

## Xecom Offers Open Networking Option for XE900SL10

**Description**

Since Xecom first introduced the XE900SL10 transceivers, they have been known for their robust networking code. This code maximized network reliability even under poor conditions. Some applications such as those with small payloads or higher data rates, found the networking code added too much overhead. Xecom has addressed this with the open network version of the XE900SL10, XE900SL10-N

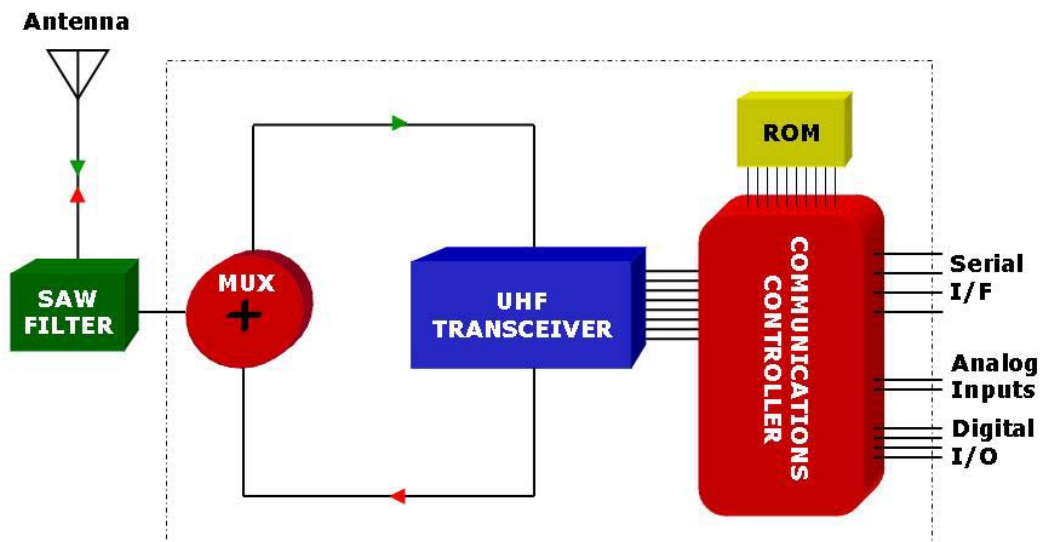
To create the XE900SL10-N Xecom removed the error correction and link recovery protocols that added overhead. The system designer now controls the level of error monitoring and link maintenance he needs.

The XE900SL10-N continues to offer many of the XE900SL10's advanced features; Frequency Hopping Spread Spectrum signaling, remote sensor reading with SensorOnAir, small size, and low power consumption. Xecom also offers a high power open network product, XE900S-500-N for applications needing greater range.

