Unique Micro Design
Advanced Thinking Products

Model M221
Peripheral Controller
User Manual

Revision History		
Date	Issue	Comments
18/05/95		Preliminary

1. Introduction

This manual provides basic information about connecting to the Unique Micro Design Model 221 Peripheral Controller, a member of the *UMD ProtoLink Architecture family of products.*

The Model 221 is based on the *UMD Model 301 Controller Module* which is also used internally in other products such as wall mount terminals, multi-in/out wedges, peripheral controllers and custom VGA terminals.

In essence, the *UMD ProtoLink Architecture* is a versatile product development system.

The architecture specifies the following:
  • standard definitions for configuration parameters that can be consistently used across a broad range of products.
  • standard command set and peripheral control philosophy.
  • standard set of hardware facilities which includes non-volatile memory to hold configuration parameters, a peripheral interface bus, serial ports which provide power for scanners and bar code wand, display, external keyboard, keyboard wedge and magnetic card reader interfaces.
  • peripheral interface bus that allows the addition of other modules to the core controller.

The *UMD Model 301 Controller Module* has extensive programmable capabilities, which are not discussed in this manual (contact Technical Support at Unique Micro Design for further information).

2. The Peripheral Controller Features

Products in the UMD Peripheral Controller family have an array of programmable attributes including the communication settings, bar code decoder symbology settings and the serial port input / output configurations. Programming can be achieved through the keyboard or serial ports also programming bar codes can be used with a wand connected to the BCR port. The programmed details are permanently saved in memory.

The UMD Model 221 can also accept transitional commands from the host computer. Typical commands would be to open a cash drawer, direct output to a specified communication port and return bar code data. In this way, one host computer communication channel can control a number of peripheral devices. Power is provided from a plug pack which also powers attached bar code scanner through the serial ports.

