

Telemetry Receiver
SRX1200
Models SRX1200 and SRX1200-D

Operational Description

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1. General Description

The SRX800 is the next level of telemetry radio receiver operating with a frequency range from 138 MHz to 176 MHz. The frequency can be adjusted with a resolution of 1 kHz. The scanning frequency can be set-up manually or automatically, in which case it is possible to sequentially scan multiple pre-programmed frequencies. The scanning time can be adjusted via software, along with the gain setting. The modes of operation are described in the user manual in more detail.

The SRX1200 model has the following main features:

- LCD Display with backlight
- 16 key keypad
- Volume Control Knob on front panel
- 3.5 mm Headphone Jack
- Built-in speaker
- BNC RF antenna input-50 Ohm
- Antenna switch control port (up to 4 or 8 antennas)
- Relative signal strength measurement
- Separate RF gain and audio controls
- Non-volatile flash memory
- Firmware control for operating flexibility
- 9V DC input from external power supply or 6 x C cell replaceable 1.5 V batteries
- Integrated GPS Receiver with external active GPS antenna
- WiFi Port for external WiFi antenna
- Type B USB port (to be connected to a PC)
- Type A USB port
- User defined configurations
- Enhanced detection algorithm
- SRX HOST software for connection to PC

The SRX 1200 can be set up independently via the keypad and the LCD display, hence it can be used for mobile applications as well. The modes of operation and the signal status are signaled via the LCD display. However, the set-up can be done via the PC as well.

The SRX1200-D model has the following main features:

- LEDs signaling the mode and detection status (no LCD display, no keypad)
- Volume Control Knob
- 3.5 mm Headphone Jack
- 4 x BNC RF antenna input-50 Ohm
- Internal programmable antenna switch
- Relative signal strength measurement
- Separate RF gain and audio controls

- Non-volatile flash memory
- Firmware control for operating flexibility
- 12 V DC input
- Integrated optional sleep mode to minimize energy consumption
- Integrated GPS receiver with external active GPS antenna
- WiFi Port for external WiFi antenna
- Type B USB port
- Type A USB port
- User defined configurations
- Enhanced detection algorithm
- SRX HOST software for connection to PC

The SRX1200-D model requires a PC and the Windows host software to be set-up. Once the set-up is done, the SRX 1200-D can operate independently. The operation modes and the signal status is signaled via three LEDs, using the following patterns:

2. Short Description of the functional Blocks

Basically, the two models operate in the same way, but the D model does not have a keypad and an LCD display and all set-up operation are done via the Windows PC, connected to the USB port.

The presentation and connection between the internal blocks are given in the block diagram (see document with block diagram).

The *CPU* board controls all its functions, being connected to the keypad, the LCD display, the GPS receiver, the RF receiver, I/O ports, and the USB ports. The resident firmware loaded in the non-volatile memory controls all required functions (e.g. configuration storage, operation modes, data communication, GPS interface, user interface). The CPU is consisting of an MSP 430 slave processor and of a DART System on module, which also has a certified WiFi engine.

The *GPS Receiver* is connected to an external GPS antenna and collects GPS positions, which are processed by the receiver.

The *VHF RF Receiver* board is connected to an external antenna via a BNC (50 Ohm) connector in the case of the SRX1200 model, and to an RF four port switch resident on the interconnect board, in the case of the SRX1200-D model. The VHF receiver board performs the functions of amplifying, filtering, converting, and demodulating the RF signal. The demodulated signal is fed into the CPU to be processed. The VHF RF receiver is also connected to a volume adjustment knob located on the front panel.

It has an audio output connected to an external 3.5 mm head-phone jack. The SRX 800 model has an internal speaker, the SRX800-D has not.

The *Interconnect Board Assembly* performs the interconnection of assemblies (i.e. CPU, VHF, LCD, LEDs and keypad), so the system is very modular. The SRX 1200-D model does not have a keypad and an LCD display, it has only three LEDs which signal the mode of operation and the detection status.

