UCI-2000-P PROTOCOL TRANSLATOR

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Document Number 81-9059-0546-0 Revision B

Original - March 2003

Rev B added P1E (CPULink) data and changed company address and logo

About This Manual

This manual provides detailed instructions for the installation, operation, and maintenance of the PESA UCI-2000-P Protocol Translator.

Warnings, Cautions, and Notes

Warning statements identify conditions or practices that can result in personal injury or loss of life.

Caution statements identify conditions or practices that can result in damage to equipment.

Notes contain information important to the correct installation, operation, or maintenance of the equipment.

Contents

List of Figures

List of Tables

Chapter 1 – Introduction

The PESA UCI-2000-P protocol converter is designed to provide an interface between BTS/Philips and PESA routing switchers and control systems. The UCI-2000-P can operate in one of two distinct modes, allowing PESA routing matrices to be controlled by the BTS/Philips Jupiter Control System or allowing BTS/Philips Venus compatible routing matrices to be controlled by a PESA 3300/3500/3500+ Control System.

1.1 BTS/Philips to PESA PRC Control Mode

The BTS/Philips to PESA control mode allows the UCI-2000-P to control up to four levels of PESA PRC-based routing switchers from the Jupiter Control System. Each of the four additional levels can support a matrix size of 512 x 512 inputs and outputs. These control levels must occupy a consecutive block in the level space of the Jupiter Control System and cannot share an existing level with a Philips router. Figure 1 depicts a typical system block diagram of the BTS/Philips to PESA control mode.

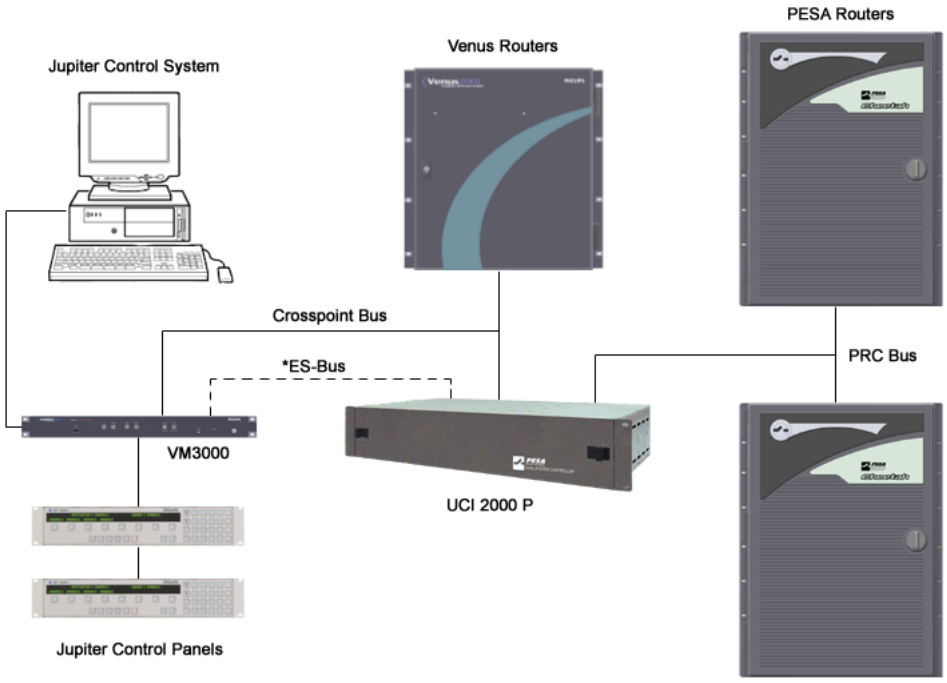

Figure 1. BTS/Philips to PESA Control Mode

The UCI-2000-P receives commands from the VM3000 through either a SMPTE ES-Bus or a native Philips Crosspoint Bus connection. Please note that in order to use an ES-Bus connection, the ES-Control option must be installed in the Jupiter Control System software. A Crosspoint Bus connection is the preferred interface method and is the standard/native connection for all Philips Venus routing switchers.

All commands received from the VM3000 are translated by the UCI-2000-P and sent to the controlled PESA routing switchers over the PESA PRC Control Bus. Appropriate Status and Confirm signals are returned to the VM3000 in response to all crosspoint takes.

1.2 PESA to BTS/Philips Control Mode

The PESA to BTS/Philips control mode allows the UCI-2000-P to control up to four levels of BTS/Philips Venus compatible routing switchers from a PESA 3500 family control system. Dune and Triton series routing switchers are not currently supported by the UCI-2000-P. Each of the four additional levels can support a matrix size of 512 x 512 inputs and outputs and cannot share an existing level with a PESA router. Figure 2 depicts a typical system block diagram of the PESA to BTS/Philips control mode.

