TSI-1000
TALLY SYSTEM INTERFACE

SECTION 1 - INTRODUCTION TO TSI-1000

1.1 PREFACE

The descriptions in this section of the manual provide an overview of the TSI-1000 Tally System Interface. The interaction of the TSI-1000 with other devices in an overall tally control system, and the function and purpose of the various devices. This information is intended to assist the user in understanding the TSI-1000 based tally control system.

1.2 TSI-1000 TALLY SYSTEM INTERFACE

The TSI-1000 Tally System Interface is a stand alone embedded controller in a 2 R.U. rack mount frame. This is a high performance microprocessor based system controller. This controller features a total of 12 serial I/O ports. These ports are of the following type: 8 standard RS-422, 2 RS-232, and 2 specialised ports for interfacing to Sony S-Bus, and Image Video coax bus.

1.2.1 Circuit Modules

Each TSI-1000 contains seven types of printed circuit modules, namely the Micro ATX form factor CPU module, Bus Riser Card, 12544 10 channel UART module, 12547 LED mounting module, 12548 Quad RJ-11 mounting module, 12549 UART mounting module, and 12546 back plane.

1.2.2 Power Supplies

Each TSI-1000 is powered by a pair of plug-in power supplies. One TSI-1000 power supply is provided standard. A second redundant power supply is available as an option. These supplies are plug-in, switch-mode units with wide range AC inputs allowing for operation in any country.

Test points for each DC output, as well as power and fault LED's have been provided on the front panel of the power supplies.

If required, a redundant power supply can be provided as an option. In this case, the TSI-1000 is powered by two supplies which share the load equally under normal circumstances. However, should one supply fail or become disconnected, the second will assume the full load without disruption of system operation.

1.2.3 Frame Cooling

The TSI-1000 requires forced air cooling, and is therefore equipped with two internal fans. One fan on the rear of the TSI, and a CPU cooler fan.

SECTION 2 - INSTALLATION

2.1 SYSTEM OVERVIEW

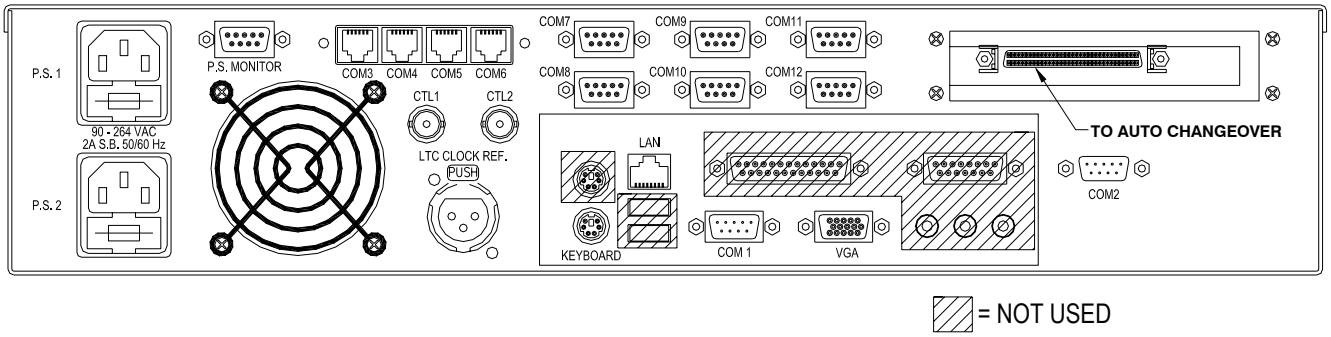
The major hardware elements of the Image Video tally system are as follows:

- TSI-1000 Tally system Interface
- Model 4211 parallel I/O interface unit
- RDU-1510 / 1610 / 1710 series of active under monitor displays
- Model 7721 static under monitor displays

2.2 INSTALLATION PROCEDURES

The following procedures are intended to assist the user in the installation of the TSI-1000 based tally control system, including the serial I/O connections for the TSI-1000 to external devices, and 4211 parallel I/O connections. A system interconnect diagram has also been provided at the end of the text in this section and should be referenced while reading the procedures and performing the installation process.

All connectors described below are located on the rear panel of the TSI-1000.



2.2.1 Power

P.S. 1 corresponds to the upper power supply position in the TSI-1000 frame. P.S. 2 corresponds to the lower power supply position in the TSI-1000 frame. When the TSI-1000 is ordered with only one power supply, it is installed in the upper P.S. 1 position.

