TIME SYNCHRONIZATION
& "9-1-1" PRODUCTS

Never before has the need for "Time Synchronization" been more important. Voice Loggers, Computers and Automation Systems are but a few of the devices whose performance can be enhanced when interfaced with a source of precision time. And since 1971, **ESE** has been there... providing simple, accurate and cost-effective methods for precision time keeping and Time Synchronization.

Features

- Legally Traceable to UTC (Universal Time Coordinated)
- Simple Installation & "Hands-Off" Operation
- NTP, IRIG-B, IRIG-E, RS-232 (Broadcast & Query) and **ESE** Time Code Outputs
- "Time-Syncs" Master Clock with CAD Systems, ANI/ALI Consoles & Voice Recorders, etc.
- Desk Mount, Wall Mount, Console Mount & Rack Mount Enclosures
- Time Code Converters
- 12 or 24 Hour Format
- Automatic Daylight Savings Time Correction
- Meets or Exceeds NENA-04-002 Master Clock Specifications
- UL Approved Power Supply
- Time Zone Offset
- +/- 10 Nanosecond Accuracy
- Digital, Video & Analog Clock Displays

Applications

- PSAP's (Public Safety Answering Points)
- Broadcast Facilities
- "Video" Courtrooms
- Tele-Conferencing Centers
- Schools & Distant Learning Centers
- Government & Military Installations

Many of the products described in this brochure were developed to satisfy the NENA (National Emergency Number Association) Standard "NENA-04-002". This standard originally published in 1996, defines the accuracy, features and time code outputs required for a PSAP (Public Safety Answering Point) Master Clock. Master Clocks built to this standard are able to interface with equipment typically found within a PSAP and are also used in a variety of other "Time Synchronization" applications.

One such product, the ES-911E/GPS, is a GPS (Global Positioning System) based "NENA" Master Clock. Other **ESE** Master Clocks reference "legal" time from sources such as the USNO (U.S. Naval Observatory) and the NIST (National Institute of Standards and Technology).
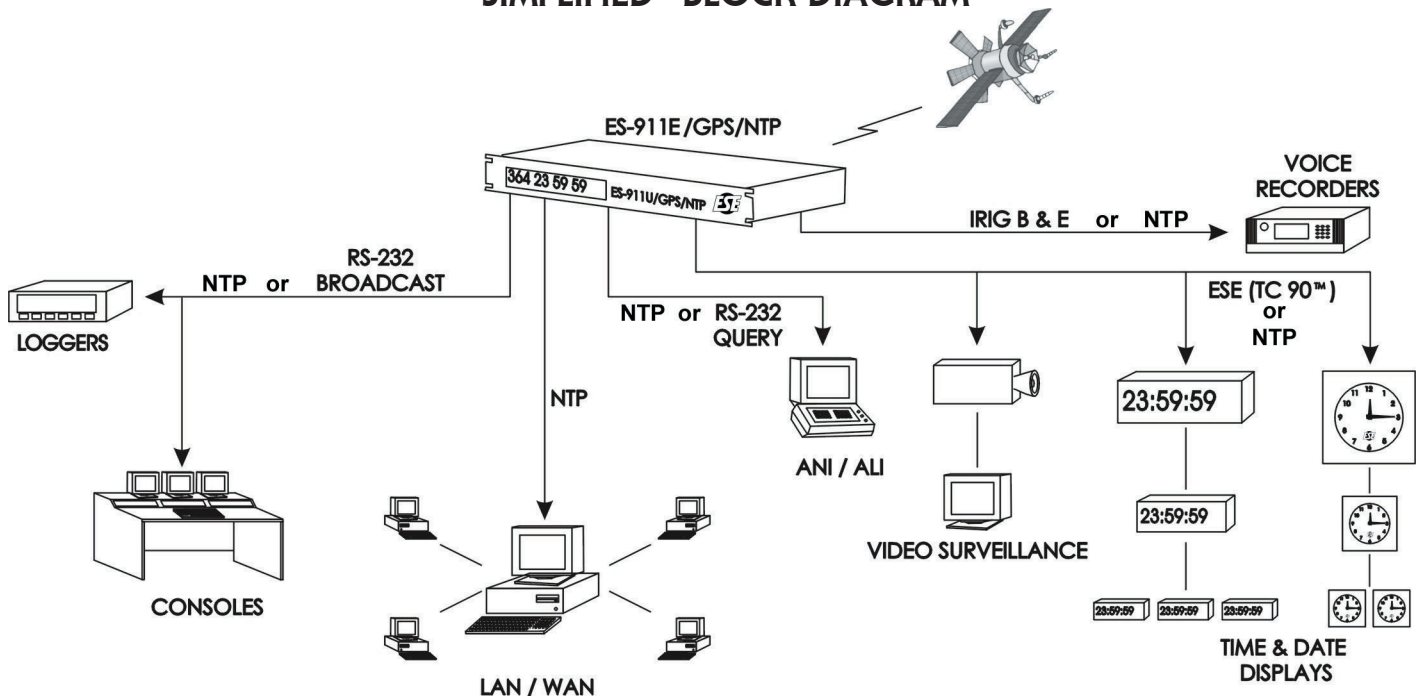
The products described in this brochure belong to the Time Synchronization or 9-1-1 Family. If information on other **ESE** Product Families or a custom product is required, please call the **ESE** factory. We are here to help you take advantage of state-of-the-art timekeeping technology.

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"SIMPLIFIED" BLOCK DIAGRAM

142 SIERRA ST., EL SEGUNDO, CA 90245 (310)322-2136 FAX (310)322-8127 www.ESE-WEB.com

GPS BASED
MASTER CLOCK / NTP SERVER

The **ES-911E/GPS/NTP** is a GPS (Global Positioning System) Master Clock and NTP (Network Time Protocol) Server. The unit displays six digits of legally traceable time as received via the internal 12-channel GPS receiver (Date information is also available on most time code outputs). Simultaneously, the **ES-911E/GPS/NTP** generates several types of time code (IRIG-B, IRIG-E, NTP, *ESE*, RS-485: "Broadcast", RS-232C: "Broadcast" and RS-232C: "Query") and two (2) 1PPS signals.

The unit is specifically designed to meet the NENA (National Emergency Number Association) Standard NENA-04-002 for a PSAP (Public Safety Answering Point) Master Clock and is capable of "Time Synchronizing" all components of a PSAP. This assures that all equipment such as VoIP Systems, Network Servers, CAD, ANI/ALI Controllers, Voice Recorders, Radio Consoles, and digital/analog clock systems can easily interface with and be synchronized to the **ES-911E/GPS/NTP**.

Features:

- NTP output on a 10Base-T Ethernet connector (RJ-45)
- Automatic Daylight Savings Time Correction
- IRIG-B, IRIG-E, RS-232C (Broadcast & Query) And *ESE* Time Code Outputs
- UL Approved Power Supply
- IRIG Codes are Switchable Between Modulated And TTL
- Internal 60 Minute Battery Back-Up
- Rugged Rack Mount Enclosure
- +/- 10 Nanosecond Accuracy
- 6-Digit, .56" LED Display
- "Time Sync" Indicator
- GPS "Lock" Indicator
- Legally Traceable to UTC (Universal Coordinated Time)
- Switchable Between 12 & 24 Hr
- Meets or Exceeds NENA-04-002 Master Clock Specifications
- Time Zone Offset
- 1 PPS Output
- Digital, Video & Analog Slave Clocks Available
- Loss of Power & Loss of Time Sync Relay Outputs
- Loss of GPS Signal Output
- Indoor/Outdoor Antenna with 16' Cable
- Signature Control ("ON/OFF")

Included with the **ES-911E/GPS/NTP** is an indoor/outdoor antenna that is connected to the unit via the provided 16' cable. If additional cable is required, "low-loss" cable, an "in-line" amplifier (LA-12F or LA-12FN for low-loss cable) or, for extra long cable runs where more than one in-line amplifier is used, an "Antenna Power Supply" (ES-AB1A) may be required. Consult the ESE factory for more information.

