

Unique Micro Design

Model M264 Custom Keyboard User Manual

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***First Choice of
professional systems integrators***

Revision History

Date	Issue	Comments
05/05/95	1	First Issue
19/05/95	2	Parallel Port change S3 and S4 reversed page 18
24/05/96	3	Company Position statement changed ProtoLink Programming Utility added Email address added
27/08/01	4	Change mission statement and setup for FPD455

1. Introduction

This manual provides basic information about the Unique Micro Design Model 264 Custom Keyboard.

The Model 264 is based on the *UMD ProtoLink Architecture* which is also used 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 platform which provides the system integrator with opportunities to ‘add value’.

The architecture specifies the following:

- standard definitions for configuration parameters that can be consistently used across the entire *ProtoLink* family of products.
- standard command set and peripheral control philosophy.
- standard set of hardware facilities which includes non-volatile memory to hold configuration parameters, 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 ProtoLink platform* has extensive programmable capabilities, which are not discussed in this manual (contact Technical Support at Unique Micro Design for further information).

2. Custom Keyboard Features

The UMD Custom Keyboard Family can have up to 128 keys arranged in an 8 x 16 matrix. Each key is programmable to return user defined codes by downloading a text file via the keyboard or serial port with details being permanently saved. There are no configuration switches to be tampered with. The customisable keycaps and layout provide a visual aid to the operator through key legend, colour and position cues. Connectors are recessed to reduce footprint and contact with spilled liquids.

There are two types of keys: *keycaps type* (Model 264-K Series) and *sealed type* (Model 264-S Series). With both types, the 8 x 16 grid spacing is flexible allowing a mixture of QWERTY style (half space offset keys) with chess board style layouts.

The *keycaps type* has removable keycaps, allowing the user to reposition the keycaps within the switch matrix. A selection of keycaps can be ordered with variations in colour, legends, spacers, style and size (single, double width and quad (double width/height)). Double width keys can be readily oriented horizontally or vertically.

The *sealed type* has a flexible plastic sheet which covers short travel mechanical keys, which provide tactile feedback. The keyboards may be labelled by writing on a paper legend insert sheet or pre-printing the plastic overlay.

The legend insert sheet and plastic overlay are held in place by registration studs and a fixing lid which is readily opened to enable quick changes. The sealed keyboard is suitable for moist areas such as those found in bars, laboratories and restaurants and can be quickly wiped down.

Products in the UMD Custom Keyboard range have two major modes of operation - *keyboard* and *serial*. In keyboard mode personal computers connect via the keyboard interface. External standard keyboards may also be used in series. There are two serial ports on the keyboard available to attach devices such as bar code scanners to the PC without the need to alter software.

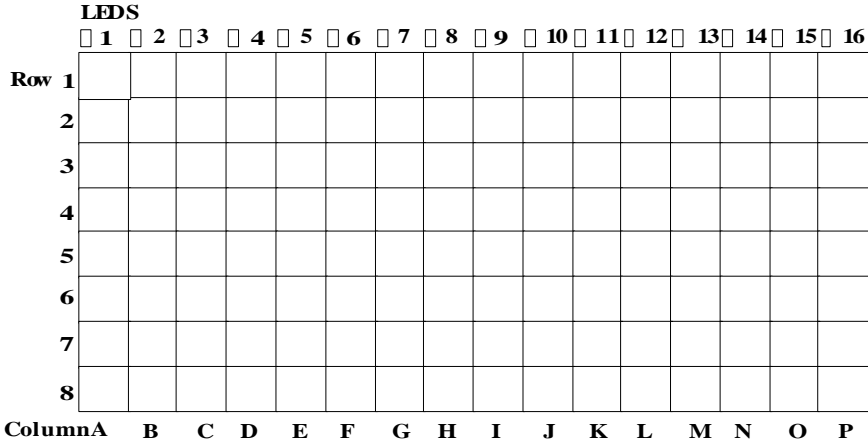
When used in the *keyboard wedge mode* Custom Keyboards are totally transparent to the PC which accepts the keyboard, bar code, magnetic card and serial inputs as if they were typed from the standard keyboard. With the *serial mode* of operation, a plug pack provides power to the unit. Any key depression, bar code or magnetic card data read is output on a serial port. The second serial port is available for auxiliary I/O, eg with a printer or bar code scanner.

