AL202A integrated headphone amplifier
- Headphone and microphone jack
- External amplified speaker assembly

**Implementation Notes:**

- Volume control is through normal Windows multimedia controls in combination with a volume control on the speaker unit.
- Bass/Treble slides in windows volume control will not be functional

This subsystem can be disabled in through Setup.

## Network

The network subsystem consists of the following elements:

- Integrated Intel MAC (ICH4)
- External 10/100 Mbit PHY, 82562ET
- EEPROM for MAC address

The network system provides the following functions:

- 10/100 Mbps ethernet
- Support for wake up on LAN using Magic Packet
- Stores register values, MAC address

## Extended POS Features

The Extended POS I/O subsystem is attached to PCI bus and provides support for additional I/O ports and miscellaneous function.

The I/O subsystem consists of the following elements:

- ASIC for UART/POS
- 80C51

The I/O subsystem provides the following functions:

- Support for 4 additional serial ports
- Cash Drawer control
- LCD Brightness and contrast control
- Internal IR Presense sensor port

## PC Card Support (Models 553 and 563)

The PC Card subsystem provides for the capability to attach PC Cards (PCMCIA). SurePOS 500-XX3 provides a slot to accommodate a single Type 1 or 2 PC Card.

The subsystem consists of the following elements:

- TI PC1410A PCI-to-PC Card Controller
- Type I/II Card Socket

The subsystem provides the following functions:

- Meets PC Card Standard 7
- PC 98/99 compliant
- 3.3v/5v PC Card16 and 3.3v CardBus support

This subsystem can be disabled through Setup.



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## Chapter 6 Power Supply Unit

The main AC power supply is enclosed in a separate metal box but enclosed within the Tower system unit. The heat generated within this supply is separated from the main electronics cavity and is dissipated by an integrated fan assembly. Reference the SurePOS 500-XX3 Power Supply specification for additional details.

### Power Management

SurePOS 500-XX3 supports both APM and ACPI power management schemes. APM is supported in DOS and Linux. ACPI is supported in Windows 2000/XP. Windows NT 4.0 does not support APM or ACPI. Hibernation mode is not supported.

Power Management Option	Supported Power States
APM	Off, APM Standby, APM Enabled, Full On
ACPI	Global States: G0, G1, G2 Sleep States: S0, S1, S5

### Power Control

SurePOS 500-XX3 supports the following power state changes based upon event:

	Power On	Resume
Power Switch	Yes	Yes
LAN	Yes	Yes
Alarm	Yes	Yes
Touch	No	Yes
Presence	No	Yes
Keyboard/Mouse (PS/2, USB)	No	Yes

The power switch can be configured in 3 modes for APM and ACPI unless otherwise noted:

- Disable - Switch operation is ignored (not for Win2K)
- Enabled - Switch operates like hard power switch - toggles between G0 - G2
- Resume - Switch operates like resume switch - toggles between G0 and G1

## Chapter 7 LCD Panel

### LCD Specifications

	12.1" TFT (1 CCFL)	12.1-inch TFT (2 CCFL)	15-inch TFT (2 CCFL)
Interface	TTL	TTL	LVDS
Minimum Brightness (cd/m**2)(w/o sensor)	160	320	250
Active Area (mm)	246 x 184.5	246 x 184.5	304.1 x 228.1
Resolution (pixels)	0.48MP (800 x 600)	0.48MP (800 x 600)	0.79MP (1024 x 768)
Contrast Ratio	300:1	300:1	350:1
Horizontal Viewing	+/- 45	+/- 65	+/- 60

<b>Angle (deg) (for CR&gt;=10:1)</b>			
<b>Vertical Viewing Angle (deg) (for CR&gt;=10:1)</b>	+10, -30	+40, -60	+/- 45
<b>Backlight Life (half brightness)</b>	20,000 hrs	50,000 hrs	40,000 hrs
<b>Thickness (mm)</b>	6.9 (max)	11.5	11

## Touch Panel

<b>Type</b>	<b>Infra-red</b>
<b>Input Method</b>	Finger, stylus (.25-in diameter min.)
<b>Controller Resolution</b>	1024x1024
<b>Accuracy (std dev)</b>	0.080-in.
<b>Accuracy (max err)</b>	0.047-in. (96%) 0.222-in (4%)
<b>Finish</b>	Chem Etch
<b>Transmissiveness</b>	92%
<b>Travel</b>	N/A
<b>Touch Activation Force</b>	None
<b>Surface Hardness</b>	Glass
<b>Abrasion Resistance</b>	n/A

## DISK DRIVE

SurePOS 500 supports industry standard 3.5-inch form factor hard disk drives with AT interface. The maximum thickness supported is 25.4 mm.

<b>Formatted Capacity (GB)</b>	40.2 GB
<b>Interface</b>	IDE (AT)
<b>Rotational Speed</b>	5400 rpm or 7200 rpm
<b>Buffer Size</b>	512 KB
<b>Performance</b>	
Seek Time (ms)	<10 typ
Track to Track (ms)	2
Latency (ms)	6.81
Transfer Rates (Mbytes/sec)	UltraDMA: 100 PIO: 16.6
<b>Power Consumption</b> Read/Write on Track	5 W

## Chapter 8 POS I/O Specifications

### MSR

SurePOS 500-XX3 supports two msr types: 3-Track and JUC. The SurePOS 500-XX3 3-Track MSR features enhanced configuration options over the predecessor models to improve compatibility with existing business partner applications. The enhancements include

- Enable/Disable Carriage Return
- Enable/Disable Sentinals
- Programmable Sentinals
- Individually selectable Tracks
- FLASH firmware
- Compatibility mode w/ previous generation

The MSR will support mini-cards as well as metalized cards.

	<b>3-Track MSR Option</b>	<b>JUC Option</b>
<b>Track Configuration</b>	ISO 7811 Tracks 1,2,3	JIS II, ISO Track 2
<b>Coercivity of Magnetic Stripe</b>	300 to 4000 Oe	300 to 4000 Oe
<b>Read Direction</b>	Bi-directional	Unidirectional
<b>Swipe Speed</b>	5 to 60 inches per second	5 to 60 inches per second
<b>Maximum Jitter</b>	12%	12%
<b>Error Rate</b>	Less than 0.5%	Less than 0.5%
<b>Electrical Interface</b>	Serial or PS/2 Keyboard (note 1)	Serial
<b>Rated Life</b>	500,000 swipes	500,000 swipes
<b>Note</b> 1. The interface is set by customer using switch before installation. Default is RS232.		

## External Stereo Speaker Unit

SurePOS 500-XX3 supports an external stereo speaker unit. The speaker unit is a self-contained assembly which attaches to SurePOS 500-XX3 using mounting screws. There is a connection provided for input, power and signal, to the speaker unit. The speaker unit contains the drivers and a 1 W per channel amplifier.

<b>Design</b>	2 element, 1 way, sealed design
<b>Drivers</b>	
Type	7 x 4 (28 mm x 40 mm x 15 mm deep)
Impedance	12 ohm impedance
Magnetic Shielding	Yes
<b>Frequency Response</b>	160Hz - 11 kHz (+/- 3 dB)
<b>Output (rms EIAJ 10% THD 1kHz)</b>	1W + 1 W
<b>Loudness</b>	82 dB +/- 3 dB (1 Watt/ch @ 1 m)
<b>S/N Ratio</b>	65 dB (IEC A weighted, ref 1 W)
<b>Channel Separation</b>	40 dB
<b>Total Harmonic Distortion</b>	10%
<b>Input Voltage</b>	10.8V V DC +/- 10%
<b>Input Sensitivity</b>	1 V (1 W, 1kHz)
<b>Input Impedance</b>	12 ohm (1 kHz)
<b>Power Consumption</b>	4 W at maximum volume setting
<b>Input Terminal</b>	Molex 70555-0038 (power + signal)

## 2x20 Displays

	Integrated 2x20	Distributed 2x20
<b>Technology</b>	Vacuum Fluorescent	
<b>Format</b>	2 rows, 20 characters	
<b>Brightness (w/o lens)</b>	300 cd/m <sup>2</sup>	300 cd/m <sup>2</sup>
<b>Display Color (w/o lens)</b>	Green	
<b>Adjustment</b>	None	Multi-position detent
<b>Character Box</b>	5 x 7	5 x 7
<b>Character Height (mm)</b>	7.74 x 4.15	9.5 x 4.45
<b>Emulations</b>	Logic Controls Emulation or IBM Multi-Mode	
<b>Character Sets (IBM Multi-mode)</b>	Code Page 437 (US/Euro) Code Page 897 (Katakana) Code Page 858 (Int'l) Code Page 852 (Central Europe) Code Page 855 (Cyrillic) Code Page 857 (Turkey) Code Page 862 (Israel) Code Page 863 (Can Fr) Code Page 864 (Arabic) Code Page 865 (Nordic) Code Page 808 (Cyrillic Russian) Code Page 869 (Greece)	
<b>User Defined Characters</b>	Logic Controls Mode: 1 IBM Mode: 8	
<b>Electrical Interface</b>	TTL Serial	RS232
<b>Power</b>	5V	12V
<b>Power Consumption (all pixels energized)</b>	6W	7.2 W
<b>Attachment Cable</b>	Pigtail	3.8 m (12 ft)

[SurePOS 500-XX3](#) supports an integrated and distributed 2x20 customer display. The integrated display mounts externally to the rear cover and provides a 3 position adjustable viewing range. The distributed display is a free standing design using existing 4690 style covers using the [SurePOS 500-XX3](#) color. The displays are Euro Ready.

## APA Display

SurePOS 500-XX3 supports an external all points addressable customer display. This is intended to meet

<b>Technology</b>	Vacuum Fluorescent
<b>Brightness</b>	300 cd/m <sup>2</sup>
<b>Format (dot)</b>	160 x 40
<b>Active Area (mm)</b>	132.55 x 32.95
<b>Dot Size (mm)</b>	0.58 (W) x 0.58 (H)
<b>Dot Pitch (mm)</b>	0.83 (W) x 0.83 (H)
<b>Display Color</b>	Green (peak wavelength 505 nm)
<b>Modes</b>	All Points Addressable (160x40) Character Mode
<b>Built in Font Code Pages for Character Mode</b> 5x7 A/N (4 and 5 line mode) 8x16 A/N English (2 line mode) 8x16 A/N Katakana (2 line mode) 16x16 Kanji (2 line mode) 16x16 Hangul (2 line mode) 16x16 Simplified Chinese (2 line mode) 16x16 Traditional Chinese (2 line mode)	Futaba Standard IBM Code Page 437 modified Futaba Standard JIS X 208-1990 KS C 5601-1992 GB-2321-80 BIG5
<b>Character Box Height (mm)</b> 5x7 8x16 16x16	3.90 (H) x 5.56 (W) 6.39 (H) x 13.03 (W) 13.03 (H) x 13.03 (W)
<b>Electrical Interface</b>	RS232 with 12 V power
<b>Power Consumption</b>	6W (typ) 8.4 (max)
<b>Adjustment</b>	Multiposition
<b>Attachment Cable</b>	3.8m

DBCS language requirements. It attaches to the SurePOS 500-XX3 external customer display port which provides power and signal.

