



SED-485 v2
915MHz Encrypted
Wireless System Rev 2 23-04-2014

**WARNING: PLEASE READ
INSTALLATION INSTRUCTIONS
FIRST**

PRODUCT WARRANTY

This product is covered by a 12 month, **back to base warranty** from date of purchase, and proof of purchase should be supplied. The warranty does not cover damage that has resulted from the improper installation or improper use of this product.

The warranty does not cover lightning damage, product misuse, electrical surges or acts of God.

LIMITATION OF LIABILITY

Sec-Eng Systems Pty Ltd does not accept any liability for the loss or damage to property or persons in relation to goods supplied. This disclaimer is only limited to the warranty of the goods supplied and the intended use.

THIS MANUAL IS SUBJECT TO COPYRIGHT

**SEC-ENG SYSTEMS
SYDNEY AUSTRALIA**

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Wireless System Overview

The SED-485 is a 915 MHz encrypted wireless product that has been designed to operate on a RS485 or RS232 output capable device, such as GE Challenger™, which allows RS485 or RS232 data communications to be operated over a wireless communication link.

The unit has been designed to operate as a peer to peer communication link, where by cables are difficult to run, and wireless is the only solution.

This unit is also capable for controlling a relay board with 4 inputs and 4 output (optional).

RULES OF THIS PRODUCT

1. The Yagi antennas must be line of sight (no exceptions).
2. The operational range is about 500m to 700m line of sight, however this can sometimes be more or even less depending on the area and conditions and the amount of RF interference.
3. The signal LEDs on the SED-485 must be at full strength at both ends. This will ensure high data rates and low transmission errors.
4. You must first pre-test the SED-485 unit on site, to ensure they are going to work in the environment that you are installing.

PRE-TEST SETUP

Wire the antenna and point them towards one another in the area you intend to install them. It must be line of sight. See next page for instructions for installing the Yagi antennas.



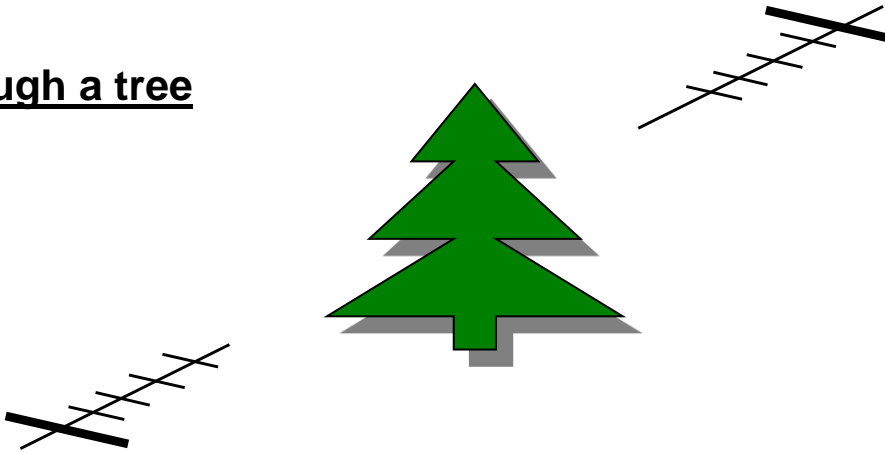
After applying power you should be able to see POWER LED on, and then the signal strength LEDs will come up, indicating strength of signal with the other side. If full signal is observed, you may proceed with the installation. If signal is not strong enough, you may need to increase the signal strength via PC Programming on page 7.

Please Read This

The SED-485 system requires line of sight from the antenna.

Here are some examples of how not to install:

