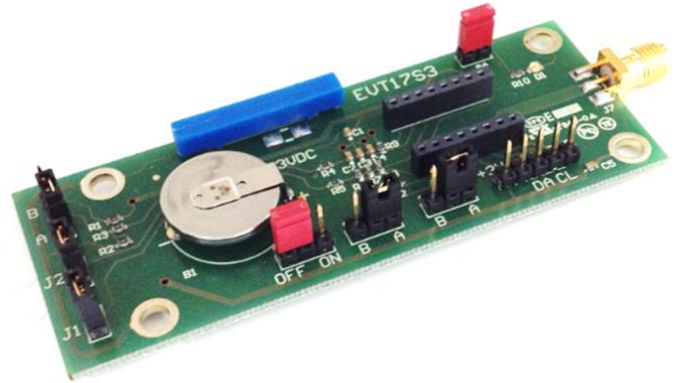


EVT17S3 Evaluation Board

SPT17x3x "microSP" Transmitter



- Evaluation of the "microSP" short pulse Technology.
- Test and measurements of the RF performances of a "microSP" Tx module.
- Understanding of the basic sensors and alarms features of a SPT17S3-D2 module.
- Evaluation of the propagation of electromagnetic waves and related anomalies and influence by obstacles.
- Test and measurements on antennas.
- Access to the programming interface.

The EVT17S3 evaluation board is designed to perform experiments and tests on the "microSP" Short Pulse RF Technology. The board can be used for generic tests on transmitter modules of the SPT17x3x serie, but its main function, for which it was designed, is performed in combination with the SPT17S3-D2 module and, on the receiver side, with the SPR27S3-D2 module on the EVR27A board. With the various measurement functions provided on the EVT17S3 it is possible to perform various types of tests and measurements that will lead to a deep understanding of the advantages offered by the "microSP" technology.



Fig.1 - Eval-board EVT17S3 with the SPT17S3-D2 and the STE n.195020 monopole quarter-wave antenna.

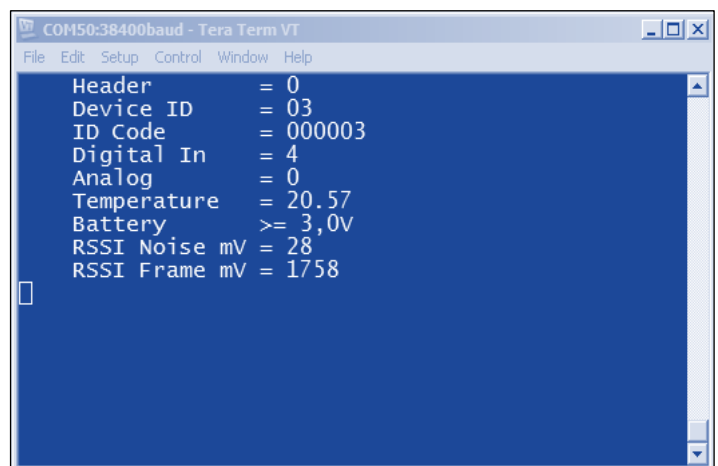


Fig.2-The SPT17S3 message as decoded by an SPR27S3 receiver and by HyperTerminal displayed in "clear" format.

The EVT17S3 Eval Board in conjunction with the SPT17S3-D2 module allows to start testing the "microSP" Technology both for the part more properly related to pulse transmission and PPM modulation and for the approach to the measurement technique of sensors and alarms .

The SPT17S3 module programmed with the "D2" software has three ON / OFF inputs, an analog input of 0-1.5 V (10kΩ input impedance), the measurement of the temperature and of the battery voltage. Furthermore, two inputs are provided to the microcontroller in order to select four different operating modes.

The EVT17S3 provides on the board two On/Off inputs (Jumper J1 and J2) and a Reed contact on the third input. The analogue input is on J3 where a Jumper is also provided for carrying out a rapid test obtained from the 3 V voltage of the battery with a one to three divider (resistors R1 and R2). The Board is powered by a 125 mA/h CR1632 Lithium Battery.

