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ERC-4 Basic Laser Rangefinder
General Instructions
Firmware V2.1G

Operational Features:

Pulse Repetition Frequency: 250 Hz (effective)
Vsupply = 6.0Vdc (nominal), 5.0 Vdc (minimum), 8.0 Vdc (maximum)
Data Comm: 4 Readings/Sec., Baud Rate: 9600, N,8,1 no handshakes, ASCII output
Minimum Range: 50 yards (appx.)
Maximum Range: 1000 yards (appx.)

LRF Connections and Signal Descriptions:

Interface Connector P1, RS-232/Power - DB-9 Female

Pin #	Signal
1*	**SLP, SLEEP Enable (TTL, Internal Pull-up, HI Active)**
2	RxD, data from LRF (RS-232C levels)
3	TxD, data to LRF (RS-232C levels) - *unused*
4*	**REN, RANGE Enable (TTL, Internal Pull-up, HI Active)**
5	GROUND
6*	**RSRV, RESERVED**
7	RTS, handshake to LRF (RS-232C levels) - *unused*
8	CTS, handshake from LRF (RS-232C levels) - *unused*
9*	**POWER Input, 6 Vdc(nom.) @ < 300mA**

***** These connections are individually completed through P1 (DB-9) only when the appropriate jumper is closed as indicated below. ***(CAUTION: enabling these jumpers and connecting directly to a standard PC serial port can result in damage to the ERC-4 and computer)***

JP3 Enable SLP signal connection on P1, pin #1
JP4 Enable RSRV signal connection on P1, pin #6
JP5 Enable REN signal connection on P1, pin #4
JP6 Enable POWER connection on P1, pin #9

P1 Signal Descriptions:

Sleep Enable, SLP (Pin #1) – This input must go logic HI (or open) to enter sleep mode. Returning this input to logic LO will wake up the ranging system and power on all components. During sleep mode, the ERC-4A based ranging system consumes less than 50uA if SLP, REN and ASC inputs are left open during shutdown. Sleep mode requires at least 2.5 seconds to enable sleep and at least 1.5 seconds to wake up.

Reserved, RSRV (Pin #6) – Reserved for future use.

Range Enable, REN (Pin #4) – This input must go logic HI (TTL) to initiate ranging. While REN is inactive (LO), no ranging or output data will occur.

Receive Data, RxD (Pin #2) – This output carries RS-232 data from the LRF to the host system.

Power Input (Pin #9) – This an optional power supply connection (see also P6). This pin should carry a nominal supply voltage of 6 Volts DC @ < 300 mA (operating with transmitter and receiver connected to ERC-4A).

P2, RX INTERFACE, 8 conductor 1mm FFC

P3, TX INTERFACE, 8 conductor 1mm FFC

P4, AUXILIARY I/O INTERFACE, 8 conductor 1mm FFC

Pin #	Signal
1	GROUND
2	REN, Range Enable (TTL, Internal Pull-up, HI Active)
3	Reserved (do not use)
4	Reserved (do not use)
5	Reserved (do not use)
6	Reserved (do not use)
7	+5V switched supply
8	+5V unswitched supply

P5, OPTION/KEY CONTROL INPUTS, 5 pin header, 0.1”ctrs.

Pin #	Signal
1	GROUND
2	SLP, SLEEP Enable (TTL, Internal Pull-up, HI Active)
3	RSRV, Reserved (do not use)
4	Reserved (do not use)
5	Reserved (do not use)

P6, EXTERNAL POWER/BATTERY INPUT, 2 pins indicated + & -

RS-232 Communication

Communication parameters: 9600,n,8,1 no handshakes
Data is output continuously at four readings per second.

Example RS-232 Output:

<cr><lf>V2G RNG: 0300 Yds., VR: 33

Where:

Range Data: 300 yards Valid Returns: 33 shots (of 64)
V2G = version 2G
<cr> & <lf> = non-printable characters for carriage return and line feed

Operational Adjustments:

Start Signal Threshold Sensitivity (R5) –

The R5 trim potentiometer (see illustration) effects the voltage level at which the Start signal's rising-edge will initiate range counting. Start is an analog signal generated by the laser transmitter and is temporally coincident with the laser emission. R5 may require adjustment if the laser power is set very low on the ETX-10 laser driver.