From the factory, the keys in the keyboard are programmed with their row / column grid position, that is, the key at the top left corner, when pushed outputs the string "A1", the next key down outputs "A2" and so on. There are sixteen LED indicators above the keypad area. The last LED on the right (LED 16) indicates the power status. LED 15 is the good read indicator used by the BCR and optional MCR inputs.

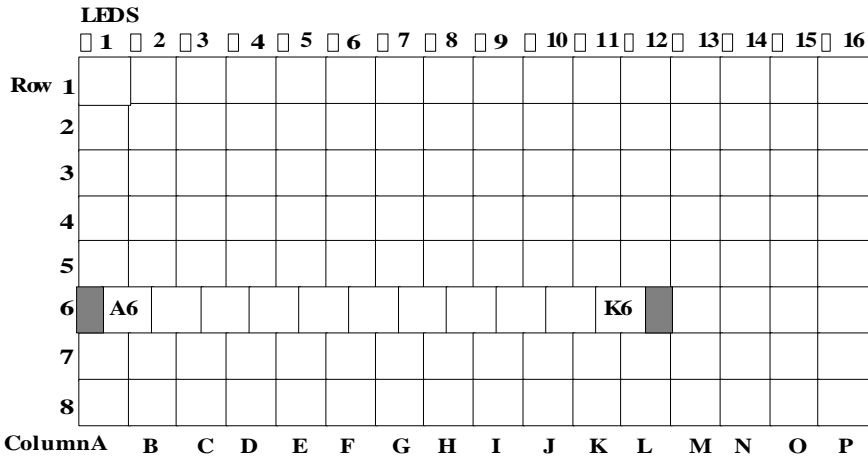
In keyboard mode, LED 12 is programmed to represent the state of the *Numlock*, LED 13 *Capslock* and LED 14 *Scroll lock*. All 16 LED's are programmable.

Other options available from UMD to interface to the M264 include: low cost bar code wands, a variety of bar code scanners, integrated magnetic card reader, expanded I/O (2 serial 1 parallel ports), keylock or "Touch Memory" security. Unique Micro Design can also provide a customisation service to meet specialised requirements.

3. Keyboard layout



Standard 128 key keyboard layout, showing the key row / column locations and indicator LED's.



127 key keyboard layout, Qwerty offset, showing the key row / column locations and indicator LED's.

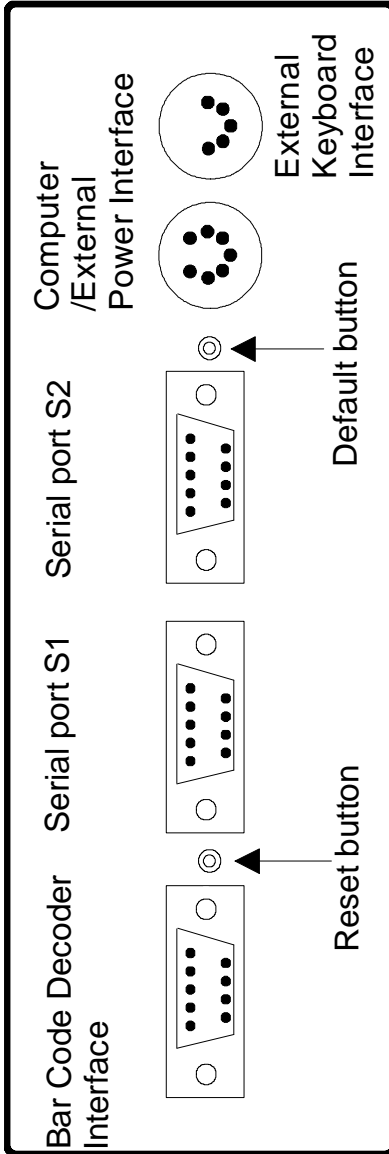
3.1. Insert Sheets and Overlays

Legend insert sheets are available for both the keycap and sealed keyboards. These sheets allow each key to be labelled to suite the programmed key sequence.