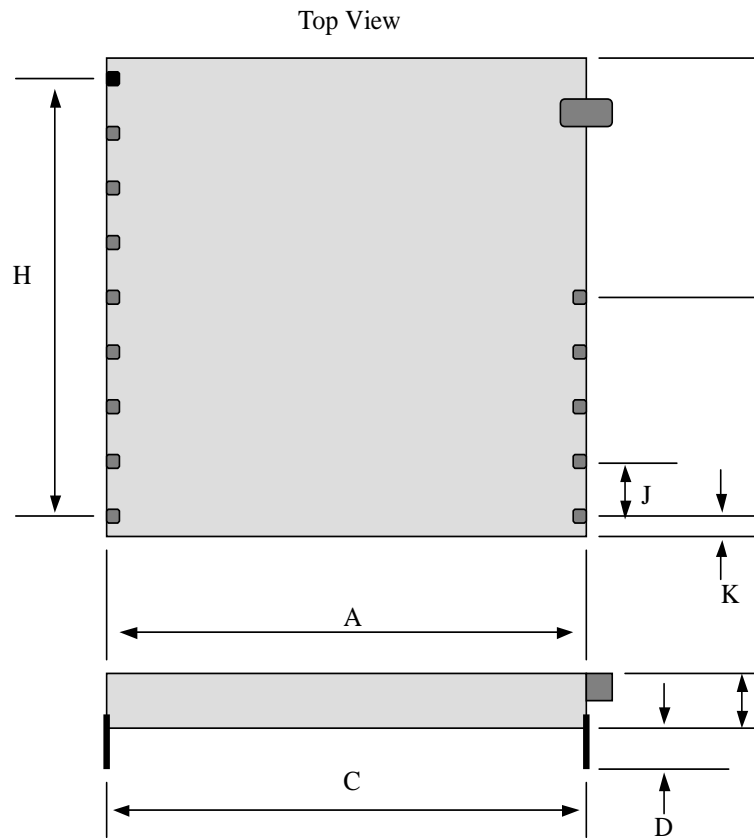
**Features**

- \* Small Size: 1.0" by 1.0" by 0.26"
- \* Serial Control and Configuration of the Wireless Link.
- \* Supports 65,000 unique node addresses
- \* Output Power Programmable from 0 to 10 mW;
- \* Maximum Receiver Sensitivity -100 dBm
- \* Obstructed signal range to 300 feet;
- \* Wireless Data Rate 76.8K bps, half-duplex; typical throughput, 12K bps
- \* Power Consumption:  
55 mA @ 3.3 Volts when transmitting at 10 mW  
less than 1 mA in Sleep Mode or Power-Down modes
- \* SensorOnAir™ allows direct connection of sensors to the Smart Transceiver
- \* Operating Temperature Range of -40 to +85 C
- \* FCC Part 15 Registered

### XE900SL10-N Block Diagram



## XE900SL10-N MECHANICAL SPECIFICATIONS



| Dimension | Description             | Inches | MM    |
|-----------|-------------------------|--------|-------|
| A         | Module Width            | 1.00   | 25.40 |
| B         | Max. Module Thickness   | 0.30   | 7.62  |
| C         | Row to Row              | 1.00   | 25.40 |
| D         | Minimum Lead Length     | 0.125  | 3.18  |
| E         | Module Length           | 1.00   | 25.40 |
| F         | Pin 10 to Pin 14        | 0.40   | 10.16 |
| G         | Pin 14 to Edge          | 0.50   | 12.70 |
| H         | Pin 1 to Pin 9          | 0.80   | 20.32 |
| J         | Pin to Pin Spacing      | 0.10   | 2.54  |
| K         | Pin 1, 9, or 10 to Edge | 0.10   | 2.54  |

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## Using the XE900SL10-N Power Saving Modes

The XE900SL10-N includes three low power operating modes (RF Monitor, Sleep and Power-Down) to maximize system battery life. The #P command determines how the transceiver will operate when not being asked to transmit or receive an RF signal. Below are descriptions of all of the XE900SL10-N operating modes.

**IDLE:** In Idle Mode all circuits within the XE900SL10-N are powered and available for immediate action. This includes the RF receiver which actively monitors the air for an incoming communications request. Current draw in Idle Mode is typically 18 milliamps.

**SLEEP:** In Sleep Mode all XE900SL10-N circuits are powered-down to reduce consumption. Commands and incoming RF communications requests will not be recognized. Any input on the /TXD line will wake the XE900SL10-N and return it either the Idle or Power-Down Mode whichever state it was last in before being put into Sleep Mode. Current draw in Sleep Mode is less than 40 microamps.

**Power-Down:** In Power-Down Mode all RF circuitry is shut down but the communications controller remains active to accept AT commands. In this mode the XE900SL10-N cannot respond to an incoming RF communications request. If a Transmit RF or Receive RF command is received, the XE900SL10-N can activate the RF section in under 200 microseconds. Current draw in Power-Down Mode is less than 500 microamps.

**RF Monitor Mode:** The XE900SL10-N RF monitor mode has 4 settings. At each of these settings the transceiver sits in power down mode for the prescribed period of time. The transceiver then wakes up, turns on its receiver and checks for incoming messages. If no messages are received the transceiver returns to power down mode after about 200 milliseconds. If a carrier is detected, the transceiver completes the transaction before returning to power down mode. Intervals of 2 seconds (#P3), 4 seconds (#P4), 8 seconds (#P5) and 16 seconds (#P6) can be chosen.

**RF Receive Mode:** In RF Receive Mode the XE900SL10-N is actively receiving an incoming 900 RF data signal. RF Receive Mode draws less than 30 milliamps.