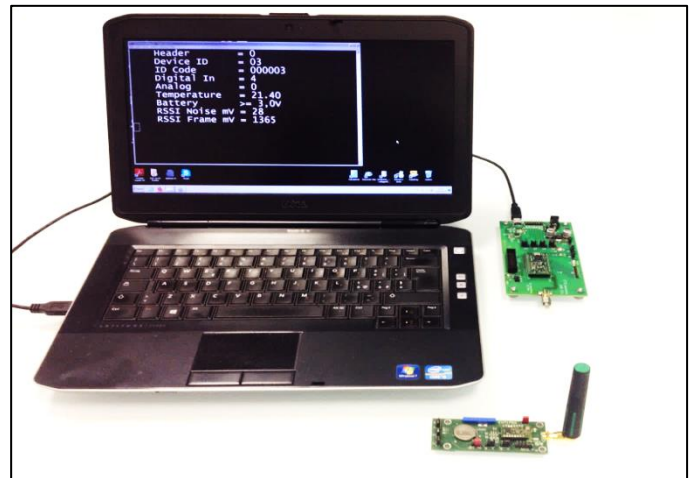


Fig. 3 - The EVT17S3 operative with the EVR27A Eval Board

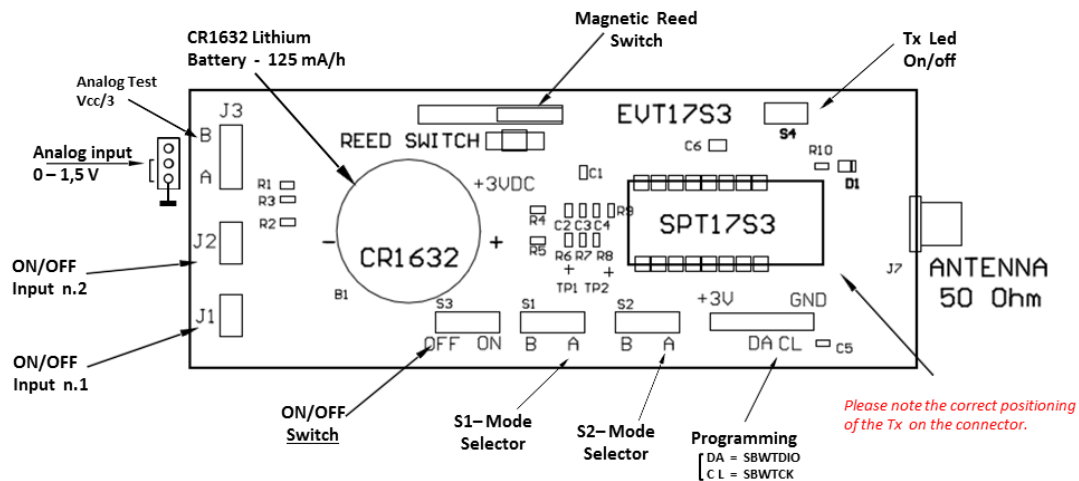


Fig. 4 - EVT17S3 with the SPT17S3-D2 Tx Module

The EVT17S3 has two jumpers on the board (S1 and S2) to select up to four operating modes (Table 1). Therefore, different monitoring and warning criteria can be evaluated.

1) **"Heartbeat"** is the repetition time of the transmission during the quiescent operation. The main purpose is to keep the network (the Receive Access Points) informed that the wireless Sensor is alive and is regularly received. Data, alarms and measurements are also transmitted together the "Heartbeat" message.

2) **"Sampling time"** is the time between successive sampling on the status of the inputs and the measurements.

3) **"Measurement refresh"** : If a measurement changes between two successive "Heartbeat" transmissions, the new status is immediately transmitted as soon as a new sampling is carried out.

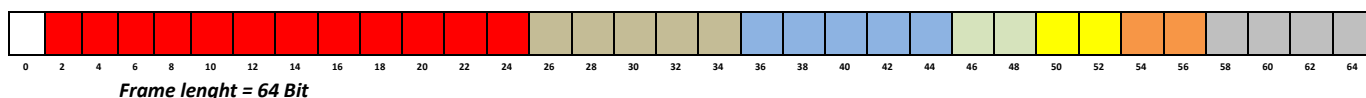
Table 1 - The four Op-mode of the SPT17S3-D2

"S" Selector	Sensors Sampling Time and TX Rep. Time			Expected Life CR1632 Batt.
	Heartbeat time	Sensor sampling time	Op. current μA	Years
S1 - S2				
A - A	3"	0,5"	4	3
A - B	15"	1"	2	6
B - A	30"	3"	1	12
B - B	3'	10"	0,7	>20

Note 1 – A-A mode with 3 seconds "Heartbeat" should only be used in laboratory tests. International norms and Regulations place limits on the total transmission time and in any case redundant and useless messages must be avoided.

Note 2 - Measurements of the absorbed current must be carried out without the Tx LED being active: disconnect S4 Jumper.

SPT17S3-D2 RF emission frame structure – D2 software



1. Transmitter ID Code (24 bit)

A 24 bit value is used for the unique serial number identifier for each SPT17S3-D2 transmitter module.

2. Analog input measurement (10 bit)

A 10 bit measurement of the analog input performed by the MSP430G2332 A/D Converter (Internal REF+= 1.5V).

3. Temperature measurement (10 bit)

A 10 bit measure of the MSP430 on chip temperature sensor.
The measurement is not calibrated.

4. Battery voltage measurement (4 bit)

A 16 step measure of the battery voltage from 1.5V to 3V (0.1V increments).