The keycaps type (Model 264-K Series) has removable keycaps, allowing the user to reposition the keycaps within the switch matrix. A selection of keycaps can be ordered with variations in colour, legends, spacers, style and size (single, double width and quad (double width/height)). Double width keys can be readily oriented horizontally or vertically.

The sealed type (Model 264-S Series) has a flexible plastic sheet which covers short travel mechanical keys, which provide tactile feedback. The keyboards may be labelled by writing on a paper legend insert sheet or pre-printing the plastic overlay, these are held in place by registration studs and a fixing lid which is readily opened to enable quick changes.

4. Connector Detail for M264



Connector detail for the standard ProtoLink Architecture interfaces

4.1. Bar Code Decoder Interface

The **bar code decoder interface** provides connectivity for industry standard digital wands, slot readers and devices that emulate wands.

The decoder interface requires input from devices that convert optical information into digital pulses, representing bars and spaces which are decoded by the keyboard hardware.

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
9 Pin DB9 plug, AMP snap release



Front view of DB9 plug
AMP snap release

4.2. Serial Ports

There are two full duplex **serial ports**, designated "S1" and "S2". The interfaces use 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
DB9 plug connector



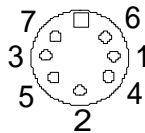
Front view of DB9 plug

4.3. Computer/Power Interface

The ProtoLink Architecture **computer/power interface** connects to a PC system unit's keyboard 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

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

Computer/Power interface 7 pin DIN socket



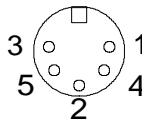
Front view of 7 pin DIN socket

4.4. External Keyboard Interface

A standard PC keyboard can concurrently be connected to the **external keyboard interface**. When connected in this way, the custom keyboard operates 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.

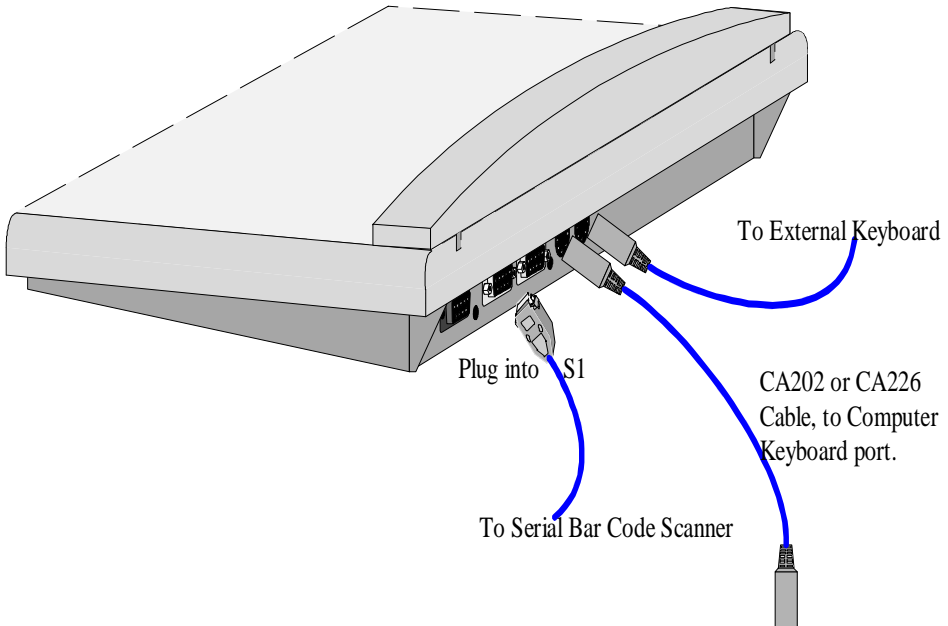
The **default button** is used to return the non volatile configuration memory back to the default settings. We suggest the use of the tip of a ball point pen to depress these buttons. To use this facility, the default button is held whilst pressing the reset button. Upon reset the controller module 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 264, these will be lost when the reset to defaults sequence above is used.