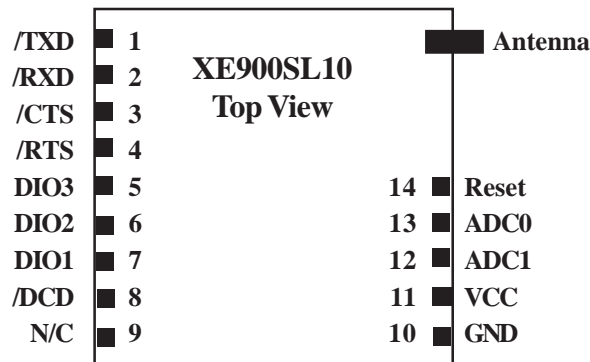
**RF Transmit Mode:** In RF Transmit Mode the XE900SL10-N actively transmits the 900 MHz data signal. Current draw in Transmit mode is no more than 55 milliamps with the transmit output power set to maximum, 10 milliwatts.

### AT Command Control

The low power modes are controlled by the AT#Pn command, see below.

- AT#P0 - Sets the transceiver to Idle mode.
- AT#P1 - Sets the transceiver to Sleep Mode.
- AT#P2 - Sets the transceiver for Power-Down Mode.
- AT#P3 - RF Monitor Mode (2 second interval)
- AT#P4 - RF Monitor Mode (4 second interval)
- AT#P5 - RF Monitor Mode (8 second interval)
- AT#P6 - RF Monitor Mode (16 second interval)

## XE900SL10-N PIN CONFIGURATION



| SIGNAL | PINS | DESCRIPTION  |
|--------|------|--|
| /TXD   | 1    | Transmit Data is the data input to the XE900SL10-N.  |
| /RXD   | 2    | Received Data is the data output from the XE900SL10-N.   |
| /CTS   | 3    | Clear to Send provides hardware flow control from the XE900SL10-N. The XE900SL10-N drives /CTS high to signal the host to temporarily stop the flow of data into /TXD.   |
| /RTS   | 4    | Request to Send provides hardware flow control from the host system. The host system drives /RTS high to signal the XE900SL10-N to temporarily stop the data flow onto /RXD.                                   |
| DIO3   | 5    | DIO3 may be programmed as either a digital input or digital output. It connects directly to the communications controller in the XE900SL10-N.  |
| DIO2   | 6    | DIO2 may be programmed as either a digital input or digital output. It connects directly to the communications controller in the XE900SL10-N.  |
| DIO1   | 7    | DIO1 may be programmed as either a digital input or digital output. It connects directly to the communications controller in the XE900SL10-N.  |
| /DCD   | 8    | /DCD, Data Carrier Detect, operates as an active low output from the transceiver. /DCD is activated when a valid RF carrier signal is received.  |
| N/C    | 9    | No Connection  |
| GND    | 10   | Common voltage reference for the XE900SL10-N.  |
| VCC    | 11   | 3.3 Volt power for the XE900SL10-N.  |
| ADC1   | 12   | Analog Input 1 to the XE900SL10-N communications controller. ADC1 connects to an internal 12-bit Analog to Digital Converter. ADC1 may also be configured as a digital input if no analog inputs are required. |
| ADC0   | 13   | Analog Input 0 to the XE900SL10-N communications controller. ADC0 connects to an internal 12-bit Analog to Digital Converter. ADC0 may also be configured as a digital input if no analog inputs are required. |
| Reset  | 14   | Provides an active high hardware reset to the XE900SL10-N.   |