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## .1 Software Description

### Boot Control

The following boot options are available:

- LAN RPL - PXE 2.0 and IBM RPL only.
- External Diskette Drive (standard or USB)
- USB CD ROM
- Hard Disk Drive

- Compact Flash Drive
- Memory Key

Wireless LAN and Solid State File Drives in the PCMCIA slot are not supported for remote load or operating system boot.

## Setup Configuration Utility

The Configuration Setup Utility program provides menus for querying and configuration the system. The menus can be navigated using touch or a keyboard attached to the PS/2 keyboard port or USB port.

The Setup Configuration Utility can be password protected. The password can be entered through on screen keypad or keyboard, and can only be numerical. If the password is forgotten, it can be cleared using the CMOS Clear Jumper located near the memory DIMM.

- Query vital product data (machine type/model, BIOS level)
- Set date and time
- Set startup options (boot sequence)
- Set power management options
- Set Advanced Options
- I/O Enable/Disable/Configuration
- Subsystem Enable/Disable (Ethernet, Audio, PCMCIA)

## Operating System

[SurePOS 500-XX3](#) supports the following operating systems:

- DOS 2000
- Windows 2000
- Windows XP/Xpe
- IBM Retail Environment for SuSe Linux•

## Maintenance Package

The following driver and diagnostic programs are available on the IBM Retail Store Solutions Web site at [www.ibm.com/solutions/retail/store/](http://www.ibm.com/solutions/retail/store/)  
SurePOS 500 Series Device Drivers

SurePOS 500 Series Service Diskette

At that site, select **Support**, then under Software select **Download Software Maintenance** and select **SurePOS 500 Series**.

DOS-based service diagnostics are provided on diskette.

## Programming Interface

### Vital Product Data

SurePOS 500-XX3 provides Vital Product Information that includes:

- Machine Type/Model
- Machine Serial Number
- BIOS/Flash ID
- System Board ID
- MAC Address

VPD is accessed using IBM standard INT 15h interface for finding the VPD data area within the system post/bios ROM address space. It is also shadowed into the flash ROM at address F000:FFA0

Vital Product Data (VPD) is the information about an IBM system that can be read with software. The data n includes machine type, machine serial number, BIOS/FLASH ID, system board unique ID, etc. The physical location of the VPD is in the EEPROM attached to the custom SurePOS 500-XX3 ASIC. This information will also be shadowed into the flash ROM at address F000:FFA0 as is standard on all IBM PC's. SurePOS 500-XX3 BIOS will implement the IBM standard INT 15h interface for finding the VPD data area within the System POST/BIOS ROM.

Much of the VPD information will be written into the DMI strings where the info can be extracted by applications such as RDM. During the manufacturing process, the machine unique data will be written into the EEPROM VPD area by the test process. POST will extract the data from the EEPROM for the outside interfaces to retrieve, such as SMBIOS. Machine unique data can include Model, box serial number, and planar serial number.

## Appendix A -Psychometrics

### Classification

Category/Class	Reference Standard
Class C - Modified	C-S 1-9700-000

### Temperature/Humidity Limits

Condition	Temp Limits (Dry Bulb)	Relative Humidity	Max. Wet Bulb Temp
Operating	5 to 40 °C	8 to 80 %	27 °C
Power Off	0 to 52 °C	5 to 95 %	27 °C
Storage	0 to 60 °C	5 to 80 %	29 °C
Shipment	-40 to 60 °C	5 to 100 %	29 °C

Psychometric Specifications at sea level. Upper limit for dry bulb temperature must be de-rated 1 C for every 137 meters of elevation above 915 meters. Upper limit for wet bulb temperature must be de-rated 1 C for every 274 meters of elevation above 305 meters.

### Altitude Limits

The product is designed to operate up to 3050 meters (10,000 ft.)

### Heat Dissipation



SurePOS 500-XX3 relies on convection cooling so placement requires the ambient air adjacent to the unit does not exceed supported maximums. The vents cannot be blocked to prevent access to ambient air.

### ***Spill/Chemical Resistance***

The system unit will be designed to meet the following standards for liquid spill resistance when mounted in normal configurations. The spill specification does not apply to the cable attached I/O devices such as the distributed customer display or scanners:

- IBM RSS Chemical Resistance Test
- NEMA Type 5 rating per NEMA Standards Publication/No. 250-1997 Enclosures for Electrical Equipment (National Electrical Manufacturers Association)
- IP 52 rating per IEC 529 (Degrees of Protection by enclosures (IP Code))

Internally tested to IP 52 but not declared in safety report.

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## Appendix B Power Specifications

The following chart defines the input requirements and power consumption specifications:

<b>Power Consumption</b>	Off (attached to mains) Suspend Standby On (idle, no I/O) On (idle, I/O: cd, msr, 2x20, printer) On (max, printing)	7 Watts Not supported 49 Watts 60 Watts -? 79 Watts 82 Watts
<b>Input Voltage/Frequency</b>	100 ~ 127, 200 ~ 240 V AC (nominal) 50 or 60 Hz (+/- 3 Hz) Sinusoidal, trapezoidal, or square wave inputs	
<b>Maximum kVA</b>	0.21	
<b>AC Input Connector/Cable</b>	IEC 320 C14, unshielded right angle type	
<b>Leakage current</b>	1.0 ma maximum	
<b>Inrush</b>	< 50 A (peak, first cycle)	

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### A. Vibration, Shock, and Drop

#### 1. Operating

Attribute	Category/Class	Reference Standard
Vibration	Class V3	C-S 1-9711-002
Shock	Class S3	C-S 1-9711-007

#### 1. Non-Operating

Item	Levels	Reference Standard
Packaged (individual, non-palletized)		IBM C-H 1-9711-005
Unpackaged Vibration Shock (drop table)	50 g's min	C-H 1-9711-001 C-H 1-9711-004

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### A. Acoustics

#### 1. Classification

Item	Category/Class	Reference Standard
Acoustics	2B	C-S 1-1710-006

## 1. Noise Emission Values

Measurement	Operator Position	Idle
<LwA>u (bels)		
<LwA>m (Operator Position) (bels)		
<LpA>m (Operator Position) (dBA)		
All measurements made in accordance with ISO DIS 7779 and reported in conformance with ISO DIS 7574/4.		

## Appendix C Standards Compliance

### Safety/EMC

Category	Standard
External Safety	UL 60950, 3rd Edition CAN/CSA 22.2 No. 60950, 3rd Edition IEC 60950/EN60950, 2nd Edition with Amendments 1,2, 3, and 4 with all country deviations CE Mark (Declaration of Conformity) Mexico NOM-19 Korea China Japan Taiwan Saudi Arabia
IBM Safety	IBM C-S 3-0501-070, Product Safety, IBM Requirements IBM C-S 3-0501-033, Product Safety, Certification Requirements IBM C-S 3-0501-201, Product Safety, National Requirements
Electrostatic Discharge (ESD) Susceptibility	IBM RSS Retail Hardened ESD Levels IBM C-S 2-0001-005 Class 2 EN 55024:1998 (EN 61000-4-2:1995) Air: Level 3 (8KV) Contact: Level 2 (4KV) Performance Criterion: B
Electromagnetic Interference (EMI)	FCC Part 15 Class A Canada EMI Class A (ICES-003) CISPR 22 Radiated Class A, Conducted Class B (EN55022): 1998 VCCI Class A Taiwan EMI CNS-13438 Class A Korea EMI MIC Notice No. 1996-78 Class A New Zealand EMI Class A Australia EMI Class A
Radiated Electromagnetic Susceptibility (RES)	IBM C-S 2-0001-012 Bands 1 through 9 EN 50024: 1998 (EN61000-4-3) Criteria A
Electrical Fast Transient/Power Line Transient (EFT/PLT)	EN 50024: 1998 (EN61000-4-4) Criteria B IBM C-S 2-0001-001 Class 2

Near Field Phenomena	C-S 2-0001-040 Low Frequency Emissions from Visual Display Units
Power Line Disturbance/Ring	EN50024: 1998 (EN 61000-4-11) IBM C-S 2-4700-033
Lightning Surge Susceptibility	EN50024: 1998 (EN61000-4-5, Criteria B) IBM C-S 2-0001-022 IBM C-P 2-0001-025 IBM C-B 2-0001-033
Immunity to conducted disturbances	EN55024:1998 EN61000-4-6 Criteria A IBM C-B 2-0001-035
Power Frequency Magnetic Field Immunity	EN55024:1998 EN61000-4-8 Criteria A IBM C-B 2-0001-028
Power Line Harmonics (Power Correction Factor)	IBM N-B 2-4700-017, Class A (EN 61000-3-2)
Voltage Fluctuations and Flicker	N-B 2-4700-038 (EN 61000-3-3)

## Appendix D Memory Map

ADDRESS RANGE (DEC)	ADDRESS RANGE (HEX)	SIZE	ISA BUS DECODE	DESCRIPTION
0 to 639K	00000 to 9FC00	512K	positive, subtractive	Conventional DOS memory
639K	9FC00 to 9FFFF	1K	positive, subtractive	EBDA (Extended BIOS Data) moveable by HIMEM, QEMM, 386MAX
640K to 767K	A0000 to BFFFF	128K	positive, subtractive	Intel 82845GV Legacy Video Buffer
768K to 815K	C0000 to CBFFF	48K	positive, subtractive	Intel 82845GV Video ROM BIOS (shadowed)
816K to 895K	CC000 to DFFFF	80K	positive, subtractive	PCI/ISA Space, DOS memory managers
896K to 1MB	E0000 to FFFFF	128K	positive, subtractive	System ROM BIOS (ISA Bus, main memory shadowed) and USB Legacy space
1MB to 16MB	100000 to FFFFFF	15MB	positive, subtractive	PCI/ISA Space
16MB to 4GB-20M	1000000 to FEBFFFFF	4060MB	subtractive only	PCI Space
4GB-20M to 4GB-19M	FEC00000 to FECFFFFF	1MB	subtractive only	APIC Configuration space
4GB-19M to 4GB-18M	FED00000 to FEDFFFFF	1MB	subtractive only	PCI - hub interface
4GB-18M to 4GB - 17M	FEE00000 to FEEFFFFF	1MB	subtractive only	APIC Configuration space
4GB-17M to 4GB - 2M	FEF00000 to FFDFFFFF	15MB	subtractive only	PCI - hub interface
4GB -2M to 4GB	FFE00000 to FFFFFFFF	2MB	subtractive only	System ROM BIOS, extended BIOS for PCI devices, A20 Alias of System BIOS

