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Document Title: Counter Hardware Design Specification

Document Type: Design Specification

Release: BI3

Abstract: This paper provides a description of the counter hardware provided by Pathway to meet the requirements of the OPS as specified by Post Office Limited

Document Status: APPROVED

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0.0 Document Control

0.1 Document History

Version No.	Date	Reason for Issue	Associated CP/PinICL
1.0	30/01/96	Externally published	
2.0	04/07/96	Updated to reflect final OPS configuration and DSS/POCL Functional Specification	
2.1	16/08/96	Status changed to Draft. Updated to reflect comments from BA/POCL arising from document review of 06/08/96	
2.2	11/09/96	Updated following document review of 03/09/96	
3.0	17/10/96	Updated to reflect change of counter barcode reader to Welch-Allyn 3400-HP This version now issued to BA/POCL and baselined	
3.1	19/11/97	Updated to reflect changed peripherals and correct minor errors. Issued to PDA for comment	
3.2	05/12/97	Updated to reflect PDA comments	
4.0	03/02/98	Issued internally to Pathway	
4.1	23/07/98	Updated to include details from CPs	CP1055/1092 CP1133/1315 CP1265/1295
4.2	11/9/98	Document updated to reflect comments received on version 4.1 for formal issue of document under CCN	
4.3	2/10/98	Document updated to include details from CP	CP1286
5.0	23/3/99	Updated based on comments from POCL and.CP	CP 1832
5.1	17/05/99	Reformatted and tidied. Update to include details from CPs.	CP1715, 1833 and 1966
6.0	25/05/99	Issued version including minor comments.	
6.1	11/06/99	Updated for CP, physical dimensions of	CP1989

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		printers. For internal/external review.	
7.0	12/07/99	Updated based on comments from POCL and correction to Panasonic printer model.	
7.1	4/7/02	Change to the Fujitsu Services template Changes from POCL to Post Office Ltd Changes from ICL Pathway to Pathway Inclusion of NBS Inclusion of PIN pad for NBS	
7.2	11/7/02	Minor changes to format	
7.3	1/8/02	Updates to include comments from review at 7.2. Including removal of 4-port hub. Updated to include references to UPS (CCN 906), satellite (CCN 633) and mobile counters (CCN 632).	

0.2 Review Details

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0.3 Associated Documents

Reference	Version	Date	Title	Source
1	6.1	30/08/96	DSS/POCL Functional Specification	Pathway
2 IM/STR/0027	0.2	30/03/98	High Level Implementation Strategy	Pathway
3	8.1	08/06/99	Authorities Agreements - Schedule A06 - Charging mechanisms	BA/POCL
4	8.1	9/3/98	Double key requirements	BA/POCL
5 PA/TEM/001	6.0	26/3/02	Fujitsu Services (Pathway) Limited Document Template	PVCS
6 NB/PDN/010			PIN Pad Product Specification	PVCS
7 CCN 906B	990-2045 rev 1	12/97	Specification for APC Back-UPS Pro 280/420/650 230 VAC User's Manual UPS Specification	PVCS
8 CR/SPE/025			Introduction Of The Mobile Configuration	PVCS
9 CCN633			Introduce Satellite	PVCS

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			Communications Access Method	

Unless a specific version is referred to above, reference should be made to the current approved versions of the documents.

0.4 Abbreviations/Definitions

Abbreviation	Definition
AA	Authorities Agreement
AGP	Accelerated Graphics Port
API	Application Programming Interface
APS	Automated Payment Service
BA	Benefits Agency - now Dept of Works and Pensions
CRT	Cathode Ray Tube (type of monitor)
CC/S	Counter Configuration - Standard
CC/S/C	Counter Configuration - Standard - Counter
CC/S/G/1	Counter Configuration - Standard - Gateway - 1 (single counter)
CC/S/G/M	Counter Configuration - Standard - Gateway - M (multi-counter)
dBA	deci-Bel Acoustic
EPOS	Electronic Point of Sale
FSP	Flat Screen Panel
HDD	Hard Disk Drive
ICL	International Computers Limited - now Fujitsu Services Limited
IDE	Integrated Drive Electronics
IP	Internet Protocol
ISA	Industry Standard Architecture
ISDN	Integrated Services Digital Network
LAN	Local Area Network
LED	Light Emitting Diode

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MCR	Magnetic Card Reader
OBCS	Order Book Control Service
OPS	Outlet Processing Service
PES	Personal Earth Station
PCI	Peripheral Component Interconnect
PIN	Personal Identification Number
POCL	Post Office Counters Limited - now Post Office Limited
PoLo	Post Office LOgon
PSTN	Public Switched Telephone Network
SCR	Smart Card Reader
UDP	User Datagram Protocol
UPS	Uninterrupted power Supply
VPN	Virtual Private Network

0.5 Changes in this Version

Version	Changes
8.0	For Approval

0.6 Changes Expected

Changes
Inclusion of the 40Gb hard disc. This disc is being introduced into the spares' chain. It can be used to replace faulty discs in any configuration except mobile counters.

0.7 Trademarks and Acknowledgements

Pathway is a registered trademark of International Computers Limited in the UK, now known as Fujitsu Services Ltd..

Windows NT® is a registered trademark of Microsoft Corporation in the USA and/or other countries.

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0.8 Table of Content

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1 Introduction

This document describes the counter hardware infrastructure supplied by Pathway to meet the requirements of Outlet Processing Service (OPS) and the required application services:

- APS (Automated Payment Service)
- OBCS (Order Book Control Service)
- EPOS (Electronic Point of Sale)
- NBS (Network Banking Service).

This hardware infrastructure is known by Post Office Limited as Horizon.

Each post office will have installed a set of PC-based equipment comprising a counter configuration for each active counter and, where agreed with Post Office Limited, a back-office configuration.

1.1 Who Should Read This Document

This document is intended to be read by those staff at Post Office Limited who need to know what hardware OPS requires.

1.2 Conventions Used in This Document

The following stylistic conventions are used in this document, to highlight specific types of information:

➢	Note: This information is especially noteworthy.

☞ This is a reference to another document or another part of this document.

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2 Scope

☞ Refer to the OPS Architecture Specification for background information on the business context of OPS and for further details on OPS.

Three service layers are used by Pathway to deliver the Horizon solution to Post Office Ltd. These are:

- Transaction Management Service (TMS)
- Central Services
- OPS Counter and Back Office services.

The scope of this document is to detail the OPS-related hardware used as part of the Horizon solution.