## ABSOLUTE MAXIMUM RATINGS

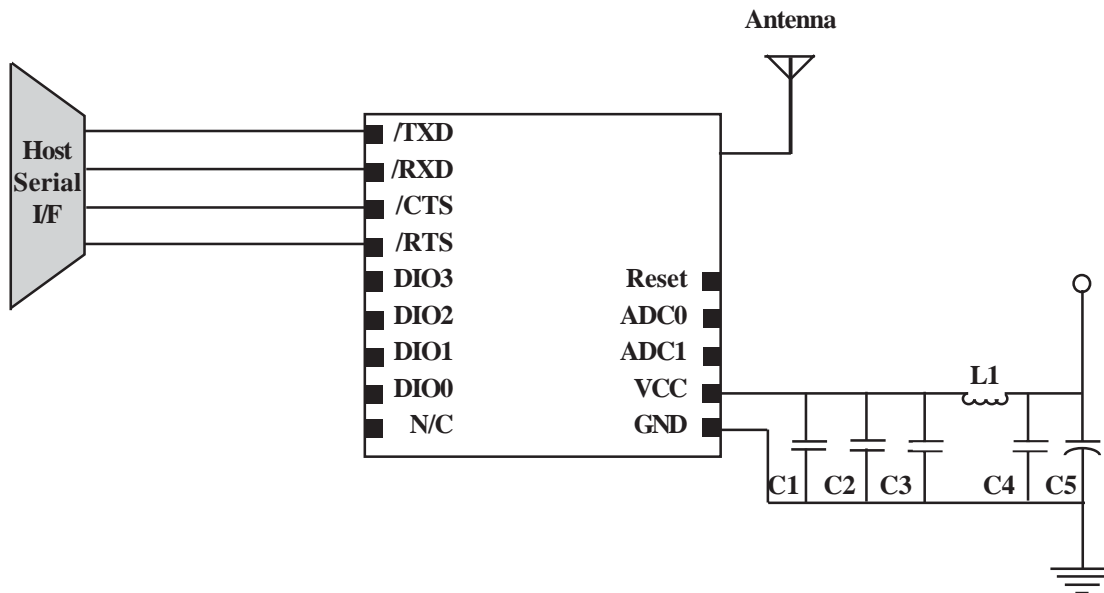
|                             |                   |
|-----------------------------|-------------------|
| VCC                         | 3.9 Volts         |
| Storage Temperature         | -55° C to +125° C |
| Operating Temperature Range | -40° C to +85° C  |

WARNING: Exceeding any of these ratings will void the warranty and may damage the device

## XE900SL10-N ELECTRICAL SPECIFICATIONS

| Parameter                    | Min  | Typ  | Max   | Units | Comments                        |
|------------------------------|------|------|-------|-------|---------------------------------|
| VCC                          | 2.7  | 3.3  | 3.6   | Volts | Transceiver power               |
| ICC                          |      | 55   |       | mA    | Transmit Mode (10 mW output)    |
|                              |      | 30   |       | mA    | Receive Mode                    |
|                              |      | 23   |       | mA    | Idle Mode                       |
|                              |      | 1.7  |       | mA    | Avg; 2-sec RF Monitor interval  |
|                              |      | 0.85 |       | mA    | Avg; 4-sec RF Monitor interval  |
|                              |      | 0.43 |       | mA    | Avg; 8-sec RF Monitor interval  |
|                              |      | 0.22 |       | mA    | Avg; 16-sec RF Monitor interval |
|                              |      | 18   |       | mA    | Idle Mode                       |
|                              |      |      |       | 0.500 | mA                              |
|                              |      |      | 0.040 | mA    | Sleep Mode                      |
| Output Power:                | 1    |      | 10    | mW    | 50 Ohm Load                     |
| Wireless Receive Sensitivity |      | -100 |       | dBm   |                                 |
| Frequency Hopping Channels   |      | 50   |       |       |                                 |
| Frequency Range              | 902  |      | 928   | MHz   |                                 |
| Communications Range         |      | 300  |       | ft.   |                                 |
| Antenna Output Impedance     |      | 50   |       | Ohms  |                                 |
| Voh                          | 2.25 |      |       | Volts | VCC =3.3 Volts                  |
| Vol                          |      |      | 0.75  | Volts | VCC =3.3 Volts                  |
| Vih                          | 2.25 |      |       | Volts | VCC =3.3 Volts                  |
| Vil                          |      |      | 0.75  | Volts | VCC =3.3 Volts                  |

## XE900SL10-N TYPICAL CONNECTION DIAGRAM



### Parts List for XE900SL10 -N Typical Connection Diagram

| Reference Designation | Qty | Description                                |
|-----------------------|-----|--|
| C1                    | 1   | Capacitor, Electrolytic, 100 ufd, 10 Volts |
| C2,C4                 | 2   | Capacitor 0.1 ufd, 10 Volts                |
| C3,C5                 | 2   | Capacitor 47 pfd, 10 Volts                 |
| L1                    | 1   | Coilcraft 0603HC-7N5XJB                    |
| Antenna *             | 1   | 50 Ohm, 1/4 Wave                           |

\* The Antenna connector on the XE900SL10-N is a Male AMC connector. An Female AMC to Female SMA adapter is needed for the antenna connection

## XE900SL10-N COMMUNICATIONS CONTROLLER

The XE900SL10-N communications controller controls both the wireless communications and the user interfaces. The XE900SL10-N has two system interfaces; the serial interface and the direct sensor interface supported by the SensorOnAir™ feature.