2.2.2 PS Monitor

The power supply monitor connector can be used to signal another device, such as an alarm detection system, that each of the electronics frame's two power supplies are switched on and operating properly. The connector has the following pinout:

Pin	Signal
1	chassis ground
2	power supply 1 (upper) switched on
3	power supply 1 (upper) operating properly
4	power supply 2 (lower) switched on
5	power supply 2 (lower) operating properly
6	ground
7	Ground
8	Ground
9	Ground

The signals are an open collector pull to ground type. The indicated condition is true when the corresponding signal is pulled to ground. A pull-up resistor must be connected to a pull to ground type signal in order to detect a low or high level.

2.2.3 CTL 1 / Sony S-Bus

For Systems Interfacing to Sony DVS series of routing switchers:

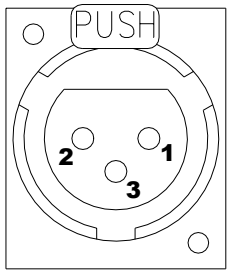
Using customer supplied coaxial cable, make a connection from the BNC labelled CTL 1 on the TSI-1000 to the Sony S-Bus.

2.2.4 CTL 2 / IV Coax Bus

For Systems Interfacing to Image Video routing switchers:
Using customer supplied coaxial cable, make a connection from the BNC labelled CTL 1 on the TSI-1000 to the Image Video Coax Bus.

2.2.5 LTC CLOCK REF.

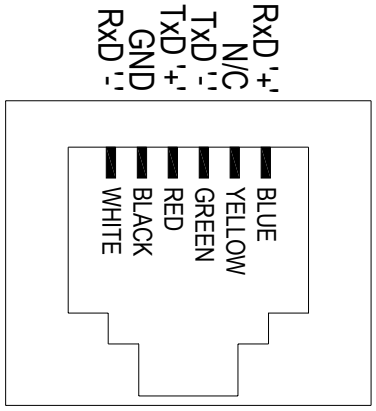
For Systems using the optional Time-Code reader:



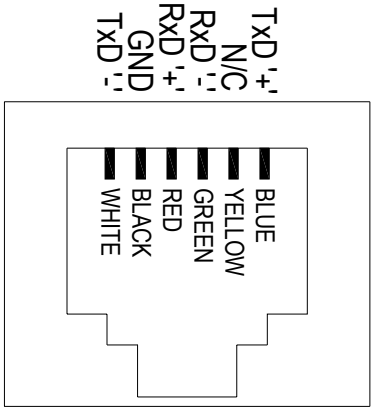
Pin #	Function
1	Signal Ground
2	Time-Code '-'
3	Time-Code '+'

2.2.6 COM 3 – 6

These RJ-11 connectors are RS-422 / RS-485 ports designed to interface to our RDU-1500 / 1600 series of under monitor displays using customer supplied pin to pin cable. It is important to note that standard telephone RJ-11 interconnect cables are not pin to pin connections. Each of the 4 RJ-11 connectors is a separate UART channel from the TSI-1000. It is important to make a note of which RDU's are on each of the ports. This information is required when entering the configuration.



TSI-1000 COM 3 TO COM 6



RDU-1500/1600 SERIES

2.2.7 COM 7

This RS-422 / RS-485 port is reserved for interfacing to Image Video Model 4211 parallel interface units. A pin to pin RS-422 cable should be used to interconnect to the 4211 parallel interfaces. Up to 32 separate 4211 interfaces may be connected to this port in a multi-drop arrangement. Although COM 7 is reserved for use with the 4211's, additional 4211's may be connected to any available RS-422 / 485 port.

2.2.8 COM 8 – 12

Pin #	Function
3	Tx Data +
8	Tx Data -
4	Tx Data Common
7	Rx Data +
2	Rx Data -
6	Rx Data Common
1	Chasis GND
9	Chasis GND

These connectors are RS-422 / RS-485 port and are to be used for interfacing to other devices such as routing switchers and production switchers. Please note that COM 10 is shared with the IV coax bus port and COM 12 is shared with the Sony S-Bus port.

2.2.9 COM 1

This port is reserved for interfacing the TSI-1000 to a PC running the configuration console software. Using customer supplied RS-232 Null Modem cable, make a connection from the 9 Pin Male connector COM 1 on the TSI-1000 to an available RS-232 port on the PC.

Suggested pinout for a null modem cable to interconnect a PC to the TSI-1000 is as follows:

TSI-1000 9-PIN Female (Cable end) Pin #	Function	PC 25-PIN Female (Cable end) Pin #	PC 9-PIN Female (Cable end) Pin #	Function
2	RxD Receive Data	2	3	TxD Transmit Data
3	TxD Transmit Data	3	2	RxD Receive Data
4	DTR Data Terminal Ready	6,8	6, 1	DSR, CD
5	GND Signal Ground	7	5	GND Signal Ground
6, 1	DSR, CD	20	4	DTR Data Terminal Ready
7	RTS Request to Send	5	8	CTS Clear to Send
8	CTS Clear to Send	4	7	RTS Request to Send

2.2.10 COM 2

RS-232 – Standard PC.

