



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)
- Automatic Daylight Savings Time Correction
- Simple Installation & "Hands-Off" Operation
- Meets or Exceeds NENA-04-002 Master Clock Specifications
- IRIG-B, IRIG-E, RS-232 (Broadcast & Query) and **ESE** Time Code Outputs
- UL Approved Power Supply
- "Time-Syncs" Master Clock with CAD Systems, ANI/ALI Consoles & Voice Recorders, etc.
- Time Zone Offset
- Desk Mount, Wall Mount, Console Mount & Rack Mount Enclosures
- +/- 45 Nanosecond Accuracy
- Time Code Converters
- Digital, Video & Analog Slave Clocks
- 12 or 24 Hour Format



Applications

- PSAP's (Public Safety Answering Points)
- "Video" Courtrooms
- Schools & Distant Learning Centers
- Broadcast Facilities
- Tele-Conferencing 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, 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-911/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).

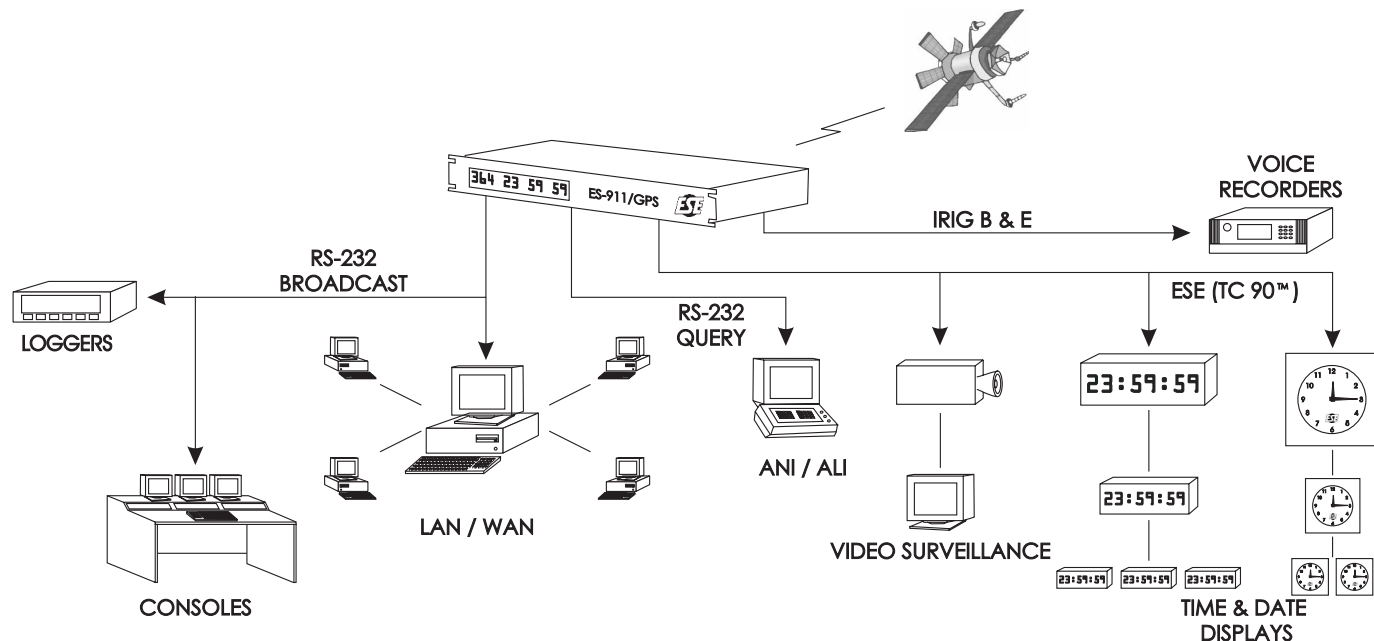
The products described in this brochure belong to the "Time Synchronization" or "9-1-1" Family. If information on other **ESE** Product "Families" or a custom product is required, please call the **ESE** factory. We are here to help you take advantage of the state of the art in timekeeping technology.