### Serial Interface

The XE900SL10-N maintains a limited serial interface to the system. Control and configuration of the transceiver takes place through the serial interface using modem-like AT commands. Serial data rates from 1200 bits per second to 115.2K bits per second are supported. The serial interface signals are listed below.

- /TXD - Transmit Data provides the input to the XE900SL10-N for AT commands and Data to be transmitted on the wireless network.
- /RXD - Received Data supplies the output from the XE900SL10-N for received RF data and responses to AT commands.
- /RTS - Request to Send acts as the hardware flow control input to the XE900SL10-N. The DTE deactivates /RTS to stop the XE900SL10-N from sending more data on the /RXD line.
- /CTS - Clear to Send is the hardware flow control output from the XE900SL10-N. The XE900SL10-N deactivates /CTS to advise the host to stop inputting data on the /TXD lead.
- /DCD - Data Carrier Detect is an output from the XE900SL10-N which indicates to the system that a valid carrier signal is being received. .

### XE900SL10-NAT Command Format

AT commands for the XE900SL10-N follow a strict format. Each command begins with the prefix AT and ends with a carriage return. The communications controller accepts commands at data rates from 1200 to 115,200 bps. The default serial data rate is 9600 bps and can be changed using register S23.

**Command Prefix** - Each command, except the A/ command, begins with the AT prefix. The "A" and "T" may be either both upper case or both lower case but cannot be of different cases. The prefix identifies parity of the commands sent to the XE900SL10-N by comparing the parity bits of the "A" and the "T" characters.

**Command Line** - XE900SL10-N commands may be strung together in a single command line of up to 30 characters. Commands in the command string are executed in the sequence they appear.

**Omitted Parameters** - Most commands include a parameter which determines the function setting. When the command parameter is omitted from the command string, it is assumed to be a 0.

**Result Codes** - A result code is normally issued after each action. Result codes may be provided as full words, one or two digit numeric codes, or may be disabled all together. Each result code ends with a carriage return when numeric result codes are chosen. When full word result codes are chosen, a Line Feed and Carriage Return precede and follow each result code.

**Escape Sequence** - A three character sequence allows you to a disconnect from the wireless link and return to command mode. The sequence “~~~” is assigned to disconnect the link.

### Sensor Interface:

#### SensorOnAir™

Sensors can be connected directly to the XE900SL10-N without an applications controller. In this SensorOnAir™ configuration the XE900SL10-N communications controller controls the operation of the sensors.

### Sensor I/O Lines

SensorOnAir controls the operation of 5 I/O lines to the XE900SL10-N. This includes 2 analog inputs, ADC0 and ADC1, and 3 digital I/O lines, DIO1, DIO2, and DIO3. ADC0 and ADC1 are connected to a 12-bit analog to digital converter and using a 2.5 volt reference derived from VCC as their reference voltage. The digital I/O lines can be programmed to act as either inputs or outputs.

### Configuring for Sensor Operation

All SensorOnAir control functions for the analog inputs and digital I/O's are performed by the communications controller. AT commands program the functions of the analog and digital I/O lines. The AT commands used to program the SensorOnAir functions are then stored in Flash memory. This allows the XE900SL10-N to be first programmed and then installed in the application. The communications controller uses the information stored in Flash memory to control the analog and digital I/O lines. SensorOnAir only works in the XE900SL10-N “Addressed” mode.

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## XE900SL10 COMMUNICATIONS CONTROLLER

### SensorOnAir Commands™

Below is a list of the AT commands used to program the direct control of sensors using the communications controller in the XE900SL10.

**S107** - Defines the function of the programmable I/O lines. The two analog input lines, ADC0 and ADC1, can also be defined as digital I/O lines if needed. The three programmable digital I/O lines, DIO1, DIO2, and DIO3; can be set as either inputs or outputs. The value of this command is stored in flash memory.

**AT&IAn?** - This command allows a local host to read the value of Analog Input “n.”

**AT&IDn?** - This command allows a local host to read the status of Digital I/O “n.”

**AT&IDn=z** - This command allows a local host equipment to set the condition of the local digital output “n.” When z=0 the output is set to a logic low; when z=1 the output is set to a logic high.