The interconnect board assembly also ensures the following power management functions:

- Voltage regulation for the CPU (9 V) and the VHF RF board (5.8 V). For the SRX 1200 model, the input voltage is 9 V, for the SRX1200 D model it is 12 V.
- Protection via fuses;
- Reverse voltage protection;
- Overvoltage protection;
- Control of rear panel LED (green) for the SRX 1200 only, signaling the presence of power. In the case of the SRx1200-D model, the battery status is signaled via the LEDs located on the top panel.
- The SRX1200-D has an optional sleep mode, which can be scheduled, in order to minimize energy consumption in the non-active periods.

The external AC wall power supply used for the SRX1200 does not belong to the unit, it is external, and it converts the AC mains voltage (110 V AC, 60 Hz or 220 V AC, 50 Hz) to 9 V DC. The external power supply does not charge the battery. When plugged, the internal C cell primary batteries (if present) located inside, are disconnected automatically.

The SRX1200-D model is powered from an external 12 V power source (e.g. a standard 12 V battery or an external power supply).

3. Labeling:

- All ports are properly labeled (Power input, VHF, GPS, WiFi, etc.)
- The DC input is labeled differently for the two models:
DC 9 V/1 A for the SRX 1200 model, and 12 V/1 A, for the SRX 1200-D model.
Along with the CE symbol, the \wedge will be added to the label.
- Signal inputs or outputs are labeled according to the function which is performed.
- In addition, the FCC and the IC regulatory labels will be attached (see the document referring to the labeling for more details).

4. Insertion or replacing batteries (only for the SRX1200 model):

To insert or replace the batteries, the two round threaded lids located on the rear panel must be removed. Each side contains a cylinder which accommodated three batteries. The orientation of the battery is labeled: the plus terminal of the battery should be oriented toward the exterior.

5. Mechanical, electrical and environmental Parameters

a. For the SRX1200 model:

| | |
|---------------------------------------------|----------------------------------------------------------------------------------------|
| Operating Voltage | 9V |
| Operating Current | 250-450 mA @ 9 V |
| Battery Life (6 x C cell 1.5 V Alkaline) | Standard: 16 hrs. @ 20°C (LCD back light off) 12 hrs. @ 20°C (LCD back light on) |
| Operating Temperature Range | -20°C to +50°C -5°C to +50°C, when LCD Display On |
| Set-up | via LCD and 16 key Keypad |
| Size | ~21.5 x 20.3 x 7.7 cm |
| Weight | ~ 2.3 kg (with no batteries) |
| Memory Capacity | 128 MByte |
| WiFi | Uses external WiFi antenna via SMA connector |
| GPS | Uses external active GPS antenna via SMA connector |
| RF Parameters | |
| VHF Antenna Input | BNC |
| Operating Frequency Range | 138-176 MHz |
| Frequency Resolution | 1 kHz |
| Frequency Stability | 5 ppm |
| Sensitivity | |
| Minimum discernible audio level | -150 dBm |
| Minimum discernible by software | -135 dBm |

b. For the SRX1200-D model:

| | |
|---------------------------------|----------------------------------|
| Operating Voltage | 12 V (no internal batteries) |
| Operating Current | 350-450 mA @ 12 V |
| Size | ~28 x 25 x 13 cm |
| Weight | ~ 2.5 kg |
| Operating Temperature Range | -30°C to +50°C |
| Set-up | Via PC and Windows Host Software |
| Size | ~27 x 25 x 13 cm |
| Memory Capacity | 128 MByte |
| WiFi | Uses external WiFi antenna |
| GPS | Uses external active GPS antenna |
| RF Parameters | |
| 4 x VHF Antenna Inputs | BNC |
| Operating Frequency Range | 138-176 MHz |
| Frequency Resolution | 1 kHz |
| Frequency Stability | 5 ppm |
| Sensitivity | |
| Minimum discernible audio level | -150 dBm |
| Minimum discernible by software | -135 dBm |