Model 8010-SIE
&
Model 8010-SIE-GPSII
Digital Source ID Encoders

Instruction Manual

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INFORMATION TO USERS IN EUROPE

NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INFORMATION TO USERS IN THE U.S.A.

NOTE

FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Issue	May 00
2.0	Revised for 8046 based Hardware Added 8010-SIE-GPSII	Aug 02
2.1	Revised for switching power supply in 8010-SIE, Mon Option Add Reference Mode, LVS Address and On Air Mode menus	Dec 02
2.2	Fixed description of GPI functions	Jan 07

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CHAPTER 1: OVERVIEW

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1. OVERVIEW

The 8010-SIE series Source ID Encoders provide a cost-effective method of keying timecode, source ID and machine status information into the digital video. The 8010-SIE uses Digital VITC (D-VITC) to encode the source ID information into the video. The 8010-SIE series VITC generator's lines can be easily programmed from the front panel. The model 8010-SIE also contains a high speed reader for Linear Time Code (LTC) and Vertical Interval Time code (VITC) reader, and contains a high resolution character Inserter which can insert onto the program output as well as an optional analog monitoring output. The 8010-SIE is available in two versions.

The basic 8010-SIE operates in one of four modes. In VTR mode, it is designed to listen to communications between a VTR and its controller, and take time code and machine status. In LVS mode, the 8010-SIE is designed to interface to a Profile Disk recorder running the LVS software. The serial port of the LVS device sends recorder status, scene and control information to the 8010-SIE. In RDR mode, the 8010-SIE takes time from its LTC or VITC reader and in GEN mode it allows the user to preset a time into the time code generator. In all modes, the source ID name is programmed from the front panel of the 8010-SIE and encoded into the user bits.

The model 8010-SIE-GPS II Source ID Encoder interfaces to a GPS receiver, allowing the generator time to be precisely synchronized to a world wide time standard known as the Global Positioning system. The 8010-SIE-GPS II is supplied with a Trimble ACCUTIME 2000 GPS Smart Antenna that houses the GPS receiver, antenna, power supply and other support circuitry in a sealed, shielded, self-contained unit with a digital interface to the 8010-SIE-GPS II. When the 8010-SIE-GPS II is operated in the GPS SID mode, the generator is synchronized to the GPS time reference being received from the smart antenna. When the GPS based time is within 0.5 seconds of the 8010-SIE-GPS II's UTC time clock, the generator will continue to increment normally. If for any reason the offset between the 8010-SIE-GPS II's UTC time clock and the GPS based time is greater than 0.5 seconds; the generator will resynchronize to the GPS based time. In addition, the 8010-SIE-GPS II can be set to resynchronize once per day at a user specified time, or on demand so that the optimal time accuracy is continuously maintained, at the same time minimizing the potential for code disturbances during resynchronization. The 8010's UTC time clock will normally be within +/- 1 colour frame of the GPS based time. A manual TIME SID mode operates the same as the GPS SID mode, except that UTC time clock and date may be set from the front panel. This mode is useful where a GPS time reference is not available. A RDR SID mode allows the time to be jam synced to incoming LTC or VITC time and is used when encoding Source ID from a VTR output. In all modes, the source ID name is programmed from the front panel of the 8010-SIE and encoded into the user bits.
The high resolution character inserter provides independently positionable windows to show time, source ID, status, LVS info and control information on both the program output and the analog monitor output. The characters on the program output can be turned off by using the ON AIR tally on the parallel remote control connector. Three character sizes and the choice of white or black characters with or without contrasting background mask are selected from the front panel.

Features:

- Accepts 4:2:2 (525 and 625 line) digital video
- Serial digital video input provides automatic cable equalization on cable lengths up to 200 meters of low loss coax such as Belden 8281
- Serial digital video bypass output activates on power loss
- Auxiliary serial digital video output (not bypass protected)
- Passes embedded audio and other ancillary data signals
- Character Inserter displays timecode, source ID and VTR status in the picture
- Separate positioning of each character window
- Active low 'ON AIR' GPI turns off all local displays of characters on SDI program output.
- Active low 'VCG ON/OFF' GPI can be used to remotely turn the character generator on and off
- On 8010-SIE Serial interface reads status LVS info and CTL information from the Profile in LVS mode or Timecode and VTR status from a Sony protocol VTR in VTR mode
- On 8010-SIE-GPSII Serial interface reads status time from ACCUTIME GPS antenna
- LTC and VITC Time Code reader to supply time code in RDR modes
- 16 digit Alpha-numeric display, with 16 pushbuttons
- Rack mountable

1.1. THE GLOBAL POSITIONING SYSTEM – OVERVIEW

The Global Positioning System (GPS) is a satellite based navigation system operated and maintained by the U.S. Department of Defense. When fully implemented, the GPS will consist of 24 satellites providing worldwide 24 hour, coverage. Originally conceived for military needs, the GPS has a broad array of civilian applications including timing, surveying, marine, land aviation and vehicle navigation. GPS, the most accurate technology available for marine and land navigation is emerging as the technology of choice in timing applications including site and network synchronization.

As a satellite system, the GPS is immune from the limitations of land based systems previously available. By computing the distance to GPS satellites orbiting the earth, a GPS receiver can calculate an accurate position. This process is called satellite ranging. A two-dimensional position calculation requires three satellite ranges. A three-dimensional position calculation, including altitude requires four satellite ranges. GPS receivers can also provide precise time, speed, and course measurements.

1.2. HOW TO USE THIS MANUAL

This manual covers the models 8010-SIE and 8010-SIE-GPSII models. Certain sections of the manual pertain only to the model 8010-SIE-GPS II model and are noted clearly. Throughout the remainder of the manual references to the model 8010-SIE are applicable to both versions of the unit.

This manual is organized into 3 chapters: Overview, Installation, Operation, and Serial Port Protocol.

Items of special note are indicated with a double box like this.

1.3. DEFINITIONS

AES: (Audio Engineering Society): A professional organization that recommends standards for the audio industries.

AES/EBU: Informal name for a digital audio standard established jointly by the Audio Engineering Society and the European Broadcasting Union organizations.

ANALOG: An adjective describing any signal that varies continuously as opposed to a digital signal that contains discrete levels representing digits 0 and 1.

A-TO D CONVERTER (ANALOG-TO-DIGITAL): A circuit that uses digital sampling to convert an analog signal into a digital representation of that signal.

BIT: A binary representation of 0 or 1. One of the quantized levels of a pixel.

BIT PARALLEL: Byte-wise transmission of digital video down a multi-conductor cable where each pair of wires carries a single bit. This standard is covered under SMPTE 125M, EBU 3267-E and CCIR 656.

BIT SERIAL: Bit-wise transmission of digital video down a single conductor such as coaxial cable. May also be sent through fiber optics. This standard is covered under SMPTE 259M and CCIR 656.

BIT STREAM: A continuous series of bits transmitted on a line.

BNC: Abbreviation of "baby N connector". A cable connector used extensively in television systems.

BYTE: A complete set of quantized levels containing all the bits. Bytes consisting of 8 to 10 bits per sample are typical in digital video systems.

CABLE EQUALIZATION: The process of altering the frequency response of a video amplifier to compensate for high frequency losses in coaxial cable.

CCIR: (International Radio Consultative Committee) An international standards committee. (This organization is now known as ITU.)

CCIR-601: (This document now known as ITU-R601). An international standard for component digital television from which was derived SMPTE 125M and EBU 3246-E standards. CCIR-601 defines the sampling systems, matrix values and filter characteristics for both Y, B-Y, R-Y and RGB component digital television signals.

CCIR-656: (This document now known as ITU-R656). The physical parallel and serial interconnect scheme for CCIR-601. CCIR-656 defines the parallel connector pinouts as well as the blanking, sync and multiplexing schemes used in both parallel and serial interfaces. It reflects definitions found in EBU Tech 3267 (for 625 line systems) and SMPTE 125M (parallel 525 line systems) and SMPTE 259M (serial 525 line systems).

CLIFF EFFECT: (also referred to as the 'digital cliff') This is a phenomenon found in digital video systems that describes the sudden deterioration of picture quality due to excessive bit errors, often caused by excessive cable lengths. The digital signal will be perfect even though one of its signal parameters is approaching or passing the specified limits. At a given moment however, the parameter will reach a point where the data can no longer be interpreted correctly, and the picture will be totally unrecognizable.

COMPONENT ANALOG: The non-encoded output of a camera, video tape recorder, etc., consisting of the three primary colour signals: red, green, and blue (RGB) that together convey all necessary picture information. In some component video formats these three components have been translated into a luminance signal and two colour difference signals, for example Y, B-Y, R-Y.

COMPONENT DIGITAL: A digital representation of a component analog signal set, most often Y, B-Y, R-Y. The encoding parameters are specified by CCIR-601. CCIR-656 and SMPTE 125M specify the parallel interface.

COMPOSITE ANALOG: An encoded video signal such as NTSC or PAL video, that includes horizontal and vertical synchronizing information.

COMPOSITE DIGITAL: A digitally encoded video signal, such as NTSC or PAL video that includes horizontal and vertical synchronizing information.

D1: A component digital video recording format that uses data conforming to the CCIR-601 standard. Records on 19 mm magnetic tape. (Often used incorrectly to refer to component digital video.)

D2: A composite digital video recording format that uses data conforming to SMPTE 244M. Records on 19 mm magnetic tape. (Often used incorrectly to refer to composite digital video.)

D3: A composite digital video recording format that uses data conforming to SMPTE 244M. Records on 1/2" magnetic tape.

EBU (European Broadcasting Union): An organization of European broadcasters that among other activities provides technical recommendations for the 625/50 line television systems.

EBU TECH 3267-E: The EBU recommendation for the parallel interface of 625 line digital video signal. This is a revision of the earlier EBU Tech 3246-E standard, which was in turn derived from CCIR-601.

EDH Error Detection and Handling (EDH) is defined in SMPTE RP-165 as a method of determining when bit errors have occurred along the digital video path. According to RP-165, two error detection checkwords are used, one for active picture samples, and the other on a full field of samples. Three sets of flags are used to convey information regarding detected errors, to facilitate identification of faulty equipment or cabling. One set of flags is associated with each checkword, and the third is used to evaluate ancillary data integrity. The checkwords and flags are combined into a special error detection data packet that is included as ancillary data in the serial digital signal.

EMBEDDED AUDIO: Digital audio is multiplexed onto a serial digital video data stream.

ITU: The United Nations regulatory body governing all forms of communications. ITU-R (previously CCIR) regulates the radio frequency spectrum, while ITU-T (previously CCITT) deals with the telecommunications standards.

ITU-R601: See CCIR601

PIXEL: The smallest distinguishable and resolvable area in a video image. A single point on the screen. In digital video, a single sample of the picture. Derived from the words *picture element*.

RESOLUTION: The number of bits (four, eight, ten, etc.) determines the resolution of the signal. Eight bits is the minimum resolution for broadcast television signals.

4 bits = a resolution of 1 in 16.
8 bits = a resolution of 1 in 256.
10 bits = a resolution of 1 in 1024.

SERIAL DIGITAL: Digital information that is transmitted in serial form. Often used informally to refer to serial digital television signals.

SMPTE (Society of Motion Picture and Television Engineers): A professional organization that recommends standards for the film and television industries.

SMPTE 125M: The SMPTE standard for bit parallel digital interface for component video signals. SMPTE 125M defines the parameters required to generate and distribute component video signals on a parallel interface.

SMPTE 259M: The SMPTE standard for 525 line serial digital component and composite interfaces.

TRS: Timing reference signals used in composite digital systems. (It is four words long).

TRS-ID: Abbreviation for "Timing Reference Signal Identification". A reference signal used to maintain timing in composite digital systems. (It is four words long.)

4:2:2: A commonly used term for a component digital video format. The details of the format are specified in the CCIR-601 standard. The numerals 4:2:2 denote the ratio of the sampling frequencies of the luminance channel to the two colour difference channels. For every four luminance samples, there are two samples of each colour difference channel.

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CHAPTER 2: INSTALLATION

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2. INSTALLATION

2.1. REAR PANEL

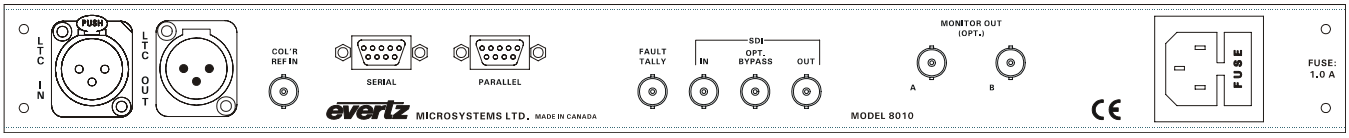

Figure 2-1: 8010-SIE Rear Panel

The following sections describe the purpose of the rear panel connectors of the 8010-SIE. Sections 2.1.1 to 2.1.7 describe the specific signals that should be connected to the 8010-SIE.

2.1.1. Digital Video Connections

SDI IN: A BNC connector for input of 10 bit serial digital video signals compatible with the SMPTE 259M standard.

SDI BYPASS: A BNC connectors for output of 10 bit serial digital video signals compatible with the SMPTE 259M standard. This output will normally be the video input with VITC (encoded with source ID information) and characters inserted onto it. When the SDI bypass relay is activated (on power failure or from the front panel) the SDI BYPASS output is a direct relay connection to the SDI IN.

SDI OUT: A BNC connectors for output of 10 bit serial digital video signals compatible with the SMPTE 259M standard. This output will normally be the video input with VITC (encoded with source ID information) and characters inserted onto it. When the SDI bypass relay is activated (on power failure or from the front panel) the SDI OUT output will not have any video signal on it.

2.1.2. Analog Monitor Video Connections (optional)

MONITOR OUT: Two BNC connectors for output of the optional composite analog encoder. This output will normally be an analog video copy of the video on the SDI OUT connector. When the SDI bypass relay is activated (on power failure or from the front panel) the MONITOR OUT outputs will not have any video signal on them.

2.1.3. Linear Time Code Connections

LTC OUT: A male XLR connector for output of SMPTE/ EBU linear timecode from the generator. (Balanced)

LTC IN: A female XLR connector for input of SMPTE/ EBU linear timecode for the reader (Balanced)

2.1.4. Tally Connections

FAULT TALLY OUT: A BNC connector for output of a SMPTE 269M fault tally. The output will be open circuit when the 8010-SIE is processing video normally. The output will be grounded when the optional SDI bypass relay is active.

2.1.5. Serial Port Connections

SERIAL: A 9 pin female 'D' connector for connection to the RS-232/RS-422 serial communications. See section 5.2.2 for the information on configuring the port for various applications.

On the 8010-SIE this port is configured at the factory for configured for a 'straight through RS-232 connection to a PC COM port. In this configuration it can be used for uploading firmware to the unit or connected to a Profile server (when the 8010-Sie is in *LVS-SID* mode). Table 2-1 shows the pinout of the serial port in its default RS-232 DCE configuration.