Computer synchronization is effortlessly maintained by using NTP client software such as Dimension 4 or Tardis which are available on the Internet at no charge. Software is also supplied with the **ES-911E/GPS/NTP** permitting the user to continuously update a computer's DOS or Windows clock to the GPS time available on the ASCII output.

SPECIFICATIONS

Accuracy:	+/- 10 ηS Of UTC When Locked To GPS
Drift:	33 mS/Day (if no GPS signal)
Displays:	Six Digits, Yellow LED, .56" High
Power:	15 Watts Maximum
Electrical:	117 VAC, 50/60 Hz Via UL/CSA/CE Approved, External Power Transformer
Mechanical:	1.75" x 19" Rack Mount, 10" Deep
GPS Receiver:	Internal 12-Channel
Antenna:	Indoor/Outdoor With 16' Cable
Battery:	60 Minute Back-Up (all outputs and displays)

Outputs:	NTP - IPv4/IPv6 10/100 BaseT Ethernet, RJ45
	1 PPS - TTL, 20% Duty Cycle
	1 PPS - TTL, 50% Duty Cycle (regenerated)
	IRIG-B - 3 VPP (mark amplitude) (AM or TTL)
	IRIG-E - 3 VPP (mark amplitude) (AM or TTL)
	ESE Time Code - Drives 100 Slaves @ 4000'
	RS-232C - ASCII Date & Time @ 1200-9600 Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query
	RS-485 - (same as RS-232C; no Query)
Options:	Ant, HR, J, K

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GPS BASED
MASTER CLOCK

The **ES-911E/GPS** is a GPS (Global Positioning System) Master Clock and Time Code Generator. The unit displays six digits of legally traceable time as received via the internal 12-channel GPS receiver. (Date information is also available on most time code outputs.) Simultaneously, the **ES-911E/GPS** generates several types of time code (IRIG-B, IRIG-E, *ESE*, RS-485: "Broadcast", RS-232C: "Broadcast" and RS-232C: "Query") and two (2) 1PPS signals.

The unit is specifically designed to meet the NENA (National Emergency Number Association) Standard NENA-04-002 for a PSAP (Public Safety Answering Point) Master Clock and is capable of "Time Synchronizing" all components of a PSAP. This assures that all equipment such as CAD, ANI/ALI Controllers, Voice Recorders and Radio Consoles can easily interface with and be synchronized to the **ES-911E/GPS**. The **ES-911E/GPS** can also synchronize other computers and digital/analog clock systems.

Features:

- IRIG-B, IRIG-E, RS-232C (Broadcast & Query) And *ESE* Time Code Outputs • UL Approved Power Supply
- IRIG Codes Are Switchable Between Modulated And TTL • Automatic Daylight Savings Time Correction
- Internal 60 Minute Battery Back-Up
- Rugged Rack Mount Enclosure
- "Time Sync" Indicator
- GPS "Lock" Indicator
- 6-Digit, .56" LED Display
- Signature Control ("ON/OFF")
- +/- 10 Nanosecond Accuracy
- Legally Traceable to UTC (Universal Coordinated Time)   • 1 PPS Output
- Time Zone Offset   • Meets or Exceeds NENA-04-002 Master Clock Specifications
- Digital, Video & Analog Clocks Available   • Loss of Power & Loss of Time Sync Relay Outputs
- Loss of GPS Signal Output • Switchable Between 12 & 24 Hr • Indoor/Outdoor Antenna with 16' Cable

Included with the **ES-911E/GPS** is an indoor/outdoor antenna that is connected to the unit via the provided 16' cable. If additional cable is required, "low-loss" cable, an "in-line" amplifier (**LA-12F** or **LA-12FN** for low-loss cable) or, for extra long cable runs where more than one in-line amplifier is used, an "Antenna Power Supply" (**ES-AB1A**) may be required. Consult the *ESE* factory for more information.

Software is supplied with the **ES-911E/GPS** permitting the user to continuously update a computer's DOS or Windows® clock to the GPS time available on the ASCII output.

(Some Options Shown)

SPECIFICATIONS

Accuracy:	+/- 10 ηS Of UTC When Locked To GPS
Drift:	33 mS/Day (if no GPS signal)
Displays:	Six Digits, Yellow LED, .56" High
Power:	110-120 VAC, 50/60 Hz, 15 Watts Maximum
Electrical:	117 VAC, 50/60 Hz Via UL/CSA/CE Approved, External Power Transformer
Mechanical:	1.75" x 19" Rack Mount, 10" Deep
GPS Receiver:	Internal 12-Channel
Antenna:	Indoor/Outdoor With 16' Cable
Battery:	60 Minute Back-Up (all outputs and displays)

Outputs:	1 PPS - TTL, 20% Duty Cycle
	1 PPS - TTL, 50% Duty Cycle (regenerated)
	IRIG-B - 3 VPP (mark amplitude) (AM or TTL)
	IRIG-E - 3 VPP (mark amplitude) (AM or TTL)
	ESE Time Code - Drives 100 Slaves @ 4000'
	RS-232C - ASCII Date & Time @ 1200-9600 Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query
	RS-485 - (same as RS-232C; no Query)
Options:	ANT, HR, J, K (see page 12)

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<div align="center">**THE INCREDIBLE**</div>

TIME-SYNC MACHINE ™

The **ES-911/TSM** is a Master Clock and Time Code Generator. The unit is specifically designed to provide the time code outputs recommended by the NENA (National Emergency Number Association) Standard NENA-04-002 for a PSAP (Public Safety Answering Point) Master Clock and is capable of "Time Synchronizing" all components of a PSAP.

The unit displays six digits of time (a front panel "DATE" switch allows MO-DAY-YR to be viewed) and continuously references an internal oscillator. Simultaneously, the **ES-911/TSM** generates several types of time code (IRIG-B, IRIG-E, *ESE*, RS-485, RS-232C: "Broadcast" and RS-232C: "Query") and a 1PPS signal. These outputs allow the **ES-911/TSM** to synchronize and easily interface with equipment such as CAD, ANI/ALI Controllers, Voice/Data Recorders and Radio Consoles. The **ES-911/TSM** can also synchronize other computers and digital/analog clock systems.

Features:

- IRIG-B, IRIG-E, RS-485, RS-232C (Broadcast & Query) And *ESE* Time Code Outputs • 1 PPS Output
- IRIG Codes are Switchable Between Modulated And TTL • Automatic Daylight Savings Time Correction
- Provides NENA-04-002 Master Clock Time Code Outputs
- Rugged Rack Mount Enclosure
- 6-Digit, .56" LED Display
- Loss of Power Relay Outputs
- Switchable Between 12 & 24 Hr
- Simple Operation & Installation
- UL/CSA/CE Approved Power Supply
- Digital, Video & Analog Clock Displays Available
- Optional 60 Minute Battery Back-Up   • ASCII Outputs Selectable Between Format #0 & Format #1
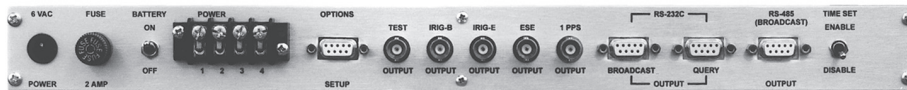
The **ES-911/TSM** provides a truly economical solution where the need for precise "time synchronization" and cost-savings are the main considerations. The "accuracy" of the Time-Sync Machine™ can be enhanced with the "1 Second per Month" option. For applications requiring better accuracy, please refer to the ES-911E/GPS.