5. Connecting the M264

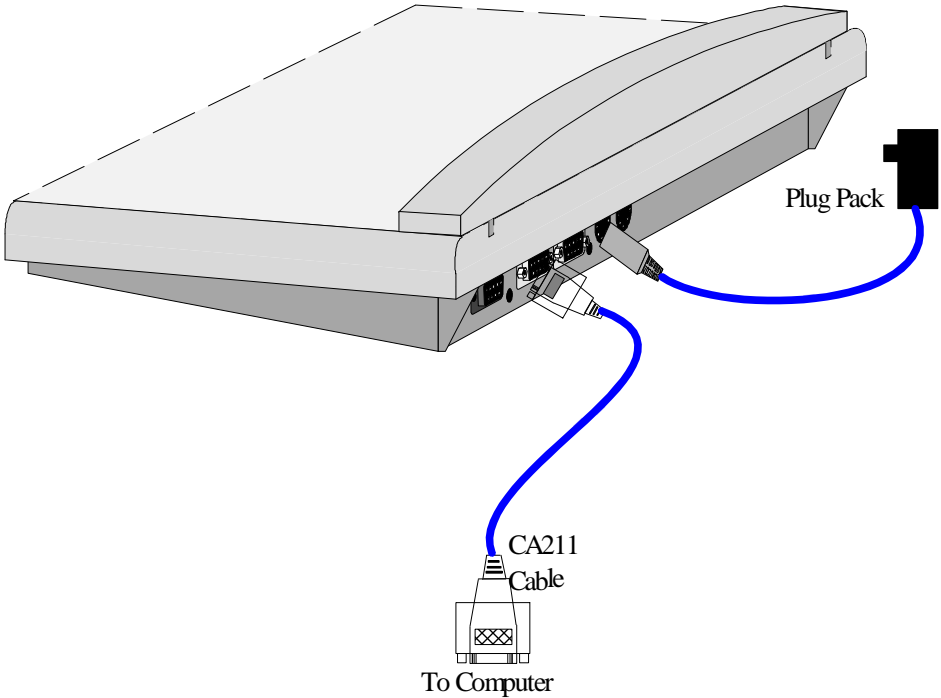
5.1. Keyboard Mode



Turn computer off when connecting devices to the computer keyboard port. Plug the CA202 (AT) or CA226 (PS/2) cable into the keyboard port of the computer and the other end into the **Computer/External Power Interface** on the M264. When an external 101 keyboard is used plug this into the **External Keyboard Interface**.

Serial bar code scanners can be plugged into S1 and S2. Bar code wand scanners are connected to the **Bar Code Decoder Interface**.

