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

Applications
- PSAP's (Public Safety Answering Points)
- "Video" Courtrooms
- Broadcast Facilities
- 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**

[Diagram showing connections between devices and systems, including NTP, IRIG B & E, and various electronics.]

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142 SIERRA ST., EL SEGUNDO, CA 90245  (310)322-2136  FAX (310)322-8127  www.ESE-WEB.com
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 codes). 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)
- IRIG-B, IRIG-E, RS-232C (Broadcast & Query) And ESE Time Code Outputs
- IRIG Codes are Switchable Between Modulated And TTL
- 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.

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

SPECIFICATIONS

| Accuracy: | +/- 10 ns 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) |
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.

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.

SPECIFICATIONS

| Accuracy: +/- 10 ns Of UTC When Locked To GPS | Outputs: 1 PPS - TTL, 20% Duty Cycle |
| Drift: 33 m/s/Day (if no GPS signal) | 1 PPS - TTL, 50% Duty Cycle (regenerated) |
| Displays: Six Digits, Yellow LED, .56” High | IRIG-B - 3 VPP (mark amplitude) (AM or TTL) |
| Power: 110-120 VAC, 50/60 Hz, 15 Watts Maximum | IRIG-E - 3 VPP (mark amplitude) (AM or TTL) |
| Electrical: 117 VAC, 50/60 Hz Via UL/CSA/CE Approved, External Power Transformer | ESE Time Code - Drives 100 Slaves @ 4000’ |
| Mechanical: 1.75” x 19” Rack Mount, 10” Deep | RS-232C - ASCII Date & Time @ 1200-9600 |
| GPS Receiver: Internal 12-Channel | Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query |
| Antenna: Indoor/Outdoor With 16’ Cable | RS-485 - (same as RS-232C: no Query) |
| Battery: 60 Minute Back-Up (all outputs and displays) | Options: ANT, HR, J, K (see page 12) |
THE INCREDIBLE

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.

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

**SPECIFICATIONS**

- **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
**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
- Loss of Power & Loss of Time Sync Relay Outputs
- Digital, Video & Analog Clock Display Available

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”.

**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

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:** IBM type PC with Pentium®, 16 MB RAM, Windows® 98-OSR 2.1 or better, USB port
**ES-911/USB:** Windows 95 or better

---

*Some Options Shown*
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
- Optional ESE, & SMPTE/EBU Time Code Outputs
- 12/24 Hour Format
- Error Detection & Correction
- Display Date or Time
- Optional Time Zone Offset
- Simple Installation & “Hands-Off” Operation
- Desk Top, Console, Wall & Rack Mount Enclosures
- Perfect Synchronization With Master Clock
- Optional Time Code Outputs
- Error Detection & Correction
- Simple Installation & “Hands-Off” Operation
- Desk Top, Console, Wall & Rack Mount Enclosures
- Perfect Synchronization With Master Clock

