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
- GPS "Lock" indicator
- Automatic Or Manual Daylight Saving Time Correction
- Leap Second Correction
- Rugged Desk Top & Rack Mount Enclosures
- Indoor / Outdoor Antenna With 16' Cable
- Time Zone Offset
- 6-Digit Or 9-Digit .56" LED Display
- Loss Of GPS Signal Output
- Dual 1 PPS Outputs
- 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	**ES-102U**	**ES-103U**
Electrical:	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz	117 VAC, 50/60 Hz
Power:	5 Watts Typical	15 Watts Typical	15 Watts Typical
Enclosure:	Desk Top	Rack Mount	Rack Mount
Mechanical:	1.6" H x 7" W x 5" D	1.75" x 19"; 10" Deep	1.75" x 19"; 10" Deep
Displays:	-	Six Digits, Yellow LED, .56" High	Nine Digits, Yellow LED, .56" High
Accuracy:	1 PPS @ <500ηS	1 PPS @ <500ηS	1 PPS @ <500ηS
Drift:	33mS/day (if no GPS signal)	33mS/day (if no GPS signal)	33mS/day (if no GPS signal)
Video Input:	-	RS-170A Composite Video/Blackburst, 1 Vpp, 75Ω	-
	-	-	-
Outputs:	***ESE***-TC89: drives 100 Slaves @ 4000'	***ESE***-TC89: drives 100 Slaves @ 4000'	***ESE***-TC89: drives 100 Slaves @ 4000'
	ESE-TC90: drives 100 Slaves @ 4000'	***ESE***-TC90: drives 100 Slaves @ 4000'	***ESE***-TC90: drives 100 Slaves @ 4000'
	1 PPS: TTL, 20% Duty Cycle	1 PPS: TTL, 20% Duty Cycle	1 PPS: TTL, 20% Duty Cycle
	1 PPS: TTL, 50% Duty Cycle	1 PPS: TTL, 50% Duty Cycle	1 PPS: TTL, 50% Duty Cycle
	-	SMPTE: 600Ω Balanced or Unbalanced	-
	-	-	IRIG-B: 3 Vpp(mark amplitude)600Ω
	RS-232C: ASCII Date & Time @9600 Baud 8 Data, No Parity, 1 Stop	RS-232C: Date & Time Output	RS-232C: Date & Time Output
		USB: Universal Serial Bus, Date & Time Output	USB: Universal Serial Bus, Date & Time Output
GPS Receiver:	Internal 12-Channel	Internal 12-Channel	Internal 12-Channel
Antenna:	Indoor/Outdoor with 16' Cable	Indoor/Outdoor with 16' Cable	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, 10ηS	Ant, BBU, DC, EBU, HR, J, K, UL, 10ηS	Ant, BBU, DC, HR, J, K, UL, 10ηS

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