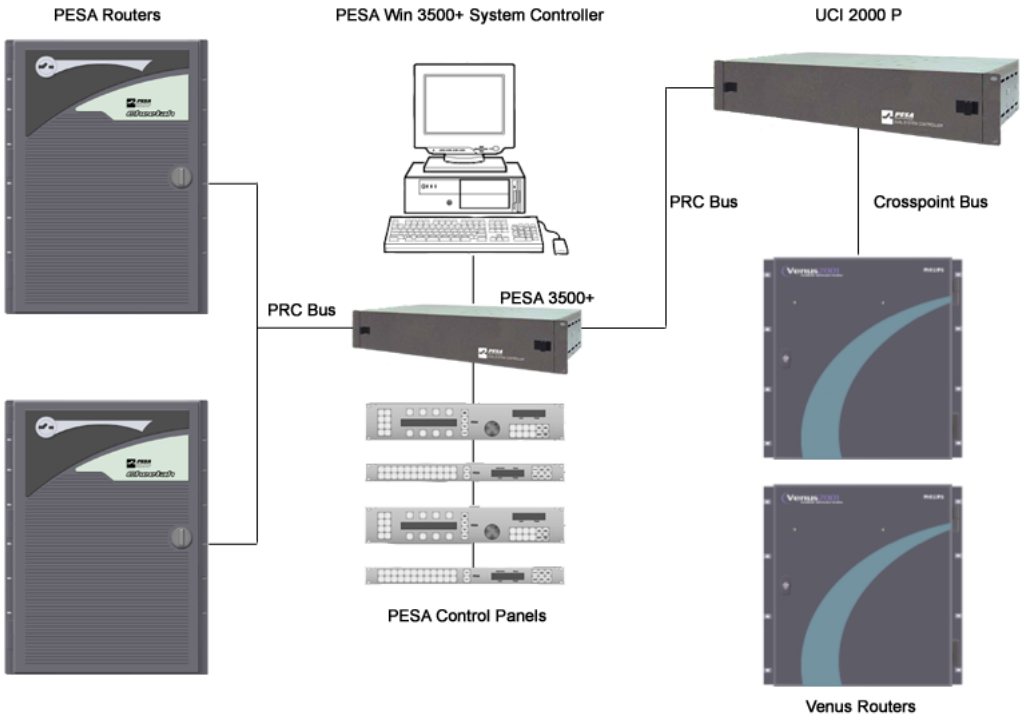

Figure 2. PESA to BTS/Philips Control Mode

The UCI-2000-P receives commands from the PESA 3500 family system controller through its PRC Bus connection. These commands are then translated into appropriate BTS/Philips Crosspoint Bus commands and transmitted to the BTS/Philips routing switchers.

1.3 BTS/Philips to PESA P1E (CPULink) Control Mode

The BTS/Philips to PESA P1E, or CPULink, control mode allows the UCI-2000-P to control up to four levels of PESA routing switchers from the Jupiter Control System. Each of the four additional levels can support a matrix size of 512 x 512 inputs and outputs.

The P1E Mode extends the list of PESA routers that can be controlled by the Jupiter Control System by providing support for PESA routers that do not support the PRC interface. These include the new generation of P2-based routers, such as the Cheetah DRS, and legacy RM-5000 based systems. This is accomplished by connecting the UCI-2000-P to a PESA System Controller, such as the PERC2000 or 3500Pro, which drives the PESA routers.

As with the PRC Mode, these PESA control levels must occupy a consecutive block in the level space of the Jupiter Control System and cannot share an existing level with a Philips router. Figure 3 depicts a typical system block diagram of the BTS/Philips to PESA P1E control mode.

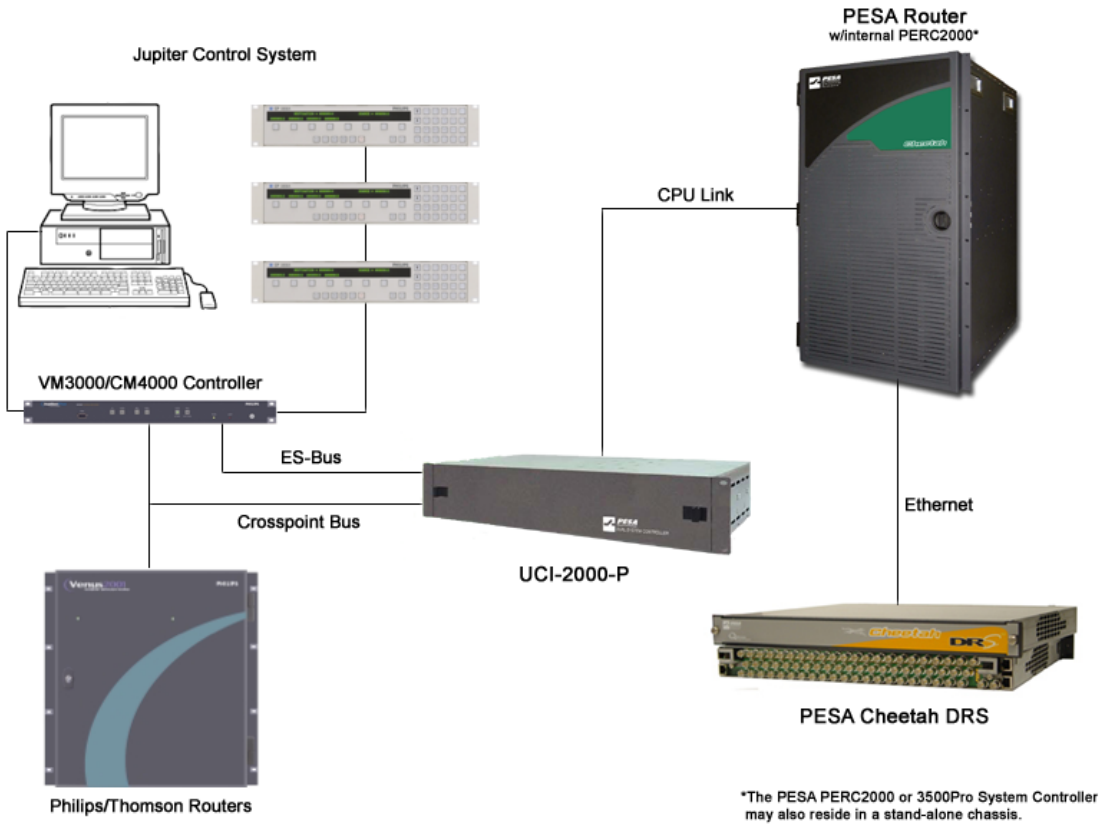

Figure 3. BTS/Philips to PESA P1E Control Mode

Chapter 2 - Installation

This section details UCI-2000-P Mainframe installation procedures. The following topics are discussed:

- Receipt Inspection
- Unpacking
- Location
- Mounting
- Cabling
- Plug-In Card Installation
- Power Supply Installation

The UCI-2000-P contains static sensitive devices. Care should be used when it is necessary to handle the internal circuit cards. It is recommended that a ground wrist strap and grounding mat be used before attempting any equipment installations.