Some other options available include low cost bar code wand, a variety of bar code scanners, magnetic card reader, key lock or "Touch Memory" security and 2 line by 16 character LCD display.
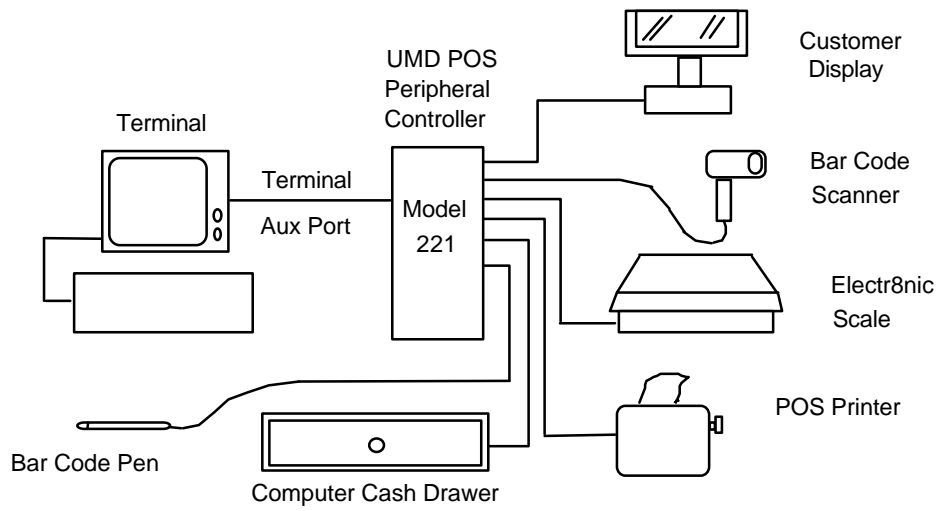
3. Peripheral Controller applications.
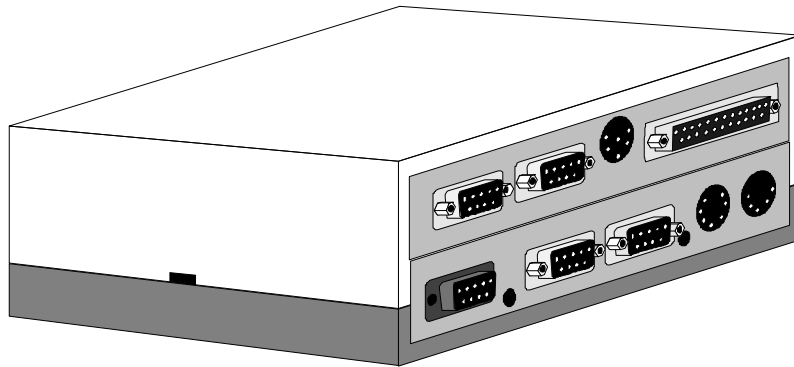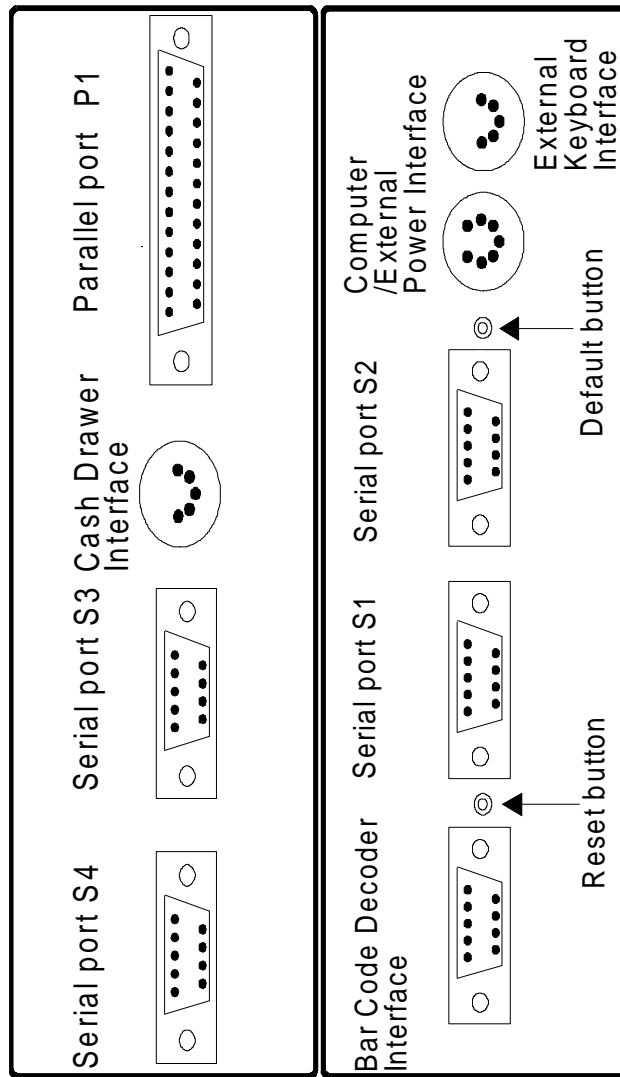
Model 221 Peripheral Controller.

The UMD Model 221 provides 4 serial ports, 1 cash drawer driver output, 1 bidirectional parallel port, 1 BCR wand port and keyboard input port, all in the one programmable product.

The M221 can be used connected directly to a computer serial port or used between a terminal and its host.

UMD POS
Peripheral
Controller

Customer
Display

Terminal

Terminal

Model
221

Aux Port

Bar Code
Scanner

Electr8nic
Scale

POS Printer

Bar Code Pen

Computer Cash Drawer

A typical application

4. Connector Detail for M221

4.1. Bar Code Decoder Interface

The bar code decoder interface connects to industry standard digital wands, slot readers and devices that emulate wands.

These scanners contain an optical sensor with a LED light source, optics and circuits. The signal conditioning circuits converts optical information into digital pulses representing bars and spaces which the controller module decodes.