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<th>Description</th>
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<td>ES-171U</td>
<td>6-digit, 0.4&quot; Red LED in Console mount enclosure</td>
<td>10'</td>
<td>ESE, SMPTE/EBU, J, V, T, U, L, W</td>
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<td>LX-161U</td>
<td>6-digit, .56&quot; Amber LED in &quot;LX&quot; enclosure</td>
<td>20'</td>
<td>ESE, SMPTE/EBU, J, RS, T, U, L</td>
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<tr>
<td>ES-161U</td>
<td>6-digit, .56&quot; Amber LED in Desk mount enclosure</td>
<td>20'</td>
<td>ESE, SMPTE/EBU, J, RS, T, U, L</td>
</tr>
<tr>
<td>LX-164U</td>
<td>6-digit, 1.0&quot; Amber LED in &quot;LX&quot; enclosure</td>
<td>35'</td>
<td>ESE, SMPTE/EBU, J, RS, T, U, L</td>
</tr>
<tr>
<td>ES-166U</td>
<td>6-digit, 1.0&quot; Amber LED in Desk mount enclosure</td>
<td>35'</td>
<td>ESE, SMPTE/EBU, J, RS, T, U, L</td>
</tr>
<tr>
<td>LX-991U</td>
<td>4-digit (Hr, Min), 2.3&quot; Amber LED in &quot;LX&quot; enclosure</td>
<td>70'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<tr>
<td>LX-993U</td>
<td>6-digit, 2.3&quot; (1&quot; Sec) Amber LED in &quot;LX&quot; enclosure</td>
<td>70'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<tr>
<td>ES-993U</td>
<td>6-digit, 2.3&quot; (1&quot; Sec) Amber LED in Wall mount enclosure</td>
<td>70'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<tr>
<td>ES-996U</td>
<td>6-digit, 2.3&quot; Red LED in Wall mount enclosure</td>
<td>70'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<tr>
<td>ES-941U</td>
<td>4-digit (Hr, Min), 4.0&quot; Red LED in Wall mount enclosure</td>
<td>120'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<tr>
<td>ES-943U</td>
<td>6-digit, 4.0&quot; Red LED in Wall mount enclosure</td>
<td>120'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<td>ES-976</td>
<td>6-digit, 7.0&quot; Red LED in Wall mount enclosure</td>
<td>250'</td>
<td>ESE, SMPTE/EBU, J, NT-P-C/Poe, E, Poe, T, U, L, Wall</td>
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<td>0.4&quot; LED:</td>
<td>5 Watts</td>
<td>117 VAC, 50/60 Hz</td>
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<tr>
<td>.56&quot; LED:</td>
<td>5 Watts</td>
<td>117 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>1.0&quot; LED:</td>
<td>5 Watts</td>
<td>117 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>2.3&quot; LED:</td>
<td>8-10 Watts</td>
<td>117 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>4.0&quot; LED:</td>
<td>10 Watts</td>
<td>117 VAC, 50/60 Hz</td>
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*Amber, Blue, Green or Red LED display color can be specified.
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
- 5”, 12” or 16” Dials
- Optional IRIG-B Input
- Self-Setting
- Sweep Or Step Second Hand
- Error Indicator
- Rack Mount Option
- Stand-Alone, Impulse & Reader Modes
- Battery Back-Up
- Simple Installation & “Hands-Off” Operation
- Time Zone Offset
- Lighted-Dial Option

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

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

These units are designed to read the serial data from any Master Clock, Converter or Calendar that has an 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**

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

**“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
- Side-By-Side Display can be Stacked
- 12 Hour Format (with AM/PM Indicator) or Optional 24 Format
- Multiple Mask Selection

**Specifications**

| Electrical: 117 VAC, 50/60 Hz |
| Power: 7 Watts Maximum |

| Mechanical: 1.75” x 19” Rack Mount, 10” Deep |
| Input: Any ESE Time Code (TC76 must be 24 Hr) |
| Options: Black, D, DC, J, L2, L4, P2, R, UL |
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
- Manufacturing Process Control
- Financial Institutions
- Securities Exchanges
- Military Installations
- Broadcast Facilities
- 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

Output: 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

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
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 $1 \times 10^{-8}$ 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

**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:** $1 \times 10^{-8}$
- **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
ES 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
ES 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

<table>
<thead>
<tr>
<th>ES-223</th>
<th>ES-225A</th>
<th>ES-226</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power:</td>
<td>5 Watts Maximum</td>
<td>5 Watts Maximum</td>
</tr>
<tr>
<td>Electrical:</td>
<td>117 VAC, 50/60 Hz</td>
<td>117 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>Mechanical:</td>
<td>1.75” x 19” Rack Mount, 10” deep</td>
<td>1.6” x 6” Table-Top, 5” deep</td>
</tr>
<tr>
<td>Input:</td>
<td>ESE (TC90-™)</td>
<td>ESE (TC76™-24H, TC89™ or TC90-™)</td>
</tr>
<tr>
<td>Output:</td>
<td>IRIG-B, IRIG-E, RS232C/ASCII (Broadcast &amp; Query)</td>
<td>ASCII (format ‘A’, ‘0’, ‘1’ or ‘B’-Timer), RS-232C &amp; RS485</td>
</tr>
<tr>
<td>Connectors:</td>
<td>BNC, 9-pin D-sub</td>
<td>BNC, Two) 9-pin D-sub</td>
</tr>
<tr>
<td>Setup Features:</td>
<td>AM/TTL; Signature Control; Baud Rate</td>
<td>ASCII Format</td>
</tr>
<tr>
<td>Options:</td>
<td>Black, J, UL</td>
<td>-</td>
</tr>
</tbody>
</table>
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
Passive I/O Circuits: IRIG-B, IRIG-E, ASCII (Broadcast & Query), 1 PPS (20% & 50%)
Electrical: 117 VAC, 50/60 Hz
Power: 2 Watts
Mechanical: 1.75” x 19” Rack Mount, 10” Deep