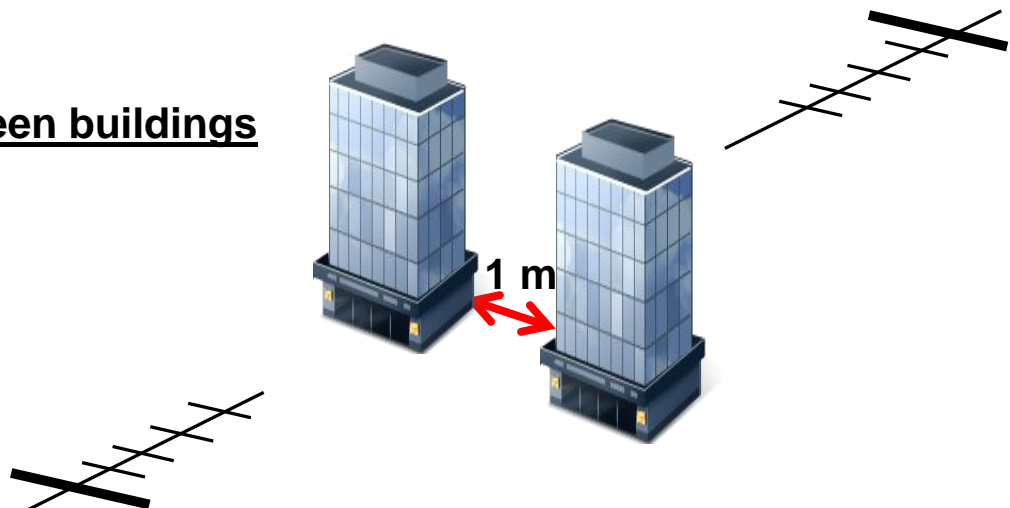
1. Through a tree



2. Through a building

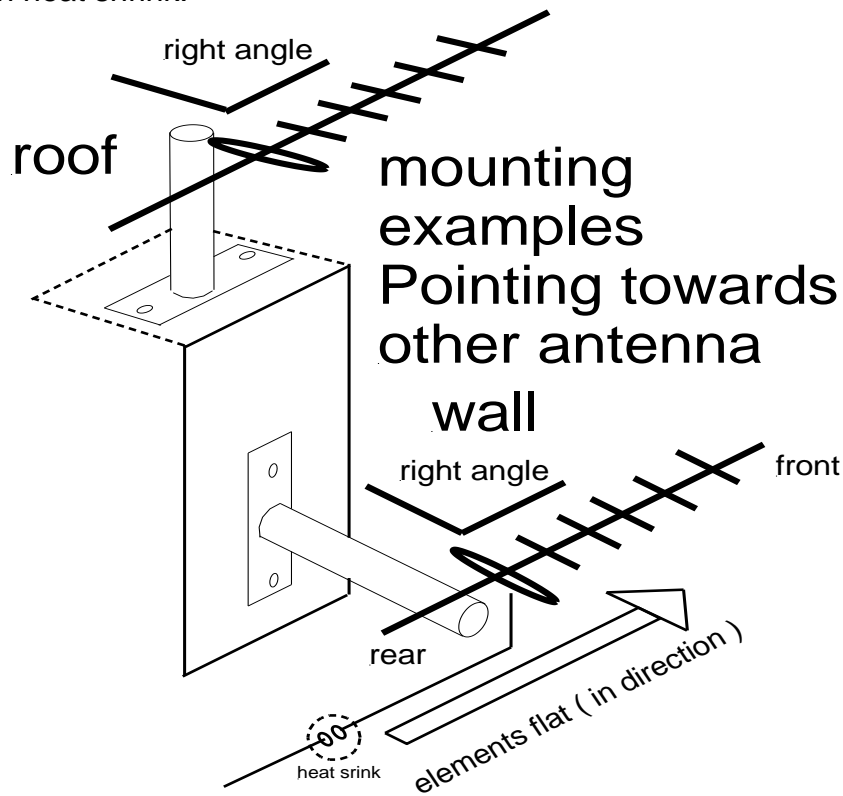


3. Between buildings



INSTALLATION OF YAGI ANTENNA

- The Yagi antenna must be pointed towards one another, a minimum amount of coax cable has been supplied, we don't recommend extending it.
- If extension is needed, we recommend to run 20m-50m from the Main GE Challenger™ to the SED-485, instead extending the antenna cable.
- When installing the antenna, they needed to be mounted at a **right angle** from the bracket and at the **same polar orientation** (see diagram below).
- The external TNC connector that connects the coax to the antenna must be covered in heat shrink.



NOTE:

The termination box on top of the antenna must be in this position, pointing upwards as shown, so water can run off.

DO NOT mount upside down as this may trap water and cause the antenna to fail!!!

