

# ECONOMY GPS MASTER CLOCKS

The **ES-101**, **ES-102U** and **ES-103U** are low-cost yet very accurate GPS Master Clocks/Time Code Generators. All three receive time and date information from Global Positioning System satellites and supply data to the user in several different forms. A twelve-channel receiver is employed that is capable of tracking up to twelve (12) satellites simultaneously, although reception of only one is required for time data to be output.

All three units have ASCII (RS-232C), **ESE-TC89** and **ESE-TC90** Time Code outputs, two (2) One Pulse Per Second outputs and a GPS "Lock" output. Additionally, the **ES-102U** has a 6-digit display (hours, minutes & seconds) of time information and a SMPTE/EBU time code output. Meanwhile, the **ES-103U** has a 9-digit display (day of year, hours, minutes & seconds) and an IRIG-B time code output.

Several Options are available that allow the unit to meet most any demand required of a Master Clock or a Time Code Generator.

## Features:

- SMPTE/EBU, IRIG-B, USB, ASCII (RS-232C) & **ESE** Time Code Outputs
- Automatic Or Manual Daylight Saving Time Correction
- Rugged Desk Top & Rack Mount Enclosures
- Time Zone Offset
- Dual 1 PPS Outputs
- GPS "Lock" indicator
- Leap Second Correction
- Indoor / Outdoor Antenna With 16' Cable
- 6-Digit Or 9-Digit .56" LED Display
- Loss Of GPS Signal Output
- Optional DC Operation for Field and Ground Mobile Applications



Included is an indoor/outdoor antenna which 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 or website for more information.

Software is also supplied permitting the user to continuously update a computer's Windows® clock to the time available on the Serial or USB port (ES-102U/ES-103U only).

## Specifications

### ES-101

**Electrical:** 117 VAC, 50/60 Hz  
**Power:** 5 Watts Typical  
**Enclosure:** Desk Top  
**Mechanical:** 1.6" H x 7" W x 5" D  
**Displays:** -  
**Accuracy:** 1 PPS @ <500ns  
**Drift:** 33mS/day (if no GPS signal)  
**Video Input:** -  
**Outputs:** **ESE-TC89:** drives 100 Slaves @ 4000'  
**ESE-TC90:** drives 100 Slaves @ 4000'  
1 PPS: TTL, 20% Duty Cycle  
1 PPS: TTL, 50% Duty Cycle  
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-  
RS-232C: ASCII Date & Time  
@9600 Baud  
8 Data, No Parity, 1 Stop  
**GPS Receiver:** Internal 12-Channel  
**Antenna:** Indoor/Outdoor with 16' Cable  
**Options:** Ant, BBU, DC, EBU, HR, IRIG-B, IRIG-E, J, K, P, P2, SMPTE, UL, 6-Digit, 9-Digit, 10ns

### ES-102U

117 VAC, 50/60 Hz  
15 Watts Typical  
Rack Mount  
1.75" x 19"; 10" Deep  
Six Digits, Yellow LED, .56" High  
1 PPS @ <500ns  
33mS/day (if no GPS signal)  
RS-170A Composite Video/Blackburst,  
1 Vpp, 75Ω  
**ESE-TC89:** drives 100 Slaves @ 4000'  
**ESE-TC90:** drives 100 Slaves @ 4000'  
1 PPS: TTL, 20% Duty Cycle  
1 PPS: TTL, 50% Duty Cycle  
SMPTE: 600Ω Balanced or Unbalanced  
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RS-232C: Date & Time Output  
USB: Universal Serial Bus, Date &  
Time Output  
Internal 12-Channel  
Indoor/Outdoor with 16' Cable  
Ant, BBU, DC, EBU, HR, J, K, UL, 10ns

### ES-103U

117 VAC, 50/60 Hz  
15 Watts Typical  
Rack Mount  
1.75" x 19"; 10" Deep  
Nine Digits, Yellow LED, .56" High  
1 PPS @ <500ns  
33mS/day (if no GPS signal)  
-  
-  
**ESE-TC89:** drives 100 Slaves @ 4000'  
**ESE-TC90:** drives 100 Slaves @ 4000'  
1 PPS: TTL, 20% Duty Cycle  
1 PPS: TTL, 50% Duty Cycle  
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IRIG-B: 3 Vpp(mark amplitude)600Ω  
RS-232C: Date & Time Output  
USB: Universal Serial Bus, Date &  
Time Output  
Internal 12-Channel  
Indoor/Outdoor with 16' Cable  
Ant, BBU, DC, HR, J, K, UL, 10ns