Pin #	Name	Description
1	GND	Chassis ground
2	TxD	RS-232 Transmit Output
3	RxD	RS-232 Receive Input
4		
5	Sig Gnd	RS-232 Signal Ground
6		
7	RTS	RS-232 RTS Input
8	CTS	RS-232 CTS Output
9		

Table 2-1: Serial Control Pin Definitions - RS-232 DCE Configuration

On the 8010-SIE this port can also be configured in an RS-422 controller port and used to sense status information from the video recorder supplying video to the 8010-SIE (when the 8010-SIE is in *VTR SID* mode).). Table 2-2 shows the pinout of the serial port in its RS-422 Controller configuration.

Pin #	Name	Description
1	GND	Chassis ground
2	Rx-	Receive A (Rx-) Input
3	Tx+	Transmit B (Tx+) Output
4	Tx Gnd	Transmit Signal Ground
5	Spare	Not connected
6	Rx Gnd	Receive Signal Ground
7	Rx+	Receive B (Rx+) Input
8	Tx-	Transmit A (Tx-) Output
9	GND	Chassis ground

Table 2-2: Serial Control Pin Definitions - RS-422 Controller Configuration

On the 8010-SIE-GPSII this port is configured at the factory for connection to the GPS antenna. If you need to upload firmware to the 8010-SIE-GPSII you will have to reconfigure the port to its RS-232 configuration as described in section 5.2.2. Table 2-3 shows the pinout of the serial port in its GPS antenna configuration.

Pin #	Name	Description
1	GND	Chassis ground
2	Tx-	Transmit A (Tx-) Output
3	Rx+	Receive B (Rx+) Input
4	PPS+	1 PPS Interrupt in +
5	+12V	+12 Volts DC out
6	PPS-	1 PPS Interrupt in -
7	Tx+	Transmit B (Tx+) Output
8	Rx-	Receive A (Rx-) Input
9	GND	Chassis ground

Table 2-3: Serial Control Pin Definitions – GPS Antenna Configuration

2.1.6. Parallel Remote Control Connections

PARALLEL: A 9 pin D connector located on the rear panel labeled PARALLEL provides 6 parallel control inputs for remote control of some of the model 8010-SIE functions. There are also two open collector outputs that can be assigned to a variety of functions. See section 2.6 for information on connecting the parallel inputs and outputs and section 3.8.5 for a complete description of the operation of the Parallel I/O functions. The pinout of the **PARALLEL** connector is as follows:

Pin #	Name	Description
1	GPO 1	General Purpose Output 1
2	GPO 2	General Purpose Output 2
3	GPI 1	General Purpose Input 1
4	GPI 2	General Purpose Input 2
5	JAM Ena	Jam Sync enable (8010-SIE)
	Sync GPS	Resync to GPS Time (8010-SIE-GPSII)
6	Bypass	Enable Bypass Relay
7	VCG Ena	VCG On/Off
8	VITC Ena	VITC reader enable
9	GND	Frame ground

Table 2-4: Parallel Remote Control Pin Definitions

2.1.7. Power Connections

LINE: The 8010-SIE was manufactured with two different power suply configurations. Earlier versions may be set for either 115v/60 Hz or 230v/50 Hz AC operation. The voltage selector switch is accessible on the rear panel. The line voltage connector contains an integral slow blow fuse (and a spare one).

The 8010-SIE-GPS II and later versions of the 8010-SIE have a universal power supply operating on either 115v/60 Hz or 230v/50 Hz AC operation.

2.2. MOUNTING

The 8010-SIE Digital Source ID Encoder is equipped with rack mounting angles and fits into a standard 19 inch by 1 3/4 inch (483 mm x 45 mm) rack space. The mounting angles may be removed if rack mounting is not desired.

2.3. POWER REQUIREMENTS

2.3.1. Power Requirements – Early versions of Model 8010-SIE

2.3.1.1. Selecting the Correct Mains Voltage

Power requirements are 115 or 230 volts AC at 50 or 60 Hz, switch selectable on the rear panel. Power should be applied by connecting a 3 wire grounding type power supply cord to the power entry module on the rear panel. The power cord should be minimum 18 AWG wire size, type SST marked VW-1, maximum 2.5 m in length.

Before connecting the line power, be sure to select the proper line voltage. Also, check that the line fuse is rated for the correct value marked on the rear panel.

The power entry module combines a standard IEC 320 power inlet connector, voltage selector switch, two 5 x 20 mm fuse holders (one active, one spare) and an EMI line filter.

To change the mains voltage setting, open the cover of the power entry module using a small screwdriver. Remove the drum selector switch, and re-insert it so that the desired voltage is visible through the opening on the mains connector cover. Check that the correct fuse is in use as shown in section below.

2.3.1.2. Changing the Fuse

The fuse holder is located inside the power entry module. To change the fuse, open the cover of the power entry module using a small screwdriver. The fuse holder on the bottom contains the active fuse. The one at the top contains a spare fuse. Pull the bottom fuse holder out and place a fuse of the correct value in it. Use slo blo (time delay) 5 x 20 mm fuses rated for 250 Volts with the following current ratings:

For 115 Volt operation	250 mA
For 230 Volt operation	125 mA

Make sure that the arrow is pointing down when you replace the fuse holder. Close the door on the power entry module and connect the mains voltage.

Never replace with a fuse of greater value.

2.3.2. Power Requirements – Model 8010-SIE-GPS II and Later Versions of Model 8010-SIE

2.3.2.1. Selecting the Correct Mains Voltage

Power requirements are 115 or 230 volts AC at 50 or 60 Hz. The 8010-SIE-GPS II and later versions of the 8010-SIE have a universal power supply that automatically senses the input voltage. Power should be applied by connecting a 3-wire grounding type power supply cord to the power entry module on the rear panel. The power cord should be minimum 18 AWG wire size; type SVT marked VW-1, maximum 2.5 m in length.

The power entry module combines a standard power inlet connector, two 5 x 20 mm fuse holders and an EMI line filter.

2.3.2.2. Changing the Fuse

The fuse holder is located inside the power entry module. To change the fuses, disconnect the line cord from the power entry module and pull out the fuse holder from the power entry module using a small screwdriver. The fuse holder contains two fuses, one for the line and one for the neutral side of the mains connection. Pull out the blown fuse and place a fuse of the correct value in its place. Use

slo blo (time delay) 5 x 20 mm fuses rated for 250 Volts with a current rating of 1 amp. Carefully reinsert the fuseholder into the power entry module.

Never replace with a fuse of greater value.

2.4. CONNECTING THE DIGITAL VIDEO

2.4.1. Video Input

The 8010-SIE requires that a digital video source be connected to the SDI IN video input. The 8010-SIE may be configured to accept either 525 or 625 line digital video in the component (4:2:2) format. The VIDEO TYPE parameter on the front panel menu must be set correctly to match the video input. (See section 3.6.1 for information on changing the VIDEO TYPE setting). When the VIDEO TYPE parameter is set to *422 Auto* the 8010-SIE will automatically detect the video standard of the input.

The Video LED indicator will be On when there is video present matching the selected video type. When it is blinking it indicates that there is video present but the VIDEO TYPE menu item does not match the input video format.

2.4.2. Video Output

The SDI BYPASS and SDI OUT outputs contain the input video with VITC (with timecode, source ID and VTR status encoded), and character data keyed in by the keyer. Connect one of these outputs to any input on your system that accepts 8 or 10 bit SERIAL digital video. The two outputs are identical except that the SDI BYPASS output is protected by the bypass relay. When the relay is active, the SDI BYPASS output is directly connected to the SDI input, and the SDI OUT output will have not video output.

2.5. LINEAR TIME CODE CONNECTIONS

The LTC reader input provides a means of bringing linear time code into the 8010-SIE when the 8010-SIE is operating in RDR mode (model 8010-SIE and 8010-SIE-GPS II) or LVS mode (model 8010-SIE only). Pin 1 of the XLR is ground, and pins 2 and 3 provide a balanced output.

When using an unbalanced input to the reader, the signal should be applied to pin 3 of the LTC reader input connector. Normally, the unused input (pin 2) should be connected to ground (pin 1).
The LTC generator code output is available on an XLR connector at the rear panel. Output level is adjustable from approximately 0.5 V to 4 V using the LTC LEVEL item on the Engineering setup menu system. (See section 3.4.1) The generator code output should be connected to the record input of the time code channel of your video recorder. Pin 1 of the XLR is ground, and pins 2 and 3 provide a balanced output.

2.6. CONNECTING THE GENERAL PURPOSE INPUTS AND OUTPUTS

The 9 pin PARALLEL I/O connector has 6 general purpose inputs and 2 tally outputs. The GPI inputs are active low. This means that if you leave an input floating (not connected) then it will not be

activated. Lowering the GPI input to a voltage below 0.8 volts will activate the input. The user can activate GPIs simply by connecting the GPI input pins to Ground using a button, switch, relay or an open collector transistor.

The outputs are internally pulled up to 5 volts. Care must be taken to limit the load to 0.5W so there is no affect on the power supply source in the frame.

Each I/O pin is electrically wired so it can be used as either an input or output. When the pins are used as inputs, the software turns off the output driver transistor. Figure 2-2 shows the circuitry for each of the I/O pins.

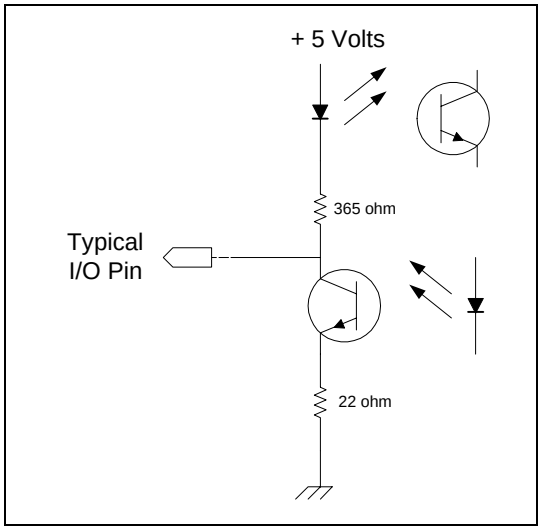

Figure 2-2: Typical GPIO Circuitry.

2.7. CONNECTING TO A VTR RS-422 PORT (MODEL 8010-SIE ONLY)

When the 8010-SIE is in the VTR mode, the serial remote control port is used to eavesdrop on the RS-422 serial control between a VTR and its controller. The serial port is used to obtain timecode and status information from the VTR. At this time the 8010-SIE is customized to eavesdrop on the communications between a Lance HSE-100 Edit Controller and a Sony VTR. The use of other edit controllers may not give expected results on the VTR status of the 8010-SIE (See chapter 4 for a complete description of the serial port operation). The wiring diagram below can be used to make an appropriate cable.

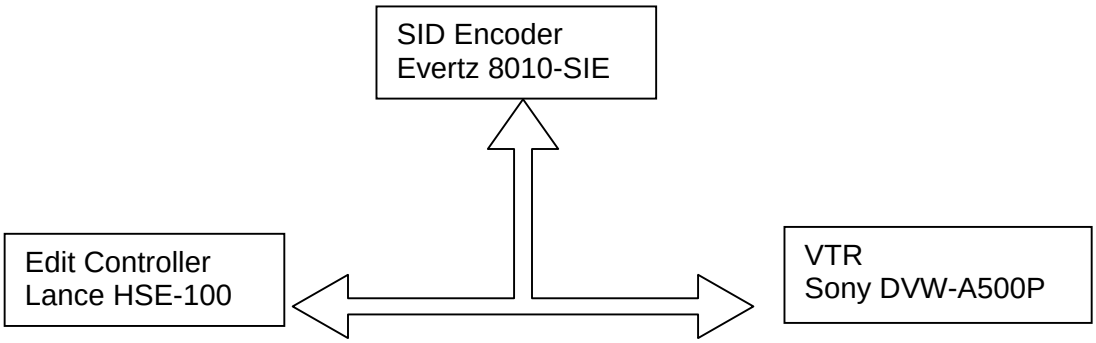

Figure 2-3: Connection of 8010-SIE in Eavesdropping Mode

Edit Controller RS422 Controller port		VTR RS422 Tributary port		SID Encoder Serial Port (RS422 Controller)	
Description	**Pin**	**Pin**	**Description**	**Pin**	**Description**
Frame Ground	1	1	Frame Ground	1	Frame Ground
Receive A (Rx-)	2	2	Transmit A (Tx-)	2	Receive A (Rx-)
Transmit B (Tx+)	3	3	Receive B (Rx+)	3	Transmit B (Tx+)
Transmit Gnd	4	4	Receive Gnd	4	Transmit Gnd
Spare	5	5	Spare	5	Spare
Receive Gnd	6	6	Transmit Gnd	6	Receive Gnd
Receive B (Rx+)	7	7	Transmit B (Tx+)	7	Receive B (Rx+)
Transmit A (Tx-)	8	8	Receive A (Rx-)	8	Transmit A (Tx-)
Frame Gnd	9	9	Frame Gnd	9	Frame Gnd

Figure 2-4: RS-422 Eavesdrop Cable

2.8. CONNECTING TO A PROFILE RS-232 PORT (MODEL 8010-SIE ONLY) When the 8010-SIE is in the LVS mode, the serial remote control port is used to listen to a serial data stream from the Profile disk recorder. This serial communication is normally daisy-chained to each of the 8010-SIE units that are connected on the Profile outputs. The serial port is used to obtain status, LVS and CTL information from the Profile recorder. (See chapter 4 for a complete description of the serial port operation).

In order to properly address each of the 8010-SIE units connected in the daisy chain, the Profile sends out an 'address' before each command. The **LVS ADDRESS** menu item on the Engineering menu of the 8010-SIE must be set to match the address that the Profile is using for a specific output.

2.9. GPS ANTENNA INSTALLATION (MODEL 8010-SIE-GPS II ONLY)

The 8010-SIE-GPS II units are designed to work with the Trimble Accutime 2000 Smart Antenna that can be located up to 1000 feet from the 8010-SIE-GPS II unit. The Smart Antenna houses the GPS receiver, antenna, power supply and other support circuitry in a sealed, shielded, self-contained unit with a digital interface to the main unit. The GPS Smart Antenna also receives power from the main unit through the connection cable.

2.9.1. Mounting the GPS Smart Antenna

The smart antenna's enclosure is completely waterproof and is designed for outdoor installation. It is protected against jamming signals and thus is suitable for reliable operation in most environments. Select an outdoor location for the antenna, like the roof of your building that has a relatively unobstructed view of the sky. Dense wood and concrete or metal structures will shield the antenna from satellite signals. The antenna can receive satellite signals through glass, canvas and thin fiberglass; thus it may be mounted inside a skylight, if an outdoor location is not possible.

The smart antenna is an active-head antenna. For optimal performance, locate the smart antenna as far as possible from transmitting antennas, including radar, satellite communication equipment and cellular transmitters. When locating the antenna near a radar installation, ensure that the antenna is positioned outside of the radar's cone of transmission. Follow the same guidelines when installing the antenna near satellite communication equipment. For best results, mount the antenna at least ten feet away from satellite communication equipment. Do not mount the antenna near high vibration areas such as fan or motor housings, or near sources of heat such as exhaust stacks.