2.2.11 4211 I/O Pin Outs (MALE CONNECTORS ON 4211)

Inputs / Ouputs

Voltage Sense Inputs			
A voltage sense input is activated when a voltage of 5 to 24VDC is applied to its connector pins. The input current is internally limited to a maximum of 6mA. The Voltage sense inputs are optically isolated from the model 4211 circuit. To maintain the isolation between the external device and the 4211 interface, the external device must supply the power for the inputs. If isolation is not required, or if the external device is not able to supply the power for the input, the +5V and circuit ground connections can be used to power the inputs.			
11	Opto-Isolated Inp #1 +	29	Opto-Isolated Inp #1 -
12	Opto-Isolated Inp #2 +	30	Opto-Isolated Inp #2 -
13	Opto-Isolated Inp #3 +	31	Opto-Isolated Inp #3 -
14	Opto-Isolated Inp #4 +	32	Opto-Isolated Inp #4 -
15	Opto-Isolated Inp #5 +	33	Opto-Isolated Inp #5 -
16	Opto-Isolated Inp #6 +	34	Opto-Isolated Inp #6 -
17	Opto-Isolated Inp #7 +	35	Opto-Isolated Inp #7 -
18	Opto-Isolated Inp #8 +	36	Opto-Isolated Inp #8 -
1	4211 Chassis GND	20	4211 circuit GND
19	Current Limited +5V	37	4211 circuit GND
Contact Closure / Pull-to-Ground Inputs			
A contact closure / pull-to-ground input is activated when the path between the parallel input + pin and the circuit ground pin is closed. The external device closing the path must be capable of switching 6mA. The open circuit voltage on the input + is 5 VDC			
11	Circuit Ground	29	Pull-to-GND Inp #1 +
12	Circuit Ground	30	Pull-to-GND Inp #2 +
13	Circuit Ground	31	Pull-to-GND Inp #3 +
14	Circuit Ground	32	Pull-to-GND Inp #4 +
15	Circuit Ground	33	Pull-to-GND Inp #5 +
16	Circuit Ground	34	Pull-to-GND Inp #6 +
17	Circuit Ground	35	Pull-to-GND Inp #7 +
18	Circuit Ground	36	Pull-to-GND Inp #8 +
1	4211 Chassis GND	20	4211 circuit GND
19	Current Limited +5V	37	4211 circuit GND

Contact Closure Outputs

The contact closure outputs are rated at a maximum of 50V, 0.5A and 10W

Pin #	Function	Pin #	Function
3	Contact closure #1 a	21	Contact closure #1 b
4	Contact closure #2 a	22	Contact closure #2 b
5	Contact closure #3 a	23	Contact closure #3 b
6	Contact closure #4 a	24	Contact closure #4 b
7	Contact closure #5 a	25	Contact closure #5 b
8	Contact closure #6 a	26	Contact closure #6 b
9	Contact closure #7 a	27	Contact closure #7 b
10	Contact closure #8 a	28	Contact closure #8 b

Voltage Source Outputs

The voltage source outputs can provide up to 150mA of current. The output voltage is equal to the 4211 power supply input voltage minus the drop across the output switching transistor (this is approximately 0.4V at a 150mA load)

Pin #	Function	Pin #	Function
3	Voltage Source #1 +	21	Circuit Ground
4	Voltage Source #2 +	22	Circuit Ground
5	Voltage Source #3 +	23	Circuit Ground
6	Voltage Source #4 +	24	Circuit Ground
7	Voltage Source #5 +	25	Circuit Ground
8	Voltage Source #6 +	26	Circuit Ground
9	Voltage Source #7 +	27	Circuit Ground
10	Voltage Source #8 +	28	Circuit Ground

Open Collector Outputs

The open collector outputs can sink up to 150mA of current. The open circuit voltage range on the outputs is between 0 and 30VDC

Pin #	Function	Pin #	Function
3	Voltage Source #1 +	21	Circuit Ground
4	Voltage Source #2 +	22	Circuit Ground
5	Voltage Source #3 +	23	Circuit Ground
6	Voltage Source #4 +	24	Circuit Ground
7	Voltage Source #5 +	25	Circuit Ground
8	Voltage Source #6 +	26	Circuit Ground
9	Voltage Source #7 +	27	Circuit Ground
10	Voltage Source #8 +	28	Circuit Ground