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"SIMPLIFIED" BLOCK DIAGRAM



GPS BASED MASTER CLOCK

The **ES-911/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 8-channel GPS receiver. (Date information is also available on most time code outputs.) Simultaneously, the **ES-911/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-911/GPS**. The **ES-911/GPS** can also synchronize other computers and digital/analog clock systems.

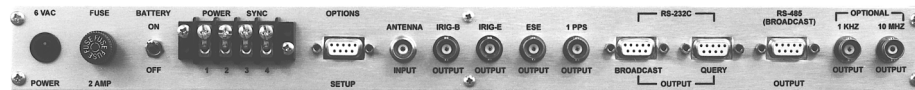
Features:

- 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")
- +/- 45 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 Slave 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 19' Cable



Included with the **ES-911/GPS** is an indoor/outdoor antenna that is connected to the unit via the provided 19' cable. If additional cable is required, "low-loss" cable, an "in-line" amplifier (**GA-12F** or **GA-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-AB1**) may be required. Consult the **ESE** factory for more information.

Software is supplied with the **ES-911/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: +/- 45 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 8-Channel
Antenna: Indoor/Outdoor With 19' 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: HR, J, K (see page 12)



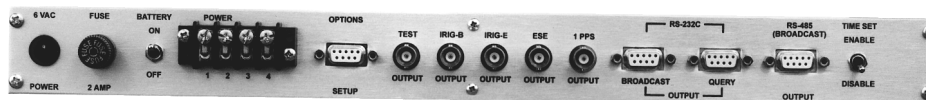
THE INCREDIBLE TIME-SYNC MACHINE™

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 Slave Clocks 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-911/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, One Second Per Month Accuracy
 BBU, Battery Back-Up (60 minute, all outputs)
 HR, HR & 1/2 HR Relay Contact Closure
 J, 220 VAC Operation



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 Buss" 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.

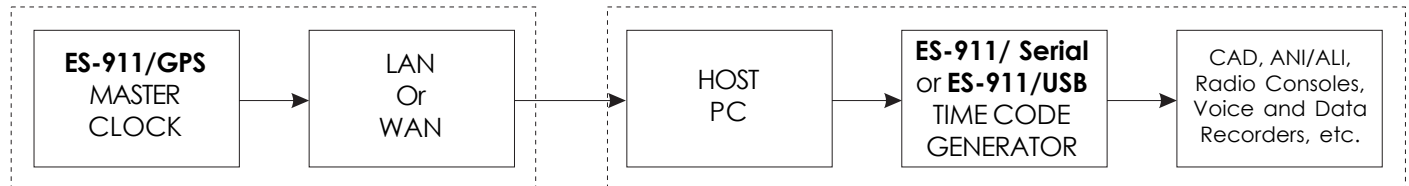
Both units generate several types of time code (IRIG-B, IRIG-E, **ESE**, RS-485, RS-232C: "Broadcast" and RS-232C: "Query") and a 1PPS signals. These units allow synchronization and easily interfaces to equipment such as CAD, ANI/ALI Controllers, Voice Recorders and Radio Consoles. Both products can also synchronize other computers and digital/analog clock systems.

Features:

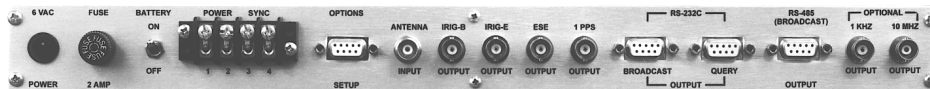
- IRIG-B, IRIG-E, RS-485, RS-232C (Broadcast & Query) And **ESE Time Code™** Outputs
- 1 PPS Output
- IRIG Codes Are Switchable Between Modulated And TTL
- Automatic Daylight Savings Time Correction
- Optional Internal 60 Minute Battery Back-up
- Rugged Rack Mount Enclosure
- Time Zone Offset
- "Time 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 Slave Clocks Available
- Loss of Power & Loss of Time Sync Relay Outputs



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".