Consider the length of the cable run when selecting the location. A 50 foot cable is supplied; however, longer cables are available on special order from the factory. You may also wire a straight-through extender cable to extend the able distance up to 200 feet. The smart antenna is designed for a pole mount with a 1" - 14 straight thread, which is a common marine antenna mount. For stationary installations a 3/4" pipe thread can be used, but a 1"-14 straight thread is recommended. Pole mounting is illustrated in Figure 2-5.

Secure the mounting pole to a solid structure so that it is oriented vertically. Thread the smart antenna onto the pole or pile and hand tighten until snug.

CAUTION: Over-tightening the smart antenna on the pole or using a tool could damage the threaded socket in the base of the antenna. In addition, do not use thread-locking compounds, since they can corrode plastic

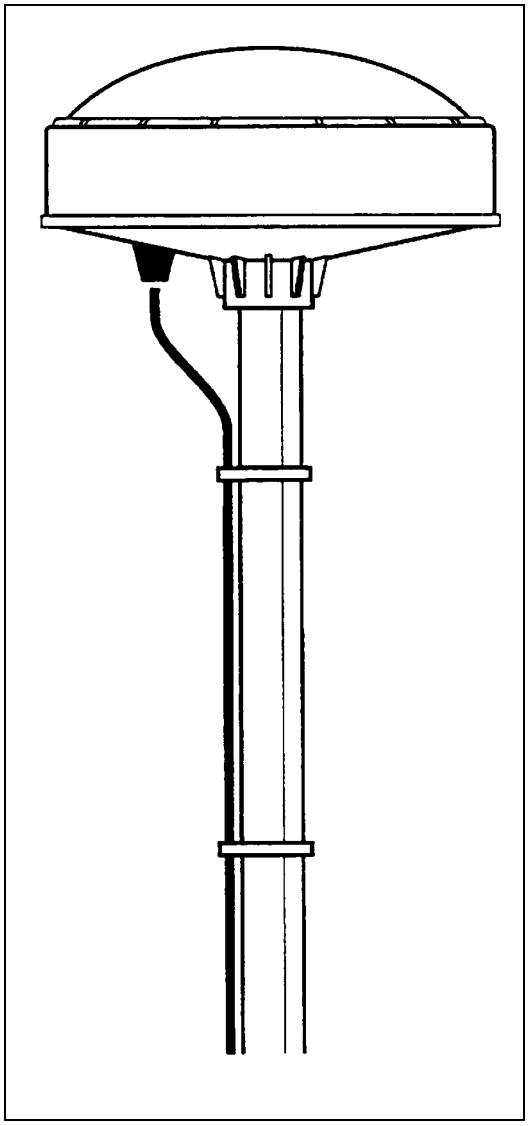

Figure 2-5: Pole Mounting the Smart Antenna

2.9.2. Connecting the GPS Smart Antenna to the 8010-SIE-GPS II

A standard 50 foot long interface cable (Evertz part WA-T09) is provided with the 8010-SIE-GPS II and the smart antenna. One end of this cable is fitted with a weather-tight 12 pin Molex connector. The other end is fitted with a 9 pin male subminiature D connector and should be connected to the SERIAL I/O connector on the rear panel of the 8010-SIE-GPS II. The pin out of the cable is shown in Figure 2-6. If you require a longer cable, a 100 foot (Evertz part WA-T76) or 400 foot cable (Evertz part WA-T11) may be ordered from the factory. Custom length weatherproof cables can also be special ordered. Alternately, you can wire a 9 pin Extender cable as shown in Figure 2-7.

Connect the interface cable to the smart antenna. The connector on the interface connector has a locking ring for securing the connection.

CAUTION: Over tightening the locking ring can damage the connector on the smart antenna

Route the interface cable to the location of the 8010-SIE-GPS II unit using the most direct path. Avoid routing the cable near hot surfaces, sharp or abrasive surfaces, or corrosive fluids or gases. Avoid sharp kinks or bends in the cable. Additional protection such as heat shrink tubing may be required to protect the cable jacket at points where the cable enters the building, especially if the opening is rough or sharp. Once the cable is run, use cable-ties to secure the cable to the pole and to provide strain relief for the connections. When securing the cable, start at the antenna and work towards the 8010-SIE-GPS II unit.

Before connecting the cable to the 8010-SIE-GPS II make sure that the jumpers are set correctly inside the 8010-SIE-GPS II. Improper configuration of the jumpers may cause damage to the smart antenna. See section 5.2.2 for the correct jumper positions

Power is provided from the 8010-SIE-GPS II along the interface cable to the smart antenna. The Jumpers located near the Serial I/O D connector on the main circuit card of the 8010-SIE must be in the correct configuration in order to provide power to the antenna. Your 8010-SIE-GPS II should have been preset at the factory to this configuration but it is wise to remove the top cover of the unit and verify the correct orientation of this jumper before proceeding. See section 4.4 for the correct location of jumpers on the main circuit board.

Trimble antenna Mini-Con 12 pin (female)		**Evertz 8010-SIE-GPS II 9 pin "D" style (male)**	
DC Ground	9 ----------	1	Frame Ground
Receive Port (R-)	2 ----------	2	TX A -
Transmit Port (T+)	5 ----------	3	RX B +
Timing pulse 1pps	11 ----------	4	1 PPS interrupt in +
DC Power IN	1 ----------	5	+12 V DC Unreg.
Timing pulse 1pps	12 ----------	6	1 PPS interrupt in -
Receive Port (R+)	3 ----------	7	TX B +
Transmit Port (T-)	4 ----------	8	RX A -
	----------	Drain Wire	Shield

Figure 2-6: Accutime 2000 Smart Antenna to 8010-SIE-GPS II Interface Cable (Evertz part WA-T09)

9 pin "D" style (female) Pin	Pair #	9 pin "D" style (male) Pin	Description
7	1	7	TX B +
2	1	2	TX A -
8	2	8	RX A -
3	2	3	RX B +
4	3	4	1 PPS +
6	3	6	1 PPS -
5	4	5	+12 V DC Unreg.
1	4	1	Ground.
	Drain Wire		Shield

Figure 2-7: Accutime 2000 Extender Cable

2.9.3. System Startup

At power up, the smart antenna will automatically begin to acquire and track the GPS satellite signals. From a cold start, the smart antenna will normally take from 2 to 5 minutes to lock on to sufficient satellites to accurately determine the time. During this time the GPS STATUS display on the front panel will show the various stages of initialization. For complete information on configuring the 8010-SIE-GPSII to operate with the GPS Smart antenna see section 3.9 of this manual

CHAPTER 3: OPERATION

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Tables

3. HOW TO OPERATE THE DIGITAL SOURCE ID ENCODER

The model 8010-SIE Source ID Encoder combines the latest LSI technology with sophisticated microcontroller firmware to provide a powerful, flexible Source ID Encoder. The model 8010-SIE contains a Vertical Interval Time Code (VITC) generator and a high-resolution character inserter. A 16 digit alphanumeric display can be quickly delegated to show the required data.

The basic 8010-SIE operates in one of four modes. In VTR mode, it is designed to listen to communications between a VTR and its controller, and take time code and machine status. In LVS mode, the 8010-SIE is designed to interface to a Profile Disk recorder running the LVS software. The serial port of the LVS device sends recorder status, scene and control information to the 8010-SIE. In RDR mode, the 8010-SIE takes time from its LTC or VITC reader and in GEN mode it allows the user to preset a time into the time code generator. In all modes, the source ID name is programmed from the front panel of the 8010-SIE and encoded into the user bits.

The model 8010-SIE-GPS II Source ID Encoder interfaces to a GPS receiver, allowing the generator time to be precisely synchronized to a world wide time standard known as the Global Positioning system. The 8010-SIE-GPS II is supplied with a Trimble ACCUTIME 2000 GPS Smart Antenna that houses the GPS receiver, antenna, power supply and other support circuitry in a sealed, shielded, self-contained unit with a digital interface to the 8010-SIE-GPS II. When the 8010-SIE-GPS II is operated in the GPS SID mode, the generator is synchronized to the GPS time reference being received from the smart antenna. When the GPS based time is within 0.5 seconds of the 8010-SIE-GPS II's UTC time clock, the generator will continue to increment normally. If for any reason the offset between the 8010-SIE-GPS II's UTC time clock and the GPS based time is greater than 0.5 seconds; the generator will resynchronize to the GPS based time. In addition, the 8010-SIE-GPS II can be set to resynchronize once per day at a user specified time, or on demand so that the optimal time accuracy is continuously maintained, at the same time minimizing the potential for code disturbances during resynchronization. The 8010's UTC time clock will normally be within +/- 1 colour frame of the GPS based time. A manual TIME SID mode operates the same as the GPS SID mode, except that UTC time clock and date may be set from the front panel. This mode is useful where a GPS time reference is not available. A RDR SID mode allows the time to be jam synced to incoming LTC or VITC time and is used when encoding Source ID from a VTR output. In all modes, the source ID name is programmed from the front panel of the 8010-SIE and encoded into the user bits.

3.1. AN OVERVIEW OF KEY AND DISPLAY FUNCTIONS

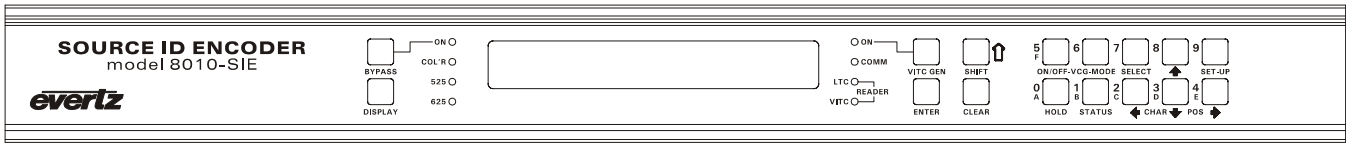

Figure 3-1: Model 8010-SIE Front Panel Layout

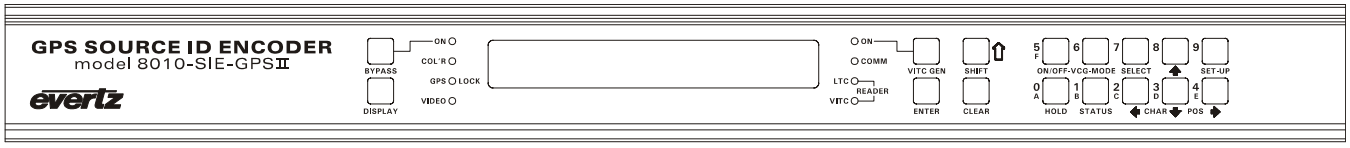

Figure 3-1: Model 8010-SIE-GPSII Front Panel Layout

The display area consists of a 16 digit alphanumeric display, 6 LED status indicators and a 16 pushbutton keypad.

The keypad is used to program the source ID message that will be encoded, to control the front panel menu system, to position the character display windows, and to provide control of the front panel display. When the **SHIFT** key is held down, the meanings of some of the keys are modified, gaining quick access to a wider variety of functions. (Throughout this manual **SHIFT +** indicates that you should hold down the **SHIFT** key while pressing the second key.)

A front panel programming menu provides a quick and simple method of configuring the 8010-SIE Source ID Encoder for your application. Operation of the 8010-SIE and 8010-SIE-GPSII are very similar. Unless otherwise specified, references to model 8010-SIE include model 8010-SIE-GPS II.

Sections 3.2 to 3.9 give detailed information on the specific operations required to control the 8010-SIE.

3.1.1. The Setup Pushbutton Group

The Setup key group consists of the **SELECT, SETUP** and ←, →, ↑, ↓ keys and is used to navigate the front panel programming menu system, to position character windows and to enter the source ID message.

SETUP Enters the Setup mode that is used to set up various modes of operation. Pressing **SETUP** again while in this mode exits the Setup mode. (See also section 3.4)

SHIFT + SETUP Enters the Engineering Setup mode that is used to set up various items that are normally only required during installation.

SELECT When in the Setup mode the SELECT key is used to activate/deactivate sub menus from the drop down menu

↑ ↓ ← → When in the Setup mode, the ↑ ↓ ← → arrow keys are used to move to various items in the menu system. (See also section 3.4)

When in the Source ID programming mode, the ← & → arrow keys are used to move between characters in the message and the ↑ & ↓ arrow keys are used to change the characters of the message. (See also section 3.3.)

When in the VCG window select mode, the arrow keys are used to position the individual character windows on the screen. (See also section 3.7.4.)

When not in the Setup mode, Source ID programming mode or the VCG window select mode, the arrow keys are used to position all the character windows on the screen. (See also section 3.7.5.)

3.1.2. The Character Window Pushbutton Group

CHAR GEN WINDOW Initiates VCG window select mode and highlights the Time VCG window. Use the arrow keys to move the window, use the CHAR GEN ON/OFF key to turn the window on or off. Press the WINDOW key again to select the SRC ID VCG window. Press the WINDOW key again to select the next window and so on. The 8010-SIE returns to the normal VCG display mode after the last window has been selected. Some windows are only available when the 8010-SIE is in LVS mode.

CHAR GEN ON/OFF Turns the character generator ON and OFF. When in the VCG window select mode the CHAR GEN ON/OFF key is used to turn individual windows ON and OFF.

3.1.3. The Function Button Group

BYPASS Is used to enable and disable the SDI bypass relay. To activate the bypass relay press **SHIFT + BYPASS**. The BYPASS indicator is ON when the bypass relay is enabled. To de-activate the bypass relay press **BYPASS** or **SHIFT + BYPASS**.

DISPLAY Selects what data is being displayed on the front panel. Each time it is pressed it cycles to the next display data. There are also some extended displays which are accessible by pressing the **SHIFT + DISPLAY** keys. See section 3.2 for more information about the front panel displays.

VITC GEN Is used to turn the VITC generator on and off. The VITC indicator is ON when the VITC generator is enabled. The time and user bits of the VITC generator are the same as for the LTC generator.

HOLD When the generator is displayed on the front panel, pressing the HOLD key stops the generator time from incrementing when the unit is operating in the *TIME SID* mode.. A special character (H) appears to the left of the numeric display on the front panel, indicating that the display is in Hold mode. Pressing the HOLD key again starts the generator incrementing.

STATUS Displays the current operational modes of the 8010.

3.1.4. An Overview of the Status Indicators

There are 8 status indicators located on the front panel that show operational status of the 8010-SIE at a glance.

BYPASS Indicates that 8010-SIE is operating in the Bypass Mode. The SDI video input is directly connected to the SDI Bypass output and the 8010-SIE will have no effect on the video signal.

COLR Indicates that the 8010-SIE is receiving a valid colour frame reference and is operating in the colour frame mode.

GPS LOCK On the 8010-SIE-GPSII this LED indicates that the generator time is locked to the GPS reference time being received from the antenna. The generator will be locked to within 1 colour frame of the GPS time.

VIDEO On the 8010-SIE-GPSII this LED indicates that input video is present. If it is blinking, it indicates a video signal is present but the video standard is different from the VIDEO TYPE menu setting. (See section 3.8.1 for information on selecting the video type).

525 On the 8010-SIE this LED indicates that a 525 line video is present at the input. If it is blinking, it indicates a video signal is present but the VIDEO TYPE menu setting is set to 422 625. (See section 3.8.1 for information on selecting the video type).