## I/O Map

ADDRESS (HEX)	SIZE (DEC)	DESCRIPTION	REFERENCE
0000-001F	32 bytes	Intel 82801DB (ICH4), Master DMA Controller	Intel 82801DB (ICH4)
0020-003F	32 bytes	Intel 82801DB (ICH4), Master Interrupt Controller	Intel 82801DB (ICH4)
0030-003F	16 bytes	Intel 82801DB (ICH4), Interrupt Controller #1	Intel 82801DB (ICH4)
0040-005F	32 bytes	Intel 82801DB (ICH4), Counter/Timer 1	Intel 82801DB (ICH4)
0060	1 byte	SMC LPC47M192 Keyboard Data (on ISA data bus)	SMC LPC47M192
0061, 63, 65, 67	1 byte each	Intel 82801DB (ICH4), System Port B, NMI controller	Intel 82801DB (ICH4)
0064	1 byte	SMC LPC47M192, 8042 Keyboard Controller, Command and Status Byte (on ISA data bus)	SMC LPC47M192
0062, 64, 66, 68-6F		AVAILABLE	Intel 82801DB (ICH4)
0070, bit 7 write only	1 bit	Intel 82801DB (ICH4), Enable/Disable NMI	Intel 82801DB (ICH4)
0070, bits 6:0	7 bits	Intel 82801DB (ICH4), Real Time Clock (RTC) Address	Intel 82801DB (ICH4)
0071	1 byte	Intel 82801DB (ICH4), RTC and CMOS Data	Intel 82801DB (ICH4)
0072-0077	6 bytes	Intel 82801DB (ICH4), RTC and CMOS	Intel 82801DB (ICH4)
0078-007F	8 bytes	AVAILABLE	Intel 82801DB (ICH4)
0080	1 byte	POST Checkpoint Register	N/A
0081-008F	15 bytes	Intel 82801DB (ICH4), DMA Controller	Intel 82801DB (ICH4)
0090-0091	2 bytes	AVAILABLE	Intel 82801DB (ICH4)
0092	1 byte	Intel 82801DB (ICH4), System Control Register	Intel 82801DB (ICH4)
0093-009F	13 bytes	Intel 82801DB (ICH4), DMA Controller	Intel 82801DB (ICH4)
00A0-00B1	18 bytes	Intel 82801DB (ICH4), Slave Interrupt Controller	Intel 82801DB (ICH4)
00B2-00B3	2 bytes	Intel 82801DB (ICH4), Power Management	Intel 82801DB (ICH4)
00B4-00BF	12 bytes	Intel 82801DB (ICH4), Slave Interrupt Controller	Intel 82801DB (ICH4)
00C0-00DF	32 bytes	Intel 82801DB (ICH4), Slave DMA Controller	Intel 82801DB (ICH4)
00E0-00EF	16 bytes	Intel 82801DB (ICH4),	Intel 82801DB (ICH4)
00F0-00FF	16 bytes	Intel 82845GV (MCH4), numeric data processor	Intel 82845GV (MCH4)
01F0-01F7	8 bytes	IDE Channel 0 (decoded by Intel 82801DB (ICH4))	Intel 82801DB (ICH4)
0295-0296	6 bytes	SMC LPC47M192 Index/Data port for LPC	SMC LPC47M192

		interface	
02F8-02FF	8 bytes	SMC LPC47M192, Serial Port 2 (Motherboard)	SMC LPC47M192
0377, bit 7	1 bit	SMC LPC47M192, Floppy Disk Change	SMC LPC47M192
0378-037F	8 bytes	SMC LPC47M192, Parallel Port (typical, setup default)	SMC LPC47M192
03F0-03F5	8 bytes	SMC LPC47M192, Floppy Controller	SMC LPC47M192
03F6	1 byte	IDE Channel 0 (decoded by Intel 82801DB (ICH4))	Intel 82801DB (ICH4)
03F7, bit 7	1 bit	IDE, Floppy Disk Change (Intel 82801DB (ICH4))	Intel 82801DB (ICH4)
03F7, bits 6:0	7 bits	IDE Status Channel 0 (decoded by Intel 82801DB (ICH4))	Intel 82801DB (ICH4)
03F8-03FF	8 bytes	SMC LPC47M192, Serial Port 1 (Motherboard)	SMC LPC47M192
0CF8-0CFB	4 bytes	Intel 82845GV/Intel 82801DB (ICH4) PCI Configuration Address Register	Intel MHC4 and ICH4
0CFC-0CFF	4 bytes	Intel 82845GV/Intel 82801DB (ICH4) PCI Configuration Data Register	Intel MCH4 and ICH4

## PCI Configuration

IDSEL Connection	PCI DEVICE	PCI Bus Number	PCI Device Number (hex)	PCI IO Register Address range (hex)
AD(00) internal	Intel 82845GV MCH4 Fn 0: Host Bridge Fn 2: VGA Graphics	0	0	80000000 to 800000FC 80001000 to 800010FC
	Intel 82801DB (ICH4) Fn 0: USB controller Fn 1: USB controller Fn 2: USB controller  Fn 0: PCI to PCI Bridge  Fn 0: ISA Bridge Fn 1: IDE Controller Fn 3: SMBus Controller Fn 5: Audio Multimedia	0	1Dh  1Eh  1Fh	8000E800 to 8000E8FC 8000E900 to 8000E9FC 8000EA00 to 8000EAFc  8000F000 to 8000F0FC  8000F800 to 8000F8FC 8000F900 to 8000F9FC 8000FB00 to 8000FBFC 8000FD00 to 8000FDFC
AD(24)	Intel Ethernet Controller	0	8h	80004000 to 800048FC
AD(25)	TI 1211 PCMCIA Controller	0	9h	80004800 to 800048FC
AD(26)	Secondary Video controller (Cedar card)	0	0Ah	80005000 to 800050FC
AD(20)	SurePOS 500-XX3 custom ASIC Fn 0: POS interface/special functions Fn 1: UARTs interace	0	7h	80003800 to 800038FC 80003900 to 800039FC



## Interrupt and DMA Assignments

Most IRQ assignments are dynamic because of Plug-and-Play and PCI configuration. However, some are fixed based on legacy requirements, as shown in the table below. Because the SurePOS 500-XX3 design will make use of the APIC interrupt controller in the ICH4, there will be 20 interrupts instead of 16 as we had in the previous designs. The legacy ISA interrupts are the same from 0 - 15, and interrupts 16-19 correspond to the PCI interrupts INTA, INTB, INTC, and INTD. Thus PCI devices no longer need to take an ISA interrupt with the APIC design.

IRQ Number	Resource	Notes...
0	System Timer	NS (Not Sharable)
1	PS2 Keyboard	NS
2	Cascade	NS
6	Floppy Drive	NS, available if floppy not attached or enabled
8	RTC	NS
12	Mouse	NS, available is mouse not attached or enabled
13	Floating Point	NS
14	HDD controller	NS

Below is a list of other resources that will be configured to any available interrupt:

Resource	Notes
Serial A	Relocate and can be Disabled
Serial B	Relocate and can be Disabled
LPT1	Relocate and can be Disabled
Ethernet	Relocate and can be Disabled
PCMCIA	Relocate and can be Disabled
Audio	Relocate and can be Disabled
USB	Relocate and can be Disabled
MSR	Relocate and can be Disabled
VFD	Relocate and can be Disabled
Serial C	Relocate and can be Disabled

## DMA Assignments

DMA	DATA WIDTH	SYSTEM RESOURCE
0	8 bits only	User Available for ISA bus
1	8 bits only	User Available for ISA bus (normally used for LAN)
2	8 bits only	RESERVED, Floppy
3	8 bits only	Parallel Port if ECP, otherwise User Available for ISA bus
4		RESERVED - Cascade Channel
5	16 bits only	User Available for ISA bus
6	16 bits only	User Available for ISA bus
7	16 bits only	User Available for ISA bus

Note: Channels 0-3 can transfer data in 64KB pages and channels 5-7 can transfer data in 128KB pages.

## Special SurePOS 500-XX3 POS Devices Interfaces

### ASIC PCI Function 0: POS Interface - special devices

Function 0 of the SurePOS 500-XX3 ASIC contains the interface for several special Point of Sale devices. The Presence Sensor Interface is explained below. The EEPROM control, UART enable/disable control, and the other functions are available by request for the ASIC specification from Partnerline. These items are controllable through Setup and DOS tools, or intended for usage only by the BIOS, thus their interface details are not included in this document. Below is the PCI Configuration space of function 0, with the Presence Sensor device details in the next section.

31-24	23-16	15-8	7-0	Address
Device ID (02A2h)		Vendor ID (1014h)		00h
Status Register		Command Register		04h
Class Code (088000h)			Revision ID (01h)	08h
Reserved (00h)	Header Type (80h)	Latency Timer (00h)	Cache Line Size (00h)	0Ch
<b>RW Control Registers (16 Bytes of I/O Space)</b>				10h
<b>EEPROM (128 Bytes of Memory Space)</b>				14h
Reserved (00000000h)				18h
Reserved (00000000h)				1Ch
Reserved (00000000h)				20h
Reserved (00000000h)				24h
Reserved (00000000h)				28h
<b>PCI Subsystem Vendor/Subsystem ID (loaded from Config EEPROM)</b>				2Ch
Reserved (00000000h)				30h
Reserved (00000000h)				34h
Reserved (00000000h)				38h
Reserved (00h)	Reserved (00h)	<b>Interrupt Pin Use INTA# (01h)</b>	<b>Interrupt Line</b>	3Ch
Reserved (00h)	Reserved (00h)	<b>Interrupt Status Register A</b>	Reserved (00h)	40h

Note: The interrupt in Function 0 is meant for Presence Sensor logic.

## **Interrupt Status Register A (Read Only)**

**Offset 41h**

Bit

3 Status of UART 3 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

2 Status of UART 2 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

1 Status of UART 1 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

0 Status of UART 0 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

The UARTs are compatible with standard 16550 FIFO UARTs. Refer to datasheet of 16550 for the details on how interrupts are cleared via the UART's registers.