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

- | | |
|---|--|
| <p>Power: 5 - 15 Watts Maximum</p> <p>Electrical: 117 VAC, 50/60 Hz via UL/CSA/CE Approved, External Power Transformer</p> <p>Mechanical: 1.75" x 19" Rack Mount, 10" Deep</p> <p>Accuracy: Provided by host PC & LAN or WAN</p> <p>Drift: 200mS/day (if no update via serial or USB port)</p> <p>Options: 6-Digit Display, BBU, HR, J</p> <p>Input: Serial or USB</p> <p>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</p> | <p>Outputs: 1 PPS - TTL, 50% Duty Cycle</p> <p>IRIG-B - 3 VPP (mark amplitude) (AM or TTL)</p> <p>IRIG-E - 3 VPP (mark amplitude) (AM or TTL)</p> <p>ESE Time Code - drives 100 Slaves @ 4000'</p> <p>RS-485 - ASCII Date & Time @ 1200-9600 Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query</p> <p>RS-232C - ASCII Date & Time @ 1200-9600 Baud, 8 Data, No Parity, 1 Stop; Broadcast & Query</p> |
|---|--|



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), EBU or SMPTE time code.

Setup Features allow the unit to display time in either 12 or 24 hour format and if reading **ESE** Time Code to display "Date" information and if reading 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 "U" Series Readers. 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 outputs 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 12 (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 4.0" 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



SPECIFICATIONS

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

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

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:	Walnut Grain / 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:	Walnut Grain / 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:	Walnut Grain / 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



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

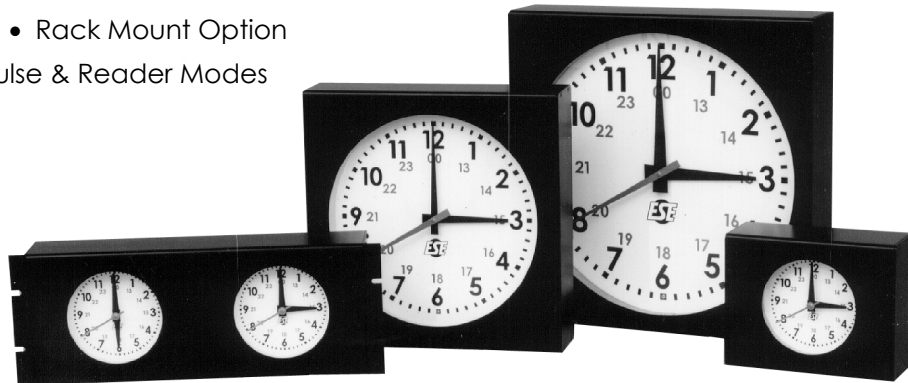
The **LX-5105**, **LX-5112** and **LX-5116** are Self-Setting Analog Clocks with 5", 12" and 16" viewing diameters, respectively. The units are designed to operate as Time Code Readers (Slaves), Stand-Alone Clocks or Impulse Clocks. All three can read, decode and display time information from most any 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-911/GPS, 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: 10k Ω , Balanced or Unbalanced, 100mVpp to 10 Vpp;

ESE: TC76™, TC89™ or TC90™, 120k Ω , Unbalanced;

ASCII: 120k Ω , 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

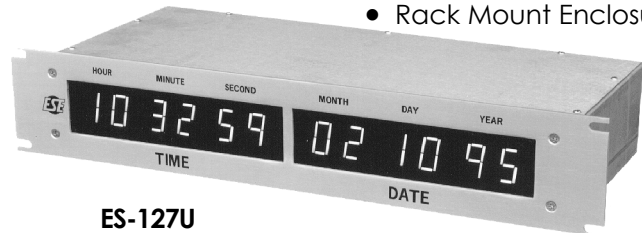


"DIGITAL" TIME & DATE SLAVE DISPLAY

ESE offers two different size displays of the Digital Clock/Calendar Slave. The **ES-126U** is a twelve-digit Time Code Reader 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
- Long-Life Yellow LED Displays
- Optional Time Zone Offset
- Reads **ESE**, ASCII, SMPTE Or EBU Time Code
- Rack Mount Enclosure



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-911/GPS, ES-911/TSM, ES-911/USB, ES-911/Serial.