625 On the 8010-SIE this LED indicates that a 625 line video is present at the input. If it is blinking, it indicates a valid video signal is present but the VIDEO TYPE menu setting is set to 422 625. (See section 3.8.1 for information on selecting the video type).

VITC GEN Indicates that the VITC keyer is enabled.

COMM Indicates that communications to the VTR or LVS device is present.

LTC READER Indicates that LTC reader is reading valid code.

VITC READER Indicates that VITC reader is reading valid code.

3.2. FRONT PANEL DISPLAY FUNCTIONS

3.2.1. Front Panel Displays

The **DISPLAY** key is used to select which data is being displayed in the alphanumeric display. Each time the **DISPLAY** key is pressed, the front panel display cycles to the next available display. The leftmost characters of the display indicate what is being displayed as follows:

`GTM  12:34:56:00`	Generator Time information
`SRC ID:  VTR-10`	Source ID Message
`LTM  12:34:56:00`	LTC Reader Time information
`LUB  12 34 56 78`	LTC Reader User Bit information
`VTM  12:34:56:00`	VITC Reader Time information
`VUB  12 34 56 78`	VITC Reader User Bit information

When the reader time or user bits are being displayed the active reader will be indicated by an asterisk (e.g. `LTM*` indicates that the LTC reader is active, or `VTC*` indicates that the VITC reader is active) See section 3.6.1 for more information on selecting which reader is active.

On the 8010-SIE-GPSII there are additional front panel messages that relate to the GPS functions. See section 3.9 for more information about using the messages related to the GPS functions of the unit. The most common operational displays are:

`GPS STS:SATS  xx`	XX indicates the number of visible satellites
`UTC:  12:34:56`	Universal Coordinated Time (adjusted GPS receiver time)
`UDC:  Aug 22, 2002`	Universal Coordinated Date (adjusted GPS receiver date)
`TIME ZONE:  00:00`	Time Zone Offset

There are also some extended displays which are accessible by pressing the **SHIFT + DISPLAY** keys. At this time the extended displays are:

`OFFS`	Jam Sync Offset register
`REVT`	Time at which Reader Time Event GPO will occur
`GEVT`	Time at which Generator Time Event GPO will occur

On the 8010-SIE-GPSII there are additional extended front panel messages that relate to the GPS functions.

`GPS@`	Time at which GPS resync will occur

3.2.2. Special Front Panel Indicators

The following special indicators are used between the seconds and frames digits of the front panel time display to identify non-drop frame and drop frame code (NTSC only)

Non Drop Frame	Colon (:)
Drop Frame (NTSC)	Period (.)

The following special indicators are used between the hours and minutes digits of the front panel time display on the 8010-SIE-GPSII to identify when the GPS referenced time has is being adjusted for Daylight Saving Time

DST Time Off	Colon (:)
DST Time On	Period (.)

3.3. PROGRAMMING A SOURCE ID MESSAGE INTO THE ENCODER

The 8010-SIE encodes a source ID message of up to 9 alphanumeric characters, and is shown in the following format:

AAAAAAAAA

The A represents alphanumeric message characters. Leading spaces in the source ID message are automatically blanked and the messages are right justified.

3.3.1. Source ID Data Entry Mode

A special data entry mode is provided to allow the user to program the source ID message. Press **DISPLAY** one or more times until the SRC ID is displayed on the front panel. Press **ENTER** to enter the Source ID programming mode. The four arrow keys (↑, ↓, ←, →) are used to select individual characters in the message and change them.

The following detailed procedure should be used to enter the source ID message.

1. Press **DISPLAY** one or more times until the `SRC ID` is displayed on the front panel.

2. Press the **ENTER** key to enter Source ID programming mode. The display will show:

   ```
   ID AAAAAAAAA
   ```

   The leftmost character of the message will blink indicating that it is selected for entry. If the character is a space then it will be shown as a blinking underline (__) character.

3. Use the ↑ & ↓ arrow keys to change the character. Only the ASCII characters from <space> to Z are permitted for the message characters.

4. Use the ← or → arrow keys to select the next character to be entered.

5. Repeat steps 3 and 4 until all the characters have been entered.

6. When you have entered the desired Source ID message press **ENTER** to accept the new Source ID message. If you want to exit the Source ID programming mode without changing the programmed message press the **CLEAR** key.

3.4. AN OVERVIEW OF THE FRONT PANEL PROGRAMMING MENU

The key to the operational flexibility of the 8010-SIE Digital Source ID Encoder lies in the front panel programming menu system. The programming menu system uses the 16 digit alphanumeric display and provides a quick, intuitive method of configuring 8010-SIE Digital Source ID Encoder, guiding you to the correct setup for your application. The six keys in the Setup key group (**SELECT**, **SETUP,** ← → ↑ ↓) are used to cycle through the various items on the programming menu.

The 8010-SIE menu system consists of a main menu with two or more choices for each menu item. The sub menu items are shown in lower case to allow them to be easily distinguished from the main level items.

To enter the front panel programming menu, press the **SETUP** key. The two vertical arrow keys (↑, ↓) allow you to move vertically within the menu tree. When you have selected the desired menu item, press the → key to reveal the choices for that item. The choice that is currently selected will be blinking. When you have selected the desired sub menu choice press the **SELECT** key to save your choice.

When you have made all the desired changes, press the **SETUP** key to return to the normal display mode.

The following table shows the items in the main level of the menu tree. Sections 3.5 to 3.7 provide detailed descriptions of each of the sub menus. The tables in these sections are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

GEN SRC ID MODE	Sets the overall operating mode of the Source ID encoder.
GEN VITC LINE 1	Sets the first line number of the VITC Generator
GEN VITC LINE 1	Sets the second line number of the VITC Generator
GEN DROP FRAME	Configures the generator drop frame mode
GEN COLOUR FRAME	Configures the generator colour frame mode
GEN LTC PARITY	Configures the parity of the LTC generator
GEN NO CODE JAM	Configures the action when input code is missing (RDR SID mode only)
GEN TZ ADJUST	Sets whether the 8010-SIE-GPSII is generating Local or UTC time
RDR ASSIGNMENT	Sets whether the reader will read LTC or VITC
VRDR START LINE	Sets the first line number for the VITC Reader line range
VRDR END LINE	Sets the second line number for the VITC Reader line range
CHAR SIZE	Sets the Character generator character size
CHAR STYLE	Sets the Character generator character style
VCG FRAMES	Turns the Character generator Time code Fields display on or off
VCG FIELDS	Turns the Character generator Time code Fields display on or off
VCG SYMBOLS	Turns the Character generator Window Symbols on or off
BYPASS MODE	Activates the SDI Bypass relay

Table 3-1: Overview of the 8010-SIE Programming Menu System

3.5. PROGRAMMING THE GENERATOR MODES

The first four items on the programming menu are used to program various generator modes such as selecting the overall Source ID encoding mode, whether the VITC keyer is on, the VITC Generator Line numbers and the source for the generator time information. The following descriptions appear in the order they appear on the menu.

3.5.1. Configuring the Generator Source ID Modes – Model 8010-SIE

GEN SRC ID MODE
Id mode time sid
Id mode rdr sid
Id mode rdr lvs
Id mode vtr sid

The **GEN SRC ID MODE** menu item is used to choose a method of encoding the source ID information. The 8010-SIE operates in one of four modes. In all modes, the source ID name is programmed from the front panel of the 8010-SIE and encoded into the user bits.

The encoded source ID information consists of a nine alphanumeric character message and optional VTR status and LVS info and is multiplexed into the user bits of three consecutive frames.

In *TIME SID* mode the user enters the time from the front panel and encodes 9 character source ID into the user bits.

In *RDR SID* mode, the 8010-SIE takes time from its LTC or VITC reader and encodes 9 character source ID into the user bits.

In *RDR LVS* mode, the 8010-SIE is designed to interface to a Profile Disk recorder running the LVS software. The serial port of the LVS device sends recorder status, scene and control information to the 8010-SIE. In this mode the 8010-SIE takes time from its LTC or VITC reader and encodes the source ID and LVS info into the user bits.

In *VTR SID* mode, it is designed to listen to communications between a VTR and its controller to get time code and machine status.

3.5.2. Configuring the Generator Source ID Modes – Model 8010-SIE-GPSII

GEN SRC ID MODE
Id mode time sid
Id mode rdr sid
Id mode gps sid

The **GEN SRC ID MODE** menu item is used to choose a method of encoding the source ID information. The 8010-SIE-GPSII operates in one of three modes. In all modes, the source ID name is programmed from the front panel of the 8010-SIE and encoded into the user bits.

The encoded source ID information consists of a nine alphanumeric character message and is multiplexed into the user bits of three consecutive frames.

In *TIME SID* mode the user enters the time from the front panel and encodes 9 character source ID into the user bits.

In *RDR SID* mode, the 8010-SIE takes time from its LTC or VITC reader and encodes 9 character source ID into the user bits.

In *GPS SID* mode, the 8010-SIE takes time from the GPS antenna and encodes 9 character source ID into the user bits.

3.5.3. Setting the Generator Time

When the 8010-Sie is operating in the *TIME SID* mode, the user can set the generator time using the following procedure. Press the **DISPLAY** key one or more times to display the generator time if it is not already displayed. The display prompt will show `GTM` when generator time is being displayed. The **ENTER** and **CLEAR** keys are used in conjunction with the numeric keys to set the generator time.

Press the **ENTER** key to recall the last time that you entered into the generator. The display prompt at the left of the display will blink while data entry mode is active, and the dual functioned keys are now changed to their numeric values. If you want to re-enter this time press the **ENTER** key to complete the data entry into the generator time
.
Pressing any numeric key will clear the previous value and place the new value into the numeric display, starting at the right. Unentered digits are assumed to be zero, hence leading zero digits are not required. When the required number of digits are entered, then press the **ENTER** key to complete the data entry into the generator time.

Attempts to enter too many digits, or make illegal entries, i.e. 65 minutes, will result in the display returning to the last valid time entry made. Re-enter the correct value and press the **ENTER** key. Pressing the **CLEAR** key will cancel the data entry mode without changing any data.

The numeric keys return to their normal display functions when the data entry has been completed by pressing **ENTER** or cancelled by pressing the **CLEAR** key. The display prompt will return to its steady On state when data entry mode has been completed.

Numeric entry mode must be terminated (GTM will be On steady) before any of the front panel keys will resume normal operation.

In *TIME SID* mode, press **GEN HOLD** key (when the Generator time is being displayed on the front panel) to start or stop the generator clock. In all the other operating modes, the generator time will be slaved to incoming code from the GPS antenna, LTC or VITC reader or VTR timecode.

3.5.4. Turning the VITC Generator On

The **VITC GEN ON/OFF** key is used to turn the VITC keyer on and off. (You must exit the Setup menu to turn the VITC generator on or off.) When the VITC generator is Off, the program video passes through the VITC keyer with nothing added. When the VITC generator is On, the VITC will be added to the program video.

3.5.5. Selecting the Lines to Record VITC On.

GEN VITC LINE 1
Gvitc line 1 = 10

The GEN VITC LINE1 and GEN VITC LINE2 menu items are used to select the lines on which the VITC will be inserted.

When the GEN VITC LINE1 sub menu is first selected, the LINE1 number will be shown. Press the left and right (🡐,🡒) keys to change LINE 1. Press the down (🡓) key to select the GEN VITC LINE2 menu item. Press the left and right (🡐,🡒) keys to change LINE 2

The user will have to determine by experience the most suitable lines for recording VITC according to the following criteria.

In order to protect the VITC reading process against dropouts, the VITC is usually repeated on 2 non-adjacent lines in the vertical interval of the video signal, not earlier than line 10 (6 for PAL) or later than line 32. For certain recordings, the use of some of these lines may interfere with other signals inserted into the vertical interval.

It is recommended that two non-adjacent lines are used, however adjacent lines and a single line (selected when both lines are the same) are permitted.

3.5.6. Selecting the Generator Drop Frame Mode (NTSC only)

In NTSC, the video frame rate of approximately 29.97 frames per second causes an error between real time and 'colour time'. To overcome this problem, the drop frame mode was created. This mode compensates for the approximate 4 minute per day error by dropping the first two frame counts (0, 1) at the start of each minutes, except minutes 0, 10, 20, 30, 40, and 50. A drop frame flag bit is set in the code when the drop frame format is used. When the 8010-SIE is operating in the NTSC (525 line) video standard, the generator may be programmed to operate in either the drop frame or non drop frame mode.

GEN DROP FRAME
Drop frame off
Drop frame on
Drop frame rdr
No drop in 625
Drop fr in gps

The *GEN DROP FRAME* menu item is used to the desired drop frame mode for the generator.

Select *Drop frame off* to configure the generator in the non-drop frame or 'full frame' mode.

Select *Drop frame on* to configure the generator in the drop frame mode.

When the 8010-SIE is in the *RDR SID, RDR LVS* or *VTR SID* mode, the generator drop frame mode is the same as the incoming time code data. The Drop Frame sub menu shows *Drop frame jam*.

When the 8010-SIE is operating in the 625 line video standard, the Drop Frame sub menu shows *No drop in 625*.

When the 8010-SIE-GPS II is operating in the 525 line video standard, in the GPS SID mode the unit will automatically switch to the Drop Frame mode so that the time base is as close as possible to real time. The menu will show *Drop fr in gps*.

3.5.7. Selecting the Generator Colour Frame Mode

In most applications the 8010-SIE will be gen-locked to the program video. It is also necessary to supply an external colour reference if you desire to apply colour frame synchronization to the generated time code. This reference is not required when the generator is operated in the 2 field mode.

When the video standard is 4:2:2 525:

When the video standard is 4:2:2 525 the 8010-SIE must get its colour frame information from the External Colour frame reference input. The COL'R REF LED will be on.

GEN COLOUR FRAME
Col'r frame 2 fld
Col'r frame 4 fld

The *GEN COLOUR PHASE* menu item is used to adjust the colour phase relationship of the timecode to the colour frame reference when the 8010 is operated in colour frame mode. This adjustment is necessary to compensate for frame delays in digital to analog encoders used in the system.

Select *Col'r frame 2 fld* to configure the generator in the non colour frame mode. This is the normal mode for component applications. It is not necessary to connect a colour reference in the 2 fld mode.

Select *Col'r frame 4 fld* to configure the generator in the colour frame mode. An RS-170A colour reference signal must be applied to the Col'r Ref BNC loop in the rear panel. The Front panel COL'R FRM indicator will be on and code generated will have the colour flag bit set indicating that the generator numbers are properly synchronized to the NTSC 4 field sequence.

When the video standard is 4:2:2 625:

When the video standard is 4:2:2 625 the 8010 must get its colour frame information from the External Colour frame reference input. The COL'R REF LED will be on.

GEN COLOUR FRAME
Col'r frame 2 fld
Col'r frame 4 fld
Col'r frame 8 fld

The *GEN COLOUR PHASE* menu item is used to adjust the colour phase relationship of the timecode to the colour frame reference when the 8010 is operated in colour frame mode. This adjustment is necessary to compensate for frame delays in digital to analog encoders used in the system.

Select *Col'r frame 2 fld* to configure the generator in the non colour frame mode. This is the normal mode for component applications. It is not necessary to connect a colour reference in the 2 fld mode.