2.1 Receipt Inspection

The UCI-2000-P Mainframe was tested and inspected prior to leaving the factory. Upon receipt, inspect the equipment for shipping damage. If any damage is found, contact the carrier and PESA immediately and save all packing material.

2.2 Unpacking

The UCI-2000-P Mainframe is comprised of 1RU chassis/backplane assembly, one UCI2000 protocol translator card and one SRU Power Supply. Prior to discarding packing material compare the parts received against the packing list. Carefully inspect the layers of packing material for any components that may have been overlooked during the initial unpacking.

The UCI2000P comes in both 1 RU single chassis (single operation) and a 2 RU dual chassis (Redundant operation).

2.3 Location

The UCI-2000-P Mainframe may be located anywhere power is available. However, units should be mounted as close as possible to their associated equipment to minimize cable runs. Installation should be in an area where the ambient temperature does not exceed 40°C (104°F) inside the equipment rack.

2.4 Mounting

The UCI-2000-P Mainframe is rack mounted in a standard 19” equipment rack. Sufficient space must be provided behind the rack to allow for the control and power cables. All mounting holes should be utilized and mounting hardware tightened securely. As with all equipment installed in a rack, the bottom screw on each side should be installed before proceeding with the remainder of the screws. Then all screws should be securely tightened. Support the UCI-2000-P Mainframe's bottom while installing it in the rack. Figure 4 illustrates chassis installation in the equipment rack.

To install a UCI-2000-P Mainframe in an equipment rack, follow these steps:

1. Align the chassis with the slotted opening in the rack.
2. Install the bottom screws first.
3. Install the two top screws
4. Tighten all four screws securely.

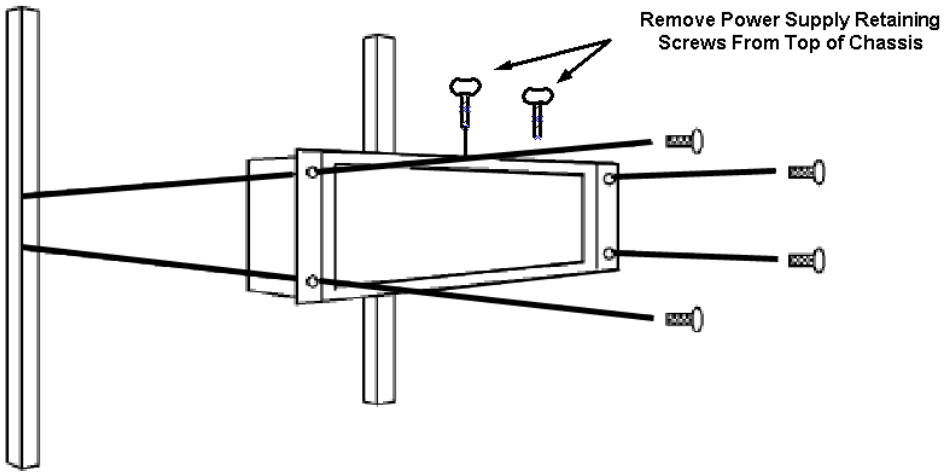

Figure 4. Chassis Mounting

2.5 Cabling

All cables should be strain relieved and secured to racks or other supporting structures. Failure to provide adequate cable support can result in cables separating from connectors. If cable runs are to be stored under an elevated floor, they should be tied to the racks as a guide. If cables are run along the floor, do not allow them to lay in the work area behind the racks. Stepping or tripping on the cables may result in connections being pulled free or wire breakage inside the insulation. The UCI-2000-P Mainframe should be installed in the equipment rack prior to attaching cables.

Use the following rules when cabling the UCI-2000-P Mainframe:

1. Lay all cables in their intended positions, separating control from power cables wherever possible.
2. Provide proper support for each cable during the cabling process. The use of tie-wraps is recommended, as shown below in Figure 5.

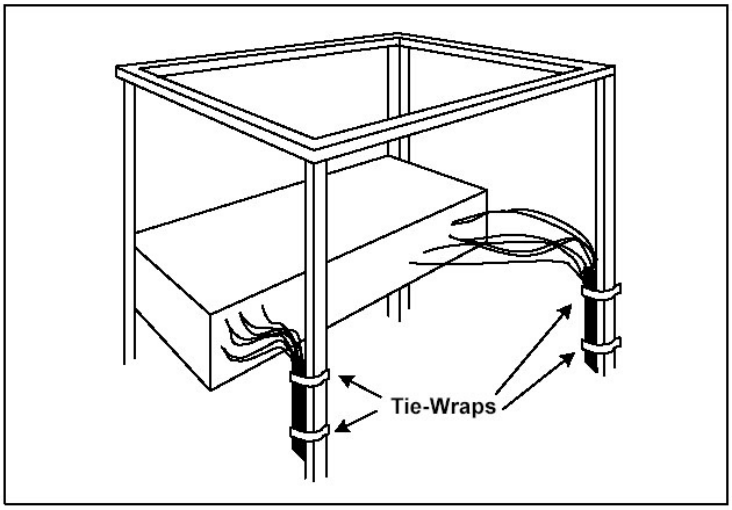

Figure 5. Cabling

2.6 Plug-In Card Installation

To install a board in the UCI-2000-P Mainframe, take the following steps:

1. Align the board with a set of circuit card guides in the center of the frame.
2. Carefully push the board into the frame until the circuit card connector makes initial contact with the backplane connector. At this point, firmly but carefully push the board into the frame while making sure the connectors are properly aligned. Continue pushing the board until it is in place and the connectors are firmly mated.