Pin	I/O	Description
1	-	no connection
2	i/p	data input
3	-	no connection
4	o/p	+5 volts DC
5	-	no connection
6	-	no connection
7	-	signal ground
8	-	shield ground
9	o/p	+5 volts DC

Bar code decoder interface

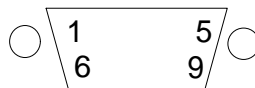Front view of DB9 plug
AMP snap release

8

4.2. Serial Ports

There are two full duplex serial ports, designated "S1", "S2", "S3" and "S4". The interfaces are RS232 +/- 9 volt levels. Five volt DC power is also provided on the interface to allow bar code scanners to derive their power from the controller module.
The default communications parameters are 9600 baud, 8 data, no parity and one stop bits.

| Pin	I/O	Description
1	-	no connection
2	i/p	RxD
3	o/p	TxD
4	o/p	DTR
5	-	Ground
6	-	no connection
7	o/p	5 Volts
8	i/p	CTS
9	o/p	optional auxiliary power

Serial interface

Front view of DB9 plug

4.3. Computer/Power Interface

The controller module connects to a PC system unit's keyboard interface via the seven pin computer/power interface. When connected in this manner, power is derived from the PC. Note that the seven pin DIN connector will mate with five pin 180 degree DIN connectors which are used to connect the PC to this interface. If the controller module is not connected to a PC via the keyboard interface, then power must be supplied externally. Five volts DC at typically 300 ma is required to operate the controller. The computer/power interface can accept either 6V to 9V unregulated, or 5V regulated power inputs. When the unit is supplied with unregulated power, usually from a 6 to 9V plug pack, an internally regulated 5V output is provided. Note that this 5V output is required to be reconnected to the 5V regulated input on the connector.

Pin	I/O	Description
1	i/o	Clock
2	i/o	Data
3	-	Reset
4	-	Ground
5	i/p	5 Volt DC power
6	i/p	DC unregulated power in
7	o/p	5 Volt DC regulated out (jumper to pin 5, must have unregulated input on pin 6)

Computer/Power interface 7 pin DIN socket

```
      7 ⌐▢⌐ 6
      3 (∘  ∘) 1
          ∘ ∘
      5 ⌐∘ ∘⌐ 4
          2
```
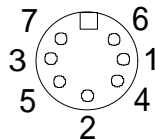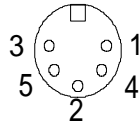
Front view of 7 pin DIN socket

4.4. External Keyboard Interface

A standard PC keyboard may optionally be connected to the external keyboard interface. When connected, this allows the controller module to operate as a keyboard wedge between the system unit and the standard keyboard.

Pin	I/O	Description
1	i/o	Clock
2	i/o	Data
3	-	Reset
4	-	Ground
5	o/p	5 Volt DC

Keyboard interface 5 pin 180 degree DIN socket

Front view of 5 pin DIN socket

4.5. Reset and Default Buttons

The reset button physically resets the microcontroller, forcing it to perform a power up sequence.

The default button is used to return the non volatile configuration memory back to the default settings. To use this facility, the default button is held whilst pressing the reset button. Upon reset the controller module will issue three rapid beeps to indicate that the defaults have been set.

NOTE:
If any changes have been made to the programming of the Model 221, these will be lost when the reset to defaults sequence above is used.

4.6. Parallel Port

The Input/Output module has a parallel port, that can be programmed to be an input or an output. The parallel port is designated as "P1".

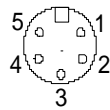| Pin	Description	As output	As input
1	Strobe(-)	O	I
2	Data 0	O	I
3	Data 1	O	I
4	Data 2	O	I
5	Data 3	O	I
6	Data 4	O	I
7	Data 5	O	I
8	Data 6	O	I
9	Data 7	O	I
10	Acknowledge(-)	I	O
11	Busy	I	O
12	Paper end	I	-
13	Select	I	-
14	Autofeed(-)	n/c	n/c
15	Error(-)	I	-
16	Initialise(-)	n/c	n/c
17	Select input(-)	Ground	Ground
18-25	Ground	Ground	Ground

