

Application Note: MVIP Connection for conferencing applications

Background:

This application note describes MVIP set up and configuration for MUSIC Telecom products. This application note is useful for anyone building systems with multiple CTI boards that must communicate with each other.

The MVIP bus is a time-division-multiplexed highway used to transport up to 256 full-duplex, 64 K bit/sec PCM data / voice channels. The bus consists of 2 clock signals, a 125 uS framing signal, and 8 transmit/receive data signal pairs.

Clocking:

In all MVIP applications, one board must be configured as a clock master, outputting the clock to the bus, and all other boards must be configured as a clock slave. Typically, the first board in the system, at one end of the MVIP cable, is configured as the master.

Note: When multiple boards in a system are NOT connected to an MVIP cable, each board must be set to a clock master.

Clock Terminations:

Because the MVIP bus is a relatively high speed synchronous interface, the clock lines must be properly terminated. The MVIP-90 specification recommends the following:

In systems with less than five boards, the board furthest from the clock master should be terminated. In systems with more than five boards, the boards at both ends of the MVIP cable should be terminated.

Setting MVIP Clock Terminations:

Product	Jumper	Pins	Notes
Passport ISA	JP5	1-6	Short Pins 1-2, 3-4, 5-6
Passport PCI & PT	J4	1-6	Short Pins 1-2, 3-4, 5-6
SmartTAP VR series	J8	1-2	Short Pins 1-2

Refer to the individual product Quick Install or Users Manuals for more information on setting MVIP clock terminations.

MVIP Signal Assignments:

The MVIP bus consists of 16 serial data streams – 8 input streams and 8 output streams. The 16 data streams provide a total of 512 time slots, 256 transmit timeslots, and 256 receive timeslots.

The MVIP-90 specification labels the input streams DSi0-7 and outputs are DSo0-7. Each stream can transport up to 32 full-duplex 8 bit -PCM channels (a stream is defined as a transmit / receive pair).

The MVIP-90 specification defines two signaling conventions: Network interface, and Resource interface. On Network interfaces, data is output on DSi0-7 and input on DSo0-7. On Resource interfaces, data is input on DSi0-7 and output on DSo0-7.

MUSIC Telecom Voice boards that are designated as Resource interfaces *listen* to DSi streams and *talk* on DSo streams. This means that two like interfaces (either 2 resource cards or 2 network cards) cannot communicate with each other. This limitation is overcome by shorting the DSix and DSox on a

given stream together. This in effect halves the number of time slots available but they become bi-directional – 256 bi-directional time slots. In this case, each time slot can be either transmit or receive, but not both. For a full-duplex connection, each device will use two time slots.

For the purpose of this document, it will be assumed that the Input and Output streams are tied together. All streams will be referred to simply as DS0..DS7 and time slots (“slots”) will be numbered from 0 – 255. All Slots will have an associated direction, *Talk* or *Listen*.

CONFERENCING:

For conferencing to work properly on the Passport, Passive Trigger & SmartWORKS (VR 32 & 64) products, the MVIP serial data out (DSox) and serial data in (DSix) signals must be tied together as discussed above. This is accomplished by inserting a wire shunt into the last connector of the MVIP cable as shown in Figure 2.

Depending on the number of boards in a system and the number of required time slots, up to 8 shunts can be installed (DS0-7 and DSi0-7).

Time slots	Shunt position	MVIP Stream	Notes
0 – 31	Pin 7 + Pin 8	DS0	
32 – 63	Pin 9 + Pin 10	DS1	
64 – 95	Pin 11 + Pin 12	DS2	
96 – 127	Pin 13 + Pin 14	DS3	
128 – 159	Pin 15 + Pin 16	DS4	
160 – 191	Pin 17 + Pin 18	DS5	
192 – 223	Pin 19 + Pin 20	DS6	
224 – 255	Pin 21 + Pin 22	DS7	(DS7 is reserved on Passport)