2.7 Power Supply Installation

The SRU Power Supply connects to the rear of the chassis through a 3 pin M-N-L connector. Loop through power is available which allows you to connect to either power connection. The Dual frame has internal power supplies.

Chapter 3 – Setup and Operation

3.1 Hardware Configuration

3.1.1 Setting the Operating Mode

DIP switch S1 on the UCI-2000-P PC board is used to set the card's operating mode. Available operating modes for the UCI-2000-P are listed in Table 1 below.

Table 1. UCI2000P Operating Modes

Operating Mode	S1-8	S1-7	S1-6	S1-5	S1-4	S1-3	S1-2	S1-1
Controlling PESA Routers in PRC Mode	Off	Off	Off	Off	Off	Off	Off	**On**
Controlling Philips Routers	Off	Off	Off	Off	Off	Off	**On**	Off
Controlling PESA Routers in P1E Mode	Off	Off	Off	Off	Off	Off	**On**	**On**
Factory Test Mode	**On**	**On**	**On**	**On**	**On**	**On**	**On**	Off
Board Reset	**On**	**On**	**On**	**On**	**On**	**On**	**On**	**On**
***All other settings are Reserved**								

*Positions 6 through 8 of switch S1 are used in conjunction with the available operating modes to provide diagnostic information to Customer Service Personnel through the diagnostic port on the back of the chassis. S1-6 provides crosspoint take information, S1-7 provides error information, and S1-8 provides verbose diagnostic information. These diagnostic switches are typically turned Off during normal operation.

3.1.2 Setting the PRC Base Strobe (Control Level) and Number of Controlled Levels

BTS/Philips To PESA PRC Mode:

Switches 1 – 6 of DIP switch S2 set the starting (base) strobe number of the controlled PESA matrices using a binary representation according to the following table. Valid level numbers are 1 – 63. (ON is to the right when viewing from above and the rear connectors are at the top of the board).

The starting (base) strobe number of the PESA matrices must match the setting for Physical Level number in the Jupiter Software that has been assigned to the PESA matrices.

Table 2. Base Control Level of PESA Routers

Starting Level #	S2-6	S2-5	S2-4	S2-3	S2-2	S2-1
Level 1	Off	Off	Off	Off	Off	**On**
Level 2	Off	Off	Off	Off	**On**	Off
Level 3	Off	Off	Off	Off	**On**	**On**
Level 4	Off	Off	Off	**On**	Off	Off
Level 5	Off	Off	Off	**On**	Off	**On**
Level 6	Off	Off	Off	**On**	**On**	Off
Level 7	Off	Off	Off	**On**	**On**	**On**
Level 8	Off	Off	**On**	Off	Off	Off
Up to…						
Level 60	**On**	**On**	**On**	**On**	Off	Off
Level 61	**On**	**On**	**On**	**On**	Off	**On**
Level 62	**On**	**On**	**On**	**On**	**On**	Off
Level 63	**On**	**On**	**On**	**On**	**On**	**On**

Switches 7 and 8 of S2 set the number of controlled PESA matrices according to the following table:

Table 3. Number of Controlled PESA Levels

S2-7	S2-8	Function
Off	Off	UCI Controls 1 Level
On	Off	UCI Controls 2 Levels
Off	**On**	UCI Controls 3 Levels
On	**On**	UCI Controls 4 Levels

PESA To BTS/Philips Mode:

Switches 1 – 4 of DIP switch S6 set the starting (base) strobe number used by the PESA control system to control the BTS/Philips matrices. Valid strobe numbers are 1 – 15. (ON is to the right when viewing from above and the rear connectors are at the top of the board).

Table 4. Base Control Level of BTS/Philips Routers

Starting Level #	S6-4	S6-3	S6-2	S6-1
Reserved	Off	Off	Off	Off
Level 1	Off	Off	Off	**On**
Level 2	Off	Off	**On**	Off
Level 3	Off	Off	**On**	**On**
Level 4	Off	**On**	Off	Off
Level 5	Off	**On**	Off	**On**
Level 6	Off	**On**	**On**	Off
Level 7	Off	**On**	**On**	**On**
Level 8	**On**	Off	Off	Off
Level 9	**On**	Off	Off	**On**
Level 10	**On**	Off	**On**	Off
Level 11	**On**	Off	**On**	**On**
Level 12	**On**	**On**	Off	Off
Level 13	**On**	**On**	Off	**On**
Level 14	**On**	**On**	**On**	Off
Level 15	**On**	**On**	**On**	**On**

Switches 5 and 6 of S6 set the number of controlled BTS/Philips matrices according to the following table:

Table 5. Number of Controlled BTS/Philips Levels

S6-5	S6-6	Function
Off	Off	UCI Controls 4 Levels
On	Off	UCI Controls 1 Levels
Off	**On**	UCI Controls 2 Levels
On	**On**	UCI Controls 3 Levels

Switches 7, 8, 9, and 10 of switch S6 should be left in the OFF position

The UCI-2000P can control up to 4 Philips matrices that are up to 512x512 in size. The actual number of matrices being controlled is determined by switch S6. The Philips matrices are then mapped to Levels 1 through 4. Please refer to your Philips routing system documentation for information about how to set the Level number the matrices will respond to. They must be set to 1 through 4.