**AT#IxxxxAn?** - This command allows the value of Analog Input “n” on node address “xxxx” to be read remotely.

**AT#IxxxxDn?** - This command allows the status of Digital I/O “n” on node address “xxxx” to be read remotely

**AT#IxxxxDn=z** - This command allows the condition of the local digital output “n” on node address “xxxx” to be set remotely. When z=0 the output is set to a logic low; when z=1 the output is set to a logic high.

### WIRELESS COMMUNICATIONS

The XE900SL10-N communications controller manages the RF Link. This includes the frequency hopping algorithm for spread spectrum operation and node addressing.

#### Carrier Sense Multiple Access (CSMA)

To prevent collisions between network nodes the XE900SL10 uses a Carrier Sense Multiple Access protocol for each network transceiver. In normal communications all nodes, including the Master node in a point-to-multipoint network, listen for communications activity before initiating a session. If a wireless link already exists, the transceiver waits until that session is complete before initiating a wireless link.

#### Node Addressing

The XE900SL10-N supports both addressed communications and non-addressed communications. In the non-addressed operating mode each transceiver that detects the RF carrier signal passes the received data through to the system. The system then determines if the data was intended for that node

The XE900SL10-N offers over 65,000 individual node address. The node address is set with register S105. Separate networks can be arranged by assigning different frequency hopping schemes to the installed nodes. Register S104 selects from 256 possible frequency hopping algorithms.

The XE900SL10-N also permits data to be broadcast to all nodes simultaneously. The AT#B command causes the subsequent transmissions to be broadcast throughout the network.

## AT COMMANDS

An asterisk indicates the factory default

- A Answer Command** - forces the smart transceiver respond to a summons from another wireless device.
- Dn Initiate a Wireless Link** - attempt to establish a link with the transceiver at address n. If a "b" is inserted for the address, the data will be broadcast.
- En Echo Characters** - determines if the XE900SL10-N will echo the characters received on its serial interface during command mode.  
n=0 Characters not Echoed  
n=1 Characters Echoed \*
- In Identification** - displays product identification code.  
n=0 Display Product Code  
n=1 Display Product Name  
n=2 Display Copyright  
n=3 Display Firmware Revision
- Qn Result Code Display** - determines if result codes will be displayed.  
n=0 Display Result Codes \*  
n=1 Do not Display Result Codes
- Sn= Set Value of Register Sn**
- Sn? Read Value of Register Sn**
- Vn Response Type** - selects Full Word or Numeric responses  
n=0 Numeric Responses  
n=1 Full Word Responses \*
- Zn Reset** - executes a soft Reset  
n=0 Reset to Values Stored in User Profile 0 \*.  
n=1 Reset to Values Stored in User Profile 1
- &F Restore Factory Settings** - returns all configuration commands and registers to their factory default values.
- &IAn? Read Local Analog Input "n"** - This command allows the host equipment to read the values of the local analog inputs.  
n=0 Read input ADC0  
n=1 Read input ADC1
- &IDn? Read Local Digital Input "n"** - This command allows the host equipment to read the status of the local digital inputs.  
n=1 Read input DIO1  
n=2 Read input DIO2  
n=3 Read input DIO3  
n=4 Read input DIO4 (pin shared with ADC0)  
n=5 Read input DIO5 (pin shared with ADC1)
- &IDn=z Set Local Digital Output "n"** - This command allows the host equipment to set the condition of the local digital outputs. When z=0 the output is set to a logic low; when z=1 the output is set to a logic high.  
n=1 Set output DIO1  
n=2 Set output DIO2  
n=3 Set output DIO3
- &Kn Flow Control** - selects the type of flow control to be used between the system host and the XE900SL10-N  
n=0 Flow Control Disabled  
n=3 RTS/CTS, hardware Flow Control \*  
n=4 XON/XOFF, in-band Flow Control
- &V View Active Configuration** - sends the active configuration data to the system host.
- &Wn Store Current Configuration** - loads the current XE900SL10-N configuration into either User Profile 0 or User Profile 1.  
n=0 load configuration into User Profile 0  
n=1 load configuration into User Profile 1
- #B Wireless Broadcast Mode** - controls whether or not the radio will receive wireless data broadcasts.  
n=0 ignore broadcast data  
n=1 accept broadcast data