Select *Col'r frame 4 fld* to configure the generator in the 4 field PAL mode. A PAL 4 field reference signal must be applied to the Col'r Ref BNC loop in the rear panel. The Front panel COL'R FRM indicator will be on and code generated will have the colour flag bit set indicating that the generator numbers are properly synchronized to the PAL 4 field sequence.

Select *Col'r frame 8 fld* to configure the generator in the colour frame mode. A PAL 8 field colour reference signal must be applied to the Col'r Ref BNC loop in the rear panel. The Front panel COL'R indicator will be on and code generated will have the colour flag bit set indicating that the generator numbers are properly synchronized to the PAL 8 field sequence.

When the component video is encoded into NTSC or PAL video, there may be frame delays encountered. These will change the colour frame relationship of the timecode with respect to the video. The colour frame phase can be adjusted by using the GEN COLOUR PHASE item of the Engineering menu.

Special precautions should be taken when operating in the RDR SID or RDR LVS mode. When the colour frame mode is selected, and the code from the reader does not have the colour flag set, the generator will maintain a 2 fld lock only.

If the 8010-SIE is being operated in the colour frame mode, and the reader code has the colour flag set, the jam sync process will compare the colour framing of the reader code against the generator. If the colour framing of the two do not agree, the JAM indicator will flash on and off at a regular rate. Therefore, if the playback VTR does not have a colour framer built in the 2 fld mode of operation should be selected.

3.5.8. Generator Parity Mode Selection

The purpose of the phase correction parity bit (LTC bit 27 in NTSC, 59 in PAL) is to compensate for phase reversals in the LTC bi-phase mark modulation that could occur when code inserts are performed. Use of the bi-phase mark parity bit is optional as some readers may not recognize its presence.

GEN LTC PARITY
Ltc parity off
Ltc parity on

The *GEN LTC PARITY* item controls the parity mode of the generator.

Select *Ltc parity off* to configure the generator for the non parity mode. The bi-phase mark parity bit will be always set to zero.

Select *Ltc parity on* to configure the generator for the parity mode. The bi-phase mark parity bit will be put in a state where every 80 bit word will contain an even number of logic zeros, in order that the magnetization transient between bit cell 79 of one word and bit cell zero of the next shall always be in the same direction.

3.5.9. Configuring how the RDR SID and RDR LVS Modes Work when there is no Reader Code

GEN NO CODE JAM
No code jam run
No code jam hold
No code jam mute

The *GEN NO CODE JAM* item controls the operation of the *RDR SID* and *RDR LVS* Modes hen there is no incoming code.

Select *No code jam run* when you want the generator to free run when there is no incoming Reader code. When the reader code resumes, the generator will re-jam to the incoming code. Using this mode will allow the user to repair large dropouts in the incoming code. The generated code will be continuous if the incoming code is also continuous.

Select *No code jam hold* when you want the generator to stop when there is no incoming Reader code. When the reader code resumes, the generator will re-jam to the incoming code. Use this mode if you want the output of the generator to stop on the last number read when you stop the tape machine supplying the incoming code to the reader.

Select *No code jam mute* when you want to turn off the generator when there is no incoming Reader code. The generator time will stop at the last number read. When the reader code resumes, the generator will turn on and re-jam to the incoming code. Use this mode if you want the output of the generator to turn off completely when you stop the tape machine supplying the incoming code to the reader.

3.5.10. Configuring Whether the Generator will Output Local Time or UTC Time in Time/Date Modes

GEN TZ ADJUST
Gtm zone adj utc
Gtm zone adj loc

When the *GEN SRC ID MODE* is set to *GPS SID*, the generator internal time clock runs in Universal Coordinated Time (UTC). The GEN TZ ADJUST menu item is used to select whether the Generator will output UTC or UTC adjusted by the programmed Time Zone Offset (Local Time). The local time will also be adjusted by the daylight savings time adjustment if daylight savings time is in effect. See section 3.9.5 for a discussion of daylight savings time features of the 8010-SIE-GPS II.

Select *Gtm zone adj utc* to configure the generator to output its time as UTC

Select *Gtm zone adj loc* to configure the generator to output its time as UTC adjusted by the programmed Time Zone Offset and Daylight saving adjustment if *DST Time is On*.(Local Time)

3.6. READER FUNCTIONS

3.6.1. Configuring Whether the 8010-SIE Will Use LTC or VITC from the VTR in VTR Source ID mode

RDR ASSIGNMENT
Rass auto
*Rass *ltc* vitc*
*Rass ltc *vitc**

The *RDR ASSIGNMENT* menu is used to select whether the LTC or VITC the reader will be used in the *RDR SID, RDR LVS* modes. This menu item also determines whether the 8010-SIE will use the LTC or VITC from the VTR in *VTR SID* mode. The reader that is active will have an asterisk (*) displayed beside its name on the front panel display. The reader data from the inactive reader will still be visible from the front panel and VCG windows but will have no effect on the generator time in the *RDR SID, RDR LVS* modes.

Select *Rass auto* to configure the reader to automatically switch between Linear Time Code (LTC) and Vertical Interval Time Code (VITC) reading. The reader can be set to recover VITC from a specific range of video lines.

Select *Rass *ltc* vitc* to configure the Linear Time Code (LTC) as the active reader.

Select *Rass ltc *vitc** to configure the Vertical Interval Time Code (VITC) as the active reader.

3.6.2. Setting The VITC Reader Line Range

VRDR START LINE
Start line = xx

The *VRDR START LINE* and *VRDR END LINE* menu items are used to select the lines that are enabled for VITC reading. VITC reading is enabled between the lower and higher line numbers shown (inclusive).

When the *VRDR START LINE* menu item is first selected, the starting line number for the VITC reader will be shown. Press the left and right (🡐,🡒) keys to change the starting line. Press the down (🡓) key to select the *VRDR END LINE* menu item. Press the left and right (🡐,🡒) keys to change ending line.

3.7. CHARACTER GENERATOR FUNCTIONS

The 8010-SIE has independently positionable character windows to display the generator time and source id/status. In *RDR LVS* mode there are two additional windows to display the LVS info and CTL info. The four arrow keys (🡑, 🡓, 🡐, 🡒) control the position of all the windows. The **CHAR GEN ON/OFF** key selects whether the video character generator (VCG) keyer is on or off. The use of these keys in combination with the **CHAR GEN WINDOW** key selects which windows are displayed and their position on the screen.

Six items on the programming menu are used to configure the character size, style, and whether frames, fields and symbols should be displayed in the character generator, and whether the On Air status should blank the characters on the digital video program output. The following descriptions appear in the order they appear on the menu.

3.7.1. Selecting the Character Size

CHAR SIZE
Char tiny
Char small
Char large

The *CHAR SIZE* menu item is used to select one of three sizes for the character generator's display.

The *Char tiny* character size occupies 8 lines per field for each character row. This permits 30 vertical positions on the raster in NTSC.

The *Char small* character size occupies 16 lines per field for each character row. This permits 15 vertical positions on the raster in NTSC.

The *Char large* character size occupies 32 lines per field for each character row. This permits 7 vertical positions on the raster in NTSC.

3.7.2. Selecting the Character Style

CHAR STYLE
- *Char white*
- *Char white+black*
- *Char white+bkgnd*
- *Char black*
- *Char black+white*
- *Char black+bkgnd*

The CHAR STYLE menu item is used to select whether the background mask will be used and whether the characters will be white or black. The on screen format menus are always white characters keyed into a black background mask.

Select *Char white* to disable the background and key white characters directly into the picture.

Select *Char white* + *black* to key white characters on a black background mask into the picture.

Select *Char white* + *bkgnd* to key white characters on a transparent gray background mask into the picture.

Select *Char black* to disable the background and key black characters directly into the picture.

Select *Char black* + *white* to key black characters on a white background mask into the picture.

Select Char *black* + *bkgnd* to key black characters on a transparent white background mask into the picture.

3.7.3. Selecting whether the Frames, Fields and Symbols will be displayed on the VCG

VCG FRAMES
- *Vcg frames off*
- *Vcg frames on*

The *VCG FRAMES* menu item is used to select whether the frames will be shown when the time is displayed in the character inserter.

Select *Vcg frames off* to hide the timecode frames.

Select *Vcg frames on* to show the timecode frames.

VCG FIELDS
- *Vcg fields off*
- *Vcg fields on*

The *VCG FIELDS* menu item is used to select whether the fields will be shown when the time is displayed in the character inserter.

Select *Vcg fields off* to hide the timecode fields.

Select *Vcg fields on* to show the timecode fields.

VCG SYMBOLS
- *Vcg symbols off*
- *Vcg symbols on*

The *VCG SYMBOLS* menu item is used to select whether the symbols will be shown when the time is displayed in the character inserter.

Select *Vcg symbols off* to hide the symbols.

Select *Vcg symbols on* to show the symbols.

3.7.4. Selecting and Positioning the Individual Character Inserter Windows

In VTR mode, separately positionable character windows displaying Generator Time or Source ID/Status (user bits) are available. Although the Source ID and Status windows move together, they can be independently turned on and off. In *RDR LVS* mode there are two additional character windows to display the LVS and CTL information. There are also separate windows for the LTC and VITC reader time and user bits. The four arrow keys (↑, ↓, ←, →) control the position of all the windows. The **CHAR GEN ON/OFF** key selects whether the video character generator (VCG) keyer is on or off. The use of these keys in combination with the **CHAR GEN WINDOW** key selects which windows are displayed and their position on the screen.

Press **CHAR GEN WINDOW** to enable the window select mode. All the character windows will appear on the screen with the window for the Time highlighted. Use the arrow keys (↑, ↓, ←, →) to position the Time window on the screen. Use the **CHAR GEN ON/OFF** key to turn the Time window on or off. Press the **CHAR GEN WINDOW** key to highlight the Source ID window. Use the **CHAR GEN ON/OFF** key to turn the Source ID window on or off and the arrow keys to move it to the desired location. Press the **WINDOW** key again to select the next window and the arrow keys to move it to the desired location and so on. The 8010-SIE returns to the normal VCG display mode after the last window has been selected. Some windows are only available when the 8010-SIE is in *RDR LVS* mode.

Note that the Source ID and Status windows always move together.

3.7.5. Positioning the Overall Character Display

In the normal VCG display mode, when none of the windows are highlighted, the arrow keys (↑, ↓, ←, →) move all the displayed windows by the same relative amount. For example, to move the time and source ID/status windows both down by one line press the ↓ key.

3.7.6. Character Generator On/ Off Controls

There are several factors that control whether the character generator will be turned on or off. In order of priority these are:

- The **CHAR GEN ON/OFF** key on the front panel alternately turns the digital and analog characters on and off.
- The VCG Keyer On/Off remote control input on the rear panel alternately turns the digital and analog characters on and off. This input has equal priority with the front panel **CHAR GEN ON/OFF** key.
- The individual windows can be turned off using the CHAR GEN ON/OFF key in window select mode.

3.7.7. Special VCG Indicators

The following special indicators are used between the seconds and frames digits of the time window in the character inserter to identify non drop frame and drop frame code (NTSC only)

Non Drop Frame Colon (:)
Drop Frame (NTSC) Period (.)

The following special indicators are used between the hours and minutes digits of the generator time window in the character inserter of the 8010-SIE-GPSII to identify when the GPS referenced time has is being adjusted fore Daylight Saving Time

DST Time Off Colon (:)
DST Time On Period (.)

3.7.8. Turning on the SDI Video Bypass

BYPASS MODE
Bypass mode off
Bypass mode on

The *BYPASS MODE* menu item is used to select whether the video bypass relay will be active or not. This allows the user to manually put the 8010-SIE in Bypass mode. In this mode, the input video is directly connected to the output, and the encoder will no longer be active. Alternatively the Bypass relay can be activated by pressing **SHIFT + BYPASS.** The Front panel Bypass LED will be On when the unit is in bypass mode.

Select *Bypass mode off* to turn off the Bypass relay and process the incoming video through the source ID encoder.

Select *Bypass mode on* to activate the video bypass relay and disable the encoder.

3.8. PROGRAMMING THE ENGINEERING SETUP FUNCTIONS

An engineering Setup menu is provided to set up items that are normally required only during installation. To enter the front panel programming menu, press the **SHIFT + SETUP** keys. The two vertical arrow keys (↑, ↓) allow you to move vertically within the engineering menu tree. When you have selected the desired menu item, press the → key to reveal the choices for that item. The choice that is currently selected will be blinking. When you have selected the desired sub menu choice press the **SELECT** key to save your choice.

When you have made all the desired changes, press the **SETUP** key to return to the normal display mode.

The following table shows the items in the main level of the engineering menu tree. Sections 3.5 to 3.7 provide detailed descriptions of each of the sub menus. The tables in these sections are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

VIDEO TYPE	Sets the Video standard for the encoder
LTC LEVEL	Sets the amplitude level of the LTC output
VITC DEL START	Sets the first line that will be blanked by the VITC deleter
VITC DEL END	Sets the last line that will be blanked by the VITC deleter
CEN COLOUR PHASE	Sets an offset from the Colour reference input
REFERENCE MODE	Selects the generator framing reference
DAYLIGHT SAVING	Sets whether the Generator time will be adjusted for DST or not
GPI1 ASSIGNMENT	Assigns the function for General Purpose Input 1
GPI2 ASSIGNMENT	Assigns the function for General Purpose Input 2
GPO1 ASSIGNMENT	Assigns the function for General Purpose Output 1
GPO2 ASSIGNMENT	Assigns the function for General Purpose Output 2
GPO DURATION	Sets the duration of the momentary general purpose outputs
SERIAL BAUD RATE	Sets the baud rate of the serial port
SERIAL TEST	Turns on a Serial Port output test
SERIAL MODE	Sets the mode of the serial port
XRAM TEST	Turns on a RAM hardware test
DISPLAY LEVEL	Sets the brightness level of the Front panel display
LVS ADDRESS	
ON AIR MODE	Blanks Character windows on the SDI output when ‘On Air’
SDI VBLANK END	Sets the last line that will have the SDI V bit set to zero
NTSC SETUP	Selects if Setup will be applied on the optional analog NTSC output.
FONT DOWNLOAD	Used to Download new character fonts
SOFTWARE VERSION	Displays the current firmware version of the encoder
FACTORY RESET	Resets the encoder to its Factory default condition

Table 3-2: Overview of the 8010-SIE Engineering Menu System

3.8.1. Selecting the Video Type

VIDEO TYPE
Video 422 auto
Video 422 525
Video 422 625

The *VIDEO TYPE* menu item is used to program the 8010-SIE for the digital video format.

Select *422 auto* for operation with component video with a line rate of either 525 or 625 lines per field. The 8010-SIE will auto detect the line rate and automatically reconfigure itself.

Select *422 525* for operation with component video with a line rate of 525 lines per field. Conforming to SMPTE 125M.

Select *422 625* for operation with component video with a line rate of 625 lines per field. Conforming to EBU Tech 3267-E (1992) or the 4:2:2 level of IUT-R 601.