BTS/Philips To PESA P1E(CPULink) Mode:

Switches 1 – 6 of DIP switch S2 set the starting (base) strobe number of the controlled PESA matrices using a binary representation according to the following table. Valid level numbers are 1 – 63. (ON is to the right when viewing from above and the rear connectors are at the top of the board).

Table 6. Base Control Level of PESA Routers

Starting Level #	S2-6	S2-5	S2-4	S2-3	S2-2	S2-1
Level 1	Off	Off	Off	Off	Off	**On**
Level 2	Off	Off	Off	Off	**On**	Off
Level 3	Off	Off	Off	Off	**On**	**On**
Level 4	Off	Off	Off	**On**	Off	Off
Level 5	Off	Off	Off	**On**	Off	**On**
Level 6	Off	Off	Off	**On**	**On**	Off
Level 7	Off	Off	Off	**On**	**On**	**On**
Level 8	Off	Off	**On**	Off	Off	Off
Up to…						
Level 60	**On**	**On**	**On**	**On**	Off	Off
Level 61	**On**	**On**	**On**	**On**	Off	**On**
Level 62	**On**	**On**	**On**	**On**	**On**	Off
Level 63	**On**	**On**	**On**	**On**	**On**	**On**

Switches 7 and 8 of S2 set the number of controlled PESA matrices according to the following table:

Table 7. Number of Controlled PESA Levels

S2-7	S2-8	Function
Off	Off	UCI Controls 1 Level
On	Off	UCI Controls 2 Levels
Off	**On**	UCI Controls 3 Levels
On	**On**	UCI Controls 4 Levels

3.1.3 Setting the Operation of the COM1 and COM2 Serial Ports

Switches 1 and 2 of DIP switch S4 are used to enable or disable the COM1 serial port on the back of the UCI-2000-P chassis. Switches 3 and 4 of S4 are used to select between RS232 and RS422 operation for the COM1 and COM 2 serial ports respectively; off = RS422, on = RS232.

Table 8. DIP Switch S4 Settings

S4-1	S4-2	S4-3	S4-4	Function
Off	Off	Off	Off	PESA to Philips Mode, COM 2 RS422
Off	Off	Off	Off	PESA to Philips Mode, COM 2 RS232
Off	**On**	Off	Off	Philips to PESA Mode, COM1 RS422, COM2 RS422
Off	**On**	**On**	Off	Philips to PESA Mode, COM1 RS232, COM2 RS422
Off	**On**	Off	**On**	Philips to PESA Mode, COM1 RS422, COM2 RS232
Off	**On**	**On**	**On**	Philips to PESA Mode, COM1 RS232, COM2 RS232

BTS/Philips To PESA PRC Mode:

In BTS/Philips to PESA PRC Mode, COM1 is used to communicate with PESA routing switcher frames. In this case, COM1 should be enabled and set to RS422 operation. Table 8 above illustrates these settings. COM2 is used to communicate with a SMPTE ES-Bus controller and is typically set for RS422 operation.

PESA to BTS/Philips Mode:

In PESA to BTS Philips Mode, COM1 is not used. Switches 1 and 2 of DIP switch S4 should be turned OFF. If the UCI-2000-P is being used as a SMPTE ES-Bus Master controller, the ES-Bus connection is made using COM2 and is typically set for RS422 operation.

BTS/Philips To PESA P1E(CPULink) Mode:

In BTS/Philips to PESA P1E Mode, COM1 is used to communicate with a PESA System Controller frame such as the 3500Pro or PERC2000. In this case, COM1 should be enabled by setting switch 1 of DIP switch S4 to the ON position. Set switch 3 of DIP switch S4 for RS232 or RS422 operation as dictated by the corresponding port type on the PESA System Controller. COM2 is used to communicate with a SMPTE ES-Bus controller and is typically set for RS422 operation.

3.1.4 Note on BTS/Philips Crosspoint Bus Usage

When using a Crosspoint Bus connection with the UCI-2000-P, the use of a “Crosspoint Bus Terminator” is recommended. This terminator is available from BTS/Philips.

3.2 Software Configuration

3.2.1 BTS/Philips To PESA PRC Mode

To enable the new PESA routers in the system, they must be added to the configuration in the Jupiter control system software. The PESA routers are added and configured exactly as if they were BTS/Philips routers. If the UCI-2000-P is to operate via the SMPTE ES-Bus protocol, the ES-C third-party interface software option must be resident in the Jupiter system software and the appropriate serial port on the VM3000 must be configured as such. Please refer to the Jupiter instruction manual for more information.

3.2.2 PESA to BTS/Philips Mode

To enable the BTS/Philips Venus routers in the system, they must be added to the configuration in the PESA Win3500 Pro or PERC2000 control system software. The Venus routers are added and configured exactly as if they were PESA routers. Please refer to the Win3500 Pro or PERC2000 instruction manual for more information.

3.2.3 BTS/Philips to PESA P1E(CPULink) Mode

To enable the new PESA routers in the system, they must be added to the configuration in the Jupiter control system software. The PESA routers are added and configured exactly as if they were BTS/Philips routers. If the UCI-2000-P is to operate via the SMPTE ES-Bus protocol, the ES-C third-party interface software option must be resident in the Jupiter system software and the appropriate serial port on the VM3000 must be configured as such. Please refer to the Jupiter instruction manual for more information.

When operating in the P1E mode, a default one-to-one configuration must also be created in the PESA System Controller for the number (Levels/Components) and sizes of the PESA router frames. Please refer to the Win3500 Pro or PERC2000 instruction manual for more information. Additionally, in the PESA System Controller configuration software, the serial port used for communications between the UCI-2000-P and the PESA System Controller must be configured for: P1E Protocol, PESA Checksum, CRLF Terminator, 38400 baud, 1 stop bit and Flow Control set to None.