➢ Versions of the counter hardware infrastructure contained in previous approved versions of this document may be used for the training equipment and installed in Post Office Ltd training centres.

A request for further dimensions will be satisfied in a subsequent version.

OPS hardware can be subdivided into:

- Counter configurations
- Back-Office configurations.

2.1 Counter Configurations

Two forms of counter configuration will be provided: -

- A standard configuration (CC/S) –

This will be installed in the majority of post offices. The number is subject to AA Schedule A06 (Ref. [3]). The standard configuration will be provided in three variants each comprising:

  - A PC
  - The required communications and Local Area Network (LAN) infrastructure
  - A standard set of counter peripherals.

- A mobile configuration (CC/M) –

This includes all counter configurations which are designed to be removed and stored away from the service position (not to be confused with standard equipment configurations or trolleys or vans). This will be installed in certain outlets. The number is subject to AA Schedule A06 (Ref. [3]).

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2.1.1 Standard Configuration Types

Three types of standard configuration will be provided:

- CC/S/G/1 - Gateway Counter in a Single Counter Site

  This configuration will be installed at the counter position of all single counter outlets. It consists of the standard counter PC configuration together with all the necessary communications hardware and software to enable the outlet to communicate to the Pathway data centres.

- CC/S/G/M - Gateway Counter in a Multiple Counter Site

  This configuration will normally be installed at one of the counter positions of all multi-counter outlets. It consists of the standard counter PC configuration which is connected to the outlet LAN, together with all the necessary communications hardware and software to enable the outlet to communicate to the Pathway data centres.

- CC/S/C - Standard Counter in Multiple Counter Site.

  This configuration will be installed at all the remaining counter positions of a multi-counter outlet after a single CC/S/G/M has been installed. It consists of the standard counter PC configuration which is connected to the outlet LAN.

2.1.1.1 Back-Office Configurations

Some multi-counter outlets may also have one or more back-office configurations installed. The number of back-office configurations to be installed is subject to AA Schedule A06 (Ref. [3]). These outlets will be identified on the roll-out database.

Where required, this will consist of the gateway configuration, CC/S/G/M, which will now be installed at the back-office location. Where more than one configuration is required in an outlet, the second will be a standard counter configuration. All counter positions will then have configuration CC/S/C installed.

All outlets will have a single office printer for printing A4 reports etc. An ink-jet or a laser / LED printer will be provided. The number of each type of printer to be provided is subject to AA Schedule A06 (Ref. [3]). The roll-out database will identify which type of printer is to be installed at each outlet.

2.2 Configuration Overview

The following diagrams show the standard configuration types.

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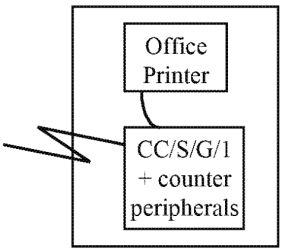
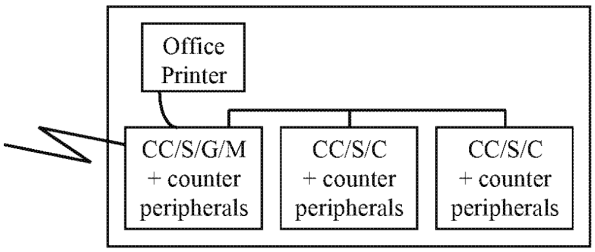
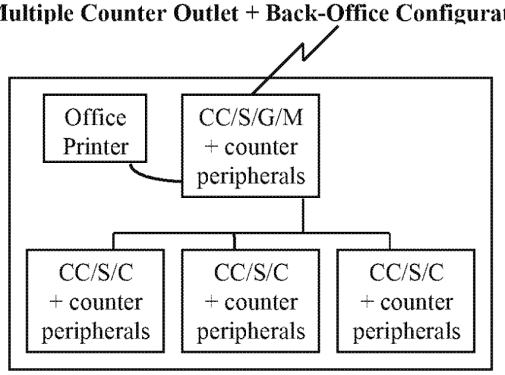
Single Counter Outlet



Multiple Counter Outlet



Multiple Counter Outlet + Back-Office Configuration(s)



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3 Configuration Details

The following subsections describe the possible configurations of OPS hardware and include:

- Standard counter configurations
- Peripheral connectivity
- Network connectivity
- The colour of standard equipment
- Health and safety provisions for equipment.

3.1 Standard Configuration

A standard counter configuration will consist of a PC together with a range of peripherals. One of the counter configurations (the gateway PC) within an outlet will contain a communications interface adapter either for ISDN or satellite. Where there is satellite connectivity instead of ISDN, the Eicon DIVA card is replaced by a second Ethernet card. A multi-counter configuration will be linked to a LAN which will be CAT-5 UTP Ethernet.

☞ Refer to Section 4.2 for further details on the LAN configuration.

A single counter post office will be configured with a PC that has one fixed and one exchangeable hard disk in a removable frame to aid recovery of the system and application data should the PC fail.

3.1.1 Configuration CC/S/G/1 - Gateway Counter in Single Counter Site

This configuration will consist of:

- A Pentium II PC running Windows - NT Workstation and fitted with:
    - Ethernet controller
    - ISDN basic rate card/2nd Ethernet controller
    - Serial card
    - Fixed hard disk
    - An exchangeable hard disk in a removable frame
- The peripherals listed in Section 3.1.4.

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3.1.2 Configuration CC/S/G/M - Gateway Counter in Multi-Counter Site

This configuration will consist of:

- A Pentium II PC running Windows - NT Workstation and fitted with:
  - Ethernet controller
  - ISDN basic rate card/2nd Ethernet controller
  - Serial card
  - Fixed hard disk
- The peripherals listed in Section 3.1.4.

3.1.3 Configuration CC/S/C - Standard Counter in Multi-Counter Site

This configuration will consist of:

- A Pentium II PC running Windows - NT Workstation and fitted with:
  - Ethernet controller
  - Serial card
  - Fixed hard disk
- The peripherals listed in Section 3.1.4.

3.1.4 Counter Peripherals

The peripherals supplied with each standard configuration are:

- A 10" colour monitor or a 12" flat screen panel both fitted with touch screen controller
- Counter keyboard with integral Magnetic Card Reader (MCR) and Smart Card Reader (SCR)
- Barcode reader
- Counter receipt and slip printer
- Smart key reader (where required).

3.1.4.1 Electronic Weigh Scales

Electronic weigh scales (either Avery-Berkel D104 or A702) will be used in certain outlets as determined by Post Office Ltd. Electronic weigh scales are supplied separately by Post Office Ltd or independently by the outlet.