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 5V
- 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.

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**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, NASA 36, XR3, 2137 & CS3 time codes it has a transformerless design that takes a single unbalanced input and provides six unbalanced single ended outputs.

**ES-250**  
**1 x 24 RS-232/ASCII DA**  
The ES-249 is designed to accept RS-232C 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-249**  
**1 x 8 RS-232C/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-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.

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Input/Output</th>
<th>Connectors</th>
<th>Power</th>
<th>Mechanical</th>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-210</td>
<td>1 ypp nominal, 50 ohm</td>
<td>BNC</td>
<td>110-120 VAC, 50/60 Hz</td>
<td>5 Watts Maximum</td>
<td>1.75&quot; x 19&quot;; 5&quot; Deep</td>
</tr>
<tr>
<td>ES-250</td>
<td>1 x 24</td>
<td>Terminal Block</td>
<td>110-120 VAC, 50/60 Hz</td>
<td>2 Watts Maximum</td>
<td>1.75&quot; x 19&quot;; 5&quot; Deep</td>
</tr>
<tr>
<td>ES-249</td>
<td>1 x 8</td>
<td>9-Pin D-Sub</td>
<td>117 VAC, 50/60 Hz</td>
<td>2 Watts Maximum</td>
<td>1.75&quot; x 19&quot;; 5&quot; Deep</td>
</tr>
<tr>
<td>ES-251</td>
<td>1 x 24</td>
<td>9-Pin D-Sub</td>
<td>117 VAC, 50/60 Hz</td>
<td>2 Watts Maximum</td>
<td>1.75&quot; x 19&quot;; 5&quot; Deep</td>
</tr>
</tbody>
</table>

**ES-210**  
- **Options:** J, UL

**ES-242**  
- **Options:** J, UL

**ES-249**  
- **Options:** J, UL

**ES-250**  
- **Options:** J, UL

**ES-251**  
- **Options:** J, UL
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
- Automatic Error Detection and Correction
- Operates With NTSC or PAL Video
- On-Screen Programming
- Multiple Mask Selection
- Brightness Control
- Universal Power Supply (120/240 VAC)
- Vertical and Horizontal Size & Position Controls
- 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.
- **Electrical**: 90-264 VAC, 47-63 Hz
- **Video Connectors**: 2-BNC (per channel)
- **Display**: 9 Digits (12 Digits if milliseconds) Keyed or Superimposed on Video, Adjustable Size
- **Enclosure**: 1.75" x 19" Rack Mount, 10" Deep (LX-275U/1, 2, 3, 4)
  3.50" x 19" Rack Mount, 10" Deep (LX-275U/5, 6, 7, 8, 9, 10, 11, 12)
- **IRIG-B Time Code Input**: 1-BNC (per unit)
- **IRIG-B Input Impedance**: 25 kΩ
- **IRIG-B Input Amplitude**: 10 VPP Max., 0.3 VPP Minimum
- **Mark to Space Ratio**: 3:1 Nominal
- **Video In/Out**: 1 VPP, 75 ohms
- **Options**: DC, GPS, SV, Text-USB, Text-Net, UL

**SPECIFICATIONS**

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

FIVE YEAR WARRANTY
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.