Exhibit J: Users Manual

Tensleep Technologies
SST121 StepSaverTransmitter

*Installation, Setup, and Operating Instructions

Models SST121 and SSR213

User's Manual

Contents

Figures

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Tested to comply with FCC Standards. This unit has been evaluated and found compliant with the requirements as set forth in CFR 47 sections 15. 203, 15.205, 15.209 and 15.249.

Any changes or modifications not expressly approved by Tensleep will void your authority to operate this device.

tensleep technologies

Introduction

The StepSaver system consists of a simple transmitter/receiver pair that allows the control of an appliance from a remote location. The units operate in the 915 mHz frequency band with a line-of-site range up to 500 meters.

Operation is simple- each time the red SEND button, located on the side of the unit, is pushed on the handheld transmitter, the red LED will light, indicating that the unit is sending a coded message to the embedded receiver. The receiver will initiate an output to the feeder, resulting in one distribution of feed.

Each StepSaver pair can be strapped to select one of 16 possible channel/code combinations to reduce interference with neighboring units. In addition, the codes can be factory-selected from a total of 6400 possible values.

Installation

The SST handheld transmitter requires the installation of a pair of AA batteries to operate. To install the batteries, remove the 4 screws at the corners of the unit using a #1 Phillips screwdriver. When these are removed, the top should come off easily. The batteries should be installed in the battery carrier as shown in the diagram below and in the battery carrier itself. *Make sure the polarity of each battery is correct.*

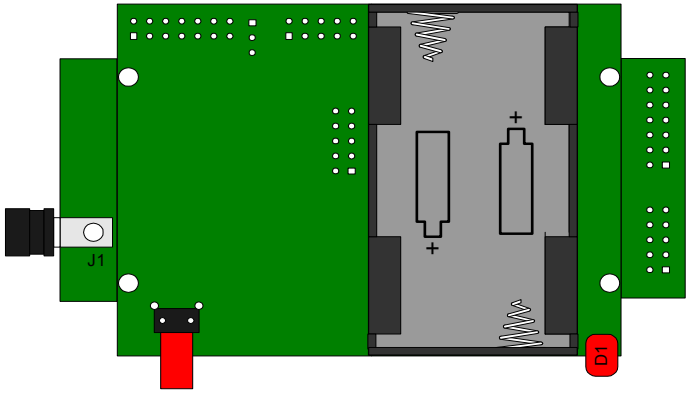


Figure 1: Battery Placement

Test the unit by depressing the pushbutton- the red LED should light after a small pause; if it did not, check the polarity of each battery and make sure each is fully seated in the carrier.

If the LED lights, replace the top cover and the four screws. **Do not over-tighten the screws**; doing so will eventually strip the threads in the plastic base.

The receiver module requires a source of power and an antenna for the receiver to function. The power source can be AC or DC between +4.5 and +26 volts at a maximum of 200 ma. All power and the input/output signals are brought to the module via connector P3.

The unit comes from the factory with the default address implemented. If Channel and Code assignments other than the default value are desired, now is the time to change them. Refer to the section on **StepSaver Channel and Code Assignments** section below. Keep in mind that the transmitter and the receiver must have the same assignments.

StepSaver Channel and Code Assignment

The address assignment to each transmitter or receiver consists of (1) choosing a channel and (2) choosing a code. With the StepSaver,

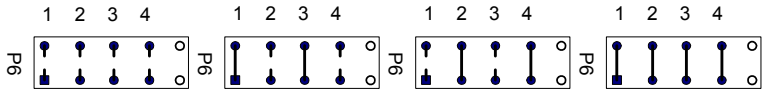
we can select any of four channels; and any of four codes for a total of 16 different assignments. These multiple assignments reduce the possibility of unwanted interference from other units.

The addresses generated by the transmitter and decoded by the receiver are chosen by a set of four jumpers or four switch settings of P6, depending upon which capability is implemented. P6 is located roughly in the center of the board. Positions 1 & 2 select the channel, and positions 3 & 4 select the code.

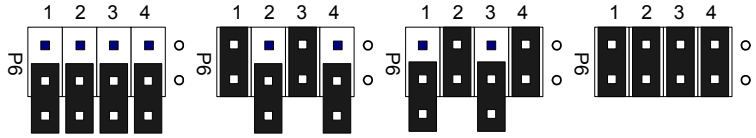
Your board has one of three methods of controlling the address assignments:

1. 4 hardwired jumpers, or
2. an 8-pin header with 4 shunts, or
3. a 4-position slide switch.