SPECIFICATIONS

ES-126U

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

ES-127U

- ESE** TC90™, ASCII, SMPTE or EBU
 117 VAC, 50/60 Hz, 10 W
 3.5" x 19" Rack Mount 10" Deep
 12 digits, 1.0" High Yellow LED (35' Viewing Distance)
 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:

- Operates With NTSC or PAL or S-Video
- Automatic Leap Year & DST Compensation
- 12 or 24 Hour Mode
- Reads **ESE** or SMPTE Time Codes
- Brightness Control
- Simple Installation And "Hands-Off" Operation
- Keyed or Translucent Display
- Vertical & Horizontal Size (2%-20% screen) And Position Controls
- Switchable Background

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: J, 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-911/GPS, ES-911/TSM, ES-911/Serial, or ES-911/USB.



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

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).



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

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'.

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 (Public Safety Answering Point).

SPECIFICATIONS

ES-223

- Power:** 5 Watts Maximum
- Electrical:** 117 VAC, 50/60 Hz
- Mechanical:** 1.75" x 19" Rack Mount, 10" deep
- Input:** **ESE** (TC90™)
- Output:** IRIG-B, IRIG-E, RS232C/ASCII (Broadcast & Query)
- Connectors:** BNC, 9-pin D-sub
- Setup Features:** AM/TTL; Signature Control; Baud Rate
- Options:** J: 220 VAC;
UL: UL approved external transformer

ES-225A

- Power:** 5 Watts Maximum
- Electrical:** 117 VAC, 50/60 Hz
- Mechanical:** 1.6" x 6" Table-Top, 5" deep
- Input:** **ESE** (TC76™-24Hr, TC89™ or TC90™)
- Output:** ASCII (format 'A', '0', '1' or 'B'-Timer), RS-232C & RS485
- Connectors:** BNC, Two 9-pin D-sub
- Setup Features:** Baud Rate; ASCII Format
- Options:** J: 220 VAC;
P: 1.75" x 19" Rack Mount;
UL: UL approved external transformer

ES-226

- Power:** 5 Watts Maximum
- Electrical:** 117 VAC, 50/60 Hz
- Mechanical:** 1.6" x 6" Table-Top, 5" deep
- Input:** RS232C/ASCII (format '0' or '1')
- Output:** IRIG-B or IRIG-E (AM or TTL) & **ESE** (TC90™)
- Connectors:** 9-pin D-sub, BNC
- Setup Features:** ASCII Format; Baud Rate; B or E; AM or TTL; Signature Control
- Options:** J: 220 VAC;
P: 1.75" x 19" Rack Mount;
UL: UL approved external transformer



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

Optional I/O Circuits: 1 KHz, 10 MHz

Options: B: Parallel BCD output;

J: 220 VAC;

UL: UL/CSA Approved, External Power

Transformer is Supplied;

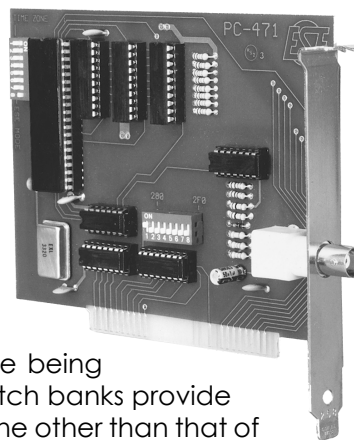
I/O Sets: Additional I/O Switched Circuits

"PC" CARD INTERFACE

The **PC-471** is a Time Code Interface Card for PC/Compatible computers. The card receives either SMPTE or **ESE** Time Code and, using the supplied DOS or Windows® software, automatically synchronizes the PC's internal time-of-day clock.