3.8.2. Adjusting the Output Level of the LTC Generator

LTC OUT LEVEL
Ltc level xx

The *LTC OUT LEVEL* menu item is used to adjust amplitude of the LTC output. Use the ← and → keys to adjust. The recommended output level setting is 35, which is approximately 1 volt peak to peak.

3.8.3. Setting The VITC Deleter Line Range

VITC DEL START
Delete Start = xx

The *VITC DEL START* and *VITC DEL END* menu items are used to select the lines will be erased by the VITC deleter. This function allows existing VITC on the incoming program video to be removed prior to inserting new VITC on the output. VITC deletion is enabled between the lower and higher line numbers shown (inclusive).

When the *VITC DEL START* menu item is first selected, the starting line number for the VITC deleter will be shown. Press the left and right (←,→) keys to change the starting line. When either the start or end line number is set to –- the VITC delete function is disabled. Press the down (↓) key to select the *VITC DEL END* menu item. Press the left and right (←,→) keys to change ending line.

3.8.4. Selecting the Colour Frame Phase

GEN COLOUR PHASE
Colour phase 01

The *GEN COLOUR PHASE* menu item is used to adjust the colour phase relationship of the timecode to the colour frame reference when the 8010-SIE is operated in colour frame mode. This adjustment is necessary to compensate for frame delays in digital to analog encoders used in the system.

When the *Colour Phase* is set to 01 the outgoing timecode will be in time with the 8010-SIE colour reference. The colour phase may be adjusted by up to 4 frames in PAL and 2 frames in NTSC applications. This menu item should be adjusted so that the timecode colour phase is in time with the video output of an analog encoder. If the MON analog output option is installed the colour sequence of the analog video will be the adjusted by the colour phase offset so that it is in time with the time code being generated. A time code analyzer such as the Evertz Model 5300 may be used to verify the correct timing relationship are being maintained.

3.8.5. Selecting the Generator Framing Reference

REFERENCE MODE
Ref auto
Ref input
Ref external

The *REFERENCE MODE* menu item is used to set whether the internal timing of the 8010TM will be locked to the input video or the External Colour Reference input. The updating of the generator clock, character displays and LTC phasing are in turn locked to the input timing of the 8010TM.

Select *auto* to allow the 8010TM to select its reference automatically. If both a reference video and SDI input video are present the 8010TM will lock to the SDI input video.

Select *input* to reference the 8010TM to the input video.

Select *external* to reference the 8010TM to the colour reference input. This setting will allow the LTC phase output of the 8010TM to remain locked to the reference when an SDI input signal is not present.

For proper operation the SDI input video and the external colour reference must be vertically in phase.

3.8.6. Turning on the Daylight Saving Time Compensation (8010-SIE-GPS II ONLY)

DAYLIGHT SAVING
Dst time off *Dst time on*

The *DAYLIGHT SAVING* menu item is used to select whether the time will be compensated for Daylight Saving time or not.

Select *Dst time on* to compensate for Daylight saving time. This setting should be used during the period when daylight saving time is in effect. When this setting is used 1 hour will be subtracted from the Time zone offset value when the 8010-SIE-GPSII converts between UTC and local time.

Select *Dst time off* to turn off compensation for Daylight saving time. This setting should be used during the period when daylight saving time is not in effect.

3.8.7. Configuring The General Purpose Inputs and Outputs

A 9 pin D connector located on the rear panel labeled **PARALLEL** provides 2 general purpose outputs and 6 general purpose inputs. The pinout of the D connector is shown in Table 2-4

The general purpose outputs can be assigned to several different functions. The outputs will be active low when the specified condition occurs. The duration of the output is user programmable except where noted. There are two user programmable general purpose inputs and four dedicated GPI inputs.

3.8.7.1. Assigning the Functions of the General Purpose Inputs

There are four dedicated remote control input pins and two user programmable inputs. The dedicated input functions are as follows:

VCG ON/OFF Provides an alternate method of turning the character inserter generator On and Off. The character inserter is toggled On or Off by a high to low transition on this input. This input has equal priority with the front panel CHAR GEN ON/OFF key.

VITC ENABLE Provides an alternate method of turning the VITC generator On and Off. The VITC generator is turned On by a high to low transition on this input, and turned Off by a low to high transition.

BYPASS When closed to ground this input activates the SDI bypass relay.

GPS SYNC Provides an alternate method of syncing the generator time of the 8010-SIE-GPSII to the GPS antenna time. Momentarily closing this input to ground and releasing it will perform a synchronization to the GPS time. (function available on 8010-SIE-GPSII only)

JAM SYNC Provides an alternate method of syncing the generator time of the 8010-SIE's active reader time when the unit is in *TIME SID* mode. Momentarily closing this input to ground and releasing it will perform a synchronization to the reader time. (function available on 8010-SIE only)

The *GPI1 ASSIGNMENT* and *GPI2 ASSIGNMENT* menu items are used to select the functions of the other two general purpose inputs (GPI 1 and GPI 2). The operation of both menus is identical so only the GPI1 Assignment menu will be shown.

GPI1 ASSIGNMENT
Gpi1 = ltc active
Gpi1 = vitc active
Gpi1 = gen hold
Gpi1 = gen set
Gpi1 = on air

The following descriptions indicate the how the GPI will function with each setting.

Ltc active Provides an alternate method of selecting the LTC reader. The LTC reader is selected by a high to low transition on this input, and deselected by a low to high transition.

Vitc active Provides an alternate method of selecting the VITC reader. The VITC reader is selected by a high to low transition on this input, and deselected by a low to high transition.

Gen hold Provides an alternate method of selecting the Generator Hold function. The generator Hold function is selected by a high to low transition on this input, and deselected by a low to high transition.

Gen set Provides an alternate method of selecting the Generator Set function. The generator Set function is selected by a high to low transition on this input, and deselected by a low to high transition.

On Air When closed to ground all the VCG windows on the digital program output will be turned off. When this input is released, the VCG windows will revert to the state they were in before the ON AIR disable input was activated.

3.8.7.2. Assigning the Functions of the General Purpose Outputs

The *GPO1 ASSIGNMENT* and *GPO2 ASSIGNMENT* menu items are used to select the functions of the general purpose outputs. The operation of both menus is identical so only the GPO1 Assignment menu will be shown.

GPO1 ASSIGNMENT
Gpo1 = rdr event
Gpo1 = gen event
Gpo1 = gps@ event
Gpo1 = 1 pulse/sec
Gpo1 = 1 pulse/min
Gpo1 = ref failure
Gpo1 = gps failure

The following descriptions indicate the how the GPO will function with each setting.

Rdr event The output will activate when the reader time matches the REVT register and the event register is armed. See section 3.8.7.3 for information about setting the REVT register and arming it.

Gen event The output will activate when the generator time matches the GEVT register and the event register is armed. See section 3.8.7.3 for information about setting the GEVT register and arming it.

1 pulse/sec The output will activate at the beginning of each second of the generator time.

1 pulse/min The output will activate at the beginning of each minute of the generator time.

Ref failure The output will activate when a proper Gen Lock video reference is missing.

The following two functions for the General purpose outputs are only available on the 8010-SIE-GPSII model.

Gps@ event The output will activate when the generator time matches the GPS@ register and the event register is armed. This is the time that the Generator will be resynchronizes to the GPS antenna time. See section 3.9.4 for information about setting the GPS@ register and arming it.

Gps failure The output will activate when communications to the GPS Receiver is missing.

3.8.7.3. Adjusting the General Purpose Output Duration

GPO DURATION
Gpo duration 01

The GPO DURATION menu item is used to adjust the duration (in frames) of the general purpose outputs. Use the ↑ OR ↓ keys to change the duration.

3.8.7.4. Setting the Time of the Event Registers

When one of the GPO assignments is set to *GEN EVENT* the output activates based on the time entered into the GEVT register. When one of the GPO assignments is set to *RDR EVENT* the output activates based on the time entered into the REVT register. On the 8010-SIE-GPS II when one of the GPO assignments is set to *GPS@ EVENT* the output activates based on the time entered into the GPS@ register (see section 3.9.4).

To access the GEVT, REVT or GPS@ registers press the **SHIFT+DISPLAY** buttons one or more times until the display prompt is GEVT, REVT or GPS@. The **ENTER** and **CLEAR** keys are used in conjunction with the numeric keys to set the value stored in the event registers. Enter a valid time into the desired register following the same method used to enter the generator time.

When the GEVT, REVT or GPS@ register is being displayed, press the **SELECT** key to 'arm' the respective event register for a single event. Press the **SELECT** key again to 'disarm' the event register. A lower case 's' will be shown to the left of the hours digits of the display when the register is armed for a single event. Press the **SHIFT+SELECT** keys to 'arm' the respective event register for continuous events. Press the **SHIFT+SELECT** keys again to 'disarm' the event register. A lower case 'c' will be shown to the left of the hours digits of the display when the register is armed for continuous events. When the time code being generated matches the value entered into the GEVT register, the event output will be activated for the duration set in the GPO DURATION menu. When the time code being read by the Reader matches the value entered into the REVT register, the event output will be activated for the duration set in the GPO DURATION menu. When the event register is armed for single event mode, the output will occur the *first time* the comparison matches. The event must be re-armed for the event to occur again. When the event register is armed for continuous event mode, the output will occur *each* time the comparison matches.

3.8.8. Configuring The Serial Port

3.8.8.1. Selecting the Serial Port Baud Rate

SERIAL BAUD RATE
Baud rate 2400
Baud rate 9600
Baud rate 19200
Baud rate 38400

The *SERIAL BAUD RATE* menu item is used to set the baud rate of the remote control serial port. The 8010-SIE supports four different baud rates from 2400 to 38400 baud. Select the highest baud rate that you computer can use for best results.

If you are using *VTR SID, RDR LVS* or *GPS SID* mode the baud rate is fixed.

3.8.8.2. Testing the Serial Port

SERIAL TEST
Serial test off
Serial test on

The SERIAL TEST menu item is used to turn on a serial port test message. When the serial test is on, the 8010 outputs a message similar to:

```
EVERTZ DTCG 8010 SOFTWARE VERSION DG86D1.M R020822
```

3.8.8.3. Setting the Serial Port Mode

SERIAL MODE
Serial mode active
Serial mode passive

The *SERIAL MODE* menu item is used determine if the 8010-SIE will passively listen to VTR communications or actively poll the VTR for time and status information when it is in *VTR SID* mode.

Select *Serial mode active* to have the 8010-SIE poll the VTR.

Select *Serial mode passive* to have the 8010-SIE listen to communications between the VTR and a controller.

3.8.9. Adjusting the Front Panel Display Brightness

DISPLAY LEVEL
Display level xx

The *DISPLAY LEVEL* menu item is used to adjust brightness of the front panel display. Use the ← and →keys to adjust.

3.8.10. Turning off the SDI Characters When The Program Source is 'ON AIR' (8010-SIE Only)

ON AIR MODE
On air mode off
On air mode on

The Characters on the digital program output of the 8010-SIE can be turned off when the source device is in PLAY or VAR PLAY. This feature is controlled by the ON AIR menu item. The characters on the analog output are not affected by the ON AIR menu setting.

Select *On air mode on* to blank all the Character windows on the digital program output when the machine Status is Play or VAR, or when the ON AIR remote control input is closed to ground. The character windows on the analog output are not turned off when the machine status is PLAY or VAR PLAY

When *On air mode off* is selected, the Character windows on the digital and analog outputs ignore the VTR Status and the ON AIR remote control input.

3.8.11. Setting the LVS address (8010-SIE Only)

LVS ADDRESS
Lvs Address = xx

The LVS ADDRESS menu item is used to set up the LVS address that the 8010-SIE will respond to. Use the ↑ and ↓ keys to adjust. Valid numbers are in the range of 01 to 09. LVS Address is not fully implemented in the 8010-SIE.

3.8.12. Setting the SDI Vertical Interval Blanking

SDI VBLANK END
Vbl end line 06
Vbl end line 22
Vbl end line 10
Vbl end line 20

The *SDI VBLANK END* menu item is used determine where the V bit in the SDI TRS will be set to zero (indicating vertical blanking). If the V blank bit is zero on a higher line number than the VITC is placed on, some devices may discard the VITC.

For 525 systems the normal setting is for the vertical blanking to end at line 10. If this causes problems with downstream devices, it can be set to end at line 20, however some devices may blank the VITC if it is placed prior to line 20.

For 625 systems, the normal setting is for the vertical interval to end at line 6. If this causes problems with downstream devices, it can be set to end at line 23, however some devices may blank the VITC if it is placed prior to line 20.

3.8.13. Setting the NTSC Setup Pedestal on the Monitor Analog Output

NTSC SETUP
NTSC setup on
NTSC setup off
No setup in PAL

The *NTSC SETUP* menu item is used to determine how the NTSC Setup Pedestal will be applied on the Monitor Analog Output. The NTSC setup pedestal should not be present when operating in Japan.

Select *NTSC setup on* to apply the Setup pedestal to all lines of the active picture.

Select *NTSC setup off to remove* the NTSC Setup Pedestal from all lines.

3.8.14. Downloading New Character Fonts

FONT DOWNLOAD
Shift+sel=start

The *FONT DOWNLOAD* menu item is used to change the character inserter font. For more information about uploading new font files see section 5.4.

3.8.15. Testing the RAM

XRAM TEST
Xram test on ?

The *XRAM TEST* menu item is used to initiate a test of the Character RAM.

3.8.16. Resetting the 8010-SIE to Factory Defaults

FACTORY RESET
Shift+sel=reset

The *FACTORY RESET* menu item is used to return the 8010-SIE to its factory defaults. When you press the ← or → keys, the display shows Shift+sel=reset. When you press **SHIFT + SELECT** the 8010-SIE will reload its factory defaults and show the message

```
Reset done
```

3.8.17. Displaying the 8010-SIE Software version

SOFTWARE VERSION
DG86D9.M R020822

The SOFTWARE VERSION menu item is used to display the 8010's software version. When you press the ← or → keys, the display shows the software version which will be something like:

```
DG86D9.M R020822
```

3.9. GLOBAL POSITION SYSTEM OPERATION (MODEL 8010-SIE-GPS II ONLY)

The 8010-SIE-GPS II is supplied with a Trimble Accutime 2000 GPS Smart Antenna that houses the GPS receiver, antenna, power supply and other support circuitry in a sealed, shielded, self-contained unit with a digital interface to the 8010-SIE-GPS II. See section 2.9 for information on mounting the antenna and connecting it to the 8010-SIE-GPS II.

3.9.1. Setting the GPS Time Reference Mode

To operate the 8010-SIE-GPS II in its GPS based time mode select the *GPS SID* mode from the **GEN SRC ID MODE** menu. (See section 3.5.2 for information about setting the **GEN SRC ID MODE)**

When the 8010-SIE-GPS II is operating in the 525 line video standard, it will automatically switch to the Drop Frame mode so that it's time base is as close as possible to real time.