3.1.5 Office Printer

An office printer will be supplied to every outlet and will consist of either an ink-jet printer or a laser / LED printer. The ink-jet printer configuration is intended for use in the majority of

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outlets. The laser / LED printer configuration is intended for use in a limited number of outlets, subject to AA Schedule A06, where operational requirements or print volumes demand this type of printer.

The office printer will be connected to the gateway counter.

3.1.6 PIN pad

A PIN pad will be supplied to every counter position operating the Network Banking Service. The PIN pad is described in detail in [6]. Some counter positions, identified in the pre-installation survey, will also be supplied with a Pay Pole described in [6].

3.2 Peripheral Connectivity

Each counter configuration provides a total of ten serial connections where:

- Two are supplied by the PC
- Eight are supplied via an internal serial card.

☞ Refer to Section **Error! Reference source not found.** for further detail on peripheral connectivity and port usage.

3.3 Network Connectivity

This subsection describes the following types of network connectivity:

- ISDN
- Frame Relay
- Satellite

3.3.1 ISDN Connectivity

Each outlet capable of utilising ISDN communications will usually have an ISDN-2e NTE 8C termination unit installed in a convenient place within the outlet. The gateway configuration will be connected to this.

➢ Existing outlets with previous versions of the termination unit (NTE 6C, NTE 8A, NTE 8B) will retain them. Outlets will no longer have these versions installed. There is no impact on functionality when using any of these types of termination units.

3.3.2 Frame Relay

In some of the larger outlets, communications may be achieved using Frame Relay in place of ISDN. These outlets will have a Kilostream Network Termination Unit and a LAN router installed in a convenient place within the outlet. The counter PCs in the outlet will

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communicate with the Pathway Campus through the LAN router which will be connected to the LAN hub.

☞ Refer to Section 4.2 for further detail on the LAN.

3.3.3 Satellite

The satellite solution provides equivalent facilities to the ISDN solution. The gateway counter PC is provided with a second Ethernet card that replaces the Eicon DIVA ISDN card. The additional Ethernet card is configured to a separate sub-net, termed the WAN IP address. The PC communicates through this card with the Personal Earth Station (PES) via a cross-over Ethernet cable. There is no other change in the standard configuration.

3.4 Equipment Colour

All standard configurations, including counter peripherals (apart from those items noted below), will be supplied with their principal casings in colour RAL 7021. Other peripherals parts, including switches, cables etc., will be supplied in a complementary colour.

The following items will remain in their original manufactured colour and livery:

- The laser / LED office printer
- The smart-key reader - APPU (existing and additional units)
- The electronic weigh scales (existing and additional units)
- The Local Area Network Hub.

☞ Refer to Section 4.7 for further detail on the smart key reader.

3.5 Health and Safety

All equipment specified in Section 4 complies with the relevant standards and Health and Safety provisions contained in Post Office Ltd AA Agreement Schedules A15 & A16.

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4 Product Descriptions

The following subsections contain product descriptions for the individual hardware components, this includes:

- Counter PC
- Local area network
- Counter monitor
- Keyboard
- Counter printer
- Barcode reader
- Smart key reader/writer
- Back-office printer
- PIN pad
- Consumables
- Cables and connectors
- Implementation strategy.

4.1 Counter PC

The counter PC or "Base Unit" consists of a:

- Fujitsu ICL ErgoPro X365 Pentium II

The mobile PC is described in CR/SPE/025 [8]. It provides the same functions as the counter PC in a special carrying case.

4.1.1 Fujitsu ICL ErgoPro X365 Pentium II

The ErgoPro X365 is based on the Intel Pentium II 400 MHz processor supporting either ISA or PCI and offering AGP.

The principal facilities are IDE and PCI interfaces.

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Technical Specification

This subsection describes the following aspects of the Fujitsu ICL ErgoPro X365 Pentium II:

- Processor
- Storage device
- Expansion slots
- Operating conditions
- Dimensions
- Weight
- Other.

The specifications of the processor are summarised in the following table.

Bus architecture	ISA or PCI
Processor	Pentium II
Clock frequency	400 MHz
Memory	64 MB
	128 MB
Cache	512 Kb second level cache
Connections	1 x parallel port 2 x serial ports

The storage device consists of a single internal 3.5" bay supporting either a 4.3 GB or 13 GB hard disk. For single counter configurations (CC/S/G/1), a further 4.3 GB or 13 GB hard disk will be supported in a removable frame which is accessed via a key available to authorised Pathway engineers.

➢ Although a floppy drive is fitted, it will be disabled via BIOS and the slot covered with a securely fitting cover to prevent use by users.

The following expansion slots are available:

- One PCI slot
- Two PCI/ISA slots.

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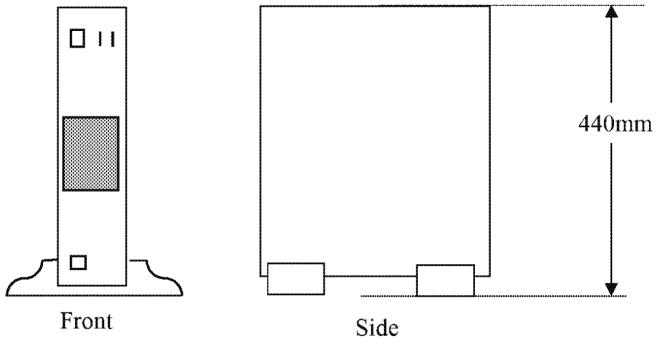
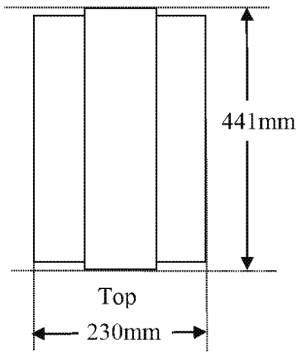
The operating conditions are summarised in the following table.

Power	Outlet socket via mains cable
Power supply unit	145W
Ambient temperature	+10°C to +37°C
Relative humidity	20 to 80 %, non-condensing
Mains input	110-120V/200-240V AC +10 %, 50/60 Hz
Noise level	22 dBA

A counter PC may be mounted vertically in a PC-foot below the counter.





