

# CRYSTAL CONTROLLED MASTER CLOCK / TIME CODE GENERATOR

The **ES-160E** is a Master Clock/Time Code Generator. The unit employs a voltage controlled/temperature compensated crystal oscillator which provides the **ES-160E** with an accuracy of one second per month. Six .56" yellow LEDs display real time while the unit simultaneously generates several types of time (and date) code (SMPTE-LTC/EBU, **ESE-TC89**, **ESE-TC90** and RS232C/ASCII) and a 1 PPS signal. An optional ethernet NTP (Network Time Protocol) port may be specified (**ES-160E/NTP6**) allowing the clock to be an NTP server and providing clock set-up via a LAN.

Since the **ES-160E** is a completely self-contained unit with no link to GPS, USNO or WWV, it is a practical alternative where users have a concern over the "availability" of such time references. The **ES-160E** is designed as a "primary" Master Clock. However, the unit is an excellent choice for use as a "secondary" Master Clock in a system utilizing an Automatic Master Clock Switcher (**ES-150U**) and any other Master Clock with a SMPTE-LTC/EBU or **ESE** Time Code output.

## Features:

- SMPTE-LTC/EBU, ASCII (RS-232C) & **ESE** (TC89 & TC90) Time Code Outputs
- Automatic Daylight Savings Time Correction
- Rugged Rack Mount Enclosure
- Dual Battery Back-Up
- 6-Digit .56" LED Display
- External Time Sync Input
- Simple Operation & Installation
- Several Options Available as well as Custom Modifications
- Optional NTP Output
- One Second per Month "VCTCXO" Crystal Accuracy
- 1 PPS Output
- 12 or 24 Hour Display



Real Time (Hour, Minute & Second) and Gregorian Date (Month, Day & Year) are set via the front panel mounted "Set" switch. A rear mounted "Enable" switch is provided to protect the unit from accidental setting. Once set, the unit can be synchronized "manually" to any source of reliable time via the "Set" switch or "automatically" via the External Sync Input.

Software is also supplied with the **ES-160E** allowing the user to select SMPTE mode (DF, NDF, EBU & Real Time), modify dates for Daylight Saving Time and set the display for 12 or 24 hour format.

## Specifications

**Electrical:** 117 VAC, 50/60 Hz  
**Power:** 15 Watts Maximum  
**Mechanical:** 1.75" x 19" Rack Mount, 10" Deep  
**Displays:** Six Digits, Yellow LED, .56" High  
**Accuracy:** +/-33mS/day  
**Video Input:** RS-170A Composite Video/Blackburst, 1 Vpp, 75Ω  
**Time Sync Input:** TTL, 1 PPS or Slower

**Outputs:** 1 PPS: TTL, 50% Duty Cycle  
**ESE** Time Code: drives 100 Slaves @ 4000'  
SMPTE: 600Ω Balanced or Unbalanced  
RS-232C: ASCII Date & Time @ 9600 Baud, 8 Data, No Parity, 1 Stop  
**Battery:** 10-Hour Back-Up of CPU (displays are blank)  
**Options:** DC, HR, J, NTP6, UL