The front panel display will show a sequence of messages, indicating the status of the GPS receiver. The most common messages you will see are:

`GPS STS:  NO FIX`	indicates no satellite position fixes yet
`GPS STS:  NO SATS`	indicates no usable satellites yet
`GPS STS: 1 SV FIX`	1 satellite vector fixed
`GPS STS: 2 SV FIX`	2 satellite vectors fixed
`GPS STS:  FIXING`	obtaining 2 dimensional position fix
`GPS STS: GET TIME`	getting time from receiver
`GPS STS: GET PPS`	getting timing pulses from receiver

While this message is being shown, the 8010-SIE-GPS II is acquiring the time and date information and synchronizing its internal UTC clock to the receiver time and timing pulses. Once stable timing pulses are detected from the antenna, and synchronization is complete, the **GPS LOCK** indicator will go on. After synchronization has been achieved, the 8010-SIE-GPS II's colour framing circuitry will adjust the

time code so that it is on a valid colour frame sequence. The 8010-SIE-GPS II's UTC time clock will normally be within +/- 1 colour frame of the GPS based time. The front panel GPS status message will show

`GPS STS:SATS xx` XX indicates the number of visible satellites

This message is available any time that the antenna is connected and the 8010-SIE-GPS II is in the *GPS SID* mode. Press the **DISPLAY** key to display other front panel messages.

If the antenna is not connected, or is being initialized the front panel will show the message:

`NO GPS ANTENNA`

If the antenna is not responding properly, the front panel will show the message:

`ANTENNA ERROR 01`

If this occurs, check the installation procedure outlined in section 2.6 of this manual.

3.9.2. Displaying the Receiver's UTC Time

When the 8010-SIE-GPS II is receiving valid time information from the smart antenna, two additional front panel displays are available. To access them press the **DISPLAY** button one or more times until the desired message is visible.

`UTC` Universal Coordinated Time (adjusted GPS receiver time)
`UDC` Universal Coordinated Date (adjusted GPS receiver date)

3.9.3. Controlling the Synchronization Accuracy to the GPS Based Time

When the 8010-SIE-GPS II is operated in the *GPS SID* mode, the generator is synchronized to the GPS time reference being received from the smart antenna. During normal operation, the 8010-SIE-GPS II will monitor the difference between the GPS Receiver time and its UTC time clock. When the GPS Receiver time is different from the 8010-SIE-GPS II's UTC time by more than one half second, the 8010-SIE-GPS II will rejam to the GPS Receiver. Under certain circumstances, it may be desirable to disable this feature. DIP switch #3 on the 8010-SIE-GPS II main circuit card will disable the auto jamming function.

When DIP switch #3 is CLOSED, this continuous monitoring is disabled. Jamming to the GPS Receiver will still occur once a day at the "GPS@" time (provided the GPS@ register is armed for continuous mode). If the DIP switch is CLOSED when the unit powers up, it will jam the generator to the GPS Receiver ONCE. After that, the unit will only jam to the GPS Receiver time at the "GPS@" times, or if the user forces a jam to the Receiver time using the GPS SYNC remote control input (see section 3.8.7.1).

When DIP switch #3 is OPEN (default), the 8010-SIE-GPS II will also resynchronize to the GPS Receiver time when there is a difference of more than one half second between the GPS Receiver time and the 8010-SIE-GPS II UTC time.

3.9.4. Setting the Time Each Day when the 8010-SIE-GPS II will Synchronize to the GPS time.

The 8010-SIE-GPS II can also be set to resynchronize once per day at a user specified time, so that the optimal time accuracy is continuously maintained, at the same time minimizing the potential for code disturbances during resynchronization.

The *GPS@* register contains the time each day when the internal UTC clock will be synchronized to the GPS receiver time. Normally this time should be set to occur during a time of the day least likely to cause interruptions if there is a minor skip in the time (usually between midnight and 6:00 am). The factory default setting for the *GPS@* register is midnight. To set another value into the *GPS@* register, use the following procedure.

Press the **SHIFT + DISPLAY** buttons one or more times until the *GPS@* prompt is shown at the left of the display. The **ENTER** and **CLEAR** keys are used in conjunction with the numeric keys to set the generator time.

Press the **ENTER** key to recall the last time that you entered into the *GPS@* register. The display prompt at the left of the display will blink while data entry mode is active, and the dual functioned keys are now changed to their numeric values. If you want to re-enter this time press the **ENTER** key to complete the data entry into the *GPS@* register.

Pressing any numeric key will clear the previous value and place the new value into the numeric display, starting at the right. Unentered digits are assumed to be zero, hence leading zero digits are not required. When the required number of digits are entered, then press the **ENTER** key to complete the data entry into the generator time.

Attempts to enter too many digits, or make illegal entries, i.e. 65 minutes, will result in the display returning to the last valid time entry made. Re-enter the correct value and press the **ENTER** key. Pressing the **CLEAR** key will cancel the data entry mode without changing any data.

The numeric keys return to their normal display functions when the data entry has been completed by pressing **ENTER** or canceled by pressing the **CLEAR** key. The display prompt will return to its steady On state when data entry mode has been completed.

Numeric entry mode must be terminated (GPS@ will be On steady) before any of the front panel keys will resume normal operation.

3.9.5. Entering the Time Zone Offset

The 8010-SIE-GPS II is capable of displaying time/date information in either the Universal Coordinated Time (UTC) or the local time that has been adjusted with the appropriate time zone offset from UTC. In local time mode, the generator encodes the time adjusted for the local time zone offset from UTC. In local time mode, the time is also adjusted for Daylight saving time when the *DST TIME* menu setting is set to *On*. In UTC mode, the generator encodes the UTC time and date received from the receiver antenna.

To enter the time zone offset press the **DISPLAY** buttons one or more times until the *TIME ZONE* prompt is shown at the left of the display. The **ENTER** and **CLEAR** keys are used in conjunction with the arrow keys to set the time zone.

The leftmost digits of the display will blink and indicate TIME ZONE. The last time zone you entered will be shown as +/-HH:MM where HH represents the whole hour time offset and MM indicates the minutes offset for time zones where there are partial hours. The +/- sign indicates if the time is ahead or behind UTC. If you want to re-enter this time zone offset, press **ENTER.** To change the whole hour offset press the ↑ or ↓ keys. To change the partial hour offset press the ← or → keys. The 8010-SIE-GPS II will only allow valid time zone offsets to be selected. If daylight saving time is observed in your area, then you should enter the time zone offset for standard time. You can set up the daylight saving time adjustment using the procedure outlined in section 3.8.5.

When you have selected the correct time zone offset, press the **ENTER** key to complete the data entry process. The arrow keys return to their normal functions when the data entry has been completed by pressing the **ENTER** key or canceled by pressing the **CLEAR** key. The display prompt will stop blinking when data entry mode has been completed.

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CHAPTER 4: SERIAL PROTOCOL

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4. SERIAL REMOTE CONTROL PROTOCOL

The serial port of the 8010-SIE operates in two distinctly different modes depending on whether the 8010-SIE is in VTR Source ID mode or LVS Source ID mode.

When the 8010-SIE is in the VTR mode, it is designed to listen to communications between a VTR and its controller, and take time code and machine status. At this time the 8010-SIE is customized to eavesdrop on the communications between a Lance HSE-100 Edit Controller and a Sony VTR. The use of other edit controllers may not give expected results on the VTR status of the 8010-SIE. The serial port is used to obtain timecode and status information from the VTR. See section 4.1

When the 8010-SIE is in the LVS mode, the serial remote control port is used to listen to a serial data stream from the Profile disk recorder. This serial communication is normally daisy-chained to each of the 8010-SIE units that are connected on the Profile outputs. The serial port is used to obtain status, LVS and CTL information from the Profile recorder. See section 4.2.

LVS mode is not fully implemented in the 8010-SIE.

The following sections describe the commands supported by the 8010-SIE in each mode.

4.1. VTR MODE - COMMUNICATING WITH A VTR

4.1.1. Data Format

The serial port is used to listen to RS-422 communications between a VTR and its edit controller. This communications protocol runs at 38400 baud and follows the industry standard SONY VTR protocol.

4.1.2. Communications Protocol

The 8010-SIE lists to the responses that the VTR is giving to commands it receives from the edit controller. Because various edit controllers use different parts of the protocol, it is necessary to optimize the 8010-SIE for specific controllers. At this time the protocol is optimized for use with the Lance HVS-100 edit controller. The use of other edit controllers may not give the expected results in monitoring the VTR status information.

All command values, arguments and data values shown in this document are expressed in hexadecimal format unless otherwise noted.

4.1.3. Message Block Format

The MESSAGE consists of two command bytes followed by optional bytes of data, followed by a checksum and is structured as follows:

CMD 1/CNT	CMD 2	DATA 1	.....	DATA n	CHECKSUM

CMD1/CNT First byte of the command. The upper nibble is the command prefix and the lower nibble is the number of bytes of data.
CMD2 Second byte of the command.
DATA 1...DATA n variable length, any arguments required by the command.
CHECKSUM The one byte sum of the CMD1/CNT, CMD2 and DATA bytes. The checksum is calculated on the actual bytes of the command not the ASCII Hex representation of these bytes.

The purpose of the checksum is to verify that all the bytes in the message that contain variable data have been received properly. The checksum is calculated by adding all the previous bytes together. The least significant byte of this sum is then used as the checksum.

For example, to request the current time code data from the VTR, the command message would be transmitted as follows:

6	1	0	C	6	D
CMD1	CNT	CMD 2		CHECKSUM	

If the VTR does not accept the command message due to a checksum error, parity error or an invalid command, the VTR will respond with an NAK response (11H, 12H).

If the VTR accepts the command message and there is no data response required it will respond with an ACK response (10H, 01H).

If the command message requires a data response, the VTR will transmit a response message that consists of two command bytes followed by optional bytes of data, followed by a checksum and is structured as follows:

RSP 1/CNT	RSP 2	DATA 1	.....	DATA n	CHECKSUM

RSP1/CNT First byte of the response. The upper nibble is the response prefix and the lower nibble is the number of bytes of data.
RSP2 Second byte of the response.
DATA 1...DATA n variable length, any data required by the response.
CHECKSUM The one byte sum of the RSP1, RSP2 and DATA bytes. The checksum is calculated on the actual bytes of the response not the ASCII Hex representation of these bytes.

If the current LTC reader time code was 12:45:30:00 Non Drop Frame the response message would be received as follows:

7	4	0	4	0	0	3	0	4	5	1	2	F	F
RSP1	CNT	RSP2		10 FRMS	1 FRMS	10 SEC	1 SEC	10 MIN	1 MIN	10 HR	1 HR	CHKSUM	

4.1.4. Commands Supported

Command from Controlling Device	Return to Controlling Device

CMD1/ CNT	CMD2	DESCRIPTION	RSP1/C NT	RSP2	NAME
61	0C	Time Code Sense	74	04	LTC time data
			74	06	VITC time data
61	20	Status Sense	7X	20	Status data

Table 4-1: VTR Commands and their Valid Responses

4.1.5. Time Code Sense Command

The argument byte for the time code sense command indicates whether the VTR will respond with LTC or VITC, as programmed in the GEN RDR MODE menu setting of the 8010-SIE.

When LTC data is required the time code sense command will be:

61 0C 01

The response that comes back from the VTR is:

74 04 ff mm ss hh ck

When VITC data is required the time code sense command will be:

61 0C 02

The response that comes back from the VTR is:

74 06 ff mm ss hh ck

When either LTC or VITC data is required the time code sense command will be:

61 0C 03

If the VTR is reading LTC, the response that comes back from the VTR is:

74 04 ff mm ss hh ck

If the VTR is reading VITC, the response that comes back from the VTR is:

74 06 ff mm ss hh ck

4.1.6. Status Sense Command

The argument byte for the status sense command indicates the starting byte of the status block, and how many bytes are to be sent. The 8010-SIE requests the first three bytes of the status block as follows:

61 20 04

The response that comes back from the VTR is: (sbn represents the nth byte of the status block)

74 20 sb1 sb2 sb3 sb4

4.2. LVS MODE - COMMUNICATING WITH A PROFILE DISK RECORDER

When the 8010-SIE is in the LVS mode, the serial remote control port is used to listen to a serial data stream from the Profile disk recorder. The Profile sends status, LVS scene and CTL information out to multiple devices that are connected in a 'daisy chain' to the Profile's serial port. In order to properly address each of the 8010-SIE units connected, the Profile sends out an ‘address’ before each command. The **LVS ADDRESS** menu item on the Engineering menu of the 8010-SIE must be set to match the address that the Profile is using for a specific output. (See section 3.8.10 for further information).

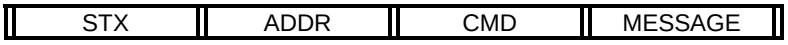
4.2.1. Data Format

The serial port receiver/driver allow communications in the RS-232C electrical standard. The serial port operates at 9600 baud, 8 bits, and no parity.

4.2.2. Message Block Format

All command values, arguments and data values shown are expressed in hexadecimal format unless otherwise noted.

Each message block starts with the ESC (1BH) and is structured as follows:



ESC Unique character which indicates the start of a message block (0x1B hex)

ADDR Address of the unit command is intended for. The address is sent as 2 ASCII characters. The 8010-SIE will respond to addresses that match the “LVS ADDRESS” on the menu.

CMD Command to be processed. The command is sent as 2 ASCII characters.

MESSAGE Variable length string of ASCII characters. The content of the message is dependent on the CMD.

4.2.3. Command Processing

The 8010-SIE only responds to commands 0x27 and 0x28. Each of these commands sends a string of ASCII characters that defines what the message is. Command 0x28H also sends down a 3 ASCII character location pointer at the beginning of the string of characters. Since the MESSAGE is a variable length, and there is no byte count associated with the message, the 8010-SIE units use a timeout to determine when a message is complete. This means that if the MESSAGE portion of the command is being received and the characters stop coming in for approximately 70 milliseconds the command will be treated as complete and the MESSAGE will be processed.