Parallel I/O Interface
DB25 socket

Front view of DB25 socket

13

4.7. Cash Drawer interface

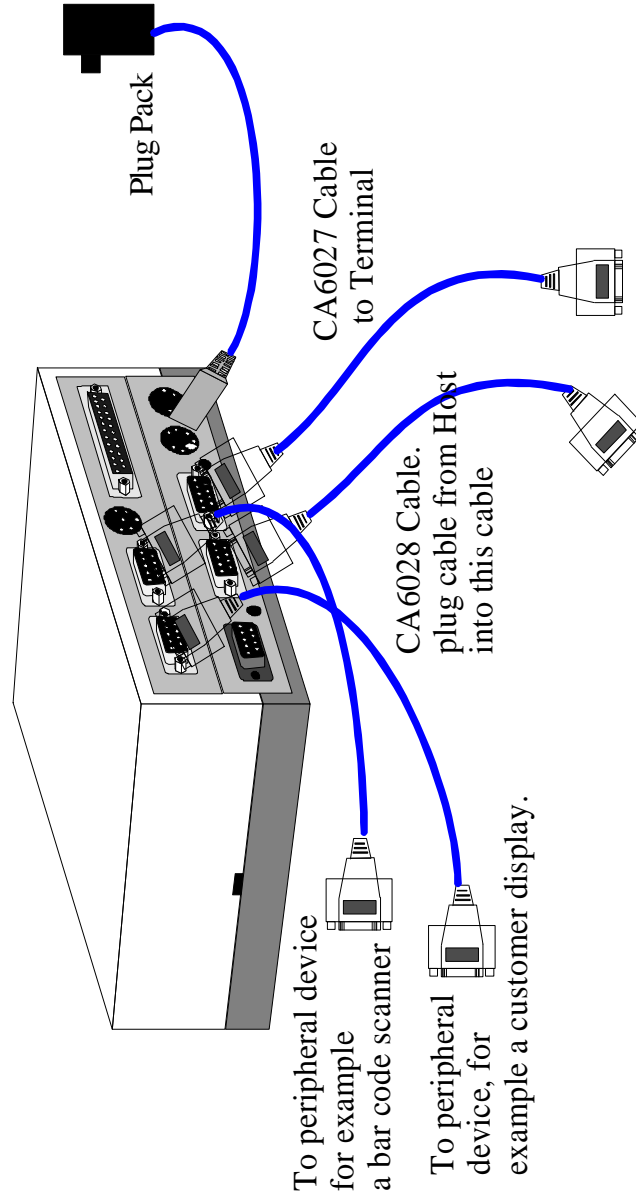The Input/Output module has an output drive for solenoid type cash drawers .

Pin	I/O	Description
1	o/p	coil positive
2	i/p	status feedback
3	o/p	coil negative
4	-	no connection
5	-	no connection
case	-	ground

Cash Drawer Interface
5 Pin 270 degree DIN socket

Front view 5 pin DIN socket

5. Configuration Example for M221

Plug Pack

CA6027 Cable
to Terminal

CA6028 Cable.
plug cable from Host
into this cable

To peripheral device
for example
a bar code scanner

To peripheral
device, for
example a customer display.

15

A. Ordering information and Accessories

Part Number	Model Number	Description

M221 peripheral controller with 4S, 1P, 1CDI, 1BCR

9-0221-001-6	K221-001	M221 UMD Peripheral controller

Options

	option Cx	Mag card reader (single track, x= 1,2 or 3)*
	option Cy	Mag card reader (two track, y= 1&2, 2&3)*
	option D216	2x16 LCD Display

Cables and accessories

2-5202-020-2	CA202	5 pin DIN plug to 5 pin DIN plug (AT)
2-5226-020-0	CA226-2	PS/2 system cable (5 pin DIN plug to 6 pin mini DIN plug)
2-5227-000-1	CA227	Adapter (5 pin DIN plug to 6 pin mini DIN socket, keyboard)
2-5211-020-1	CA211-2	*UMD* serial - D9 skt to D9 skt 2m
2-6027-020-1	CA6027-2	*UMD* serial - D9 skt to D25 plug Wyse 60 com port
2-6028-020-2	CA6028-2	*UMD* serial - D9 skt to D25 plug com port emulation
2-6999-002-8	CA308/309	*IBM* 319*x* terminal series adaptor set
2-6035-020-5	CA6035-1	ProtoLink CDI to base cash drawer
1-6004-107-5	PP6D1000-E	M264 plug pack

Documentation

6-0221-992-8	DOC-M221-PD	Product description
6-0264-997-9		M264 programming kit
6-0221-993-6	DOC-M221-UM	M221 user manual
7-5010-122-7	DOC-AN-122	Product overview: *UMD* Custom Keyboards
7-5020-107-7	DOC-TN-107	*UMD* ProtoLink Architecture

17

... Technologists & Suppliers to Professional Systems Integrators ...