Software is supplied with the **ES-911/TSM** permitting the user to continuously update a computer's DOS or Windows® clock to the time available on the ASCII output.

SPECIFICATIONS

Outputs: 1 PPS - TTL, 50% Duty Cycle
IRIG-B - 2 To 7 VPP (mark amplitude)
IRIG-E - 2 To 7 VPP (mark amplitude)
ESE Time Code - Drives 100 Slaves @ 4000'
RS-232C - ASCII Date & Time @ 1200-9600
     Baud, 8 Data, No Parity, 1 Stop
RS-485 - ASCII Date & Time @ 1200-9600
     Baud, 8 Data, No Parity, 1 Stop
Displays: Six Digits, Yellow LED, .56" High

Accuracy: 2 -3 Seconds Per Week
Power: 10 Watts Maximum
Electrical: 117 VAC, 50/60 Hz Via UL/CSA/CE Approved,
     External Power Transformer
Mechanical: 1.75" x 19" Rack Mount, 10" Deep
Options: 1 Sec/Mo, BBU, Black, HR, J

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NETWORK BASED
TIME CODE GENERATORS

The **ES-911/Serial** and **ES-911/USB** are *ESE* Master Clocks that obtain date and time information from a PC's serial port or its USB "Universal Serial Bus" port. The units are specifically designed to provide all of the time codes as described in the NENA (National Emergency Number Association) Standard NENA-04-002.
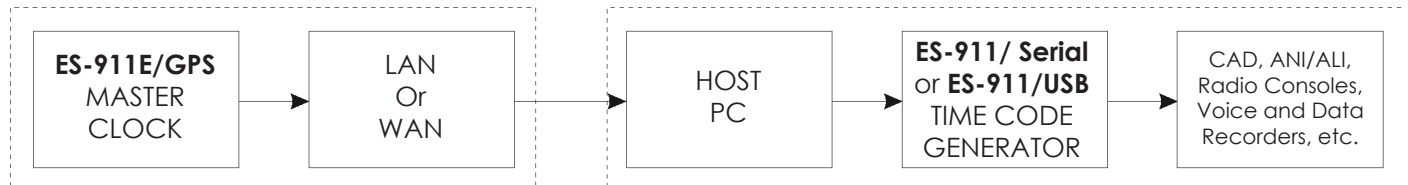
Both units generate several types of time code (IRIG-B, IRIG-E, *ESE*, RS-485, RS-232C: "Broadcast" and RS-232C: "Query") and a 1PPS signals. These units allow synchronization and easily interfaces to equipment such as CAD, ANI/ALI Controllers, Voice Recorders and Radio Consoles. Both products can also synchronize other computers and digital/analog clock systems.

Features:

- IRIG-B, IRIG-E, RS-485, RS-232C (Broadcast & Query) And *ESE* **Time Code™** Outputs
- 1 PPS Output
- IRIG Codes Are Switchable Between Modulated And TTL
- Automatic Daylight Savings Time Correction
- Optional Internal 60 Minute Battery Back-up
- Rugged Rack Mount Enclosure
- Time Zone Offset
- "Time Sync" Indicator
- "Time Lock" Indicator
- UL Approved Power Supply
- Optional 6-Digit, .56" LED Display
- Provides All NENA-04-002 Master Clock Time Code Specifications
- Digital, Video & Analog Clock Display Available
- Loss of Power & Loss of Time Sync Relay Outputs

Some Options Shown

The **ES-911/Serial** & **ES-911/USB** provide an economical method of supplying the same date and time data from a LAN or WAN to other equipment in need of "Time Sync". The host PC must receive updated time data from the network. This updated time data is then output via the host PC's serial or USB port which synchronizes the timecode generator. Each unit generates the above mentioned time codes as required by the other equipment at the PSAP (Public Safety Answering Point) or other location in need of "Time Sync".

ES-911E/GPS MASTER CLOCK	→	LAN Or WAN	→	HOST PC	→	**ES-911/ Serial** or **ES-911/USB** TIME CODE GENERATOR	→	CAD, ANI/ALI, Radio Consoles, Voice and Data Recorders, etc.

This scenario allows the *ESE* **Master Clock** (that is providing date and/or time to the network) to reach beyond the network and "Time Sync" all equipment within reach of the "Host PC" and the **ES-911/Serial** or **ES-911/USB**.
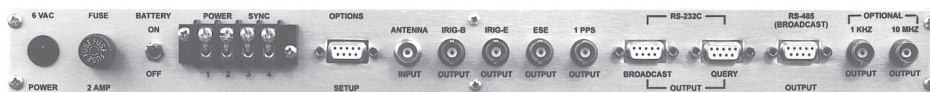
The included **ES-911** Software allows the host computer to output date and time data via its USB port to the **ES-911/Serial or ES-911/USB**. Also supplied, is software that determines the specific USB port number to be used.(**ES-911/USB** only).

SPECIFICATIONS

Power:	5 - 15 Watts Maximum
Electrical:	117 VAC, 50/60 Hz via UL/CSA/CE Approved, External Power Transformer
Mechanical:	1.75" x 19" Rack Mount, 10" Deep
Accuracy:	Provided by host PC & LAN or WAN
Drift:	200mS/day (if no update via serial or USB port)
Options:	6-Digit Display, BBU, Black, HR, J
Input:	Serial or USB
Requirements:	**ES-911/Serial:** Windows 95 or better
	ES-911/USB: IBM type PC with Pentium®, 16 MB RAM, Windows® 98-OSR 2.1 or better, USB port

Outputs:	1 PPS - TTL, 50% Duty Cycle
	IRIG-B - 3 VPP (mark amplitude) (AM or TTL)
	IRIG-E - 3 VPP (mark amplitude) (AM or TTL)
	ESE Time Code - drives 100 Slaves @ 4000'
	RS-485 - ASCII Date & Time @ 1200-9600 Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query
	RS-232C - ASCII Date & Time @ 1200-9600 Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query

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TIME CODE READERS

These six-digit (or four-digit) displays are designed to be "Universal" Time Code Readers. All models described below are able to auto-detect, read and display **ESE** (TC76™, TC89™ or TC90™), ASCII (format A, 0 or 1 @ 9600 baud; RS-232C, RS-422A or RS-485), SMPTE or EBU time code.

Setup Features allow the unit to display time in either 12 or 24 hour format and display "Date" information when reading **ESE** and SMPTE/EBU to display "User Bits". An Error Detection and Correction Feature maintains flicker-free operation in the event of poor quality or loss of time code. An Error Detection Indicator is also included and the Error Correction Feature may be turned-off via an internal DIP switch.

Several Options are available with all "U" Series Readers. LED color options of Amber, Blue, Green and Red can be specified on the 1", 2", 4" and 7" units with LED displays. Option "TZ" allows the unit to be "offset" to other time zones via an internal set of DIP switches. **ESE** and ASCII (RS-232C) time code inputs are also optionally available. Most units are available with a rack mount enclosure, option "P". Other options are listed below.

Each Reader requires only a single pair of wires (or coax) between itself and the Master Clock (or other source of time code). The wiring arrangement can be parallel, serial or both. Please note that extra long cable runs may require a Distribution/Isolation Amplifier, refer to page 15 (ES-243) for more information.