## **RW Control Registers Description**

All the I/O related registers are handled through the PCI Base Address Register (BAR) at offset of 10h of the PCI Config Space. During the PCI initialization, 16 bytes of I/O space will be allocated for the following control registers for the control of various I/O devices:

### **I/O Address Offset Description**

00h Presence Sensor Control Register

01h Function 0 Interrupt Status Register

02h EEPROM Control Register

03h UART Control Register

04h Distributed VFD Register

05h VFD Register 1

06h - Keyboard Control Register

07h - 0Fh - Reserved

### **Presence Sensor Control Register 0 (Read/Write) Register offset 00h**

Bit 0: Presence detect (0: Detected, 1: Not Detected, i.e. active low.) Reflects the detect signal coming from the Presence Sensor circuit (pin E\_DETECT#) Read only. This bit is only valid when interrupt mode is inabled.

Bit 1: Calibrate (0: Calibration not active, 1: Calibration is activated, power-up value is 1.) To enable the trigger of calibration, software needs to write a "1" to this bit. The power up default = 0. When trigger is enabled (i.e. Bit 1 = 1), the Calibrate signal (pin E\_CALIBRATE) will go active (high) when the input signal (pin E\_CALIBRATE\_TRG) is high (being triggered from the 8051).

Bit 2: Presence sensing enable/disable (0: Disable, 1: Enable, power-up value us 1) read/write bit with power-up value as 0. It is used to enable/disable the presence sensor function.

**The polled Presence Sensor status can be read via the following steps:**

1. Determine the PM (Power management) Base IO address. This is done by reading the PCI configuration register 40h-43h of the LPC Interface PCI device. The LPC device is on PCI bus 0, device 1Fh, function 0.
2. Perform logical AND of the lowest word of what is read above with FFFEh. In other words, make the lowest bit = 0 (it always reads a 1 for some reason.)
3. Add 2Bh to the PM Base IO address.
4. Do an IO read of this address and check bit 4 for the Presence Sensor status. A '1' means the sensor is detecting, and a '0' means the sensor is not detecting.

### **Function 0 Interrupt Status Register (Read/Write) Register offset 01h**

Bit 0: Status of Presence Sensor detection interrupt (0: No Interrupt, 1: Interrupt Asserted)

An interrupt will be generated (if the presence function is enabled) if the pin E\_DETECT# goes low ("0"). Software has to clear the interrupt status register by writing a 0 to bit 0 after the interrupt service is done. This register is a direct mapped register to the Function 0 PCI configuration space at offset 41h. The power-up default value of this register is 00h.

### **EEPROM Control Registers (Read/Write) Register offset 02h**

D7 D6 D5 D4 D3 D2 D1 D0 Function

x x x x x x Y 1: Read EEPROM contents into ASIC memory.

x x x x x x Y x 1: Write ASIC memory contents into EEPROM.

Note that all EEPROM is automatically loaded into ASIC RAM upon power-on reset  
(through PCI reset signal)

By writing a "1" to bit 0 of EEPROM Control Register, the ASIC will transfer (read) the contents (128 bytes) of EEPROM from the physical chip (through pins E\_SCL and E\_SDA) to the internal RAM in the ASIC. The bit 0 will remain read as "1" until the read operation (i.e. shifting of EEPROM data to RAM) is completed, this bit 0 will be cleared (i.e. set to "0"). So, software should monitor this bit 0, as RAM data only valid when it is "0". By writing a "1" to bit 1 of EEPROM Control Register, the ASIC will transfer (write) the contents in the internal RAM (128 bytes) to the external EEPROM (through pins E\_SCL and

E\_SDA). The bit 1 will remain as "1", but once the write operation (i.e. shifting of RAM data to EEPROM 0) is completed, this bit 1 will be cleared (i.e. set to "0"). So, software should monitor this bit 1 as write operation only complete when this bit is "0".

### **UART Control Registers (Read/Write) Register offset 03h**

Default Value Of UART Control Register (before EEPROM is loaded): F0h

(The above default value above is the value of UART Control Register in the case when Configuration EEPROM is not loaded or can not be loaded for any reason).

Bit Function Default (Before EEPROM loaded)

7 UART 0: 1- Enabled, 0 – Disable 1

6 UART 1: 1- Enabled, 0 – Disable 1

5 UART 2: 1- Enabled, 0 – Disable 1

4 UART 3: 1- Enabled, 0 – Disable 1

3 Reserved 0

2 Reserved 0

1 Reserved 0

0 Reserved 0

#### **Distributed VFD Registers (Read Only) Register offset 04h**

Bit 0 of this register is the logic level of the input pin, E\_DIST\_VFD\_PRESENT#.

#### **VFD Registers (Write Only) Register offset 05h**

Default Value Of VFD Control Register (before EEPROM is loaded): 07h

Bit 0: Enable/disable the Distributed VFD TX output, i.e. Pin E\_D\_VFD\_TX. This is a write only register and is set to "1" upon power up/reset. When bit 0 is "1", the D\_VFD\_TX output is enabled.

Bit 1: Enable/disable the Integrated VFD TX output, i.e. Pin E\_INT\_VFD\_TX. This is a write only register and is set to "1" upon power up/reset. When bit 1 is "1", the INT\_VFD\_TX output is enabled.

Bit 2: How the D\_VFD\_TX pin behaves when enabled by bit 0. If bit 2 is "0", D\_VFD\_TX will be disabled when Integrated is present (i.e. when signal INT\_VFD\_PRESENT# is low). If bit 2 is "1", D\_VFD\_TX will be enabled regardless of the present of Integrated VFD. Bit 2 will be set to "1" upon power up/reset.

#### **Keyboard Control Registers (Write Only) Register offset 06h**

Default Value Of Keyboard Control Register (before EEPROM is loaded): 01h

Bit 0: Enable/disable PS/2 keyboard on the planar. When bit 0 is set to "1", the keyboard will be enabled.

## Appendix E ASIC PCI Function 1: POS UARTs

In the custom ASIC, SurePOS 500-XX3 provides 4 additional 16550 compatible UARTs, one of which is general use and the other 3 are special-use. The IO address and IRQ are programmable through function 1 of the ASIC.

Below are the identification value registers for the UART PCI function:

PCI Vendor ID: 1014h

PCI Device ID: 02A4h

PCI Subsystem Vendor ID: 1014h

PCI Subsystem ID: 02A5h

### COM port/UART Assignments:

COM3 (VFD) = Base Address 0: UART 0 base I/O address (eight bytes)

COM4 (MSR) = Base Address 1: UART 1 base I/O address (eight bytes)

COM5 (Touch) = Base Address 2: UART 2 base I/O address (eight bytes)

COM6 (general) = Base Address 3: UART 3 base I/O address (eight bytes)

### Configuration Registers for Function 1:

31-24	23-16	15-8	7-0	Address
Device ID (02A4h)		Vendor ID (1014h)		00h
Status Register		Command Register		04h
Class Code (070002h)			Revision ID (01h)	08h
Reserved (00h)	Header Type (00h)	Latency Timer (00h)	Cache Line Size (00h)	0Ch
Claims 8 I/O addresses for UART 0				10h
Claims 8 I/O addressesfor UART 1				14h
Claims 8 I/O addresses for UART 2				18h
Claims 8 I/O addresses for UART 3				1Ch
Reserved (00000000h)				20h
Reserved (00000000h)				24h
Reserved (00000000h)				28h
PCI Subsystem Vendor/Subsystem ID (loaded from Config EEPROM)				2Ch
Reserved (00000000h)				30h
Reserved (00000000h)				34h
Reserved (00000000h)				38h
Reserved (00h)	Reserved (00h)	Interrupt Pin Use INTB# (02h)	Interrupt Line	3Ch
Reserved (00h)	Reserved (00h)	Interrupt Status Register B	Reserved (00h)	40h

**Interrupt Status Register B (Read Only) Offset 41h**

Bit 3 = Status of UART 3 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

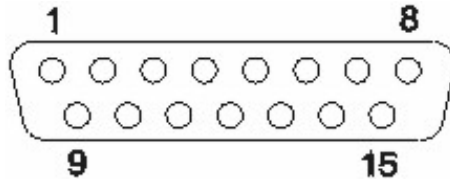
Bit 2 = Status of UART 2 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

Bit 1 = Status of UART 1 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

Bit 0 = Status of UART 0 Interrupt Status (0: No Interrupt, 1: Interrupt Asserted)

## Appendix F Connectors

### Distributed Customer Display Connector



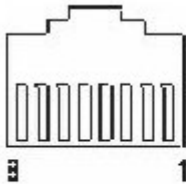
Pin	Connector
1	CD (carrier detect)
2	RxD (receive data)
3	TxD (transmit data)
4	DTR (data terminal ready)
5	Ground
6	Ground
7	+5 V dc Main
8	+12 V dc
9	+12 V dc
10	+5 V dc Main
11	Dist_VFD present
12	DSR (data set ready)
13	RTS (request to send)
14	CTS (clear to send)
15	RI (ring indicate)

### Speaker Connector

Pin	Connector
1	+12V DC
2	Ground
3	Line Left
4	Line Right
5	Ground.




## RJ45 Serial Port Connector

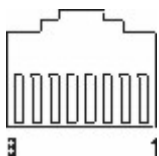


Pin	Signal
1	DSR
2	CD
3	DTR
4	Ground
5	RxD
6	TxD
7	CTS
8	RTS

## RJ45 to 9 Pin Cable Wiring

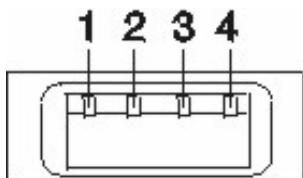
PIN OUT CHART 		
RJ-45		9-PIN SERIAL
SIGNAL	PIN	PIN
DSR/RI	1	6
CD	2	1
DTR	3	4
GND	4	5
RXD	5	2
TXD	6	3
CTS	7	8
RTS	8	7

## MSR connector



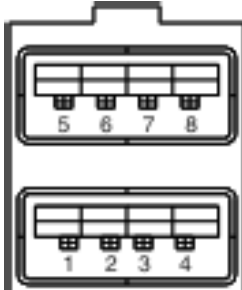
Pin	Signal
1	+5V
2	Serial Data Out (TTL)
3	Serial Data In (TTL)
4	Ground
5	KBD Enable (low enables kybd data to system)
6	Keyboard data
7	Keyboard clock
8	Ground

## USB port connector (x 6)



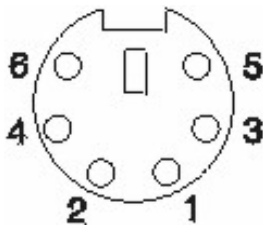
Pin	Connector
1	5V VBus
2	-Data
3	+Data
4	Ground

## USB Plus Power 12V/24V



Pin	Signal
Shell	Shield
1	VBus
2	D-
3	D+
4	Ground
5	Ground
6	Vplus (12V or 24V)
7	Vplus (12 or 24V)
8	Ground