3.3 Redundant Operation

The UCI-2000-P is capable of fully redundant operation when two cards are installed in the dual controller chassis. The front panel toggle switch is used to select one of three redundancy modes: Active, Standby and Automatic.

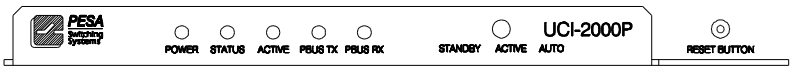

Figure 6. UCI-2000-P Card

In the automatic mode, one card operates in the active mode and the other card operates in standby. If a failure is detected on the active card by the standby, the standby card will automatically disable the active card and assume the active role. The standby card receives and processes the same data from the controller and the routers as the active card, so that in the event of a failure on the active card it can take over instantly and transparently. To enable the automatic mode, set the toggle switch on both cards to the Auto position. The Active light on the front of the card is used to indicate which of the cards is currently operating in the active state.

For the system to operate in manual mode, one card must be set to the active mode and the other to the standby mode. If the toggle switch settings on the cards are invalid, the Status light will continuously flash three times.

3.4 Connector Pin-outs

COM1, COM2:

Table 9. COM1, COM2 Connector Pinouts

Pin	RS232 Function	RS422 Function
1	CD	Ground
2	RXD (in)	RX+ (in)
3	TXD (out)	TX- (out)
4	DTR	Ground
5	Ground	Ground
6	DSR	Ground
7	RTS	RX- (in)
8	CTS	TX+ (out)
9	NC	Ground

COM3:

Table 10. COM3 Connector Pinout

Pin	RS422 Function
1	Ground
2	TX+ (out)
3	RX- (in)
4	Ground
5	Ground
6	Ground
7	TX- (in)
8	RX+ (out)
9	Ground

COM3 is used only in the PESA to Philips Mode.

COM4: (Diagnostic Port)

Table 11. COM4 Connector Pinout

Pin	RS232 Function
1	CD
2	RXD (in)
3	TXD (out)
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	NC

Typically a Null-Modem cable is used between the UCI2000 and a PC type COM port.