Features:

- Reads SMPTE/EBU, ASCII or **ESE** Time Code
- Error Detection & Correction
- Optional Time Zone Offset
- Optional **ESE**, & RS-232C Time Code Outputs
- Display Date or Time
- 0.4" To 7.0" Display Sizes
- 12/24 Hour Format
- Simple Installation & "Hands-Off" Operation
- Long-Life LED Displays
- Desk Top, Console, Wall & Rack Mount Enclosures
- Perfect Synchronization With Master Clock

ES-996U	ES-161U	ES-161UP	ES-171U
ES-943U	ES-166U	ES-166UP	LX-161U
	ES-991U	ES-996UP	ES-166UQ
			LX-166U

SPECIFICATIONS

Model Number	Description	Viewing Distance	Time Code Input	Options
ES-171U	6-digit, 0.4" Red LED in Console mount enclosure	10'	*ESE*, SMPTE/EBU	J, V, TZ, UL, W
LX-161U	6-digit, .56" Amber LED in "LX-" enclosure	20'	*ESE*, SMPTE/EBU, ASCII	J, RS, TZ, UL
ES-161U	6-digit, .56" Amber LED in Desk mount enclosure	20'	*ESE*, SMPTE/EBU, ASCII	*ESE*, J, NTP-C, NTP-C/PoE, P, P2, PoE, Q, RS, TZ, UL, W
LX-166U	6-digit, 1.0" Amber* LED in "LX-" enclosure	35'	*ESE*, SMPTE/EBU, ASCII	J, RS, TZ, UL
ES-166U	6-digit, 1.0" Amber* LED in Desk mount enclosure	35'	*ESE*, SMPTE/EBU, ASCII	*ESE*, J, NTP-C, NTP-C/PoE, P, P2, PoE, Q, RS, TZ,UL,W, Wall
LX-991U	4-digit (Hr, Min), 2.3" Amber* LED in "LX-" enclosure	70'	*ESE*, SMPTE/EBU, ASCII	J, NTP-C, NTP-C/PoE, PoE, TZ, UL
ES-991U	4-digit (Hr, Min), 2.3" Amber* LED in Desk mount enclosure	70'	*ESE*, SMPTE/EBU, ASCII	J, NTP-C, NTP-C/PoE, P, PoE, TZ, UL, W, Wall
LX-993U	6-digit, 2.3" (1" Sec) Amber* LED in "LX-" enclosure	70'	*ESE*, SMPTE/EBU, ASCII	J, TZ, UL
ES-993U	6-digit, 2.3" (1" Sec) Amber* LED in Wall mount enclosure	70'	*ESE*, SMPTE/EBU, ASCII	J, P, TZ, UL, W
ES-996U	6-digit, 2.3" Red* LED in Wall mount enclosure	70'	*ESE*, SMPTE/EBU, ASCII	CW, J, NTP-C, NTP-C/PoE, P, PoE, TZ, UL, W
ES-941U	4-digit (Hr, Min), 4.0" Red* LED in Wall mount enclosure	120'	*ESE*, SMPTE/EBU, ASCII	J, NTP-C, NTP-C/PoE, PoE, TZ, UL, W
ES-943U	6-digit, 4.0" Red* LED in Wall mount enclosure	120'	*ESE*, SMPTE/EBU, ASCII	J, NTP-C, NTP-C/PoE, PoE, TZ, UL, W
ES-976	6-digit, 7.0" Red* LED in Wall mount enclosure	250'	*ESE*, SMPTE/EBU, ASCII	CW, J, NTP-C, NTP-C/PoE, PoE, TZ, UL, W

*Amber, Blue, Green or Red LED display color can be specified

Display	Power	Electrical
0.4" LED:	5 Watts	117 VAC, 50/60 Hz
.56" LED:	5 Watts	117 VAC, 50/60 Hz
1.0" LED:	5 Watts	117 VAC, 50/60 Hz
2.3" LED:	8-10 Watts	117 VAC, 50/60 Hz
4.0" LED:	8-10 Watts	117 VAC, 50/60 Hz
7.0" LED:	10 Watts	117 VAC, 50/60 Hz

Enclosure	Style	Dimensions
0.4" - Console:	Black ABS Plastic	2.2" H x 4.5" W x 4.5" D
.56" - LX:	Black Texture (High-Tech)	1.7" H x 8" W x 6" D
.56" - Desk:	Black Plastic / Aluminum	2.8" H x 8" W x 6" D
1.0" - LX:	Black Texture (High-Tech)	3.5" H x 10" W x 6" D
1.0" - Desk:	Black Plastic/ Aluminum	5.5" H x 10.4" W x 6.6" D
2.3" - LX:	Black Texture (High-Tech)	3.5" H x 12" W x 6" D
2.3" 4-digit Desk:	Black Plastic/ Aluminum	5.5" H x 10.4" W x 6.6" D
2.3" 6-digit Wall:	Black Textured Aluminum	5" H x 12" W x 3.5" D
2.3" 6-digit Wall:	Black Textured Aluminum	5" H x 15" W x 3.5" D
4.0" 4-digit Wall:	Black Textured Aluminum	7" H x 19" W x 3.5" D
4.0" 6-digit Wall:	Black Textured Aluminum	7" H x 26" W x 3.5" D
7.0" 6-digit Wall:	Black Textured Aluminum	9" H x 43" W x 3.5" D

SELF - SETTING
# 5", 12" & 16" ANALOG CLOCKS

The **LX-5105**, **LX-5112** and **LX-5116** are Self-Setting Analog Clocks with 5", 12" and 16" viewing diameters, respectively. The units are designed to operate as Time Code Readers, Stand-Alone Clocks or Impulse Clocks. All three can read, decode and display time information from most any Master Clock or other source of time code. A rear-mounted DIP switch permits the clock to display time as received from a source of SMPTE/EBU, *ESE* or ASCII time code (IRIG-B is optional). After a very simple "set-up" procedure and receipt of time code, the clock automatically sets itself to the exact time and continuously slaves to the time code. If time code is lost, an error indicator is lit and the clock continues counting while referencing an internal crystal time base.

Other user defined modes of operation allow the clocks to be synchronized to a Master Clock with a 1 PPS alternating 12 VDC/24 VDC output or to be set to real time and allowed to run based on their internal crystal oscillators. The second hand is completely silent and can be programmed for "Sweep" or "Step" mode.

The initial set-up allows each clock to have the hours (and/or minutes) offset to that of another time zone. Also, since the unit can continuously track time code, there is no need to twice annually compensate for daylight savings time, assuming the Master Clock (ES-911E/GPS, ES-911E/GPS/NTP, ES-911/TSM, ES-911/USB, or ES-911/Serial) automatically adjusts itself accordingly.

Features:

- Silent   • Reads *ESE*, ASCII, SMPTE or EBU Time Code   • Simple Installation & "Hands-Off" Operation
- 5", 12" or 16" Dials   • Optional IRIG-B Input   • Time Zone Offset   • Lighted-Dial Option
- Self-Setting   • Sweep Or Step Second Hand
- Error Indicator   • Rack Mount Option
- Stand-Alone, Impulse & Reader Modes
- Battery Back-Up
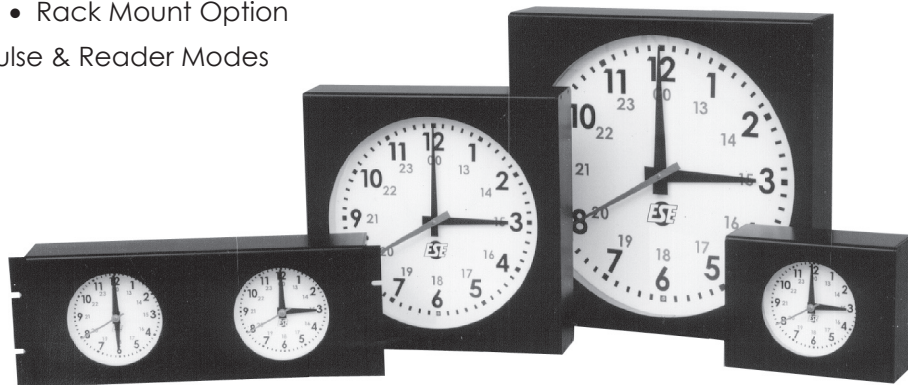
SPECIFICATIONS