PC and Foot

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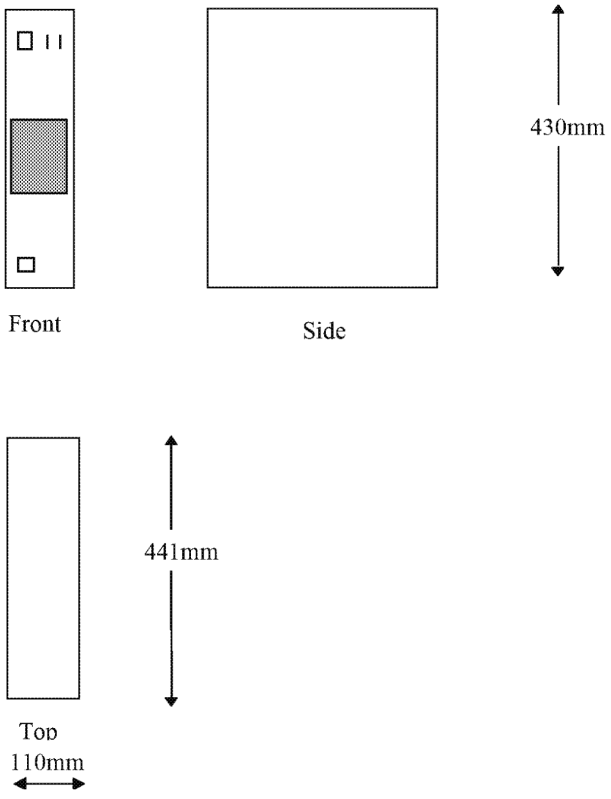

PC Chassis Only

A counter PC can also be horizontally mounted if required.

The PC weighs 15kg.

An internal speaker is provided.

4.1.2 ISDN Card

4.1.2.1 Eicon ISDN DIVA Basic Rate Card

The Eicon ISDN DIVA card uses a Digital Signal Processor operating at 40 Mhz. It supports the application interfaces CAPI 1.1 and CAPI 2.0 enabling very fine control to be exercised by the application over call connection and network usage time. One of two cards will be used: ISA or PCI.

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4.1.2.2 ISA Eicon ISDN DIVA

The specifications of the ISA Eicon ISDN DIVA are summarised in the following table.

Dimensions	162mm x 83mm
Memory	80 Kb
Connection types	Switched connections, semi-permanent connections, permanent connections
B-channel protocols	
Layer 2	X.75 (LAPB), LAPD, SDLC(SNA), transparent
Layer 3	X.25 PLP, T.90NL, T.70NL, transparent

4.1.2.3 PCI Eicon ISDN DIVA

The specifications of the PCI Eicon ISDN DIVA are summarised in the following table.

Dimensions	127mm x 107mm
Memory	80 Kb
Connection types	Switched connections, semi-permanent connections, permanent connections
B-channel protocols	
Layer 2	X.75 (LAPB), LAPD, SDLC(SNA), transparent
Layer 3	X.25 PLP, T.90NL, T.70NL, transparent

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4.1.3 Serial Card

4.1.3.1 Specialix I/O8+

An eight port serial card providing RJ12 connectors for simple cabling.

Processor	CD1864
Clock speed	12.5 Mhz
Architecture	ISA/EISA or PCI
Protocol	RS232
Form factor	Half XT
Continuous baud rate (all ports)	19.2 Kb/sec
Maximum baud rate	38.4 Kb/sec
Throughput	400 Kbits/sec
Environmental **Temperature** **Relative Humidity**	 0 to 55° C 0 to 95% non condensing
Pinouts	See table below for details

Pinouts are summarised in the following table.

PIN	Signal	Description
1	DCD	Data Carrier Detect (IN)
2	RXD	Receive Data (IN)
3	DTR/RTS	Data Terminal Ready / Request To Send (OUT)
4	GND	Ground
5	TXD	Transmit Data (OUT)
6	CTS	Clear To Send (IN)

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4.2 Local Area Network

A Local Area Network (LAN) will be installed in each outlet with more than one PC position counter comprising CAT 5-UTP cabling terminated with RJ45 connectors.

Outlets with two PC locations will use a cross-over cable between the two PCs.

Outlets with more than two PC positions will use a combination of the following unmanaged eight port hubs.

4.2.1 Eight port hub

This the 3COM OfficeConnect Hub 8/TPO.

Connections	8 RJ-45 ports for 10BASE-T twisted pair. Port 8 is switchable allowing connection of multiple units using 10 Base-T cable
Dimensions	Width = 220mm, Depth = 35.8mm, Height = 135.4mm
Weight	500g
Power	11VA

4.2.2 Hub Configuration

The number of hubs used will depend on the number of counter positions, including any back-office configuration, as shown in the following table.

Number of PC Configurations		**Number of Eight Port Hubs Required**
3 or 4		1
5 to 8		1
9 to 14		2
15 to 20		3
20 to 26		4

☞ Refer to Section 4.2 for details of interconnecting configurations of 2 PCs.

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4.2.3 Hub Installation

Hubs are mounted on the inside lid of a small steel cabinet which will be mounted at a convenient point in the outlet. The cabinet is 300mm wide by 550mm high by 95mm deep and contains a four-way power strip connected to 13A fused connection.

When 10m flyleads are used they will connect directly from the PC to the hub ports. If outlet boxes are required, they will terminate on a patch panel, and 0.5m flyleads will be used to connect the hub ports to the patch panel.

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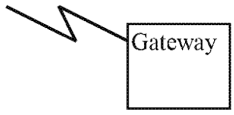
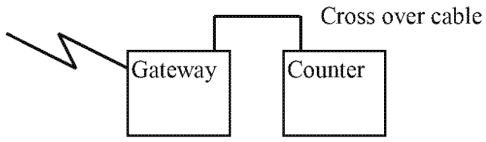
4.2.4 LAN / HUB Overview