Features:

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



The 1/2 size card occupies a single 8-bit ISA slot, with time code being input via a rear-mounted BNC connector. Two on board DIP switch banks provide Time Code selection (SMPTE or **ESE**), Time Zone offset (to a time zone other than that of the Master Clock or other source of time code) and I/O port address selection. (The card does not use any IRQ's.)

The **PC-471** allows existing Master Clock Systems to easily synchronize a PC's clock. Install the card and connect it to the Master Clock System, install and run the software provided, and enjoy the benefits of perfect synchronization.

SPECIFICATIONS

Power: Supplied by PC computer

Mechanical: Half Card, 5.5" deep x 4.0" high

Time Code Input: SMPTE/EBU: 10kΩ, Balanced or Unbalanced, 100mVpp to 10 Vpp or,
ESE: TC76™, TC89™ or TC90™, 120kΩ, Unbalanced

Connector: Single BNC



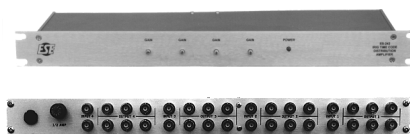
TIME CODE ISOLATION & DISTRIBUTION AMPLIFIERS

For more than a quarter century, **ESE** has been known to the Broadcast Industry as the "Clock & Timer People". However, since those early days, our product line has expanded in many different directions. During the first part of the 80's, we introduced our first Distribution Amplifier (DA) that has since sold well over 5000 units. **ESE's** DA "Family" has grown considerably and now consists of nearly 20 different "Standard" DA's.

ESE Distribution Amplifiers are well recognized in the Audio and Video Industries for their broadcast quality performance, time-proven ruggedness and exceptional value. Described below are three Distribution Amplifiers that are used extensively for time code distribution. Whether your need is to "isolate" feeds or to "amplify" a signal (or both) **ESE** is certain to have a solution to your time code distribution needs. Contact the **ESE** Factory for information on any other DA type product not mentioned below.

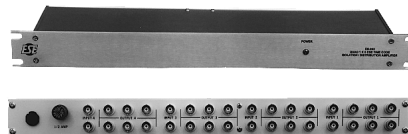
Features:

- Distributes **ESE**, RS232C/ASCII or IRIG Time Codes
- Rack Mount Enclosures
- Power Indicator
- Simple Installation & "Hands-Off" Operation
- Isolated Outputs



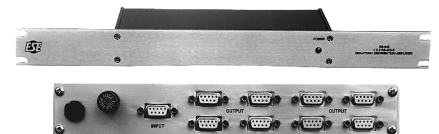
ES-242
Quad 1 x 6 IRIG DA (AM)

The **ES-242** has four separate and isolated channels, each with six available outputs. The unit is designed to accept most IRIG time code signals (A, B or E as well as 2137, NASA 36, XR3, etc.), in their carrier modulated forms, and output up to 24 identical copies. Inputs and outputs are accessible on rear-mounted BNC connectors and each of the four channels has a loop-thru input. The loop-thru input allows the input signal to be "looped" from one channel into the next, so that up to 24 identical copies can be created. Each of the four channels has its own "Gain" Control.



ES-243
Quad 1 x 6 IRIG DA (TTL)

The **ES-243** is designed to accept any IRIG time code (in its "pulse width coded" form) or any **ESE** Time Code signal (TC76™, TC89™ or TC90™) and output up to 24 identical copies. The unit has four separate and isolated channels, each with six available outputs. Inputs and outputs are accessible on rear-mounted BNC connectors. Each of the four channels has a loop-thru input that allows the input signal to be "looped" from one channel into the next, so that up to 24 identical copies can be created. Each **ESE** Time Code output is capable of driving up to 100 users at a distance of up to 4000 feet.