Power: 5 Watts Maximum (15 Watts with Light option)
Electrical: 117 VAC, 50/60 Hz
Mechanical: Desk Mount (LX-5105); Wall Mount (LX-5112 & LX-5116)
Dimensions: LX-5105: 6.95" High x 8.73" Wide x 3.45" Deep;
             LX-5112: 13.95" x 13.95" x 3.45" Deep;
             LX-5116: 17.45" x 17.45" x 3.45" Deep
Inputs: SMPTE/EBU: 10kΩ, Balanced or Unbalanced, 100mVpp to 10 Vpp;
             ESE: TC76™, TC89™or TC90™, 120kΩ, Unbalanced;
             ASCII: 120kΩ, Unbalanced;
             Impulse: Alternating 12 VDC (or optional 24 VDC)
Battery: 9v, Maintains CPU for up to 60 Hours
Viewing Distance: 20, 60 & 80 feet, respectively
Options: IRIG, J, Light, P, P2, UL

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"DIGITAL" TIME & DATE SLAVE DISPLAY

ESE offers two different size displays of the Digital Clock/Calendar Slave. The **ES-126U** is a twelve-digit Time Code Reader (*ESE*-TC90, ASCII, SMPTE or EBU) that displays six digits (Hours, Minutes & Seconds) of time and six digits (Month, Day & Year or optionally Day, Month & Year) of date. The displays are .56" high yellow LED's and the unit is mounted in a 1 3/4" Rack Mount enclosure. The **ES-127U** is identical to the **ES-126U** except that it has 1.0" high LED displays and its Rack Mount enclosure is 3 1/2" high.

Features:

- Perfect Synchronization with Master
- Reads *ESE*, ASCII, SMPTE Or EBU Time Code
- Long-Life Yellow LED Displays
- Optional Time Zone Offset
- Rack Mount Enclosure

ES-126U

ES-127U
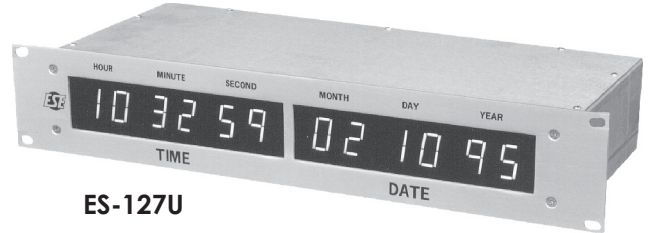
These units are designed to read the serial data from any Master Clock, Converter or Calendar that has a *ESE*-TC90 Time Code output (properly formatted ASCII, SMPTE or EBU can also be read by either unit). TC90 contains time and date data and is available on the ES-911E/GPS, ES-911E/GPS/NTP, ES-911/TSM, ES-911USB, ES-911/Serial.

Specifications

ES-126U	ES-127U
Input: *ESE* TC90, ASCII, SMPTE or EBU	*ESE* TC90, ASCII, SMPTE or EBU
Electrical: 117 VAC, 50/60 Hz, 10 W	117 VAC, 50/60 Hz, 10 W
Mechanical: 1.75" x 19" Rack Mount 10" Deep	3.5" x 19" Rack Mount 10" Deep
Displays: 12 digits, .56" High Yellow LED (20' Viewing Distance)	12 digits, 1.0" High Yellow LED (35' Viewing Distance)
Options: Black, *ESE*, J, TZ(DIP), UL, W	Black, *ESE*, J, TZ(DIP), UL, W

"VIDEO" TIME & DATE SLAVE

The **ES-266U** is a Video Time and Date "Inserter" which receives and decodes either *ESE* or SMPTE Time Code (selectable via an internal DIP switch). Six digits of Time (Hr, Min, Sec) and six digits of Date (Month, Day, Year) are then superimposed onto a video signal looped-thru the unit.

On-screen menus allow adjustment of the **ES-266U** display Size and Position, Mask Mode (black background on/off and transparent or solid display), Display Mode (side-by-side / stack / time only / date only), 12/24 Hour mode, and Time Zone offset. The Date may be manually set if receiving time codes which do not provide date information (i.e. TC76™/TC89™ or SMPTE without date-encoded User-Bits). The brightness of the characters and background may be individually set via front-panel controls. The display may be turned on/off via a front-panel control. Two BNC video outputs are provided. An RS-232 interface & Windows® Control Panel software are included, which allow remote control of the display modes

Features:

- Vertical and Horizontal Position Control
- Daylight Savings Time Correction
- Operates With NTSC Or PAL
- Vertical and Horizontal Size
- *ESE* Serial Time Code™ Input
- Brightness Control
- "Blankable" Time or Date
- On-Screen Programming
- Leap Second Correction
- 12 Hour Format (with AM/PM Indicator) or Optional 24 Format
- Multiple Mask Selection
- Side-By-Side Display can be Stacked

Specifications

Electrical: 117 VAC, 50/60 Hz	**Mechanical**: 1.75" x 19" Rack Mount, 10" Deep
Power: 7 Watts Maximum	**Input**: Any *ESE* Time Code (TC76 must be 24 Hr)
	Options: Black, D, DC, J, L2 , L4 , P2, R, UL

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NTP TIME SERVERS

ESE's line of NTP (Network Time Protocol) Time Servers provides a simple method of putting accurate time information onto a network. NTP is arguably the most reliable method for sharing time information on a network (LAN , WAN or Internet, etc.). And, each of these four NTP Time Servers offers a perfect solution for providing accurate and synchronized time throughout a network. The concept is as simple as plugging the Server into the network, configuring the unit and allowing any client to request highly accurate time from the NTP Time Server.

Features

- Create NTP from Most Any "Non-NTP" Master Clock
- NTP Primary Time Server **(ES-104E)**
- Several Options Available
- Platform Independent

- Simple Installation & Hands-Free Operation •
- 10/100BaseT - NTP Data Port (RJ-45) •
- Rugged Desktop Enclosure •
- ***ESE*** Time Code Output •

Applications

- Telephone & Radio Dispatch Time Stamps
- Financial Institutions

- Manufacturing Process Control
- Securities Exchanges

- Broadcast Facilities
- Military Installations
- Digital Signatures

The **ES-104E** employs an internal GPS Receiver as its time reference. This provides the user a source of UTC (Universal Coordinated Time) from an NTP Primary (Stratum 1) Time Server. In contrast, **ES-289E**, **ES-299E** and **ES-911E/NTP** receive their time reference from external sources of time code. They are in essence time code translators, each receiving time code and outputting NTP. The **ES-289E** accepts either SMPTE/EBU time code (must include Date data) or ***ESE*** Time Code™, while the **ES-299E** references either IRIG (A,B or E) and NASA 36. Designed to accept ASCII time code, the **ES-911E/NTP** accepts any of the formats that follow: NENA (Format "1"), ***ESE*** (Format "A"), or NMEA 0183, and also accepts ***ESE*** (TC-90).

All four units include an ***ESE*** Time Code™ output which is capable of time synchronizing up to 100 ***ESE*** Slave Clocks at a distance of up to 4000 feet. A rear mounted DB-9 connector allows access to the GPS / Time Code Lock status output. All configuration is accomplished via the 10/100BaseT network connection (RJ-45).