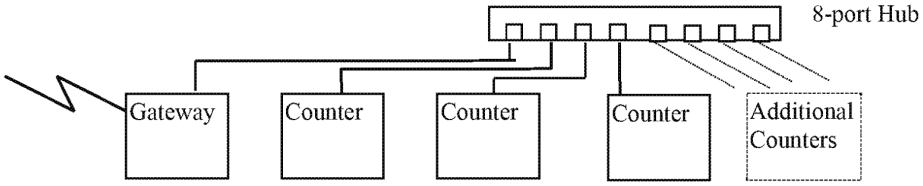
Single Counter



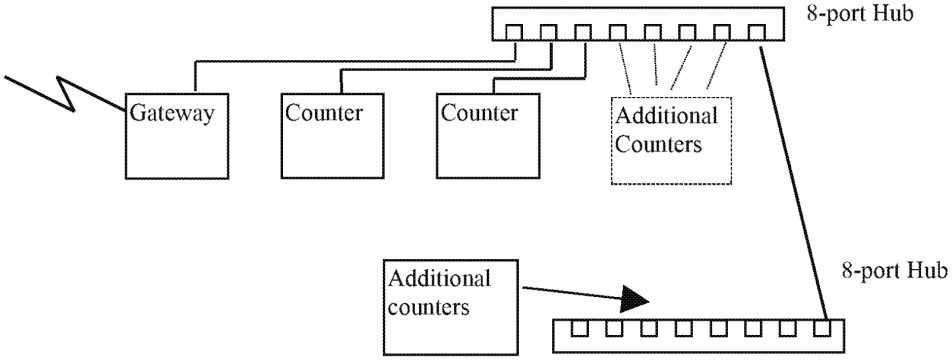
Two Counter



Multi counter configuration



Multi counter configuration



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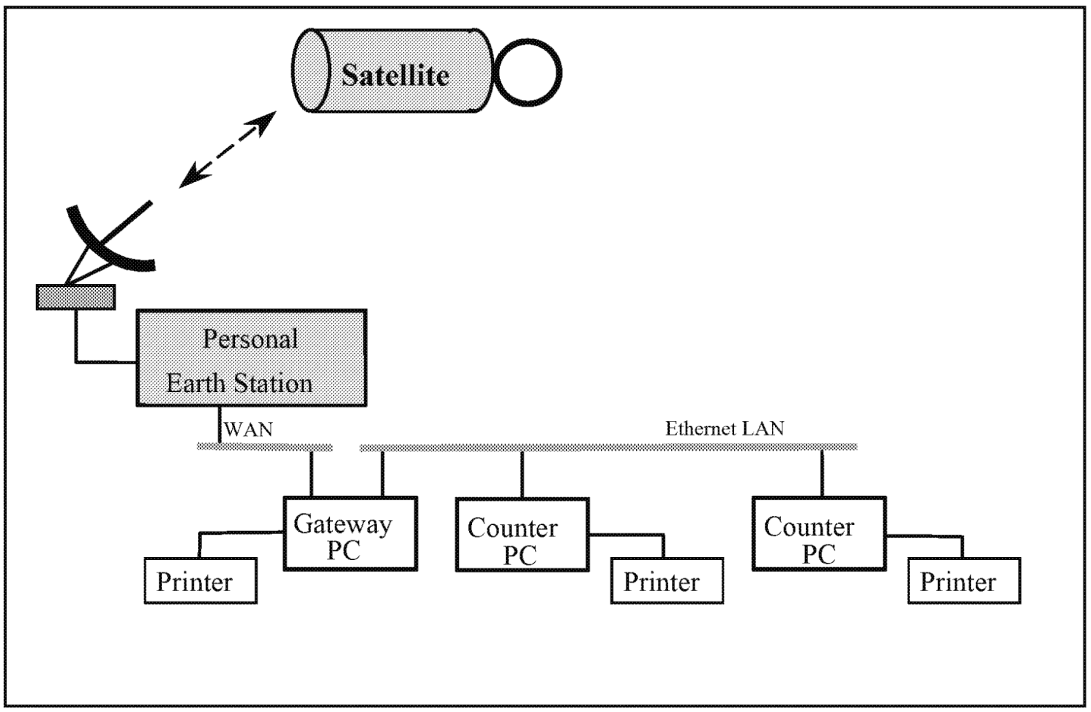
4.2.5 Counter Gateway PC to Satellite Connection

A second Ethernet controller is a provide for the gateway PC in place of the Eicon Diva Card. It is a Compaq Network Interface card (part no COM317600-B21) NC3120 10/100 TX PCI Intel UTPController.

The diagram shows that the second Ethernet connection uses a different subnet (IP WAN) to reach the PES.



4.3 Counter Monitor

An outlet will be installed with either a 10" colour monitor(s) or 12" flat screen panel(s), but not a combination of the two.

☞ Refer to Section o for further detail on counter monitors.

4.3.1 Microtouch 10" Colour Monitor

4.3.1.1 MicroTouch 10.0″ Colour Touch Monitor

Two monitor types will be used as follows:

- 10.0" Essex ND 1026 colour touch screen monitor

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- 10.0" ETC 1053 colour touch screen monitor.

4.3.1.2 Counter Monitor Specification

Each of the above monitors have the same specification as follows:

Resolution	640x480
Scanning frequency	Vertical 50 Hz to 90 Hz Horizontal 31.5,35.2,35.5,37.8 Khz
Dot pitch	0.26mm
Power	Outlet socket via mains cable
Input voltage	240v, 50/60 Hz
AC power consumption	80W (max)
Weight	7kg
Dimensions (mm)	260 (width) x 317 (depth) x 250 (height)
Temperature	0 - 50°C
Operation	10 - 90% relative humidity
User controls	Power, contrast, brightness, vertical position, vertical size

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4.3.1.3 Touch Screen

The 10.0″ colour touch screen specification is summarised in the following table.

Type	Analog capacitive
Screen resolution	1,024 touch points per axis within calibrated area
Construction	Glass sheet with transparent conductive coating beneath glass overcoat

4.3.2 12” Flat Screen Panel

4.3.2.1 Flat Screen Panel Specification

The flat screen panel specification is summarised in the following table. There are 2 suppliers Optoma and McPerson.

Resolution	640x480 (800x600 capable)
Power	Outlet socket via mains cable to a transformer
Input voltage	240v, 50/60 Hz
AC power consumption	20W (max)
Weight	Approx. 5kg
Physical Dimensions (mm)	300 (width) x 50 (depth) x 310 (height)
Temperature	0 - 45°C
Operation	20 - 80% non condensing
User controls	Power, contrast, brightness

4.3.2.2 Touch Screen

The 12” flat touch screen specification is summarised in the following table.

Type	Analog capacitive
Screen resolution	1,024 touch points per axis within calibrated area
Construction	Glass sheet with transparent conductive coating beneath glass overcoat

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4.4 Keyboard

4.4.1 LIFT-Key keyboard

A keyboard with integral SCR and MCR. The keys are arranged in four distinct areas covering:

- Alpha keys
- A centrally placed numeric block
- A set of function keys
- A set of cursor control and general keys.

☞ Refer to Appendix A for the key layout.

4.4.1.1 Keyboard Characteristics

The keyboard characteristics are summarised in the following table.