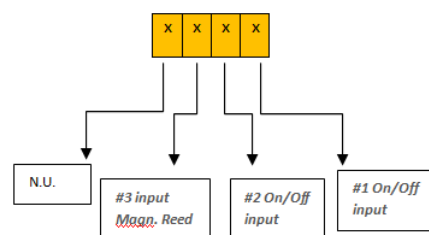
5. On/Off input (open-closed) (4 bit)

Actual state of the three On/Off digital inputs.
0 = open 1 = closed

6. Emission Incr. Counter (4 bit)

A 0 to 15 number incremented on every transmission
(1 transmission = 2 frames).

	Preamble 2 pulses	
1	ID Code	24 bit
2	Analog Input Measurement	10 bit
3	Temperature Measurement	10 bit
4	Battery voltage	4 bit
5	On/Off Input	4 bit
6	Message Incr. Counter	4 bit
7	Checksum	8 bit



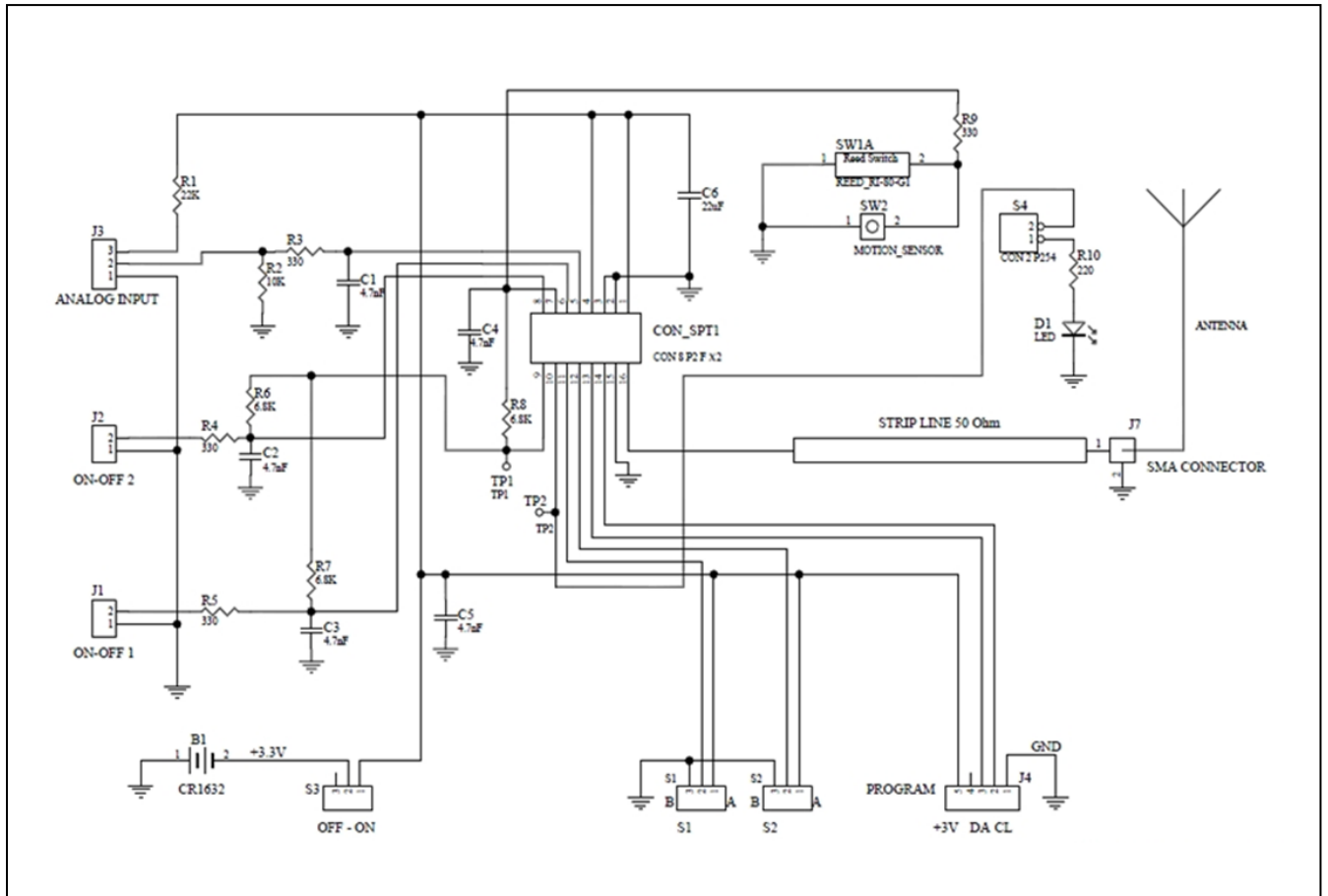


Fig. 5 - EVT17S3 Schematic