Specifications

I/O Connection:	Network: IPv4/IPv6 10/100BaseT Ethernet, RJ-45
Outputs:	***ESE*** Time Code™ TC89 or TC90, Drives 100 Slaves @ 4000', BNC
GPS Receiver:	Internal 12-Channel (**ES-104E** only)
Antenna:	Indoor/Outdoor with 16' Cable (**ES-104E** only)
Antenna Input:	L1, 1.57542 GHz, TNC (**ES-104E** only)
Time Code Input:	**ES-289E**: ***ESE*** (TC-90), SMPTE or EBU Time Code with Date data, BNC
	ES-299E: IRIG (A,B or E), NASA 36, BNC
	ES-911E/NTP: ASCII (RS-232C): NENA (format "1"), ***ESE*** ("A"),
	or NMEA 0183 (GPRMC), DB-9
	ESE (TC-90) via BNC
Drift:	33ms/Day (if no GPS signal)
Configuration:	Web page or Telnet
Enclosure:	Desk-Top, Black Anodized Aluminum
Dimensions:	1.6" H x 7" W x 5" D
Electrical:	117 VAC, 50/60 Hz
Power:	5W maximum
Options:	Ant (**ES-104E** Only), BBU, J, P, P2, UL

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GPS BASED FREQUENCY GENERATOR

The **ES-110** generates a stable source of 10 MHz and 1 PPS using GPS (Global Positioning System) satellites as a reference. The unit provides 10 MHz in both Sine Wave and Square Wave (5 volt logic) form. The 1 PPS output is a 50% duty, 5 volt logic signal, positive-edge coinciding with the UTC seconds change. An *ESE* TC90™ Time Code output is also provided for driving remote time displays. Internal DIP switches allow configuration of the Time Zone, antenna cable length compensation, and the satellite tracking mode.

Features

- Disciplined Temperature-Compensated Crystal Oscillator
- GPS Timing Reference With 1 x 10^{-8} Accuracy
- Two 10 MHz Outputs (1 - Sine & 1 - Square)
- Ruggedized Desk-Top Enclosure
- Phase Coherent 1 PPS Output
- Several Options Available
- *ESE* Time Code Output

Applications

- Radio And TV Broadcast
- Test And Measurement
- Range Instrumentation
- Telecommunications

Shown with Rackmount option ES-110P

Specifications

Outputs:	10 MHz Sine Wave, BNC, 4 VPP into 50 ohms
	10 MHz Square Wave, 5 VPP CMOS/TTL, BNC
	1 PPS, 50% Duty, 5 VPP CMOS/TTL, BNC
	ESE Time Code™ (TC90), Drives 100 Slaves @ 4000', BNC
GPS Receiver:	Internal 12-Channel
Accuracy:	1 x 10^{-8}
Antenna:	Indoor/Outdoor with 16' Cable
Antenna Input:	L1, 1.57542 GHz, TNC
Enclosure:	Desk-Top, Black Anodized Aluminum
Dimensions:	1.6" H x 10" W x 4.8" D
Electrical:	117 VAC, 50/60 Hz
Power:	5W maximum
Options:	Ant, BBU, DC, J, P, UL

TIME CODE CONVERTERS

All too often communication between various equipment is impossible due to a "language barrier". When time information must be shared, a Time Code Converter (Translator) may be a very simple solution. With more than a dozen "standard" Time Code Converters (and at least that many "Custom" Time Code Converter products), **ESE** is certain to offer a solution to whatever language barrier exists.

Described below are three Time Code Converters that have solved many Time Code communication problems in the 9-1-1 industry. If a problem exists that is not addressed in this brochure, please contact the **ESE** factory for a simple solution to your communication needs.

Features:

- Translate **ESE**, ASCII (RS232C & RS485) and IRIG Time Codes
- Optional 220 VAC and/or "UL" Operation
- Simple Installation & "Hands-Off" Operation
- Power Indicator
- Field-Selectable Set-Up Features
- Time Lock & Time Sync Indicators
- Table-Top / Rack Mount Enclosures
- NENA-04-002 Compatibility

ES-223
ESE Time Code
into IRIG (B & E) & RS232C/ASCII
(Broadcast & Query)

The **ES-223** is a "NENA" Time Code Converter. The unit accepts **ESE** TC90™ time code from most any **ESE** Master Clock and translates it into the time codes specified by the NENA-04-002 Standard for a PSAP (Public Safety Answering Point) Master Clock. Outputs include IRIG-B, IRIG-E, RS-232 (Broadcast) and RS-232 (Query).

The **ES-223** can accept **ESE** TC90™ time code from an ES-911E/GPS, ES-911E/GPS/NTP ES-911/TSM, ES-911/Serial, or ES-911/USB.

ES-225A
ESE Time Code
into ASCII (RS232C & RS485)

The purpose of the **ES-225A** is to synchronize a computer, a voice logger, an existing clock system, etc. with a Master Clock. Running **ESE** Time Code from a Master Clock allows up to 4000' feet of cable to be connected between a Master Clock and a "user" of ASCII (RS232C or RS485).

The **ES-225A** is a Time Code Converter that translates **ESE** Time Code (TC76™, TC89™ or TC90™) into ASCII (RS232C & RS485) Time Code. The ASCII output data stream may be selected as either format 'A', '0', '1' or 'B' and the baud rate can be selected from 1200 to 9600.

ES-226
RS232C/ASCII
into IRIG (B or E) & ESE

The purpose of the **ES-226** is to provide a Master Clock the ability to supply time information to a Voice Recorder or any other piece of equipment common to a PSAP.

The **ES-226** is a Time Code Converter that accepts RS232C/ASCII time code (format '0' or '1') and converts it into two other time code formats... IRIG-B or IRIG-E time code, and **ESE** (TC90™) time code. The IRIG time code is selectable for either AM (Amplitude Modulated) or TTL (pulse width coded) output and for Signature Control either 'enabled' or 'disabled'.

SPECIFICATIONS

	ES-223	ES-225A	ES-226
Power:	5 Watts Maximum	5 Watts Maximum	5 Watts Maximum
Electrical:	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
Mechanical:	1.75" x 19 " Rack Mount, 10" deep	1.6" x 6" Table-Top, 5" deep	1.6" x 6" Table-Top, 5" deep
Input:	**ESE** (TC90™)	**ESE** (TC76™-24Hr, TC89™ or TC90™)	RS232C/ASCII (format '0' or '1')
Output:	IRIG-B, IRIG-E, RS232C/ASCII (Broadcast & Query)	ASCII (format 'A', '0', '1' or 'B'-Timer), RS-232C & RS485	IRIG-B or IRIG-E (AM or TTL) & ESE (TC90™)
Connectors:	BNC, 9-pin D-sub	BNC, Two) 9-pin D-sub	9-pin D-sub, BNC
Setup Features:	AM/TTL; Signature Control; Baud Rate	Baud Rate; ASCII Format	ASCII Format; Baud Rate; B or E; AM or TTL; Signature Control
Options:	Black, J, UL	J, P, UL	J, P, UL

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MASTER CLOCK
SYSTEM SWITCHER

The **ES-151** is an Automatic Time Code Switchover unit. It is designed to provide a simple/automatic method for switching between a Primary Master Clock and a Secondary Master Clock.

Features

- Rack Mount Enclosure
- LED Status Indicators
- Simple Installation & Operation
- Automatic Time Code Switchover
- Seven Standard Input/Output Circuit Switchovers

The unit receives **ESE** time code from two different sources (A & B) and if a fault is detected from the Primary Clock (A), the **ES-151** automatically switches to the Back-up Clock (B). Once a fault is detected, the unit remains in the "B" state until manually reset. Front panel mounted LED's indicate status and a toggle switch allows manual switching between A and B.