ES-249
1 x 8 RS232C/ASCII DA

The **ES-249** is designed to accept an RS232C/ASCII signal 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 the RS232C signal, if long runs of cable are required, it may be necessary to distribute a different time code that is then "translated" into RS232C/ASCII before entering the "user". See "Time Code Converters" on page 9.

SPECIFICATIONS

ES-242

Power: 5 Watts Maximum
Electrical: 117 VAC, 50/60 Hz
Mechanical: 1.75" x 19" Rack Mount, 5" Deep
Input / Output: IRIG (A, B or E) In AM Form
Connectors: BNC
Configuration: Quad, 1 x 6
Options: J: 220 VAC;
 UL: UL approved external transformer

ES-243

5 Watts Maximum
 117 VAC, 50/60 Hz
 1.75" x 19" Rack Mount, 5" Deep
 IRIG in TTL (pulse width coded) Form
 BNC
 Quad, 1 x 6
 J: 220 VAC;
 UL: UL approved external transformer

ES-249

5 Watts Maximum
 117 VAC, 50/60 Hz
 1.75" x 19" Rack Mount, 5" Deep
 RS232C/ASCII
 9-pin D-sub
 Single, 1 x 8
 J: 220 VAC;
 UL: UL approved external transformer



CUSTOM CAPABILITIES

Since 1971, **ESE** has manufactured over 2300 "Specials" (products defined by the customer's specific requirement... designed and built by **ESE**). Many of these "Specials" have evolved into "Standard" Products, some of which are mentioned in this brochure. If you have a custom requirement, give us a call and put our "time" and experience to work for you.

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.

- | | | | |
|----------------|---|-----------------|--|
| 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. |
| J | 220 VAC Operation: Required on many overseas applications. | 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.) |
| K | Precision Frequency Outputs: 10 MHz and 1 KHz Outputs are provided. | IRIG | IRIG-B Input: Available only on LX-5100 Analog Clocks. The Impulse circuitry is replaced with the IRIG-B input. |
| 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. | Light | Lighted Dial: Available only on LX-5100 Analog Clocks. The dial of the clock can be illuminated. A brightness control is included. |
| P2 | Dual Rack Mount: Allows specific units to be mounted side-by-side on a single Rack Mount panel. | TZ | Time Zone Offset: Allows the hours digits on a slave clock to be independently "Offset" to any time zone. TZ(DIP) provides an internal DIP switch for offsetting time zone and TZ(TW) provides a thumbwheel switch instead. |
| 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. | UL | UL Power Supply: The unit is supplied with a UL/CSA/CE approved wall mount power supply. |
| V | DC Power: Unit can be operated exclusively from a +5 VDC supply. | Wall | Wall Mount Enclosure: Black textured enclosure measures 12" wide x 5" high x 3.5" deep with a clear anodized Aluminum front panel. |
| W | 3-Wire Power Cord: Recommended where static charges can occur. Option W is standard on many units and unless otherwise specified a two-wire power cord is supplied. Refer to Price List. | | |
| 6-Digit | 6-Digit Display: A 6-Digit (Hr, Min, & Sec) Front Panel Mounted Display (.55" LED) is provided. | 1 Sec/Mo | One second per month accuracy. |

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 | ◆ AUDIO PRODUCTS |
| ◆ MASTER CLOCK SYSTEMS | ◆ TIME CODE CONVERTERS |
| ◆ CLOCKS & TIMERS | ◆ TIME CONTROL SYSTEMS |
| ◆ "SMPTE/EBU" TIME CODE PRODUCTS | ◆ "IRIG" PRODUCTS (including Airborne) |
| ◆ VIDEO PRODUCTS | ◆ "CUSTOM" PRODUCTS |

THREE 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 three years (Airborne products one year) of purchase. Before returning goods, please write or call for shipping instructions.