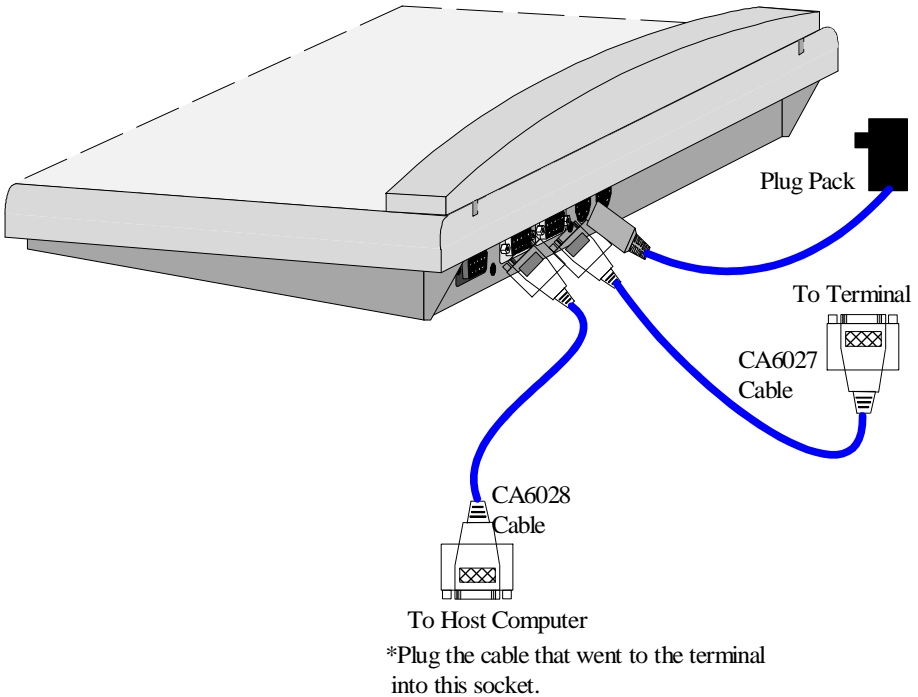
5.2. Serial Mode, Computer Serial Port connection.



The above example shows the M264 keyboard connected to the serial port on a computer. When programmed for this mode, any key depression will send the programmed key sequence to the serial port of the computer.

The plug pack provides external power to the M264 keyboard and is connected to the **computer/power interface**.

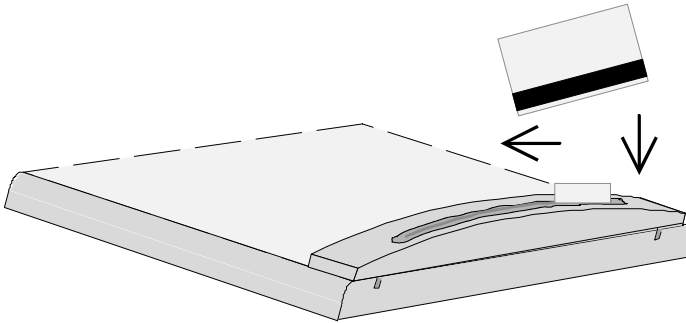
5.3. Serial Mode, Terminal - Host connection



The above example shows the M264 keyboard being used between a terminal and host computer. Once programmed for this mode, any key depression will send the programmed key sequence to the host computer.

The plug pack provides external power to the M264 keyboard and is connected to the computer/power interface.

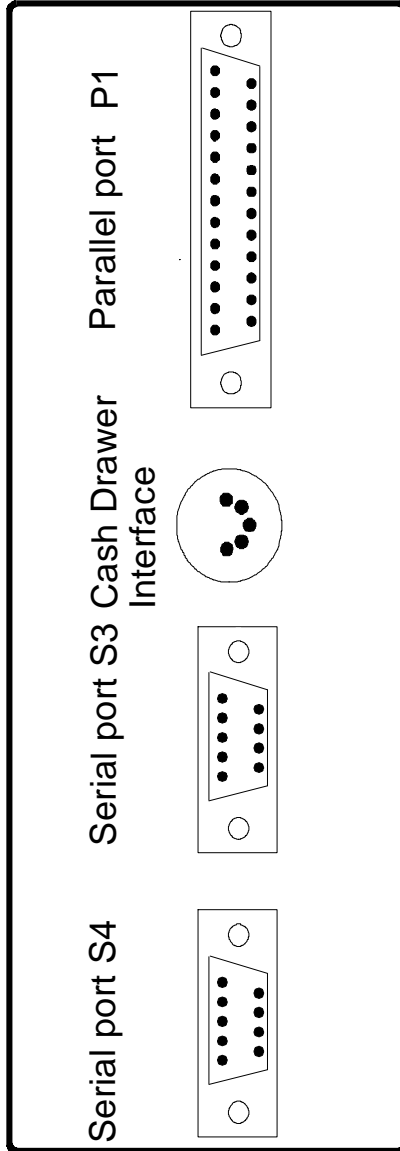
6. Optional: Magnetic card reader



The optional magnetic card reader is located inside the raised top section of the keyboard. It is accessed through the fixing lid. The tracks that the reader recognises are indicated on the serial number label, eg, track 2 or track 1 & 2.