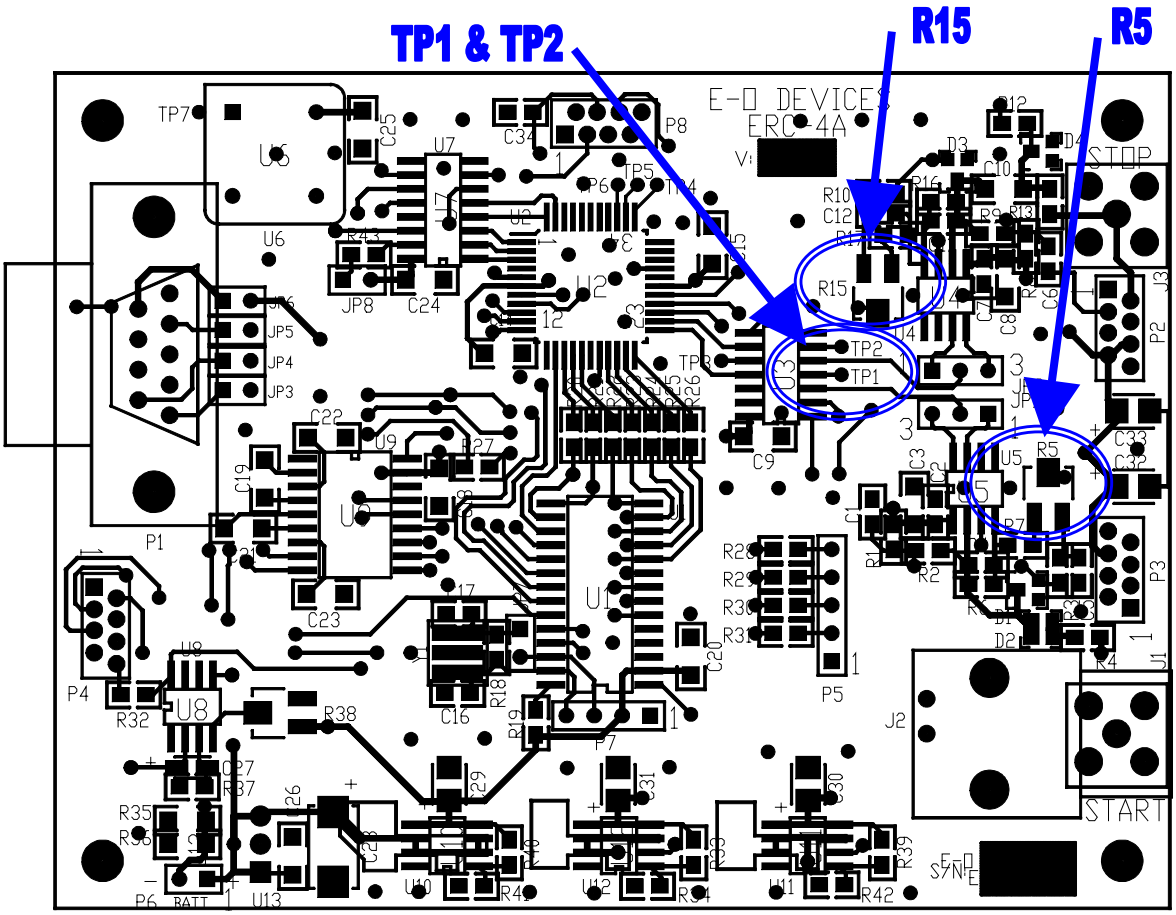
Stop Signal Threshold Sensitivity (R15) –

The R15 trim potentiometer (see illustration) effects the voltage level at which the Stop signal's rising-edge will terminate range counting. Stop is an analog signal that comes from the optical receiver's postamplifier. Adjustment of R15 will effect the detection sensitivity of the rangefinder system.

Test Points 1 & 2 –

TP1 or TP2 is monitored with an oscilloscope while setting the Start or Stop threshold (respectively). The pulsed signals at TP1 and TP2 should be normally logic LO and pulsing HI only briefly (5 – 50ns). TP1 should have a pulse rate identical to the laser PRF, approximately 250 Hz. TP2 will have a pulse rate equal to or greater than the laser pulse rate if a target is detected. If the Stop threshold (R15) is set unusually high, only strong (or close) targets can be detected by the rangefinder. Under these circumstances, the pulse rate at TP2 will be approximately the same as the laser PRF (250 Hz). Normal operation will have the Stop threshold set low enough to detect distant targets plus some tolerable level of false alarms (response to random fluctuations of the Stop signal).

ERC-4A Adjustment Locations



ERC-4A Ranging Controller (dims: 4.00 x 3.00 inches)