

# **CIRCUIT DESCRIPTION FOR M-2911 BLUEJAY UNIVERSAL DATA TRANSCEIVER**

Rev.3

08/28/2002

## **GENERAL**

The M-2911 BlueJay wireless universal data transceiver is a self-contained short range device(srd), used for transferring serial communication data between IED's and computers hosting communications programs for setting parameters, monitoring parameters, recording history, and detecting alarm events in the industrial environment.

The product is based on an Intersil five chip, direct sequence spread spectrum circuit that operates in the 2.4 GHz ISM band. The circuit was originally designed to implement the IEEE 802.11 Wireless LAN standard for data communication. The product design meets the category requirements for low power devices (lpd) for license-free operation.

## **PHYSICAL**

The M-2911 is enclosed in a non-weather-proof metallic enclosure. The approximate dimensions are 5.88 " (14.58 cm) long, 3.88" (9.9 cm) wide, and 1.25" (3.07cm) deep.

The unit weighs approximately 2.3 ounces. The product is intended for commercial / industrial use in a sheltered environment. The operational temperature range is -40 degrees Celsius to +80 degrees Celsius. The operational humidity range is 0 to 95%, non-condensing.

## **ELECTRICAL**

The M-2911 has a self-contained switching power supply that supplies the data and RF circuitry with regulated dc power as required. That power supply has an external 3.5 mm power input jack designed to accept the output of a UL approved wall transformer power supply that delivers between 7 and 60 Vdc at a maximum power output of 2.5 Watts.

## **DATA**

The M-2911 has two serial data connectors, one is a DE-9 connector for use with an RS-232 serial data port and the other is a Phoenix-type connector for use as an RS-422/ RS-485 twisted shielded pair serial data port. The ports are used singly and are capable of serial data speeds of up to 115 kbps. The Intersil-supplied MAC chip contained the bulk of the on-board 802.11 data formatting and was replaced by an Atmel processor containing the proprietary Beckwith data formatting programming. From the MAC, the data is routed to the base-band processor chip that handles the encoding and decoding of data formatting for

transmitted and received signals respectively. The base-band processor generates and decodes the quadrature modulation streams that the radio frequency section uses in its DSSS (Direct Sequence Spread Spectrum) modulation processes.

## **RADIO FREQUENCY**

The quadrature modulated data is fed to the I/Q Mod/Demod IF chip. This section up-converts the signal to intermediate frequencies by mixing the signal with the output of a 394 MHz VCO as a local oscillator.

The IF signal is then further up-converted in the RF/IF section by mixing it with a 2.08 GHz local oscillator. This output is run through a surface acoustic wave band-pass filter tuned to 2.45 GHz to properly shape the frequency response of the signal before being introduced to the Power Amplifier section. The output of the power amplifier section is switched by an Rx/Tx switch to the antenna for transmission.

The M-2911 conditions the data and transmits it over a half-duplex direct sequence spread spectrum radio operating in the 2.4 GHz ISM band. The over-the-air data rate is 1 Mbps . The output power of the device is approximately 30mW which gives the product a range of up to 1500 feet under ideal conditions.