Dimensions (mm)	280(width) x 240(depth) x 48(height)
Number of keys	99
Key size	Alpha = 15.4mm x 15.4mm Space bar = 110.0mm x 15.4mm Numeric/other = 18.3mm x 18.3mm
Key life	50 million operations

4.4.1.2 Integral Mag Card reader / Smart Card reader

The LIFT-Key keyboard includes an integrated Magnetic Card Reader (MCR) and Smart Card Reader (SCR). The MCR is positioned across the top of the keyboard providing a long swipe path for left-handed and right-handed users. The SCR is positioned centrally and uses a Zero Insertion Force connector to minimise friction on the card contacts.

Magnetic card tracks	Track 1 and track 2 supported
Standards	Magnetic Card Reader - ISO 7811(1-4) Smart Card Reader - ISO 7816 (1-4) also GFM 2K and GFM 4K cards supported
LEDs	Green (ready), Amber (running), Red (failed)

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4.4.1.3 Cables and Connectors

Single cable from keyboard splitting to:

- PS/2 minidin keyboard cable/connector
- RJ12 data cable/connector.

4.5 Counter Printer

This subsection describes the specification of the counter printer.

4.5.1 Ithaca Series 94 1½-Station Combined Receipt and Impact Slip Printer

This printer provides a small footprint, low profile, printer with easy paper loading and slip insertion features. The integral power supply means no additional cabling less equipment is required under the counter.

Three methods of printing are available:

- Receipt printing
- Validation forms printing
- Inserted slip printing.

Printing method	9-pin serial impact dot matrix
Paper	Standard receipt roll or slips
Paper dimensions	Receipt - 82mm (W) 90 mm ∅ Slip 63.5mm (W) x 85.7mm (L) to 228.6mm(W) x 296.1mm (L)
Print speed	Between 5 and 10 lps depending on pitch and chrs/line
Paper feed speed	125mm per second
Printhead life	200 million characters
Dimensions	186mm (width) x 311mm (depth) x 152mm (height)
Noise	57.3 dBA
User controls	Feed, release, resume
Indicator lights	Ready (red, orange, green) status

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4.5.1.1 Principal Characteristics

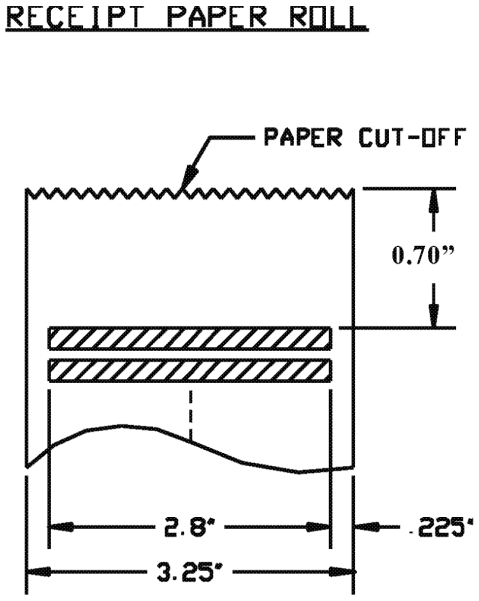
The principal characteristics of the printer are:

- Standard and EPSON command emulation
- Standard APA or EPOS bit image graphics
- CPI selections of 8,10,12,15,17.1,20 & 24
- Custom logo graphics print buffer
- Selectable printing of emphasised, enhanced, double wide, double high, double wide double high, half high, underline, subscript, superscript, & rotated (four 90 degree rotations)
- Barcode printing (I 2 of 5, Code 3 of 9, Code 128, UPC, EAN).

This printer will be installed with a Tekdata IEC filtered power supply adapter.

4.5.2 Printable Area Specification

4.5.2.1 Receipt Printing



Receipt Printable Area

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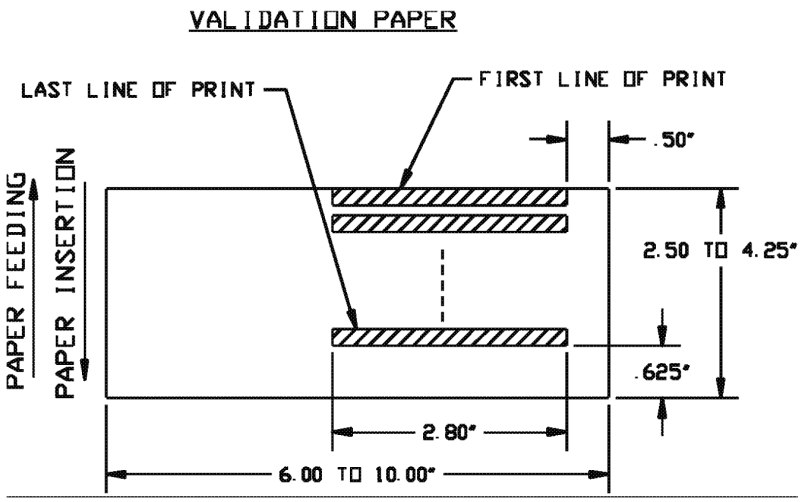
4.5.2.2 Validation Forms Printing

The Ithaca model 94 is equipped with independent validation. The movement of the validation form is under software or firmware control and allows the form to move either independent of the receipt (or receipt/journal) or in sync with the receipt (or receipt/journal).

LPI	Validation Lines
9	18
8	16
6	13



Validation Print

4.5.2.3 Inserted Forms Printing

The printing specification is summarised in the following table.

Top of form to top of print line	0.625”
Min. form length	3.375”
Min. form width	2.5”
Bottom of form to bottom wire	0.625”

