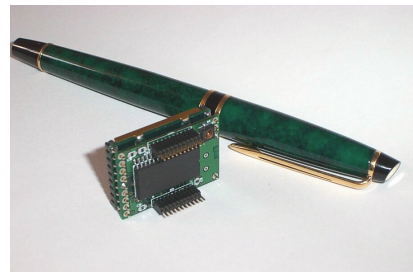
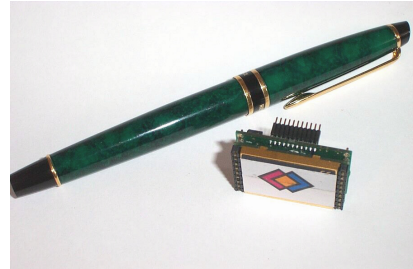




## Features

- ❖ 3120 Neuron family based control module
- ❖ Low power RF transceiver on board
- ❖ License exempt operation on -
  - 418MHz MPT1340
  - 433MHz ETC300-220
  - 914MHz FCC (TBA)
- ❖ 19.5 kilobits per second plus, half-duplex network bit rate
- ❖ Range –
  - ❖ 418 MHz - 30 Mtrs typical range within buildings, 120 Mtrs open ground, dependent upon aerial technology
  - ❖ 433 MHz – 50 - 70 Mtrs typical range within buildings, 200+ Mtrs open ground, dependent upon aerial technology
  - ❖ 914 MHz – 30Mtrs typical range within buildings, 120 Mtrs open ground, dependent upon aerial technology
- ❖ Sub-miniature compact form factor allows easy integration into OEM products



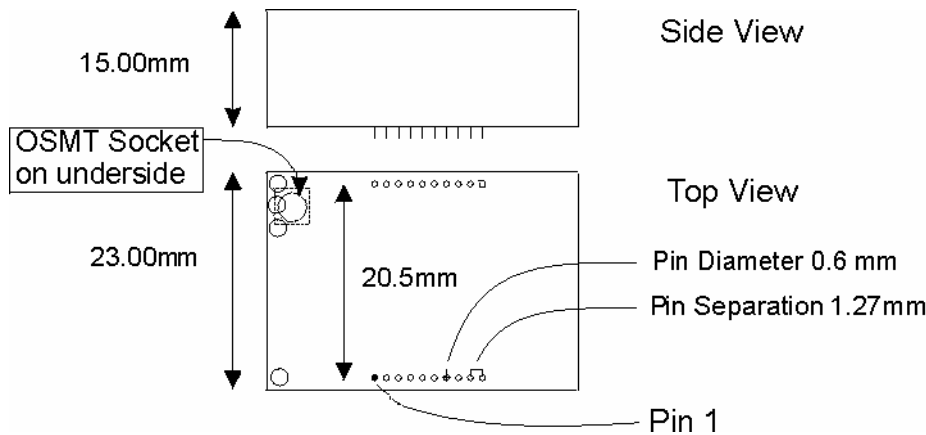
## Description

This compact Lon Radio node provides a simple, cost-effective way of adding LONWORKS technology to any control system where local conditions make a radio solution ideal for network communications. The embedded module integrates the 3120 series of single chip Neurons with a low power UHF transceiver and only requires the addition of a suitable aerial and user application interface to provide a complete system. The 22-pin I/O connector provides access to Power, Ground, Reset, Service Pin, and the 11 I/O pins of the Neuron. The unit itself integrates the Neuron, the UHF transceiver, the oscillator circuit, a DSP chip to provide robust and reliable operation over the



radio medium and an undervoltage sensing reset circuit, important for long term stability of the EEPROM writes in the Neuron into a single compact package.

### Hardware Overview



### 22-Pin Connector Pinout

- |                             |                                 |
|-----------------------------|---------------------------------|
| 1 N/C not used              | 12 RST Reset input/output       |
| 2 IO5 Neuron I/O pin 5      | 13 IO4 Neuron I/O pin 4         |
| 3 IO6 Neuron I/O pin 6      | 14 IO3 Neuron I/O pin 3         |
| 4 IO7 Neuron I/O pin 7      | 15 IO2 Neuron I/O pin 2         |
| 5 IO8 Neuron I/O pin 8      | 16 IO1 Neuron I/O pin 1         |
| 6 IO9 Neuron I/O pin 9      | 17 IO0 Neuron I/O pin 0         |
| 7 IO10 Neuron I/O pin 10    | 18 Service Neuron Service input |
| 8 RXLed Receive LED output  | 19 GND ground                   |
| 9 TXLed Transmit LED output | 20 VCC +5v input                |
| 10 CP1 Neuron comms port 1  | 21 CP3 Neuron comms port 3      |
| 11 CP0 Neuron comms port 0  | 22 CP2 Neuron comms port 2      |

### Antenna

An OSMT socket is provided for connection to an antenna. Helical stub or whip antennas are suitable types. A whip antenna can be formed from a straight length of wire 16.5cm long for 418MHz, and 15.5cm long for 433MHz. A helical stub antenna can be formed from 0.5mm enameled copper wire close wound on a 3.2mm diameter former; 26 turns for 418MHz, and 24 turns for 433MHz. It is



preferable to source these items encapsulated in a plastic or rubber sheath to prevent damage to the RF module during EMC susceptibility testing.

### RF Type Approval

The RF module used in these products is approved to MPT1340 for use in the UK and ETS-300-220 for use in Europe. In order to maintain conformance the following rules must be applied:

1. The transmitting antenna must be one of 3 types; whip, helical stub, or loop. Antenna structures, which yield ERP gain, are not permitted.
2. The module must be directly and permanently connected to the transmitting antenna without the use of an external feeder. Increasing the RF power by any means is not permitted.
3. The module must not be modified nor used outside its specification limits.
4. The equipment in which the module is used must carry an inspection mark located on the outside of the equipment and be clearly visible. The minimum dimensions of the inspection mark shall be 10x15mm and the letter and figure height must be no less than 2mm. The wording shall read: "MPT 1340 W.T. LICENSE EXEMPT"
5. Products intended for UK commercial application must be notified to the Radiocommunications Agency (RA) on form RA249 (Cat I), obtainable from the RA's library service, Tel 0207 211 0502/0505.

### Specifications

RF Module	418MHz or 433MHz license exempt MPT1340/ETS-300-220 single channel FM module 914.5MHz FCC Part 15.249 (TBA)
Network Bit Rate	19.5Kb/s +
Aerial	OSMT socket provided for separate connection to a helical stub or whip aerial.
Operating Input Voltage	+5vDC $\pm$ 5%, 3.3v option
Operating Input Current	54mA – Transmit @ 5v 58mA – Receive @ 5V



	23mA – Receive @ 3.3v
Sleep Mode	110uA
Processor Neuron	3120
Crystal Oscillator	10MHz
I/O Connectors	2 x 11 pins on 1.27mm centres
Plugs	2 x 11 pin socket – Samtech SLM-111-01-G-S
Operating Temperature	-10°C to + 55°C
Extended Operating Temperature	-20°C to + 70°C (Reduced specification)
Dimensions	33mm x 23mm x 15mm

## Ordering Information

CNSEM2RF418 RF control module with 418MHz radio module fitted

CNSEM2RF433 RF control module with 433MHz radio module fitted

CNSEM2RF914 control module with 914MHz radio module fitted

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