If your board has the hardwired jumpers, it comes from the factory assigned to Channel 3 and Code 3. To change this assignment requires you to cut one or more of these jumpers. Keep in mind that once a jumper is cut, it can't be easily replaced.

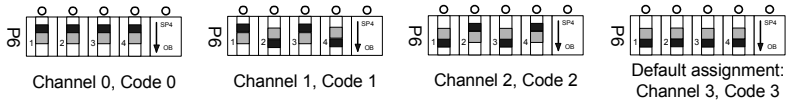


If your board has the 8-pin header, the factory default is also Channel 3 and Code 3, with all four shunts installed. To change the assignment, move one or more shunts as shown below



If your board has the slide switches in P6, The factory default is Channel 3, Code 3, with all four slides to the bottom position as shown below.

To change the assignment, move one or more switch slide as shown below.



The Channel and Code assignments are separate; for example Channel 1 and Code 3 is legitimate as are all other combinations, so, with four different channel selections and four code selections, there are 16 possible combinations to chose from.

Vagaries in Operation

Successfully sending signals at UHF frequencies is dependent upon a clear line-of-sight between the transmitter and receiver. The fewer obstructions there are between the two units, the farther away from each other they can be. Also, the farther the units are off the ground, the better the reception.

Because of the short wavelength, it is possible that moving the transmitter or receiver 1-2 feet may improve reception. Remember to hold the transmitter antenna vertical (pointing up or down).

Input/Output Connections

Three connectors are provided for input and output power/signals; however not all are provided on every version of the receiver module.

1. J1; the receiver's antenna connection. This is a standard "F" connector, identical to those typically used on commercial television sets to connect to the antenna. The unit uses a Cambridge Products, CPF-61SE or equivalent.
2. P3; a power and signal I/O connector.
3. P8; 10-pin header providing connection the 8 parallel I/O circuits.

Power:

The units require DC power with a voltage range of +4.5 to +26 volts. Depending on the implementation, power can be brought to the unit via P3 or J4.

	Board Connector	Mating Connector
P3	AMP 640457-5 or 640456-5	AMP 643813-5 or equivalent
J4	CUI, Inc. MJ3502.	CUI, Inc. MP-3501 or equivalent

Signal	Description	
	P3	
Ground	P3-3	Power supply ground reference; negative lead of power supply
Power	P3-4	Positive lead of power supply. Allowable voltage range is +4.5-26vDC or 4.5-26vAC. Maximum current draw is 30ma; unless the relay option is implemented which increases the draw by 360 milliwatts when relay is energized. If powering the module from a wall-wart and connecting via J4, we suggest the CUI, Inc. unit, part number DPD120030-P1P or equivalent.

Control:

The external control and the output signals connect via P3 and P8. Refer to Figure 3 for the locatoin of these connectors

	Board Connector	Mating Connector
P3	AMP 640457-5 or 640456-5	AMP 643813-5 or equivalent
P8	2 x 5, 0.010 header, Samtec TSW-105-07-F-D	

	Pin	Signal	Description				
P3	5	Input	Input signal to transmitter, active low.				
			Signal	**DC Voltage**		**DCCurrent**	
				Max	**Min**	**Max**	**Min**
			High	+26	+2		
			Low	+1	0		
	3	Ground	Input signal reference ground from Input signal source.				
	1	Out1	Open Collector	Output signal to appliance. Active low.			
				Signal	**DC Voltage**		**DC Current**
					Max	**Min**	**Max**	**Min**
				Low	+1	0	100 ma	
				High	+26			
			Relay	Output signal to appliance is a contact closure between Out1 and Out2. Maximum current is 10 Amps at 250v AC or 28v DC			
	-2	Out2	Relay	Output signal to appliance.			

P8	Pin	TX	Description	RX	Description
	2	Gnd	Reference ground	Gnd	Reference ground
	3	IN8		OUT7	
	4	IN1		OUT8	
	5	IN6		OUT5	
	6	IN7		OUT6	
	7	IN3		OUT3	
	8	IN5		OUT4	
	9	IN2		OUT1	
	10	IN4		OUT2	

Antenna

The receiver antenna is connected via J1. Any external antenna may be used and connected via 50 ohm coax. Tensleep can supply coax antennas with cable lengths of 1.5', 3', 6' and 12'. If one of the Tensleep antennas (or any whip-style antenna) are used, best performance is obtained when the antenna is vertical.

The transmitter has a fixed antenna attached and cannot be legally changed; therefore J1 is not implemented.