3.5 Cable Connections

3.5.1 BTS/Philips to PESA PRC Mode

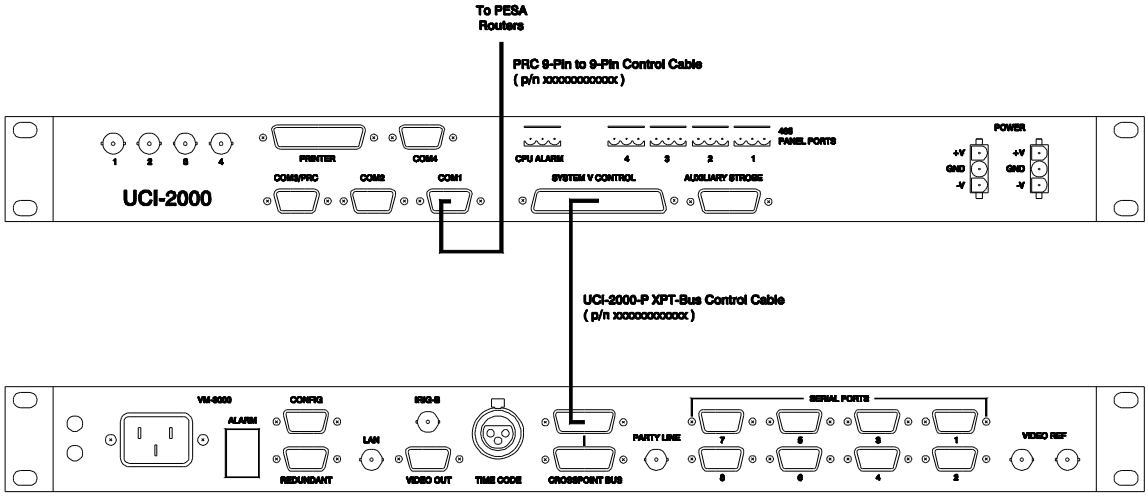

Figure 7. Control Cable Connections, BTS/Philips XPT-Bus

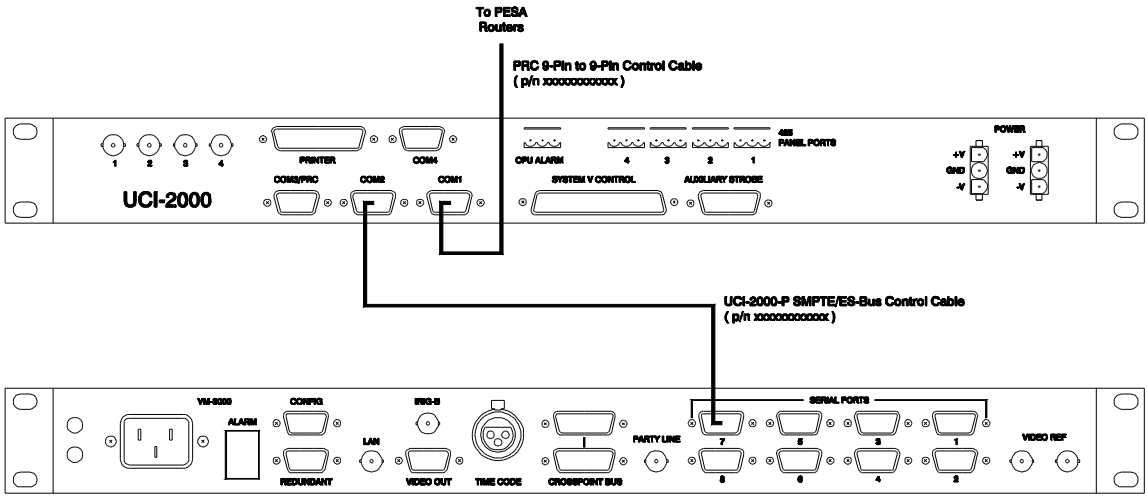

Figure 8. Control Cable Connections, SMPTE ES-Bus

3.5.2 PESA to BTS/Philips Mode

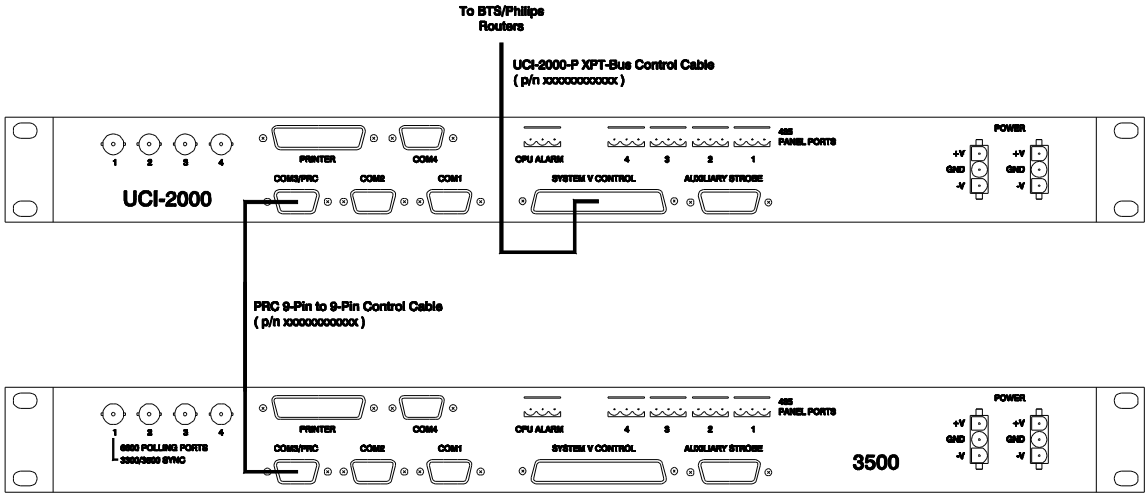

Figure 9. Control Cable Connections, PESA to BTS Philips Mode

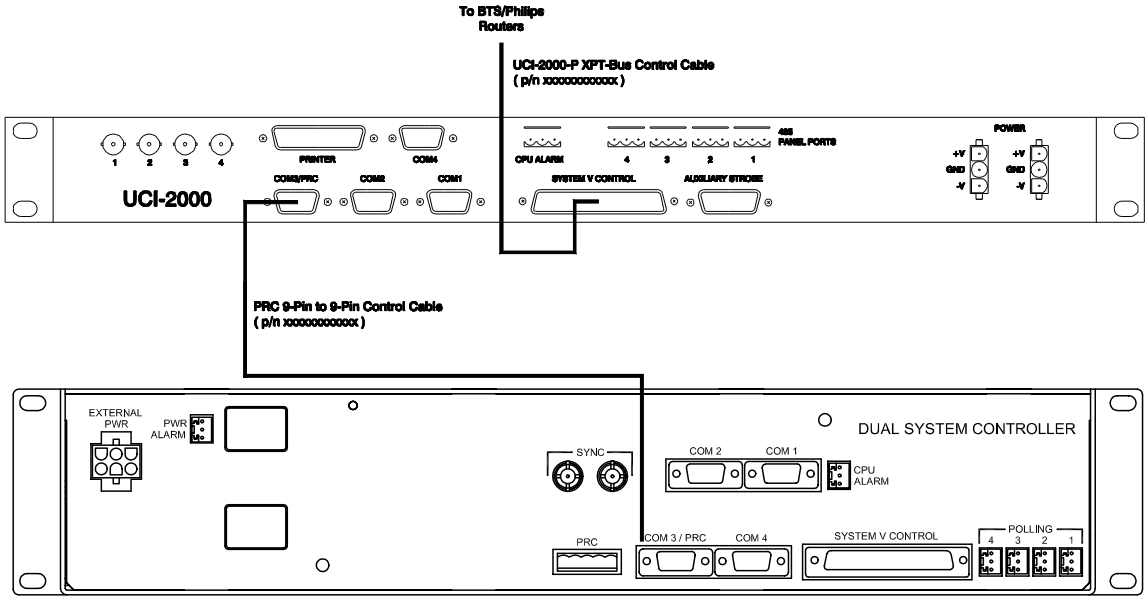

Figure 10. Control Cable Connections, PESA to BTS Philips Mode with Dual Controller