Table 1: Conferencing Configuration

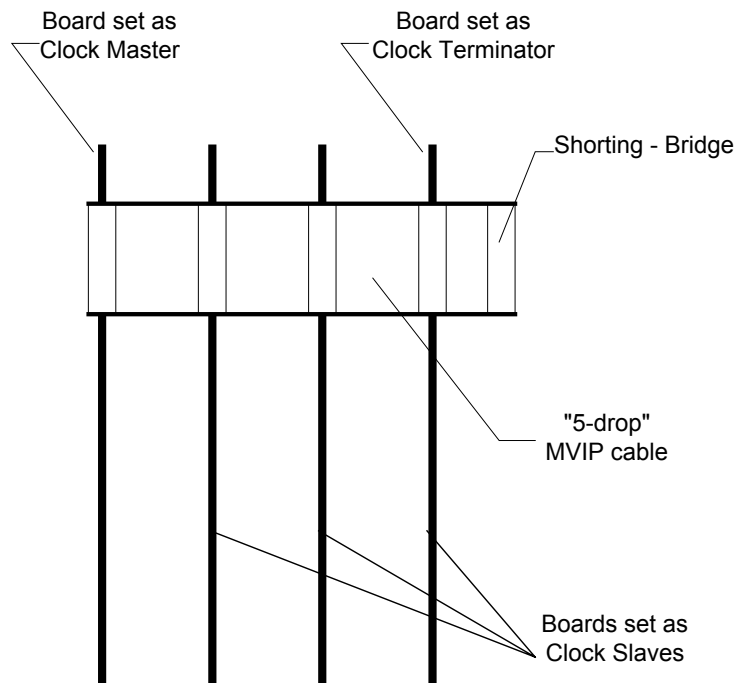


Figure 1: 4 Board MVIP Configuration

Figure 1 shows a typical MVIP configuration with four boards installed. The MVIP cable has 5 connectors, the last being used for the conferencing shunts (in the diagram it is labeled *shorting bridge*).

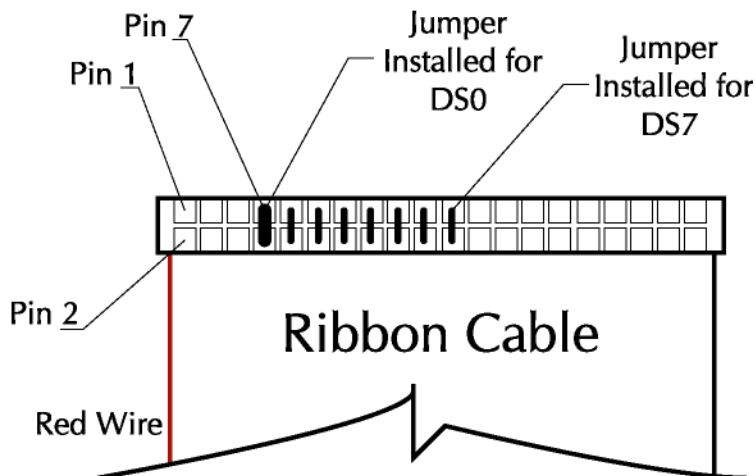


Figure 2: Shorting Bridge

Figure 2 shows a close up view of the shorting bridge. The diagram shows all 8 shunts installed, however, only the first shunt is required for the configuration shown in Figure 1. 4 boards with 8 time slots each equals a total of 32 time slots, or one MVIP stream. As more boards are added to the configuration, additional shunts may be required.

PIN #	DESCRIPTION	PIN #	DESCRIPTION
1	Reserved	2	Reserved
3	Reserved	4	Reserved
5	Reserved	6	Reserved
7	DS00	8	DSI0
9	DS01	10	DSI1
11	DS02	12	DSI2
13	DS03	14	DSI3
15	DS04	16	DSI4
17	DS05	18	DSI5
19	DS06	20	DSI6
21	DS07	22	DSI7
23	Reserved	24	Reserved
25	Reserved	26	Reserved
27	Reserved	28	Reserved
29	Reserved	30	GND
31	/C4	32	GND
33	/FO	34	GND
35	C2	36	GND
37	SEC8K	38	GND
39	Reserved	40	Reserved

Table 2: MVIP Connector Pin-out