Slide the magnetic card through the reader from **left to right** at a constant, speed. When inserting a card into the swipe reader, the **magnetic stripe must point away from the keys** indicated by the arrow moulded into the plastic fixing lid. An audible signal is emitted if the card has been read successfully and the good read indicator, LED 14, will flash..

7. Optional: Expanded I/O Module



Connector detail for the ProtoLink Architecture I/O module interfaces

7.1. Serial Ports

There are two full duplex serial ports, designated "S3" and "S4". The interfaces use 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
DB9 plug connector



Front view of DB9 plug

7.2. 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 “P1”.

Pin	Description	As	As input
1	Strobe(-)	O	I
2-9	Data 0-7	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



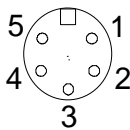
Front view of DB25 socket

7.3. 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

8. Ordering information and Accessories

Part Number	Model Number	Description
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M264 keyboards

9-0264-001-1	K264-001	Sealed keyboard only (<i>no cables</i>)
9-0264-010-6	K264-010	Keycap style (<i>QWERTY & Num pad</i>)

Keyboard with keyboard cable only

9-0264-002-5	K264-002	Sealed keyboard with AT cables
9-0264-003-3	K264-003	Sealed keyboard with PS/2 cables

Kit - keyboard, cables & programming kit

9-0264-029-5	K264-029	Sealed keyboard for PS/2
9-0264-026-1	K264-026	Sealed keyboard for AT
9-0264-027-9	K264-027	Keycap version for AT
9-0264-028-7	K264-028	Keycap - QWERTY layout for AT

Part Number	Model Number	Description
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Developers Kits - all cables, programming kit & plug pack

9-0264-004-1	K264-004	Sealed keyboard
9-0264-005-9	K264-005	Keycap
9-0264-006-7	K264-006	Keycap - QWERTY off-set layout

Options

	option Cx	Mag card reader (<i>single track, x= 1,2 or 3</i>)
	option Cy	Mag card reader (<i>two track, y= 1&2, 2&3</i>)
	option I	I/O Expansion board
	Custom cable gland option	Applies only to sealed keyboards (<i>Cables enter via cable glands for totally</i>)

Cables and accessories

2-5202-020-2	CA202	5 pin DIN plug to 5 pin DIN plug (<i>2m</i>)
2-5226-020-0	CA226-2	5 p DIN plug to 6 pin Mini DIN plug (<i>2m</i>)
2-5227-000-1	CA227	5 p DIN plug to 6 pin Mini DIN socket
2-5211-020-1	CA211-2	<i>UMD</i> serial DB9 skt to DB9 skt (<i>2m</i>)
2-6027-020-1	CA6027-2	<i>UMD</i> serial DB9 skt to DB25 plug (<i>Wyse 60 comm port</i>)
2-6028-020-6	CA6028-2	<i>UMD</i> serial DB9 skt to DB25 plug (<i>comm port emulation</i>)
1-6004-107-5	PP6D1000-E	M264 plug pack (<i>for serial mode only</i>)

Documentation

6-0264-992-6	DOC-M264-PD	Product description
9-3143-400-4	S143-4	ProtoLink programming utility
6-0264-993-7	DOC-M264-UM	M264 user manual
7-6070-001-1	DOC-ProtoLink	ProtoLink Reference manual
7-5010-122-7	DOC-AN-122	Product overview: <i>UMD</i> Custom Keyboards
7-5020-107-7	DOC-TN-107	<i>UMD</i> ProtoLink Architecture

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