## Keyboard/Mouse connector



Pin	Signal	I/O
1	Keyboard Data	I/O
2	Mouse Data	I/O
3	Ground	
Pin	Signal	I/O
4	+5 V Main	
5	Keyboard Clock	I/O
6	Mouse Clock	

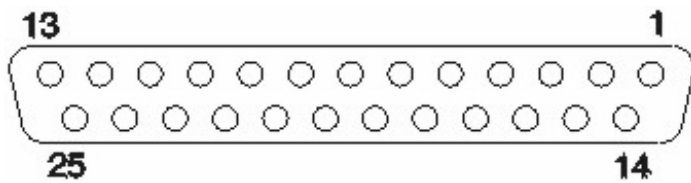
## Microphone connector

Pin	Signal
Tip	Input
Ring	+5 V
Base	Ground

## Headphone Connector

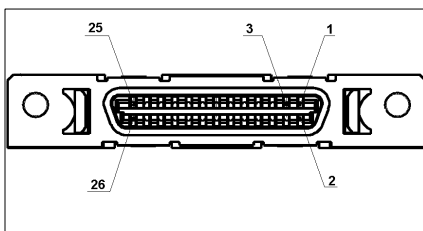
Pin	Signal
Tip	Left channel audio
Ring	Right channel audio
Base	Ground

## Parallel Connector



Pin	Signal	I/O	Pin	Signal	I/O
1	STROBE#	I/O	14	ATUO FC XT#	O
2	Data bit 0	I/O	15	Error#	I
3	Data bit 1	I/O	16	INIT#	O
4	Data bit 2	I/O	17	SLCT IN#	O
5	Data bit 3	I/O	18	Ground	
6	Data bit 4	I/O	19	Ground	
7	Data bit 5	I/O	20	Ground	
8	Data bit 6	I/O	21	Ground	
9	Data bit 7	I/O	22	Ground	
10	ACK#	I	23	Ground	
11	Busy	I	24	Ground	
12	PE	I	25	Ground	
13	SLCT				

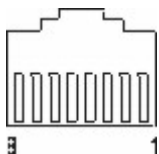
## External Diskette Drive Connector



Pin No.	Signal name	I/O	Signal Description
1	GND		Power Ground
2	+5V		Power Supply
3	GND		Power Ground
4	GND		Power Ground
5	N.C		
6	DR0	O	Drive Select 0. Select drive 0.
7	MTR0	O	Motor Control 0
8	DIR	O	Direction. Direction of head movement (0 = inward motion, 1 = outward motion)
9	WDATA	O	Write Data. Encoded data to the drive for write operations.
10	GND		Power Ground
11	DRV DEN0	O	Drive density select 0
12	RDATA	I	Read Data. Raw serial bit stream from the drive for read operations.
13	N.C		
14	N.C		
15	N.C		
16	N.C		
17	INDEX	I	Index. Sense to detect that the head is positioned over the beginning of a track
18	N.C		
19	N.C		
20	GND		Power Ground
21	STEP	O	Step. Low pulse for each track-to-track movement of the head.
22	WGATE	O	Write Gate. Signal to the drive to enable current flow in the write head.
23	TRK0	I	Track 0. Sense to detect that the head is positioned over track 0.
24	WRTPROT	I	Write Protect. Sense for detection that the

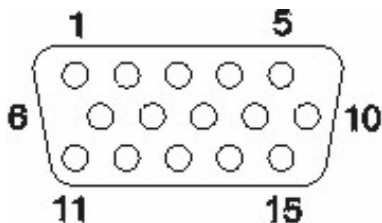
			diskette is write protected (causes write commands to be ignored)
25	HDSEL	O	Head Select. Selects the side for R/W operations (0 = side 1, 1 = side 0)
26	DSKCHG	I	Disk Change. Sense that the drive door is open or the diskette has been changed

## Ethernet connector



Pin	Signal	I/O
1	TxD+	O
2	TxD-	O
3	RxD+	I
4	Ground	
5	Ground	
6	RxD-	I
7	Ground	
8	Ground	

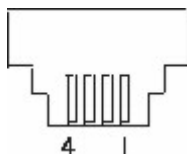
## External video connector



Pin	Connector
1	Red
2	Green
3	Blue
4	Monitor ID2 - not used
5	Ground
6	Red ground
7	Green ground
8	Blue ground
9	no connector
10	Gound
11	No connector
12	MON ID1
13	Horizontal sync

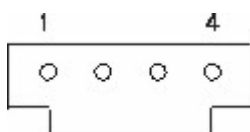
14	Vertical Sync
15	MON ID3

## Cash Drawer (x2)



Pin	Connector
1	Ground
2	Sense
3	Open
4	24V

## Internal Customer Display



Pin	Connector
1	+5V Main
2	Transmit Data
3	Int VFD Present
4	Ground

## Appendix G Input/Output device commands

This appendix lists the commands and their usage for the SurePOS 500 Series I/O devices.

### VFD commands

This section describes the following VFD commands: v Emulation Mode Select v Character Set Select v User Character Definition v Brightness Control v Alphanumeric Message Scroll v Backspace v Horizontal Tab v Line Feed v Carriage Return v Test v Display Position v Normal Display v Vertical Scroll v Cursor On v Cursor Off v Reset

**Note:** The command code format shown in the following topics is the hexadecimal value followed by the ASCII representation of that value within brackets.

#### Emulation mode select (00) <NULL>

00 nn

**Purpose:**

Sets the specified emulation mode.

This example sets Logic Controls emulation mode:

00 00

#### Character set select (02) <STX>

**Note:** This command is only effective in IBM Mode.

02 nn

**Purpose:**

Selects the specified character set.

This example selects the US/European character set:

02 00

#### User character definition (03) <EXT>

03 nn

Purpose:

Defines a custom character.

Logic Controls Emulation Mode

The byte that follows the command byte contains an ASCII character between X'20' and X'7F' of a keyboard key to be redefined. This byte is followed by five bytes, which define the bit patterns of the user-defined character. Logic Controls Emulation Mode only allows one keyboard key to be redefined. This means that there is only one user-definable character in this mode. Once a key is redefined, any occurrence of that character on the display will change to the user-defined character. If a new key is redefined, the previously redefined key is restored to the original character in all places on the display and the newly redefined key will



be changed to the user-definable character. Table 38 on page 51 shows the format of these five bytes.

**Note:** A -character in the table indicates a do-not-care bit. The other values relate to the character pixel positions shown in the diagram following the table. A value of 1 in the appropriate place in the data stream indicates that the related pixel position is on; a 0 indicates that it is off.

\* This is maintained for application compatibility with displays with 5x8 character boxes.

←5pixelswide→

#### **IBM Mode**

The byte that follows the command byte represents an address between X'15' and X'1A', or between X'1C' and X'1E' in the currently selected character set. This byte is followed by eight bytes, which define the actual bit patterns of the user-defined character. Table 39 on page 52 shows the format of these eight bytes.

**Note:** A -character in the table indicates a do-not-care bit. The other values relate to the character pixel positions shown in the diagram following the table. A value of 1 in the appropriate place in the data stream indicates that the related pixel position is on; a 0 indicates that it is off.

\* This is maintained for application compatibility with displays with 5x8 character boxes.

←5pixelswide→

### **Brightness control (04) <EOT>**

04 *nn*

**Purpose:**

### **Alphanumeric message scroll (05) <ENG>**

05 *xxx...*

**Purpose:**

Specifies a message of up to 45 characters to continuously scroll across the top line of the display. (Any text on the bottom line does not change.) Any data received after the 45th character are ignored except for a carriage return (X'0D'). The message starts to display when the carriage return command is received. If the cursor position is on the top line when this command is received, it is moved to the first position on the bottom line. If it is on the bottom line, its position does not change. Data continues scrolling on the top line until a valid character (backspace, horizontal tab, line feed, carriage return, or display position command) is written to the top line. The Test and Reset commands stop the scrolling message regardless of the display position.

### **Backspace (08) <BS>**

08

**Purpose:**

Decrements the cursor position by one and clears any character displayed in that position. If the write position is at the lower left, the position is moved to the upper right, and if it is at the upper left, it is moved to the lower right. This command stops the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

### **Horizontal tab (09) <HT>**

## 09

### **Purpose:**

Increments the cursor position by one. No characters are erased. This command stops the scrolling message if the cursor position is on the top line when the command is sent. At the end of a line, the display behavior is determined by the state of the display control mode as follows:

#### **Normal Display Control Mode (DC1)**

If the cursor is at the upper right position, it is moved to the lower left position. If the cursor is at the lower right position, it is moved to the upper left position.

#### **Vertical Scroll Display Control Mode (DC2)**

If the cursor is at the upper right position, it is moved to the lower left position. If the cursor is at the lower right position, the characters displayed on the bottom line are moved to the top line, the bottom line is cleared, and the cursor is moved to the lower left position.

## **Line feed (0A) <LF>**

## 0A

### **Purpose:**

The display behavior is determined by the state of the display control mode as follows:

#### **Normal Display Control Mode (DC1)**

The cursor is moved to the same position in the complementary line. In this mode, a line feed command stops the scrolling alphanumeric message if the cursor is on the top line when this command is sent.

#### **Vertical Scroll Display Control Mode (DC2)**

If the cursor is on the top line, it is moved to the complementary position on the bottom line. If the cursor position is on the bottom line, all characters on that line are moved to the top line, the bottom line is cleared, and the cursor position is unchanged. This command always stops the scrolling alphanumeric message.

## **Carriage return (0D) <CR>**

## 0D

### **Purpose:**

Causes the cursor to move to the leftmost position of the current line. This command stops the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

## **Test (0F) <SI>**

## 0F

### **Purpose:**

Causes the first 40 characters in the currently selected character set to be displayed once. At the end of the test, a test pattern is written that turns all pixels ON. At the end of the test, the display is cleared and is reset to the power-on state as described at "Reset (1F) <US>" on page 55.

## Display position (10) <DLE>

10 *nn*

### Purpose:

## Normal display control mode (11) <DC1>

11

### Purpose:

Sets normal display control mode (DC1) and permits data to be written to either line. After writing a character, the cursor moves one position to the right. When the display position is at the last position of the top line, the cursor moves to the first position of the bottom line. When the display position is at the last position of the bottom line, the cursor moves to the first position of the top line. The display remains in DC1 mode until a DC2 mode command is issued, a reset command is issued, or power is removed from the display.