Receiver Module Dimensions

The board dimensions and the location of the 4 mounting holes are shown in the diagram of Figure 2. The unit is low power and does not require cooling.

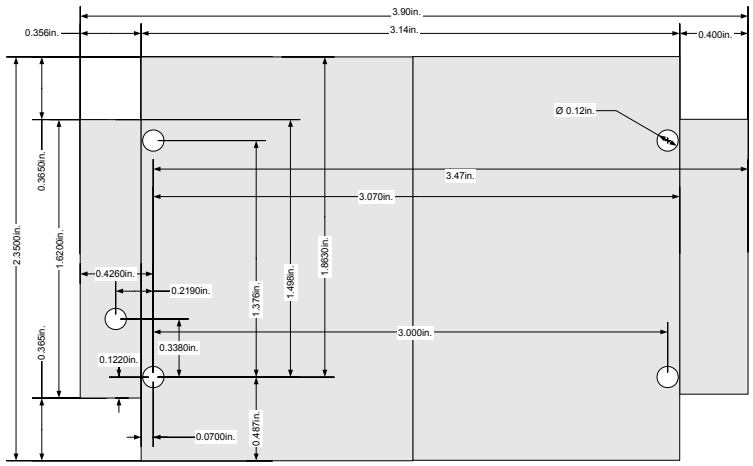


Figure 2: Board Dimensions

Figure 3 shows the placement of I/O connectors, switches and the LED for the receiver module. J4 or P5 may not be implemented, depending on the model.

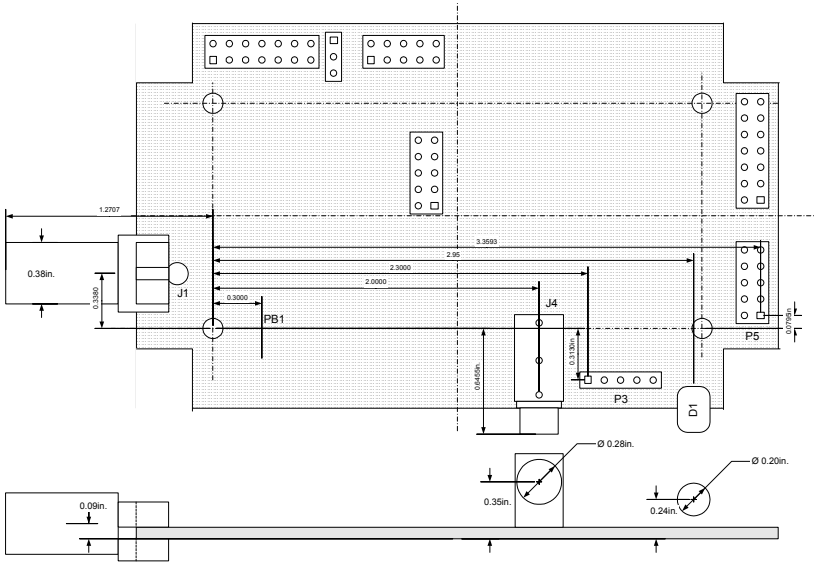


Figure 3: Receiver Component Placement

Specifications

Parameter	Transmitter	Receiver
Carrier Frequency:	915.xx MHz, UHF, North American license-free band	
Number of Channels:	1 channel	
RF Power Output	Xx mwatts	
Operating Range:	500 meters minimum, open air	
Output Drive	RF, FSK at 1200 Bps	Relay contact: 10A, 250v AC; 30A, 250v AC optional. Open collector: 100 ma, 24 vDC max (see note 1).
Signal Input	Switch closure, logic level, serial data stream	RF, FSK at 1200 Bps Sensitivity- -9x dBm
Security	Factory programmed for 16 of 1 million ID codes CRC error detection protocol	
Supply Voltage	+4.5-+24v DC/AC	
Current Consumption:	Standby 0 mA (switch & logic input) Standby 2 mA (serial data input) Transmiting 8 mA	Standby/Receiving 8 mA
Temperature Range	-10°F to +120°F	
Size	4.2" x 1.6" x 0.8" (107 x 41 x 20 mm)	4.6" x 3.1" x 1.8" (117 x 79 x 46mm)
Weight:		
Antenna	¼ wave whip	External
Accessories:		Extended-distance antennas
Approvals	USA-FCC Part 15.249	

Contact

For additional information, copies of the latest version of this document and additional technical help, visit our website www.tensleep.com or contact:

Customer Service
Tensleep Technologies Inc.
6620A Manor Road
Austin, Texas 78723
Tel: 512-326-2616
Fax: 512-927-6148