3.5.3 BTS/Philips to PESA P1E Mode

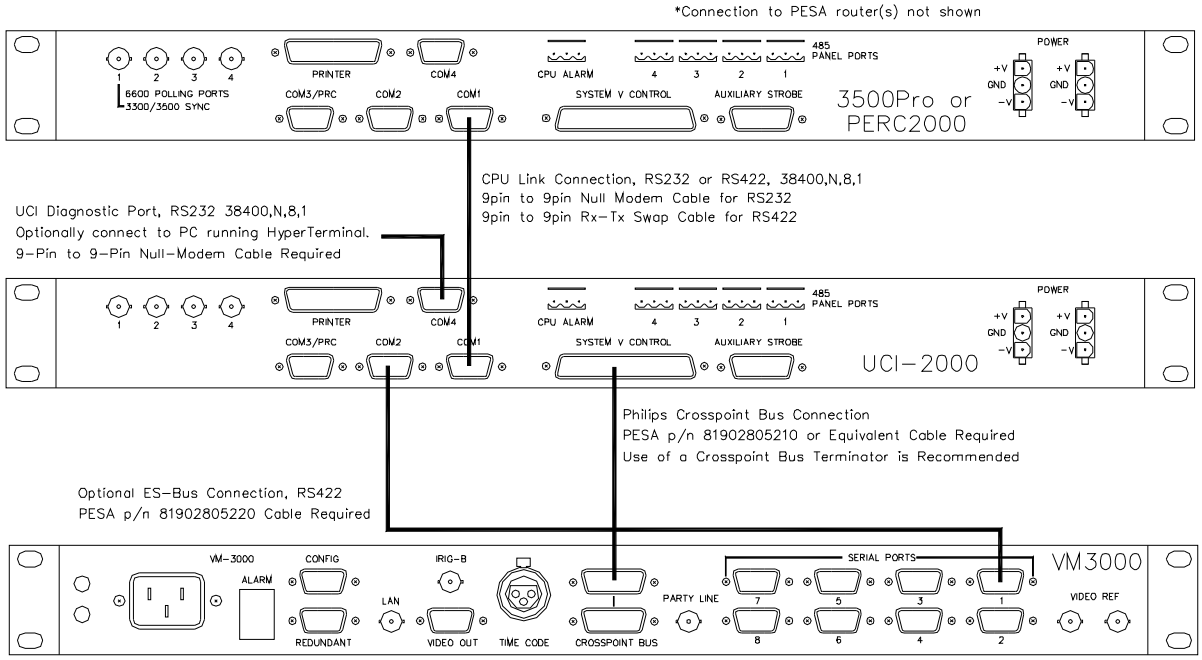

Figure 11. Control Cable Connections, BTS/Philips XPT-Bus/ES-Bus to P1E Mode

Chapter 4 - Installation and Initialization Procedure Philips to PESA Mode

This section describes the installation procedure for a new UCI-2000-P protocol conversion board. This procedure is performed with the UCI-2000-P powered up and connected to the VM3000 and all PESA routing switchers with the appropriate cables. If your system contains redundant UCI-2000-P controller cards, this procedure must be performed on each card separately.

1. Remove ***all*** UCI-2000-P boards from the controller chassis.

2. Set the PRC base strobe (level) and number of controlled levels using DIP switch S2 as follows:

Switches 1 – 6 of S2 set the starting (base) strobe number of the controlled PESA matrices using a binary representation according to the following table. Valid level numbers are 1 – 63. (ON is to the right when viewing from above and the rear connectors are at the top of the board).

Table 12. Base Control Level

Starting Level #	S2-6	S2-5	S2-4	S2-3	S2-2	S2-1
Level 1	Off	Off	Off	Off	Off	**On**
Level 2	Off	Off	Off	Off	**On**	Off
Level 3	Off	Off	Off	Off	**On**	**On**
Level 4	Off	Off	Off	Off	Off	Off
Level 5	Off	Off	Off	Off	Off	**On**
Level 6	Off	Off	Off	Off	**On**	Off
Level 7	Off	Off	Off	Off	**On**	**On**
Level 8	Off	Off	**On**	Off	Off	Off
Up to…						
Level 60	**On**	**On**	**On**	**On**	Off	Off
Level 61	**On**	**On**	**On**	**On**	Off	**On**
Level 62	**On**	**On**	**On**	**On**	**On**	Off
Level 63	**On**	**On**	**On**	**On**	**On**	**On**

Switches 7 and 8 of S2 set the number of controlled PESA matrices according to the following table:

Table 13. Number of Control Levels

S2-7	S2-8	Function
Off	Off	Controls 1 Level
On	Off	Controls 2 Levels
Off	**On**	Controls 3 Levels

On	**On**	Controls 4 Levels

3. Turn ON ***all*** switches on DIP switch S1 to re-initialize the board's internal memory to factory defaults. This will cause the UCI-2000-P to query each routing switcher connected to the PESA PRC Bus to determine the number and sizes of each of the matrices the next time the board is powered-up. This should be the default setting when shipped from the factory.
4. Set the front panel toggle switch to the AUTO or ACTIVE setting.
5. Verify that ***only*** switch #2 on DIP switch S4 is ON.
6. Install the UCI-2000-P card in the chassis and apply power (if necessary). Verify that the Power led is illuminated.
7. Press and hold the front panel Reset Button for about 1 second, then release.
8. The board will now query each PESA router. The Tx LED will indicate data activity on the PRC Bus. When it is finished, all front panel Led's will turn off (except for the power LED). This process should take between 30 seconds and two minutes to complete, depending on the number and size of the PESA routers.
9. Remove the UCI-2000-P card from the chassis.
10. Set the front panel toggle switch to the AUTO setting.
11. Turn OFF all switches on DIP switch S1 ***except*** for switch # 1. This will set the normal mode of operation for the system. Available operating modes for the UCI-2000-P are listed in the table below.

Operating Mode	S1-8	S1-7	S1-6	S1-5	S1-4	S1-3	S1-2	S1-1
Controlling PESA Routers in PRC Mode	Off	Off	Off	Off	Off	Off	Off	**On**
Controlling Philips Routers	Off	Off	Off	Off	Off	Off	**On**	Off
Controlling PESA Routers in P1E Mode	Off	Off	Off	Off	Off	Off	**On**	**On**
Factory Test Mode	**On**	**On**	**On**	**On**	**On**	**On**	**On**	Off
Board Reset	**On**	**On**	**On**	**On**	**On**	**On**	**On**	**On**
***All other settings are Reserved**								

Table 14. UCI-2000-P Operating Modes

12. Repeat steps 1-11 for the redundant UCI-2000-P card (if equipped).
13. Re-install the UCI-2000-P card(s) in the chassis.


PESA