## Vertical scroll display control mode (12) <DC2>

12

### Purpose:

Sets vertical scroll display control mode (DC2) and permits data to be written to either line. When the display position is at the last position of the top line, the cursor moves to the first position of the bottom line. When either valid character data, a Horizontal Tab command, or a Line Feed command is sent to the last position of the bottom line, the data on the bottom line is transferred to the top line and the cursor is moved to the lower left position. Note that a Carriage Return command does not cause the data on the bottom line to be transferred to the top line. This is the power-on and Reset command default setting. The display remains in DC2 mode until a DC1 mode command is issued.

## Cursor on (13) <DC3>

13

### Purpose:

Turns on the cursor. This is the power-on default setting.

## Cursor off (14) <DC4>

14

### Purpose:

Turns off the cursor.

## Reset (1F) <US>

1F

### Purpose:

Causes the display to reset some programmable parameters back to the power-on state, which is defined as:

- v Cursor on.
- v Scrolling alphanumeric message off.
- v All pixels of (all character positions are filled with X'20').
- v Write position for next write is at position X'00' (top left).
- v Default code page (437) selected.
- v DC2 mode enabled.
- v Default (Logic Controls) emulation mode selected.
- v Brightness set to 100%.
- v IBM user-defined characters are not erased. The Logic Controls user-defined character key is reset.

All byte values between X'00' and X'1F' not defined in this section are ignored by the display in Logic Controls mode. User-defined characters in the IBM mode that have not been defined previously are spaces.

## APA commands

This section describes the following APA VFD commands: v Backspace Without Deleting v Line Feed v Carriage Return v Clear Display v Display Position v Delete to End of Line v Dimming v Cursor Mode v Screen Mode v Horizontal Scroll v Display Mode v User Definable Font v Graphic Display Mode v Double Size Letter in Horizontal v Character Code Set of Full Size Letter v Character Code Set of Half Size Letter v Horizontal Scroll on All Lines v Font Selection

**Note:** The command code format shown in the following topics is in hexadecimal format.

## Backspace without deleting

08

### Purpose:

The write-in position is shifted to the left one digit and the displaying screen is not changed. This command is ignored when the write-in position is on the least significant digit.

## Line feed

0A

### Purpose:

The write-in position is shifted to the next row on the same digit position. If the write-in position is on the bottom row, the displayed character is scrolled up to the upper row and all characters on the bottom row are cleared. The write-in position is not changed. The displayed character under the screen mode of the 24x24-dot 1 row+16x16-dot 2 rows is not scrolled up from the row of 16x16-dot format to 24x24-dot.

## Carriage return

**0D**

**Purpose:**

The write-in position is shifted to the most significant digit of the same row. If the write-in position is on the most significant digit, the command is ignored.

## Clear display

**1B 5B 32 4A**

**Purpose:**

All the displayed characters are erased. The write-in position is not changed.

## Display position

**Purpose:**

Instead of writing the character from the first digit, the write-in start position can be specified with this command. The write-in position is shifted with Py and Px. (It is based on the half-size letter of the font, which is specified with the Screen Mode command.) Py indicates the position of the row and Px the digit. Py and Px must be defined under the following conditions:

v If Py is 0, it is set to 1 (X'31').

v If Py is greater than the bottom row, it is set to the bottom row.

v If Px is 0, it is set to 1 (X'31').

v If Px is greater than the least digit, it is set to the least digit.

A special form of the Display Position command exists (**Esc 1B 5B 48 27**), which sets the write-in position to the home position (Py=1 and Px=1).

## Delete to end of line

**1B 5B 30 4B**

**Purpose:**

The displayed characters from the write-in position to the end position on the same row are erased. The write-in position is not shifted.

## Dimming

**1B 5C 3F 4C 44 Ps**

**Purpose:**

Luminance can be adjusted into six levels using this command. The data byte following the command sequence (represented by Ps in the preceding command format), changes the dimming level. When the module is turned on, the level is set to 5 (100%).

**Ps Luminance %**

0 (X'30') 0 1 (X'31') 31.6

2 (X'32') 45  
 3 (X'33') 58.8  
 4 (X'34') 70.4  
 5 (X'35') 100 (default)

## Cursor mode

**1B 5C 3F 4C 43 Ps**

### Purpose:

**Ps**  
 0 (X'30') 1 (X'31') 2 (X'32')

## Screen mode

This command is only available in 5x7-dot screen mode. The data byte following the command sequence (represented by Ps in the preceding command format), changes the cursor mode. The cursor is always displayed at the write-in position. The cursor is formed by five dots located at the bottom of 5x7-dot matrix character font.

### Mode

No lighting (default)  
 Blinking  
 Lighting

### No Lighting Blinking Lighting

The cursor does not display. This is the default setting when power is turned on.

The cursor flashes ON and OFF every 0.3 seconds at the blank digit.

The cursor displays. If the write-in position is assigned to the position at which a character is displaying, the cursor displays instead of the character.

**1B 5C 3F 4C 53 Ps**

### Purpose:

The data byte following the command sequence (represented by Ps in the preceding command format), changes the screen mode.

### Ps Mode

6 (X'36') 5x7 dots, 4 rows (default)  
 7 (X'37') 5x7 dots, 5 rows  
 8 (X'38') 16x16 dots, 2 rows

## Horizontal scroll

**1B 5C 3F 4C 48 Pm 3B PI 3B Pt 3B Pn 3B Pd**

**Purpose:**

This command initiates horizontal scrolling. The control bytes embedded in the command sequence (represented by Pm, PI, Pt, and Pn in the preceding command format), change the scrolling characteristics. Pd...Pd represents the data bytes.

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**Pm** 6 (X'36'): 5x7 dots, 4 rows 7 (X'37'): 5x7 dots, 5 rows 8 (X'38'): 16x16 dots, 2 rows

**PI** 1 ~ 4 (X'31' ~ X'34'): Pm=6 1 ~ 5 (X'31' ~ X'35'): Pm=7 1, 2 (X'31', X'32'): Pm=8

**Pt** 1 (X'31'): 1 line/10 ms 1 (X'32'): 1 line/20 ms **Pn** The number of data bytes (1 for half size letter, 2 for full size letter, maximum is 128 (X'80')). **Pd...Pd** This represents the data characters.

The following list explains how the Horizontal Scroll command operates:

**1B 5B Ps 6D**

**Purpose:**

This command sets the display mode characteristics. The control byte embedded in the command sequence (represented by Ps) sets the mode.

**Reviewers** Does reverse mode mean that the character is flipped horizontally, or simply that the character color and background color are reversed?

## User-definable font set

**1B 5C 3F 4C 57 33 Pf 3B Pn 3B Pc 3B Pd...Pd**

**Purpose:**

This command specifies a user-definable font set. The control bytes embedded in the command sequence (represented by Pf, Pn, and Pc in the preceding command format), change the font characteristics. Pd...Pd represents the font data bytes.

**Pf** (font size) 1 (X'31'): 5x7 dots (ANK) 2 (X'32'): 8x16 dots 3 (X'33'): 16x16 dots  
**Pn** (font NO) 1 ~ 32 (X'31' ~ X'33', 32) Pf=1, 2 1 ~ 16 (X'31' ~ X'31', 36) Pf=3 **Pc**  
(registration 2hex digitsx7Pf=1, 2 address) 4 hex digits (Pf=3) **Pd...Pd** 2hex digitsx7Pf=1 2 hex digits x 16 Pf=2 2hex digitsx2x16Pf=3

**Note:** All data is stored into RAM. You must issue this command every time you switch on the power.

## Graphic display mode

**Purpose:**

This command specifies the graphic display mode. The control bytes embedded in the command sequence (represented by Px, Py, Ph, and Pw in the preceding command format), change the graphic display characteristics. Pd represents the data byte.

**Double size letter in horizontal**

**1B 23 Ps**

**Purpose:**

This command sets a character with double size letter in horizontal. It is available for all full size letter, all half size letter, and ANK font.

Ps        5 = Normal size letter 6 = Double size letter in horizontal

**60** SurePOS 500 Series System Reference

**Character code set of full size letter**

??

**Purpose:**

Can't figure this out from the spec.

**Character code set of half size letter**

??

**Purpose:**

Can't figure this out from the spec.

**Horizontal scroll on all lines**

The format of the Horizontal Scroll Select command is as follows:

**1B 5C 3F 4C 4D 53**

**Purpose**

This command sets horizontal scroll mode. The format of the Horizontal Scroll Release command is as follows:

**1B 5C 3F 4C 4D 45**

**Purpose**

This command resets horizontal scroll mode. The format of the Horizontal Scroll Display Mode Set



command is as follows:

**1B 5C 3F 4C 4D Pm 3B PI 3B Pt 3B Pn 3B Pd...Pd**

**Purpose:**

This command sets horizontal scrolling options. The control bytes embedded in the command sequence (represented by Pm, PI, Pt, and Pn in the preceding command format), change the scrolling characteristics. Pd...Pd represents the data bytes. This command does not affect previous display settings.

The format of the Horizontal Scroll Start command is as follows:

**1B 5C 3F 4C 4D 47**

**Purpose**

This command starts horizontal scrolling on all lines. All subsequent commands are ignored until a Scroll Mode Release command is sent.

The following list explains how the Horizontal Scroll On All Lines command operates:

- v Any codes not described here are ignored.
- v The most recent Display Mode Set command becomes effective in one screen scroll setting before the Scroll Start command is performed.
- v A screen scrolls from right to left, dot by dot.
- v The range of the display of being scrolled is defined by the screen mode setting.
- v The command is canceled when Pn = X'00'. After it is canceled, displayed characters are cleared and the write-in position moves to the most significant digit of the row.
- v The command can be executed on a single line only.
- v A character's Display Mode Set command (reverse, blinking, and so on) can be added with the display data frame. If the command is written twice or more in one scroll data frame, only the first command is valid; others are ignored.
- v When message data are changed, you must reissue this command. While scrolling, the User Definable Font Set command is not available.
- v Space data is written in the other rows except those selected with the PI code.

## Font selection

**1B 53 Pn**

**Purpose:**

Selects the language font to use.

The command stream is as follows:

**Pn** 30: English -IBM code page 437 modified (default)  
31: Japanese -JIS X 0208-1990  
32: Korean -KS C 5601-1992

## Cash drawer commands

This section describes the following cash drawer commands: v Open Cash Drawer 1 v Open Cash Drawer 2 v Close Cash Drawer 1 v Close Cash Drawer 2

### Open cash drawer 1

To open cash drawer 1, use the following command, which sends an ASCII Bell character to the customer display serial port:

**07**

### Open cash drawer 2

To open cash drawer 2, use the following 2-command sequence, which sends an Escape character followed by an ASCII Bell character to the customer display serial port:

**1B 07**

### Status cash drawer 1

To obtain status information for cash drawer 1, use the following command, which sends an ASCII Ack character to the customer display serial port. See “Cash drawer status information” for a description of the cash drawer status byte.