SPECIFICATIONS

Active I/O Circuits:	ESE Time Code	**Optional I/O Circuits:**	1 KHz, 10 MHz
Passive I/O Circuits:	IRIG-B, IRIG-E, ASCII (Broadcast & Query), 1 PPS (20% & 50%)	**Options:**	B, J, UL, I/O sets
Electrical:	117 VAC, 50/60 Hz		
Power:	2 Watts		
Mechanical:	1.75" x 19" Rack Mount, 10" Deep		

ESE & SMPTE PCI CARD

The **PC-471PCI** is a PC card designed to plug into any computer with a vacant PCI slot. The unit continuously reads Time Code (selectable **ESE** TC76, TC89, TC90 and SMPTE Formats L, E, S) and updates the time of the PC. The card may be installed in a 32-bit slot or a 64-bit slot. Windows® (98/NT/2000/XP) compatible software is provided which synchronizes the PC clock. The software also allows selection of Time Code, Update Rate and Time Zone Offset.

Features

- Simple Installation & Hands-Off Operation
- Synchronizes PC To Master Clock System
- Reads SMPTE or **ESE** Time Code
- Windows® Software Included
- Time Zone Offset
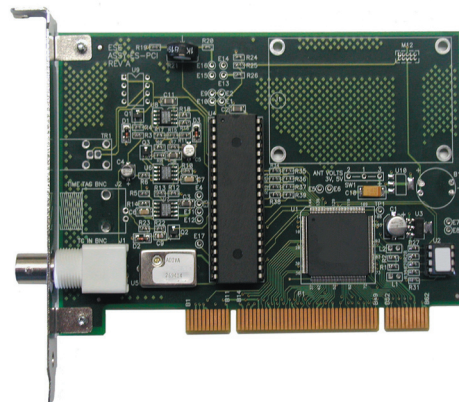
Specifications

Signaling Protocol:	3.3V or 5 V
Time Code Input:	ESE (TC76, TC89, TC90) or SMPTE (Formats L, E, S)
Drift Rate:	+/- 1 Second per month
Card Size:	5.25" L x 3.75" H
OS Requirements:	Windows® 95 or higher
Connector:	BNC

TIME CODE
ISOLATION & DISTRIBUTION AMPLIFIERS

Since the early '80s, **ESE**'s Audio and Video Distribution Amplifiers have been recognized for their quality and durability. Using very similar technology, **ESE** presents a line of Distribution Amplifiers (DAs) capable of isolating and distributing most any type of Time Code. The basic idea for each model is the same... provide the ability to distribute time code and compensate for lengthy cable runs while isolating each unit in the Master Clock System.

Described below are units capable of handling any of the IRIG time codes, **ESE** Time Code or ASCII time code. If you're in need of a DA not mentioned here refer to our *DISTRIBUTION AMPLIFIERS* Brochure available on our website or contact the **ESE** Factory.

ES-210
Quad 1x6 1/5/10 MHz DA

The **ES-210** provides four independent 1x6 Frequency DAs in a single rack-mount enclosure. Each DA has loop-thru inputs and six isolated outputs, all accessible via BNC connectors. Screwdriver-adjustable Gain controls are provided on the front of the case. The Gain control provides an overall signal level adjustment of -1.6 to +3.4 db. Unused outputs need not be terminated.

ES-242
Quad 1x6 IRIG(AM) DA

The **ES-242** is a quad, 6-output IRIG Time Code DA. Each amplifier provides a loop-thru input & six 600 ohm outputs. The inputs/outputs are connected via rear mounted BNC connectors. The unit distributes IRIG A, B, E, NASA36, XR3, 2137 & CS3 time codes it has a transformerless design that takes a single unbalanced input and provides six unbalanced single ended outputs.

ES-243
Quad 1x6 ESE DA (or IRIG-'TTL')

The **ES-243** is designed to accept any **ESE** time code signal or any IRIG time code in its "TTL" form and output up to 24 identical copies. The unit has four separate and isolated channels, each with six available outputs. Inputs and outputs are via rear mounted BNC connectors and each output is capable of driving up to 4000' of cable.

ES-249
1x8 RS-232C/ASCII DA

The **ES-249** is designed to accept RS-232C/ASCII and output up to eight identical copies. The unit has a single input and eight outputs that are accessible on rear mounted 9-pin D-sub connectors. Due to the nature of RS-232C, if long cable runs are required, it may be necessary to utilize other time code that is later translated into RS-232C. The unit is rack mounted.

ES-250
1 x 24 RS-232/ASCII DA

The **ES-250** is an RS-232C Isolation and Distribution Amplifier. Three 1 x 8 amplifier circuits allow the incoming signal to be distributed via the 24 outputs. The unit receives RS-232C and buffers the signal so that each of the 24 outputs can drive a single "user" at a distance of up to 50 feet (per output). All inputs and outputs are via rear mounted terminal block connectors.

ES-251
1 x 24 RS-232/ASCII DA

The **ES-251** is an RS-232C Isolation and Distribution Amplifier. Three 1 x 8 amplifier circuits allow the incoming signal to be distributed via the 24 outputs. The unit receives RS-232C and buffers the signal so that each of the 24 outputs can drive a single "user" at a distance of up to 50 feet (per output). All inputs and outputs are via rear mounted terminal DB-9 connectors.

Specifications

	ES-210	ES-242	ES-243	ES-249	ES-250	ES-251
Electrical:	110-120 VAC, 50/60 Hz	110-120 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	110-120 VAC, 50/60 Hz	110-120 VAC, 50/60 Hz
Power:	5 Watts Maximum	5 Watts Maximum	2 Watts Maximum	2 Watts Maximum	2 Watts Maximum	2 Watts Maximum
Mechanical:	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	1.75" x 19"; 5" Deep	3.25" x 19"; 5" Deep
Time Code-	10 KHz-15mHz +/- .5db,	IRIG (A, B or E) NASA 36,	**ESE** (TC76, TC89 or TC90)	ASCII (RS-232C)	ASCII (RS-232C)	ASCII (RS-232C)
Input/Output:	1 Vpp nominal, 50 ohm	XR3, 2137 & CS3	or IRIG(A, B or E)AM Form	-	-	-
Connectors:	BNC	BNC	BNC	9-Pin D-Sub	Terminal Block	9-Pin D-Sub
Configuration:	Quad 1 x 6 (1 x 24)	Quad 1 x 6 (1 x 24)	Quad 1 x 6 (1 x 24)	Single 1 x 8	1 x 24	1 x 24
Options:	J,UL	J, UL	J, UL	J, UL	J, UL	J, UL

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IRIG-B VIDEO INSERTER SERIES

The **LX-275U** series is a family of IRIG-B Time Code Readers / Video Inserters. The units decode 12-digits of IRIG-B (0-365 Days, Hours, Minutes, Seconds and Milliseconds) via a single BNC connector and superimpose the data upon a video signal(s) looped thru the unit.

Models in the **LX-275U** series are available with one channel up to twelve channels. Units that contain one to four channels have a 1¾" rackmount enclosure and models with five to twelve channels have a 3½" rackmount enclosure.