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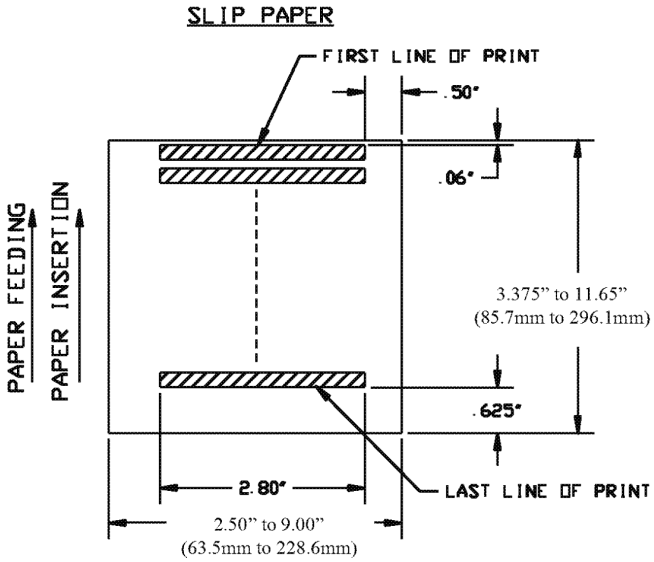
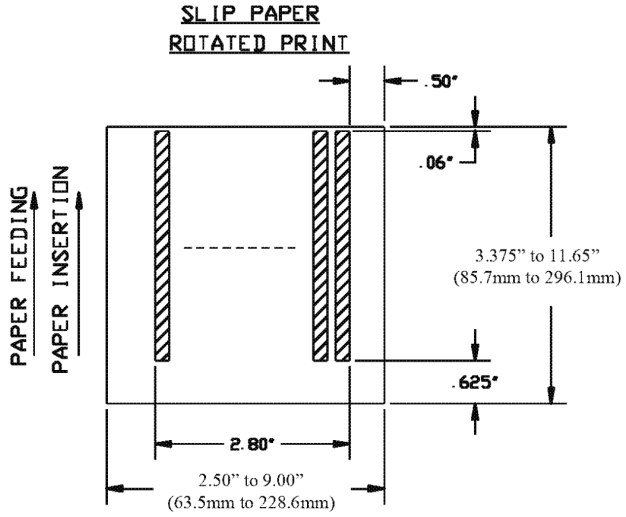


Inserted Slip Using Normal Print



Inserted Slip Using Rotated Print

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4.6 Barcode Reader

This subsection describes the specification of the barcode reader.

4.6.1 Welch-Allyn Scan Team 3400 HP

A hand-held CCD barcode reader using visible red LEDs. The reader has a pistol shaped handle which incorporates a trigger and all barcodes are read at a distance ranging from 1 to 7 inches.

The barcode reader produces a visible red line which the user generally positions across the barcode. Occasionally, the user may need to move the reader towards the barcode until an audible and visible indication is given of a successful read.

Performance

The performance of the barcode reader is summarised in the following table.

Working distance	1" to 7", depending on width of barcode
Maximum resolution	7 mm
Scan rate	120 scans per second
Symbologies	UPC, EAN, Code 39, Code 128, I 2of5, 2 of 5, Matrix 2of5, Code 11, Code 39, Plessey, Codabar

Environmental

The operating conditions for the barcode reader are summarised in the following table.

Operating temperature	0°C to +50°C
Storage temperature	-40°C to +70°C
Humidity	0 to 90% non-condensing
Mechanical shock	Functional after 10 drops from 5 feet to concrete

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Mechanical/Electrical

The mechanical/electrical specification for the barcode reader is summarised in the following table.

Weight	5.5 oz
Length	7.5 in
Current draw	235 mA @ 5V DC
Connector	RJ12 datacable and power stealer pass-through connector using mouse port

4.7 Smart Key Reader/Writer

Pathway will utilise the Post Office Ltd supplied APPU for equipping those counters that are required to handle smart key automated payments.

There is no requirement for a smart key reader at this time. This is not included in the counter configuration for roll out at this time.

4.8 Back-Office Printer

A monochrome printer will be provided as the office printer in every post office.

4.8.1 Office Printer - Ink Jet

4.8.1.1 Epson 200 Ink-Jet Printer

The specification for the Epson 200 ink jet printer is summarised in the following table.

Printing method	On-demand ink jet
Colour	Black print head - 64 nozzles
Print speed	2.5 pages per minute
Printable columns	See table below for details
Resolution	Max 360-dpi raster printed on a 720-dpi x 720-dpi matrix
Fonts supported	Bitmap: EPSON Roman, Sans Serif, Courier Scaleable: EPSON Roman, Sans Serif, Roman T, Sans Serif H
Barcode printing	Application generated 1-D (including Code 39 EAN-8, EAN-13 & Code 128) and 2-D (PDF417) bar-codes can be printed

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Weight	3.9kg
Power	15W (when printing)
Paper supported: **Single sheet**	A4 (210mm x 297mm), Letter (216mm x 279mm), Legal (216mm x 356mm) Statement (139.7mm x 215.9mm) Executive (190.5mm x 254mm)
Thickness	0.08mm to 0.11mm
Weight	64 g/m^2 to 90g/m^2
Envelopes	No. 10, DL
Thickness	0.16mm to 0.52mm
Weight	45 g/m^2 to 90 g/m^2
Index cards	A6
Thickness	0.21mm
Weight	188g/m^2
Physical Dimensions	397mm (w) x 528mm (d) x 267mm (h) (includes sheet feeder)
Noise	45 dBA (maximum)

Printable columns are summarised in the following table.

Character Pitch	Print column	Speed (chs/inch)
10	80	125
12	96	150
15	120	188
17 (10 condensed)	136	214
20 (12 condensed)	160	250

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4.8.2 Office Printer – Laser / LED

This type of office printer is either the Panasonic KX-P6500 laser printer or the OKI OKIPAGE 8p LED printer.

4.8.2.1 Panasonic KX-P6500

The specification for the Panasonic KX P6500 printer is summarised in the following table.

Printing speed	6 ppm
Resolution	300 x 300 dpi
Paper tray	Single 100 sheet tray
RAM	1 MB
Noise	45 dBA (maximum) 0 dBA in standby
Physical Dimensions	132mm (w) x 378mm (d) x 287mm (h) [295mm (w) x 378mm (d) x 360mm (h) (includes paper trays)]
Weight	6.5kg
Power	480W printing 12W power save mode (occurs after 15 mins with no printing)
Operating environment	10°C to 32.5°C 20% to 80% relative humidity

4.8.2.2 OKI OKIPAGE 8p

The specification for the OKI OKIPAGE 8p printer is summarised in the following table.

Printing speed	7.7 ppm
Resolution	600 x 1200 dpi (maximum)
Paper tray	Single 100 sheet tray
RAM	2 MB
Noise	50 dBA (operating)
Physical Dimensions	324mm (w) x 346mm (d) x 264mm (h) (includes paper tray)
Weight	4.3 kg

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Power	450W Peak 180W Typical Operation 37W Idle 6W Power Save Mode
Operating environment	10°C to 32°C 20% to 80% relative humidity

4.9 PIN pad

A detailed specification is available [6].

4.10 Consumables

Consumables for the above equipment are specified in Post Office Ltd Schedule B4 (Ref. [4]).