**06**

### Status cash drawer 2

To obtain status information for cash drawer 12, use the following 2-command sequence, which sends an Escape character followed by an ASCII Ack character to the customer display serial port. See “Cash drawer status information” for a description of the cash drawer status byte.

**1B 06**

## Cash drawer status information

To obtain status information for a cash drawer, send one of the status commands just described. The status byte returned indicates one of the following:

### MSR data received

This section describes the data received from the MSR when a card is swiped. The MSR is an input-only device, and therefore does not use commands. The JUCS MSR attaches to a serial port as a standard RS-232 device. The 3-track MSR has a slide switch, which enables you to connect it either as a standard RS-232 serial device or through the keyboard interface. (If you choose the latter connection, the incoming data appears to come from a keyboard so no device driver is needed.)

### **3-Track MSR data**

Incoming data from the 3-track MSR has the following format:

### **JUCC MSR data**

Incoming data from the JUCC MSR has the following format:

## **Programming**

### **Interface Description**

#### **Track data switch**

On the 3 track MSR, the track data interface is chosen with a slide switch located on the MSR such that it is only accessible when the MSR is not attached. One setting of the switch will cause the MSR to send track data with a serial interface at 19200 baud with 8 bits, no parity and 1 stop bit. The other setting of the slide switch will cause the MSR to send track data via the PS/2 keyboard interface. A pin button located so that it is not accessible with the MSR is fully installed is used to reset the MSR's configuration to the factory default state.

## Configuration Word

The configuration word is used to alter the format of the track data returned from the MSR. In the default configuration the MSR reads ISO 7811 format cards. There are three possible data tracks. Track one is formatted as 7 bit 1 parity data and is limited to a maximum of 79 characters. Tracks two is formatted as 5 bit 1 parity format with a maximum of 40 characters. Track three is also 5 bits 1 parity format but is limited to no more than 107 characters. Before the track data can be sent to the host each character must be converted to ASCII codes. For track one this is simply a matter of clearing the parity bit and adding 32 to the data value. For tracks two and three you clear the parity bit and add 48 to the data value. The following table shows the character set for the different tracks and their corresponding ASCII values:

MSR track code to ASCII code conversion chart												
Track 1 value	ASCII value		Character	Track 1 value	ASCII value		Character		Track 2 & Track 3 vaue	ASCII value		Character
	Dec	Hex			Dec	Hex				Dec	Hex	
0	32	0x20	' '	32	64	0x40	'@'		0	48	0x30	'0'
1	33	0x21	'!'	33	65	0x41	'A'		1	49	0x31	'1'
2	34	0x22	'\"'	34	66	0x42	'B'		2	50	0x32	'2'
3	35	0x23	'#'	35	67	0x43	'C'		3	51	0x33	'3'
4	36	0x24	'\$'	36	68	0x44	'D'		4	52	0x34	'4'
5	37	0x25	'%'	37	69	0x45	'E'		5	53	0x35	'5'
6	38	0x26	'&'	38	70	0x46	'F'		6	54	0x36	'6'
7	39	0x27	'\"'	39	71	0x47	'G'		7	55	0x37	'7'
8	40	0x28	'('	40	72	0x48	'H'		8	56	0x38	'8'
9	41	0x29	')'	41	73	0x49	'I'		9	57	0x39	'9'
10	42	0x2A	'*'	42	74	0x4A	'J'		10	58	0x3A	':'
11	43	0x2B	'+'	43	75	0x4B	'K'		11	59	0x3B	','
12	44	0x2C	','	44	76	0x4C	'L'		12	60	0x3C	'<'
13	45	0x2D	'-'	45	77	0x4D	'M'		13	61	0x3D	'='
14	46	0x2E	'.'	46	78	0x4E	'N'		14	62	0x3E	'>'
15	47	0x2F	'/'	47	79	0x4F	'O'		15	63	0x3F	'?'
16	48	0x30	'0'	48	80	0x50	'P'					
17	49	0x31	'1'	49	81	0x51	'Q'					
18	50	0x32	'2'	50	82	0x52	'R'					
19	51	0x33	'3'	51	83	0x53	'S'					
20	52	0x34	'4'	52	84	0x54	'T'					
21	53	0x35	'5'	53	85	0x55	'U'					
22	54	0x36	'6'	54	86	0x56	'V'					
23	55	0x37	'7'	55	87	0x57	'W'					
24	56	0x38	'8'	56	88	0x58	'X'					
25	57	0x39	'9'	57	89	0x59	'Y'					
26	58	0x3A	':'	58	90	0x5A	'Z'					
27	59	0x3B	','	59	91	0x5B	'['					
28	60	0x3C	'<'	60	92	0x5C	'\"'					
29	61	0x3D	'='	61	93	0x5D	']'					
30	62	0x3E	'>'	62	94	0x5E	'^'					
31	63	0x3F	'?'	63	95	0x5F	'_'					
									</			

The data from the card is returned as shown in the following Baccus Naur Form:

Track data: <Track1><CR><Track2><CR><Track3><CR>

Track1: [<Start Sentinel 1><Data1>{1,82}<End Sentinel>][<Error>]

Track2: [<Start Sentinel 2><Data2>{1,40}<End Sentinel>][<Error>]

Track3: [<Start Sentinel 3><Data2>{1,107}<End Sentinel>][<Error>]

CR: 0x0D or Carriage Return

Start Sentinel 1: 0x25<sup>1</sup> or value in configuration byte 2

Start Sentinel 2: 0x3B or value in configuration byte 3

Start Sentinel 3: 0x2B or value in configuration byte 4

End Sentinel: 0x3F or value in configuration byte 5

Error: 0x45

Data1: 0x21 to 0x5F

Data2: 0x31 to 0x3F

Data3: 0x31 to 0x3F

If a track is read incorrectly an ASCII 'E' is returned in place of the bad track. The following table shows the format of the MSR configuration word:

Byte1	Configuration bits	Factory	Default
Bit	Function	PS/2	RS-232
0	CR enabled	1	0
1	Raw data mode	0	0
2	track 1 disabled	0	0
3	track 2 disabled	0	0
4	track 3 disabled	0	0
5	Strip Sentinels	0	0
6	Use Custom Configuration	0	0
7	Hide Error tracks	0	0
Byte 2	SS1	0x25	0x25
Byte 3	SS2	0x3B	0x3B
Byte 4	SS3	0x2B	0x2B
Byte 5	ES	0x3F	0x3F

### ***Byte 1, Bit 0: Carriage return Enabled***

This bit enables the inclusion of Carriage returns between the tracks. This defaults to '0' or no Carriage

<sup>1</sup> ASCII conversion of characters used in this document are: 0x25='%', 0x3B=';', 0x2B='+', 0x3F='?', 0x45='E'. For more ASCII character conversions see ISO-646-US-ASCII.

returns when the data interface is 2-wire serial and defaults to '1' or Carriage returns after tracks when PS/2 is the data interface.

### ***Byte 1, Bit 1: Raw Data Mode***

In this mode control characters within the track data are not removed from the return data. In some MSRs the control characters, "!"#%&'\*+,:;<=>?[^\^-" , are removed from the track data before it is sent to the host. This mode sends exactly the characters found within the data track with no interpretation or removal. If this MSR does not currently remove control characters then this command has no effect. Any sentinel values discovered between the first start sentinel and the last end sentinel are to be treated as data.

### ***Byte 1, Bit 2: Track 1 disabled***

When set to '1' this bit disables or hides track 1 data. Factory default is '0', track 1 enabled.

### ***Byte 1, Bit 3: Track 2 disabled***

When set to '1' this bit disables or hides track 2 data. Factory default is '0', track 2 enabled.

### ***Byte 1, Bit 4: Track 3 disabled***

When set to '1' this bit disables or hides track 3 data. Factory default is '0' on 3-track MSR and '1' on 2-track JUCC models.

### ***Byte 1, Bit 5: Hide Sentinels***

When set to '1' the Sentinels are not included in the returned data. Factory default is '0'; Sentinels included in the MSR data.

### ***Byte 1, Bit 6: Use Custom Configuration***

This bit defaults to '0'. When this bit is set, the custom configuration in the rest of the configuration word is used. When not set the factory default configuration is used.

### ***Byte 1, Bit 7: Hide Error tracks***

When set to '1' this bit prevents the MSR from returning 'E' or 0x45 for bad tracks. If all three tracks on the card were corrupted no data would be sent to the host. If track 1 were bad then only tracks 2 and 3 would be sent to the host. The default setting is '0', send 'E' for bad tracks.

### ***Byte 2: Track 1 start sentinel***

The value in this byte is used as the track one start sentinel. It is set to 0x25 or '%' by default. The value assigned to this byte must be an ASCII code between 33 and 95('1'to'\_'). This value is substituted in the return data in place of the sentinel found in the track data.

### ***Byte 3: Track 2 start sentinel***

The value in this byte is used as the track two start sentinels. It is set to 0x3B by default. The value assigned to this byte must be an ASCII code between 49 and 63('1'to'?'). This value is substituted in the return data in place of the sentinel found in the track data.

### ***Byte 4: Track 3 start sentinel***

The value in this byte is used as the track three start sentinels. It is set to 0x2B by default. The value assigned to this byte must be an ASCII code between 49 and 63('1'to'?'). This value is substituted in the return data in place of the sentinel found in the track data.

### ***Byte 5: End sentinel***

The value in this byte is used as the track end sentinel. It is set to 0x3F by default. The value assigned to this byte must be an ASCII code between 49 and 63('1'to'?'). This value is substituted in the return data in place of the sentinel found in the track data.

## **Modes**

The MSR operates in three modes, functional, command and update. Functional mode is the power on default mode used by the host application to receive MSR track data. Command mode is used by a configuration application to change the format and behavior of the MSR when in functional mode. The update mode is entered from command mode and is used as a means of updating the MSR's firmware. All command communications between the MSR and the host is through the 2-wire serial interface regardless of the position of the data selection slide switch. MSR track data is always returned on the 2-wire serial interface on the JUCC model and on the 2-wire serial or PS/2 interface as selected by the MSR's interface select switch on the 3-track model.

### ***Functional Mode***

The MSR powers up into the functional mode. In this mode the MSR sends track data to the host on either the 2-wire serial interface or the PS/2 interface. The MSR data interface used is determined by the position of the data interface slide switch. The JUCC MSR will not have a slide switch and will always return data on the 2-wire serial interface. The format of the track data is determined by the configuration word loaded.

When in this mode the MSR accepts only one command, the enter command mode command. All other commands should be ignored. Only MSR track data in the configured format is sent to the host. The MSR start command mode command must be sent before device status can be read. As the MSR transitions from Functional mode to Command mode a command success string should be sent to the host.