## AT COMMANDS

### #IxxxxAn? Read Analog Input “n” at Node Address xxxx -

This command allows analog input values at any node to be read remotely.

n=0 Read input ADC0

n=1 Read input ADC1

### #IxxxxDn? Read Digital Input “n” at Node Address xxxx -

This command allows the status of the digital inputs at any node to be read remotely.

n=1 Read input DIO1

n=2 Read input DIO2

n=3 Read input DIO3

n=4 Read input DIO4 (pin shared with ADC0)

n=5 Read input DIO5 (pin shared with ADC1)

### #IxxxxDn=z Set Digital Output “n” at Node Address xxxx

This command allows the condition of the digital outputs to be modified remotely. When z=0 the output is set to a logic low; when z=1 the output is set to a logic high.

n=1 Set output DIO1

n=2 Set output DIO2

n=3 Set output DIO3

#Pn **Low Power Operation** - Allows the XE900SL10-N to operate in reduced power modes.

n=0 Sets the transceiver to Idle mode

n=1 Places Transceiver in Sleep Mode;

n=2 Places Transceiver in Power-Down Mode

n=3 RF Monitor Mode (2 second interval)

n=4 RF Monitor Mode (4 second interval)

n=5 RF Monitor Mode (8 second interval)

n=6 RF Monitor Mode (16 second interval)

## XE900SL10-N Responses

| <u>Numeric</u> | <u>Full Word</u> | <u>Description</u>                 |
|----------------|------------------|------------------------------------|
| 0              | OK               | Successfully executed command line |
| 1              | CONNECT RF       | Wireless Connection Established    |
| 2              | RING             | Wireless Link Request Detected     |
| 3              | DISCONNECT       | Lost Wireless Link                 |
| 4              | ERROR            | Error in command line              |
| 6              | NO CONNECTION    | Failed to Establish Wireless Link  |
| 7              | BUSY             | Link Request Time Out has occurred |
| 8              | SORRY            | No Response to Count-Off Request   |
| 9              | WAIT             | Wireless Link is not available     |
|                | FILE             | File Transfer Mode                 |

## XE900SL10-N Configuration Registers

**S0 Answer Wireless Link Request:** S0 determines if the XE900SL10-N will automatically respond to a wireless link request.

S0=0 No Automatic response to link requests

S0=1 Automatically respond to link requests

S0=128 Enter Broadcast mode on power-up.  
Command must be stored in nonvolatile memory using the AT&W command.

**S2 Return to Command Mode Character** - S2 sets the ASCII character to be used to drop the RF link and return the XE900SL10-N to command mode. The default character is the tilde "~".

Range: 0-255

Default: 126

**S7 Link Set-up Timer** - S7 sets the length of time in seconds that the transceiver will attempt to create a link with the destination node.

Range: 0-60

Default: 10

**S12 Escape Guard Timer** - S12 sets the guard timer before and after the escape sequence. Any characters received within the window defined by S12 cause the disconnect request to be ignored.

Range: 0-255

Default: 25

Units: 20 milliseconds

**S14 Bit-mapped Register** - S14 stores the values of the ATE, ATQ and ATV commands.

**S23 Serial Interface Data rate** - Set the serial data rate.

1 = Set serial data rate to 1200 BPS

2 = Set serial data rate to 2400 BPS

3 = Set serial data rate to 4800 BPS

4 = Set serial data rate to 9600 BPS\*

5 = Set serial data rate to 14400 BPS

6 = Set serial data rate to 19200 BPS

7 = Set serial data rate to 28800 BPS

8 = Set serial data rate to 38400 BPS

9 = Set serial data rate to 57600 BPS

10 = Set serial data rate to 115200 BPS

**S39 Bit-mapped Register** - S39 stores the value of the AT&K command.

**S104 Frequency Hopping Algorithm**- S104 selects the frequency hopping algorithm to be used. Transceivers may only communicate with other transceivers using the same frequency hopping scheme.