4.11 Cables and Connectors

Although not a specific counter component, an uninterrupted Power Supply is provided in specific outlets. It is described in [7]. It provides 4 filtered power points, and an emergency power supply in the form of a battery that allows the counter to be powered off gracefully when there is a power cut. It is fitted in the outlet between the mains power supply and the counter. Where it is in use, the counter components that would normally take the power from the Horizon power points are plugged into the power points on the UPS.

The table below identifies all of the cables at counter position within an outlet.

Component	Cable type	Connected to	Part No. (where separate)	Maximum cable length :(in mm)
PC Base Unit	Power	Mains	A7100220	2380
FSP monitor	Power	Base Unit	N/A	3500
FSP monitor	Data	Base Unit	N/A	2900
Monitor	Touch	Base Unit	N/A	2900
Monitor (Essex)	Power	Base Unit	N/A	2900
Monitor (ETC)	Power	Base Unit -		

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Component	Cable type	Connected to	Part No. (where separate)	Maximum cable length :(in mm)
		via 'short' mains filter	PP501013	3120
		via 'long' mains filter	PP501018	3250
Monitor	Data	Base Unit	N/A	2900
Keyboard	Power/ keyboard data	Base Unit	N/A	2700
Keyboard (integral MCR/SCR)	Data	Base Unit	N/A	2700
Counter printer	Power	Mains - via 'short' mains filter	98-7891 PP501013	2600
		via 'long' mains filter	PP501018	2730
Counter printer	Data	Base Unit	PP501009	2950
Barcode reader	Power Data (single cable assembly)	Keyboard port using power stealer Base Unit	N/A	2400
Office printer (ink jet)	Power	Mains	N/A	1950
			2098-3	3000
Office printer (ink jet)	Data	Base Unit	PP501010	3000
Office printer (Laser / LED)	Power	Mains	N/A	2150
			2098-3	3000

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Component	Cable type	Connected to	Part No. (where separate)	Maximum cable length :(in mm)
Office printer (Laser / LED)	Data	Base Unit	PP501010	3000
Hypercom PIN pad	Power	Mains adapter and 'flying lead'	FRF15400	2000
Hypercom PIN pad	Data	Base Unit	FC012403 FC012406	3000 6000

All mains cables will terminate with a standard 13 amp plug.

The data cable for the touch screen controller will terminate with a standard thumbscrew connected DB9 connector.

The data cable for all other counter peripherals supplied by Pathway will be terminated with an RJ12 connector.

Where more than one value is shown for a component, these indicate options for the component.

PIN pad power cables and the power supply unit are supplied by Hypercom, they are shown here for completeness. [6] holds the definitive specification.

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4.11.1 Serial Port Connectivity

The following table identifies the serial ports used by all counter components.

Port	PC-COM	Specialix	Type	Device
1	1	-	DB9	Touch screen controller
2	2	-	DB9	Ithaca counter printer
3	-		-	Reserved
4	-		-	Not used
5	-	1	RJ12	Barcode reader
6	-	2	RJ12	Smart card/Mag. card
7	-	3	RJ12	Not used
8	-	4	RJ12	Electronic weigh scale
9	-	5	RJ12	PIN pad
10	-	6	RJ12	Not used
11	-	7	RJ12	Not used
12	-	8	RJ12	Not used

4.12 Implementation Strategy

The implementation strategy for outlets will be defined for each release in Ref. [2]. This will include details relating to equipment layout, cabling options etc.

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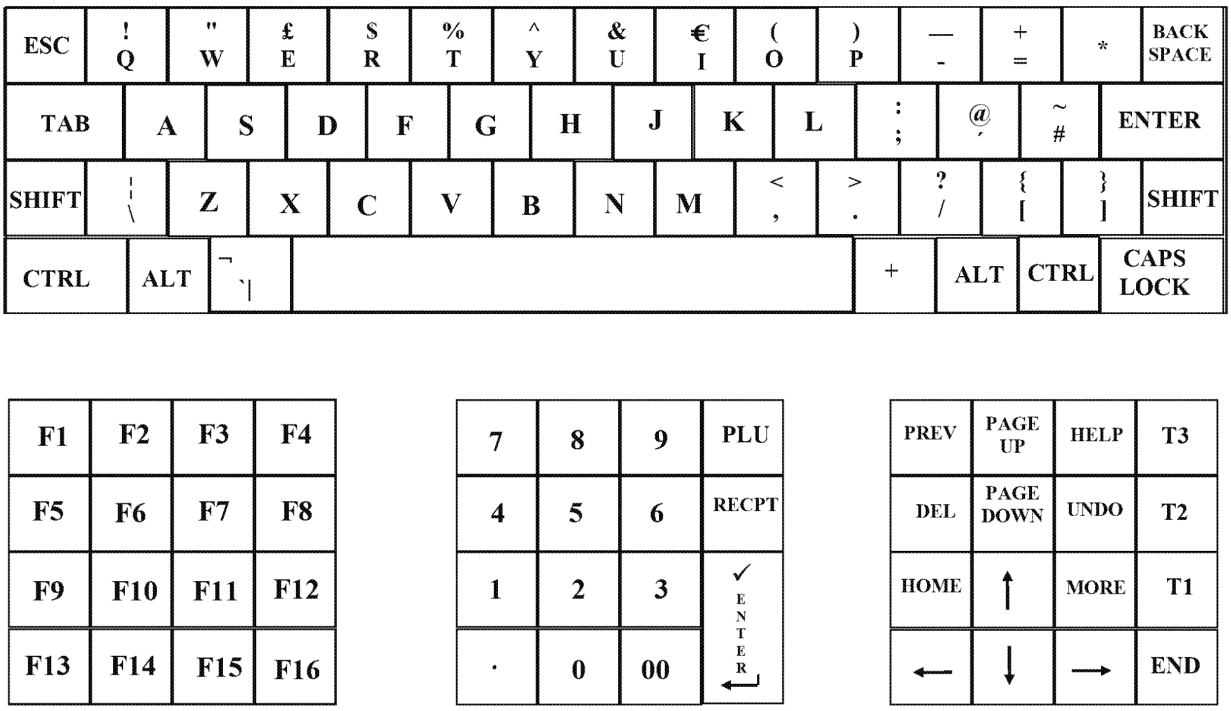
A.1 Appendix A

The counter keyboard will have the following key layout.



LIFT-Key keyboard specification

➢ The size and style of the above characters is illustrative only.

The colour of the keyboard will be RAL7021 (dark grey). The keytop colour will be Smoke Tan 85134 with black lettering.