The MESSAGE portion of the command is scanned for various character patterns to determine various status, scenes, etc. The following table shows a list of the information scanned for (in the order of priority):

MESSAGE	Interpretation	Comments
CTL	Sets CTL ON status.	
EA	Sets LVS status to EA	Next 3 characters considered to be the LVS number
EB	Sets LVS status to EB	Next 3 characters considered to be the LVS number
SA	Sets LVS status to SA	Next 3 characters considered to be the LVS number
SB	Sets LVS status to SB	Next 3 characters considered to be the LVS number
HA	Sets LVS status to HA	Next 3 characters considered to be the LVS number
HB	Sets LVS status to HB	Next 3 characters considered to be the LVS number
STOP	Sets SID status to STOP	
PLAY	Sets SID status to PLAY	
CUED	Sets SID status to CUED	
F.F.	Sets SID status to FF	
REC	Sets SID status to REC	
REW	Sets SID status to REW	
SHTL	Sets SID status to SHL.	Speed/direction character added based on last setting.
AV	Sets SID status to AV	
STBY	Sets SID status to STBY	
JOG	Sets SID status to JOG.	Speed/direction character added based on last setting.
EJCT	Sets SID status to EJCT.	
VAR= 0.00	Sets speed/direction status to still mode.	Display VAR *
VAR= -	Sets speed/direction status to reverse mode.	Display VAR <
VAR=	Sets speed/direction status to forward mode.	Display VAR >
VAR	Sets SID status to VAR.	Speed/direction character (<, *, >) based on last setting.
<spaces>	Indicates blanking required.	The CTL and LVS windows keep track of their positions on the screen when they are detected. If the blanks detected here are at the same location as the CTL or LVS windows the status of the mode will be changed to CTL OFF or LVS OFF respectively

Table 4-2: Interpretation of Messages in LVS Mode

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CHAPTER 5: TECHNICAL DESCRIPTION

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5. TECHNICAL DESCRIPTION

5.1. SPECIFICATIONS

5.1.1. Serial Digital Video Input

Standards: SMPTE 259M (270 Mb/s)
Connector: 1 BNC input per IEC 169-8
Equalization: Automatic 200m @ 270 Mb/s with Belden 8281 or equivalent cable
150m @ 270 Mb/s when bypass relay is active
Return Loss: > 15 dB up to 540 Mb/s

5.1.2. Serial Digital Video Outputs

Number of Outputs: 1 with relay bypass, 1 additional output.
Connector: BNC per IEC 169-8
Signal Level: 800 mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 470 ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB up to 540 Mb/s
Wide Band Jitter: < 0.2 UI

5.1.3. Analog Monitor Video Outputs (optional)

Standards: Analog composite NTSC if input is 525i/59.94 video
Analog composite PAL if input is 625i/50 video
Connectors: 2 BNC per IEC 169-8
Signal Level: 1 V p-p nominal, internally adjustable
DC Offset: 0V ±0.1V
Return Loss: >35dB up to 5 MHz
Frequency Response: 0.8dB to 4 MHz
Differential Phase: <0.9°(<0.6° typical)
Differential Gain: <0.9% (<0.5 % typical)
SNR: >56dB to 5 MHz (shallow ramp)
Impedance: 75 ohm

5.1.4. Electrical

Voltage:

Early 8010-SIE	115 or 230 Volts AC, 50/60 Hz – switch selectable
Later 8010-SIE	110 - 230 Volts AC, 50/60 Hz – unit auto senses input voltage
8010-SIE-GPS II	110 - 230 Volts AC, 50/60 Hz – unit auto senses input voltage
Fuse Rating:	
Early 8010-SIE	250 V, 1/4 amp for 115 volts, 250 V, 1/8 amp fore 230 Volts. time delay
Later 8010-SIE	250 V, 1/4 amp, time delay
8010-SIE-GPS II	250 V, 1 amp, time delay
Power:	30 VA
Safety:	ETL Listed, complies with EU safety directives
EMI/RFI:	Complies with FCC Part 15 Class A regulations Complies with EU EMC directive

5.1.5. Physical

Dimensions:

8010-SIE	19“ W x 1.75” H x 7.75” D. (483mm W x 45mm H x 196mm D)
8010-SIE-GPS II	19“ W x 1.75” H x 18.75” D. (483mm W x 45mm H x 477mm D)
Weight:	
8010-SIE	7 lbs. (3.2 Kg)
8010-SIE-GPS II	8 lbs. (3.5 Kg)

5.2. JUMPERS AND SWITCHES

5.2.1. DIP Switch Functions

The main circuit board contains an 8 position DIP switch (S1) that invokes setup and diagnostic functions. Most users will have no need to alter the factory switch settings. The functions of each switch are described below.

Switch	Name	Normal	Function when Open	Function when Closed
1	Not used	Open		
2	Not used	Open		
3	GPS Jam	Open	Jam when Time is different	Jam once on power up
4	Factory Reset	Open		Reset to factory defaults on power up
5	Not used	Open		
6	Quick Boot	Closed	Display boot messages	Faster boot up
7	Not used	Open		
8	Not used	Open		

Table 5-1: DIP Switch Functions

5.2.2. Configuring the Serial Port

The Serial port can be configured for various pinouts, as described in Chapter 2. During manufacture, the serial port or a model 8010-SIE is configured for RS-232 DCE and the serial port of a model 8010-SIE-GPSII is configured for the GPS antenna.

To reconfigure the serial port it is necessary to unplug the Source ID encoder and remove the top cover. Figure 5-1 shows the settings of jumper block J9 on the main circuit board for the various configurations available. The pinouts corresponding to RS-232 DCE, RS-422 controller and GPS configurations are given in Chapter 2. It is impossible to tell whether the serial port pinout has been altered without opening the unit for inspection.

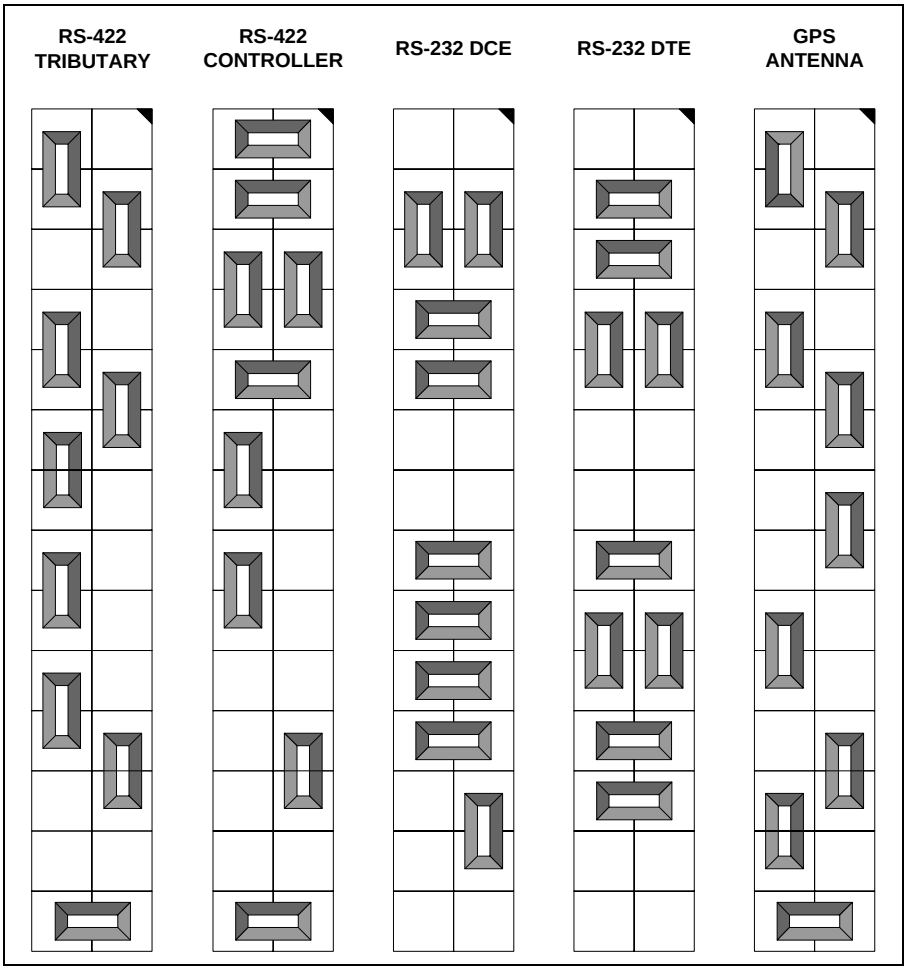

Figure 5-1: Jumper Settings for Serial Port Configurations

5.3. UPGRADING THE FIRMWARE

5.3.1. Overview

The Source ID encoder contains firmware in a FLASH ROM device. From time to time firmware updates may be provided to add additional features to the unit. The following procedure will allow you to upload new firmware from your computer.

You will need the following equipment in order to update the Firmware:

- PC with available communications port. The communication speed is 19200 baud. A 486 PC or better with a 16550 UART based communications port is recommended.
- "Straight-thru" serial extension cable (DB9 female to DB9 male) or (DB25 female to DB9 male)
- Terminal program that is capable of Xmodem file transfer protocol. (such as HyperTerminal)
- New firmware supplied by Evertz.

5.3.2. Procedure for Firmware Upgrades

1. If you have changed the Serial port wiring from the factory default you will need to remove the top cover and set the jumpers on jumper block J9 to the RS-232 DCE settings.

To avoid risk of shock, place the top cover on the unit before applying power.

2. Carefully place the top cover back on the unit before applying power to the unit.

3. With power disconnected, connect the straight through cable between the Source ID encoder serial port and the PC.

4. Power-up the PC, and start the terminal software.

5. Configure the port settings of the terminal program as follows:

Baud	**19200**
Parity	**None**
Data bits	**8**
Stop bits	**1**
Flow Control	**NONE**

6. To invoke the bootloader, hold the ↑ key on the front panel and apply power to the Source ID encoder.

7. The front panel will display the word **PROGRAMMER-19200**. You should also see a menu appear in the terminal window on the PC.

For example:

```
----------------------------------------
8045 Flash ROM Programming Utility Ver 1.3
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.
----------------------------------------
Code Bank: 0 1 2 3 4 5 6 7
BLANK?     N N N N N N N N
Flash ROM is valid

-- MENU --------------------------------
 <X>Modem download HEX file to Flash
 <A>SCII download HEX file to Flash
 production <T>est
 <Q>uit Programmer (Jump into Flash)
----------------------------------------
COMMAND:
```

6. The following is a list of possible reasons for failed communications:

- Defective Serial cable.
- Wrong communications port selected in the terminal program.
- Improper port settings in the terminal program. (Refer to step 3 for settings).
- Arrow key (↑) not being pressed correctly during power-up.

7. Press ‘X’ to initiate X-modem file transfer.

8. The boot code will prompt you to confirm that you want to erase the Flash ROM memory. Press ‘Y’ to proceed, ‘N’ to cancel.

   The Flash ROM must be erased first. Proceed (Y/N)

9. The boot code will indicate when the Flash memory is erased

   Flash ROM is now BLANK. You may proceed.

10. Upload the "*.HEX" file supplied using the X-Modem transfer protocol of your terminal program. If you do not start the upload within a short time the firmware loading operation will time out. You can restart the process by selecting ‘X’ from the menu again.

11. The boot code will indicate whether the operation was successful upon completion of the upload.

    Download Complete!

12. The following is a list of possible reasons for a failed file transfer:

- The supplied “*.HEX” file is corrupt.
- Wrong file specified to be uploaded.
- The PCs’ RS-232 communications port can’t handle a port speed of 19200 baud.

13. To complete the upgrade, either select “Q” (Quit) from the terminal menu, or power-down the unit and reapply power without pressing any keys to resume normal operation. If the Flash ROM

contains valid code, the unit will resume normal operations. If there is a problem in the new firmware, you will be prompted with an error message and remain in the bootloader.

14. If you changed jumpers at the beginning of this procedure return the jumpers to their original positions.

5.3.3. Viewing Firmware Revision Levels

The 8950-SID Source ID encoder does not need to be taken out of service to check the firmware revision levels. These can be checked from the front panel display. To view the firmware revision, use the *FIRMWARE VERSION* menu item on the Engineering menu. To access the menu item press the **SHIFT + SETUP** key and use the up or down arrows (↑, ↓) to move to the *FIRMWARE VERSION* menu item. Press the **SELECT** key to display the firmware version. The front panel display will show the firmware version as follows (or similar):

`DG86D9` This is the name of the HEX file that was downloaded to the source ID encoder.

`R020822` This is the actual firmware revision for the source ID encoder. If the first character is a 'U' instead of an 'R' then the source ID encoder contains unreleased beta firmware. (Evertz does not ship unreleased source ID encoder firmware, except where customers have requested special features.)

5.4. UPGLOADING NEW FONTS

5.4.1. Overview

The Source ID encoder contains character font information in a FLASH ROM device. From time to time font updates may be provided. The following procedure will allow you to upload new fonts from your computer.

You will need the following equipment in order to update the Firmware:

- PC with available communications port. The communication speed is 19200 baud. A 486 PC or better with a 16550 UART based communications port is recommended.
- "Straight-thru" serial extension cable (DB9 female to DB9 male) or (DB25 female to DB9 male)
- Terminal program that is capable of Xmodem file transfer protocol. (such as HyperTerminal)
- New font file supplied by Evertz.

5.4.2. Procedure for Font Upgrades

1. If you have changed the Serial port wiring from the factory default you will need to remove the top cover and set the jumpers on jumper block J9 to the RS-232 DCE settings.

To avoid risk of shock, place the top cover on the unit before applying power.

2. Carefully place the top cover back on the unit before applying power to the unit.

3. With power disconnected, connect the straight through cable between the Source ID encoder serial port and the PC.

4. Power-up the PC, and start the terminal software.

5. Configure the port settings of the terminal program as follows:

Baud	**19200**
Parity	**None**
Data bits	**8**
Stop bits	**1**
Flow Control	**NONE**

6. Power up the unit. To upload new font information, use the *FONT DOWNLOAD* menu item on the menu. To access the menu item press the **SETUP** key and use the up or down arrows (↑, ↓) to move to the *FONT DOWNLOAD* menu item. Press the **SELECT** key. Then press the **SHIFT+SELECT** keys to start the Font downlaoder

7. The front panel will display the word **PROGRAMMER-19200**. You should also see a menu appear in the terminal window on the PC.

For example:

```
***** Unknown Main Flash Memory Chip *****
*****         Cannot Program         *****
Code Bank: 0 1 2 3 4 5 6 7
BLANK?     N N N N N N N N
Flash ROM is NOT valid

***** Intel Char Flash Memory Chip Detected *****
Code Bank: 0 1 2 3 4 5 6 7
BLANK?     N N N Y Y Y Y Y
Flash ROM is valid


-- MENU --------------------------------
 <X>Modem download HEX file to Flash
 <A>SCII download HEX file to Flash
 <1> XModem download of font to Flash
 <2> ASCII download of font to Flash
 production <T>est (not implemented)
 <Q>uit Programmer (Jump into Flash)
----------------------------------------
COMMAND:
```

15. The following is a list of possible reasons for failed communications:

- Defective Serial cable.
- Wrong communications port selected in the terminal program.
- Improper port settings in the terminal program. (Refer to step 3 for settings).
- Arrow key (↑) not being pressed correctly during power-up.

16. Press ‘1’ to initiate X-modem file transfer of the font information.

17. The boot code will prompt you to confirm that you want to erase the Flash ROM memory. Press ‘Y’ to proceed, ‘N’ to cancel.

    `The Flash ROM must be erased first.  Proceed (Y/N)`

18. The boot code will indicate when the Flash memory is erased

    `Flash ROM is now BLANK. You may proceed.`

19. Upload the character font "*.HEX" file supplied using the X-Modem transfer protocol of your terminal program. If you do not start the upload within a short time the font loading operation will time out. You can restart the process by selecting ‘1’ from the menu again.

20. The boot code will indicate whether the operation was successful upon completion of the upload.

    `Download Complete!`

21. The following is a list of possible reasons for a failed file transfer:

- The supplied “*.HEX” file is corrupt.
- You pressed ‘X’ to upload a Firmware file instead of ‘1’ to upload a font file
- Wrong file specified to be uploaded.
- The PCs’ RS-232 communications port can’t handle a port speed of 19200 baud.

22. To complete the font upgrade power-down the unit and reapply power without pressing any keys to resume normal operation. If the Flash ROM contains valid code, the unit will resume normal operations. If there is a problem in the new font file, you will be prompted with an error message and remain in the bootloader.

23. If you changed jumpers at the beginning of this procedure return the jumpers to their original positions.