Range: 0-255

Default: 1

**S105 Node Address** - S105 sets the address of the node. The address is entered in hex format.

Range: 0000 to FFFF

**S107 I/O Configuration** - S107 is a bit-mapped register which defines the local programmable I/O lines.

Bit 0 = 0 - ADC0 & ADC1 used as Programmable I/O  
= 1 - ADC0 & ADC1 defined for Analog use

Bit 1 = reserved

Bit 2 = reserved

Bit 3 = 0 - DIO1 used as an output  
= 1 - DIO1 used as an input

Bit 4 = 0 - DIO2 used as an output  
= 1 - DIO2 used as an input

Bit 5 = 0 - DIO3 used as an output  
= 1 - DIO3 used as an input

Bit 6 = 0 - DIO4 used as an output (Bit 0 = 0)  
= 1 - DIO4 used as an input

Bit 7 = 0 - DIO5 used as an output (Bit 0 = 0)  
= 1 - DIO5 used as an input

Default: 193

**S108 Transmit Level Control** - S108 sets the transmit level of the XE900SL10-N.

0 = Transmit level -5 dBm

1 = Transmit level 0 dBm

2 = Transmit level 5 dBm

3 = Transmit level 10 dBm\*

## FCC PART 15 REGULATIONS

### Mounting an XE900SL10 transceiver in Your Assembly

XE900SL10 transceivers must be mounted horizontally on your printed circuit board to maintain proper orientation of the transceiver. The XE900SL10 may not be co-located with any other antenna or transmitter.

### XE900SL10 Antenna

The XE900SL10 is certified for compliance to FCC Part 15 rules only using the Xecom XE900A10, 1/4 wave monopole antenna. Use of any other antenna violates FCC Part 15 rules.

### FCC Part 15 Certification

XE900SL10 transceivers have been certified per FCC Part 15 rules for integration into OEM products without further testing or certification. This certification is your assurance that the transceiver will not cause harmful interference.

### Labeling Requirements

FCC rules require the Original Equipment Manufacturer using the XE900SL10 to place an appropriate label on the outside of the finished equipment. The label must be clearly visible and include the information shown below.

#### Contains Transmitter Module

FCC ID: DWE-XE900SL10

#### WARNING:

This device complies with Part 15 of the FCC Rules. Its operation is subject to the following conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any received interference including interference that may cause undesired operation.

### Limitations

The XE900SL10 is registered under FCC Part 15 Rules. To utilize this registration on your OEM System you must follow the applications circuit provided in this data sheet and use one of the listed antennas. Any changes or modifications to the recommended circuit must be approved by Xecom. Failure to seek Xecom's approval for modifications could void certification of the end product.

### Warning: RF Exposure

The XE900SL10 is approved for mobile, base station applications. A minimum separation of 20 centimeters should be maintained between the antenna and the equipment operator. To ensure compliance, operation at distances closer than those defined is not recommended.

The Warning message below must be included in the user Manual for the end product.

*To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20 cm separation distance between the antenna and all persons.*

### FCC Notifications

The XE900SL10 generates radio frequency energy. It must be installed according to the manufacturer's guidelines stated in the data sheet or it has the potential to cause interference with other radio devices. Testing has been performed to assure that it conforms with the FCC Part 15 rules for intentional and unintentional radiators.

No further EMI compliance testing of the *transmitter* is required as long as the 20 cm separation and co-location requirements are observed. Each new use of the module will, however, need to be scanned for unintentional radiation from digital clocks, etc.

All necessary calibration has been performed at the time of manufacture. Any modification of the device after it leaves the factory is a violation of FCC rules.

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## Terms of Sale

Devices sold by XECOM are covered by the warranty provisions appearing in its Terms of Sale only. XECOM makes no warranty, express, statutory, implied, or by description regarding the information set forth herein, or regarding the freedom of the described devices from patent infringement. XECOM makes no warranty of merchantability or fitness for any purposes.

XECOM reserves the right to discontinue production and change specifications and prices at any time and without notice. This product is intended for use in normal commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment, are specifically not recommended without additional processing and authorization by XECOM for such application.

Xecom assumes no responsibility for the use of any circuitry other than circuitry embodied in a Xecom product. No other circuits, patents, or licenses are implied.

## Life Support Policy

Xecom's products are not authorized for use as Critical Components in Life Support Devices or Systems.

**Life Support Devices or Systems** are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions provided in the labeling, can be reasonably expected to result in significant injury to the user.

A **Critical Component** is any component of a life support device or system whose failure to perform can be reasonably expected to cause failure of the life support device or system, or to affect its safety or effectiveness.

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