### ***Command Mode***

Command mode is entered when a command mode message is received from the host on the 2-wire serial interface. In this mode the user can configure the functional mode behavior of the MSR. When configuration is completed a command is sent that returns the MSR to the functional mode.

When in this mode the MSR accepts commands that change the configuration word, start update mode, or start functional mode

### ***Update Mode***

Update mode is entered when an update command is received from the host while the MSR is in command mode. In this mode the host updates the MSR's firmware. The new firmware is checked for correctness and replaces the old firmware. The code update command interface is to comply with the in circuit programming specification described in Philips Semiconductors application note AN461 2002 Jun 24 for the Philips 89C51Rx2 device.

## ***Reset switch***

A pin hole reset switch is provided on the MSR unit in a location not accessible when the MSR is fully installed. When the user presses this switch the MSR configuration word stored in flash is changed back to the factory default and the unit restarts. The configuration word in RAM is replaced by the new flash word when the MSR restarts.

The JUCC reader will communicate via the 2-wire serial interface only and there should not be a slide switch on the JUCC MSR.

## **Command Set**

The commands sent to the MSR will be used to either configure the format and features of the MSR return data or to update the MSR firmware. No changes to the configuration are permanent until a commit command is sent. This means that configuration word changes will be lost at power off unless they are committed.

## ***Control commands***

All command strings to the MSR are to be in the following format:

*MSR command:*“:nnxxx11cc[dd]{0,16}ss”

*nn:* one byte hexadecimal number representing number of command and data bytes in command string, value between 0x00 and 0x10.

*xxx:* four byte address used in memory commands, not used and should be considered don't care.

*cc:* hexadecimal command value between 0 to 127 return values are 128 to 255.

*dd:* 0 to 16 data bytes in hexadecimal format associated with the command.

*ss:* checksum, negative of the sum of the values in the command string. Summing all the hex values in the command string including the checksum should equal zero.

All commands except the “get configuration” commands will only be followed by a fail/success response. The success response will be “.” and the fail response will be “X”. Characters sent to the MSR are to be repeated back to the host as they are received. The use of upper and lower case letters are can be used in the hexadecimal numbers.

The MSR response to the “get configuration” command will be formatted as:

**:nn0000117F <b1><b2><b3><b4><b5><revision string[11]>**

**nn:** number of data bytes; b1 through b5 plus the length of the revision string.

**bx:** hexadecimal number representing bytes 1 through 5 of the configuration word .

**revision string:** Up to 11 byte long description string showing firmware revision information. Suggested format is “REV x.xx.”

An example would be the command to enter command mode, “:0100001110.” This shows the “:nn000011” preamble, the hexadecimal command byte “10” and a byte count of 01. The MSR would respond with the character ‘.’ to indicate a successful command.



The following table shows all the commands:

Function	Command Byte	Format
Reset	"00"	":0100001100EE"
Set Configuration	"01"	:0600001101<b1><b2><b3><b4><b5><ss> ss = - (18h +b1+b2+b3+b4+b5)
Get Configuration	"02"	:0200001102<source><ss> : source = "00" from RAM or "01" from flash. From ram: ":020000110200EB" From flash: "020000110201EA"
Start Update Mode	"07"	":0100001107E7"
Commit Configuration	"09"	":0100001109E5"
Custom Configuration Enable/Disable	/x0A	":020000110A<value><ss> value="01" enable custom configuration: ":020000110A01E2" value="00" disable custom configuration. ":020000110A00E3"
Start Command Mode	"10"	":0100001110DE"
Start Functional Mode	"11"	":0100001111DD"

General device responses are:

Function	ID byte	Format
Status	"7F"	:nn0000117F<b1><b2><b3><b4><b5><revision string[11]><ss>
Data return (not used )	"82"	:nn00001182<command><data packet><ss>
Command Response w/ no data		Success                    '.' Fail                        'X'

Command specific responses are:

Function	Success Response	Fail Response
Reset	":."	"X"
Set Configuration	":."	"X"

Function (return status)	Success Response	Fail Response
Get Configuration (return status)	“.:nn0000117F<b1><b2><b3><b4><b5><revision string[11]><ss>”	“X”
Start Update Mode	“.”	“X”
Commit Configuration	“.”	“X”
Custom Configuration Enable/Disable	“.”	“X”
Start Command Mode	“.”	“X”
Start Functional Mode	“.”	“X”

All changes to the configuration word are stored in RAM until a Commit Configuration command is sent. A commit configuration command stores the configuration word into flash where it is retrieved the next time power is restored.

### General command format:

**:nnxxxxiicddss**

- :** beginning of command marker
- nn** number of command bytes beyond the id byte in hexadecimal.
- xxxx** 16 bit Don't care address bytes not used for MSR control commands.
- ii** Command id byte, should be “11” for MSR commands.
- cc** Hexadecimal format MSR command ID byte.
- dd** 0 to 16 bytes of data in hexadecimal format.
- ss** hexadecimal format checksum byte. The sum of this number and all the other bytes in the command after the beginning of the command marker should equal zero.

If the sum of all the bytes in the command is not zero or if the command is not a valid command then the MSR returns ‘X’. a ‘.’ is returned for successful commands. Commands requiring return data return either a ‘.’ followed by a return data string or ‘X’.

### Update mode details

The code update command interface is to comply with the in circuit programming specification described in Philips Semiconductors application note AN461 2002 Jun 24 for the Philips 89C51Rx2 device. In general the microcontroller program will enter the in circuit programming code when a start update mode command is sent. An example would be if

a P889C51RB2 part were used. In this case the code would enable the shadow boot block by setting the ENBOOT bit to '1' and then jumping into ROM at location FC00h. If the watchdog timer is used it should be disabled before jumping to the ISP code.

### **3-Track MSR**

#### ***2-wire serial communication***

By default, data from a successful card read is presented to the host with only the start sentinel [SS], followed by the card data, followed by the end sentinel [ES]. The [SS] for track 1 is ASCII "%". The [SS] for track 2 is ASCII ";". The [SS] for track 3 is ASCII "+". The [ES] for all tracks is ASCII "?". In the case of an unsuccessful read, an ASCII "E" is returned without a [SS] or [ES] for that track or tracks. For example "EEE" would be returned for all tracks if all three tracks had bad data. For example if only track 2 had an error, then the reader would send [SS]track 1 data[ES]E[SS]track 3 data[ES].

Host commands to the MSR are sent through the 2-wire serial interface at 19200 Baud in the 8 bit, 1 stop no parity format.

#### ***PS/2 Keyboard communication***

By default, data from a successful card read is presented to the host with only the start sentinel [SS], followed by the card data, followed by the end sentinel [ES] and a carriage return [CR]. The [SS] for track 1 is ASCII "%". The [SS] for track 2 is ASCII ";". The [SS] for track 3 is ASCII "+". The [ES] for all tracks is ASCII "?". In the case of an unsuccessful read, an ASCII "E" is returned without a [SS] or [ES] for that track or tracks. For example "E[CR]E[CR]E[CR]" would be returned for all tracks if all three tracks had bad data. For example if only track 2 had an error, then the reader would send [SS]track 1 data[ES][CR]E[CR][SS]track 3 data[ES][CR].

### **JUCC MSR**

The JUCC MSR communicates to the host through the 2-wire serial interface only. The PS/2 interface is not present. Since there are only two tracks of data, only tracks one and two are used. Commands that effect track three are ignored. Data returned does not include track three information. On a successful read the data returned on a JUCC MSR in factory default configuration would appear as follows:

<Start Sentinel 1><Data1><End Sentinel><Start Sentinel 2><Data1><End Sentinel>

An unsuccessful read would return an error character or 'E' for each of the tracks and would appear for two bad tracks as "EE."

If there are 2 blocks of data on the card, the reader should ignore the 'unknown' (non-ISO compliant) data and only present to the host the 'known' (ISO-compliant) data.

### **Usage**

#### ***Card Speed***

The 3-track reader shall be capable of reading a standard card, a 12% jitter card and a 60% amplitude card at speeds ranging from 5 to 45 inches per second. Similarly, the JUCC reader shall be capable of reading a standard card, a 12% jitter card and a 60% amplitude card at speeds between 5 and 45 inches per second. The reader should be capable of reading the data from a card in both directions. The reader should "assume" the data will be read from the card in the reverse direction, as the position of the reader on the terminal is designed for "backward" swiping.

The ability to read Bank of America mini cards and other non-ISO standard cards is desired. Since some of these cards have higher track density consideration should be given to accommodating them. This effort should not endanger the MSR's ability to read ISO compliant cards.

## Appendix H Notices

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## **Industry Canada Class A emission compliance statement**

This Class A digital apparatus complies with Canadian ICES-003.

## **Avis de conformité aux normes d'industrie Canada**

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## **European Community (EC) mark of conformity statement**

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

**Warning:** This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

## **Germany**

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336).**

**66** SurePOS 500 Series System Reference

Dieses Gerät ist berechtigt in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen -CE- zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen."

EN 50082-1 Hinweis:

"Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082–2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern."

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

## Australia and New Zealand

**Attention:** This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

## Japanese power line harmonics compliance statement

## Japanese Voluntary Control Council for Interference (VCCI) statement

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Technology Equipment (VCCI). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## Mercury-added statement

The fluorescent lamp in the liquid crystal display contains mercury. Dispose of it as required by local ordinances and regulations.

## Trademarks

IBM, PS/2, SurePOS, and OS/2 are trademarks of the International Machines Corporation in the United States or other countries or both.

Microsoft, Windows, Windows NT, and the Windows 95 logo are trademarks or registered trademarks of Microsoft Corporation.

Intel is a trademark of Intel corporation in the United States, or other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, or other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

Das Gerät erfüllt die Schutzanforderungen nach EN 50082–1 und EN 55022 Klasse A.
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## 高調波ガイドライン適合品

### 高調波ガイドライン適合品

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づきクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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## Korean communications statement

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find this is not suitable for your use, you may exchange it for a non-business purpose one.

### A급 기기(업무용)

이 기기는 업무용으로 전자파적합등록을 받은 기기이오니  
판매자 또는 이용자는 이점을 주의하시기 바라며, 만약  
구입하였을 때에는 구입한 곳에서 가정용으로 교환하시기  
바랍니다.

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## Taiwanese Class A warning statement

警告使用者：  
這是甲類的資訊產品，在  
居住的環境中使用時，可  
能會造成射頻干擾，在這  
種情況下，使用者會被要  
求採取某些適當的對策。

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## Electrostatic discharge (ESD)

**Attention:** ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

### ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

### Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.



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