Features

- "Selectable" Milliseconds Display
- Multiple Mask Selection
- Brightness Control
- Automatic Error Detection and Correction
- Universal Power Supply (120/240 VAC)
- Operates With NTSC or PAL Video
- Vertical and Horizontal Size & Position Controls
- On-Screen Programming
- Superimposed or Keyed Video Characters
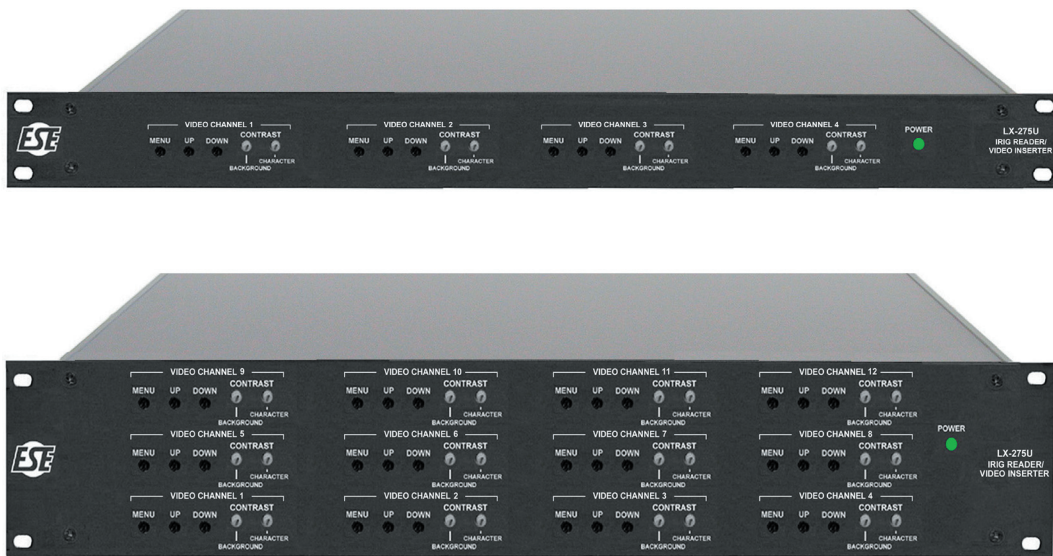
With the ease of on-screen programming, setting the **LX-275U** could never be easier. Settings include Size, Position, Brightness, Millisecond Blanking, and Mask Mode. Mask Mode enables the user to select between several styles of background masks which include solid characters on video, solid characters on a solid mask, translucent characters on video or translucent characters on a translucent mask. Front panel Character Contrast and Mask Contrast potentiometers allow variations of black, white and gray.

Specifying option "Text" allows the user to add unique text insertion for each channel, up to 3 lines and as many as 30 characters per line. The optional "Text" feature provides the flexibility of inserting text information in as many as three different methods in combination with the supplied software. The "Text-USB" option provides a USB port for inserting the text information, the "Text-Net" option provides the ability to enter information either via an Ethernet port or a USB port.

SPECIFICATIONS

Power:	2-25 (/1-/12) Watts Max.	**IRIG-B Time Code Input**:	1-BNC (per unit)
Electrical:	90-264 VAC, 47-63 Hz	**IRIG-B Input Impedance**:	25 KΩ
Video Connectors:	2-BNC (per channel)	**Input Mark Amplitude**:	10 VPP Max., 0.3 VPP Minimum
Display:	9 Digits (12 Digits if milliseconds) Keyed or Superimposed on Video, Adjustable Size	**Mark to Space Ratio**:	3:1 Nominal
		Video In/Out:	1 VPP, 75 ohms
Enclosure:	1.75" x 19" Rack Mount, 10" Deep (LX-275U/1, /2, /3, /4)	**Options**:	DC, GPS, SV, Text-USB,
	3.50" x 19" Rack Mount, 10" Deep (LX-275U/5, /6, /7, /8, /9, /10, /11, /12)		Text-Net, UL

OPTIONS

Options listed below are available only on certain products and descriptions are relative to products described in this brochure. Refer to product "Specifications" or the Price List for option availability. Features neither listed as a Standard Feature nor available as an Option may be available on a "Custom" basis. Please consult the *ESE* Factory with your specific need.

Ant   *GPS Antenna*: High Performance GPS Antenna for harsh RF Environments.

B   *Parallel BCD Output*: Provides a Parallel BCD (CMOS Compatible) output. ES-169B may be substituted when option "B" is not available.

BBU   *Battery Back-Up*: An internal battery with built-in charger is supplied. Standard on most Master Clocks.

Black   *Black Anodized Front Panel*: Available on most rack mount units.

D   *Remote Control:* This option consists of a connector wired to switches on a control plate via a six foot cable. Extra cable available.

DC   *DC Power*: Unit is operated exclusively from an external "DC" supply (+11 to +35 VDC is required).

ESE   *ESE Time Code Output*: An *ESE* Time Code output (TC90) is provided allowing the unit to drive *ESE* Time Code Slaves.

HR   *Hour & 1/2 Hour Relay Closure*: A contact closure occurs each hour and 1/2 hour (1/2 hour can be defeated). Relay contacts are rated at 10 Watts maximum load, 500 mA maximum switching current. (Additional closures can be specified on a "Custom" basis.)

I/O Sets   *Additional Input & Output Sets:* Specify L-IRIG, L-1KHz, L-10MHz and/or L--VDC.

IRIG   *IRIG-B Input*: Available only on LX-5100 Analog Clocks. The Impulse circuitry is replaced with the IRIG-B input.

J   *220 VAC, 50/60 Hz Operation:* Required on many overseas applications.

K   *Precision Frequency Outputs*: 10 MHz and 1 KHz Outputs are provided.

Light   *Lighted Dial*: Available only on LX-5100 Analog Clocks. The dial of the clock can be illuminated. A brightness control is included.

L2   *Two Additional Video Input/Output Sets*: Available on most Video Inserters.

L4   *Four Additional Video Input/Output Sets*: Available on most Video Inserters.

NTP   *NTP Server:* Provides a NTP (Network Time Protocol) Server. Allows for synchronization of compute networks.

NTP-C   *NTP Client:* NTP Client display that provides synchronization to an NTP Server.

NTP-C/PoE   *NTP Client/Power over Ethernet:* NTP Client display that provides synchronization to an NTP Server as well as provides Power over the Ethernet connector.

P   *19" Front Panel (Rack Mount)*: Designed for mounting into a standard equipment rack. Panel is 1/8" clear or black anodized Aluminum and chassis is 5" - 10" deep.

P2   *Dual Rack Mount:* Allows specific units to be mounted side-by-side on a single Rack Mount panel.

PoE   *Power over Ethernet*: Allows Provides the ability to pass electrical power over Ethernet.

Q   *9" Front Panel*: 3.5" high, 1/8" clear anodized Aluminum panel (enclosure is 8" deep. Designed for mounting into a console or a larger panel.

R   *Remote Input*: Rear-mounted connector for Remote Control.

TZ   *Time Zone Offset:* Internal DIP switch allows the hours (and half-hour) to be independently offset to any time zone.

UL   *UL Power Supply:* The unit is supplied with a UL/CSA approved wall mount power supply.

V   *DC Power*: Unit can be operated exclusively from a +5 VDC supply.

W   *3-Wire Power Cord:* Recommended where static charges can occur. Standard on many units, otherwise a 2-wire cord is supplied.

Wall   *Wall Mount Enclosure:* Black powder-coated enclosure with clear anodized aluminum front replaces standard housing.

1 Sec/Mo   *One second per month accuracy.*

6-digit   *6-digit Display:* A 6-digit (Hr, Min & Sec) Front Panel Mounted Display (.55" LED) is provided.

OTHER *ESE* PRODUCTS

Products not found in this brochure may belong to another "Family" of *ESE* Products. For product information on any of the below mentioned "Families", please contact the *ESE* Factory.

- ♦ **DISTRIBUTION AMPLIFIERS**
- ♦ **MASTER CLOCK SYSTEMS**
- ♦ **CLOCKS & TIMERS**
- ♦ **"SMPTE/EBU" TIME CODE PRODUCTS**
- ♦ **VIDEO PRODUCTS**

- ♦ **AUDIO PRODUCTS**
- ♦ **TIME CODE CONVERTERS**
- ♦ **TIME CONTROL SYSTEMS**
- ♦ **"IRIG" PRODUCTS (including Airborne)**
- ♦ **"CUSTOM" PRODUCTS**

F I V E   Y E A R   W A R R A N T Y

All products described in this brochure are warranted free of mechanical and electrical defects, and will be replaced or repaired without charge if found defective under normal operating conditions when used as intended. Assembled products must be returned for adjustment within five years (Airborne products one year) of purchase. Before returning goods, please write or call for shipping instructions.

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