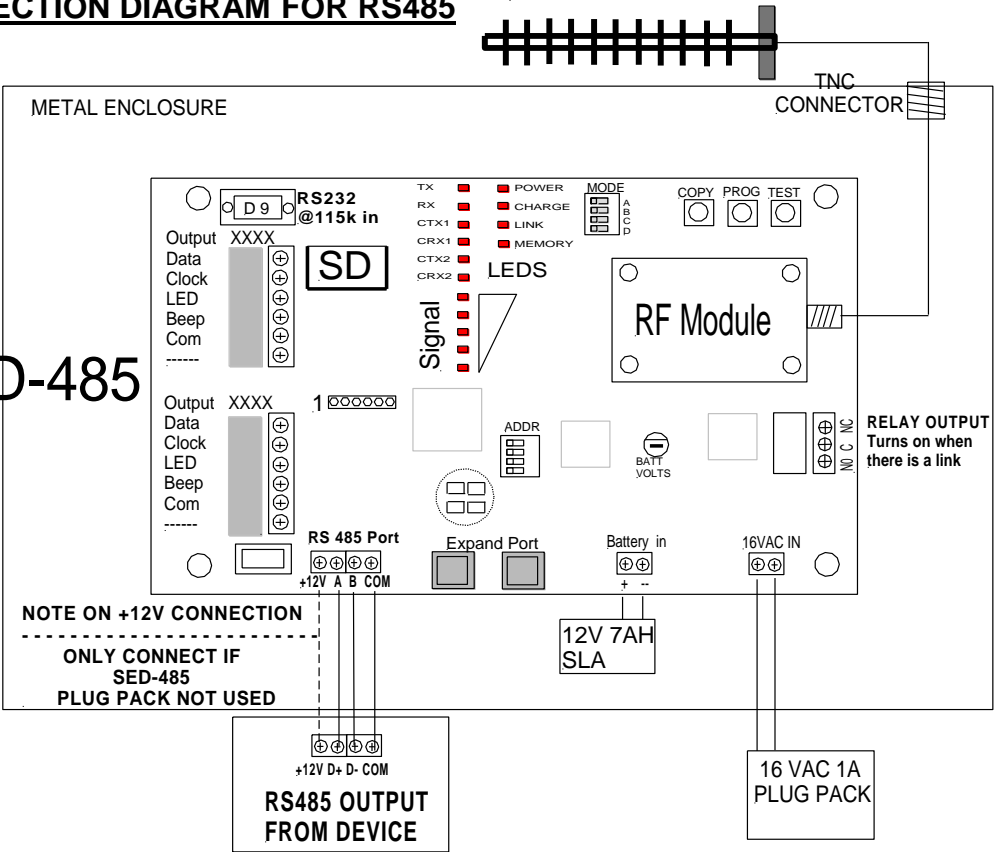
STEP BY STEP GUIDE FOR RS485, FOR WIRELESS RS232 SETUP. REFER TO PAGE 7 AND 8.

1. Connect the coax antenna cable to the TNC connector on top of the metal enclosure.
2. If programming is needed, turn DIP switch 4 to ON (on the top of the SED-485 board) to enable programming . If not leave the DIP switch 4 OFF
3. Connect the supplied plug pack to 16VAC input and power on the unit.
4. Refer to page 10 on how to change the baud rate and transmission power to suit your application. Note both units must be programmed to the same settings. After programming turn DIP switch 4 to OFF and power cycle the unit.
5. Connect the RS485 to the output of the RS485 output of the device such as GE Challenger™. See next page for instructions for the RS485 connections.
6. Repeat the same procedure for the other unit. Once done you should be able to see LINK LED and signals LEDs on both sides and you can perform your RS485 link test.
7. Connect a 12V backup battery to the BATT port for battery backup for both units if necessary.

CONNECTION DIAGRAM FOR RS485

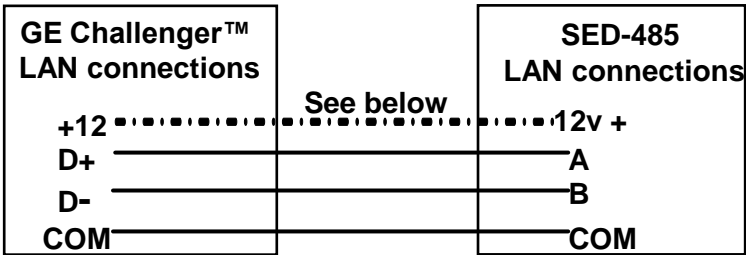
YAGI ANTENNA

SED-485



CONNECTING THE 485 LAN

- 1. It is very important before you install any device such as GE Challenger™ equipment on the SED-485 System, you should first connect your system with wiring and configure it, to a basic standard before adding the pair of SED-485 wireless system in the middle (this ensures that it worked prior to going wireless) .
- 2. If the hard-wired connection is working, you can connect your RS485 output to the SED-485, as per the diagram below.



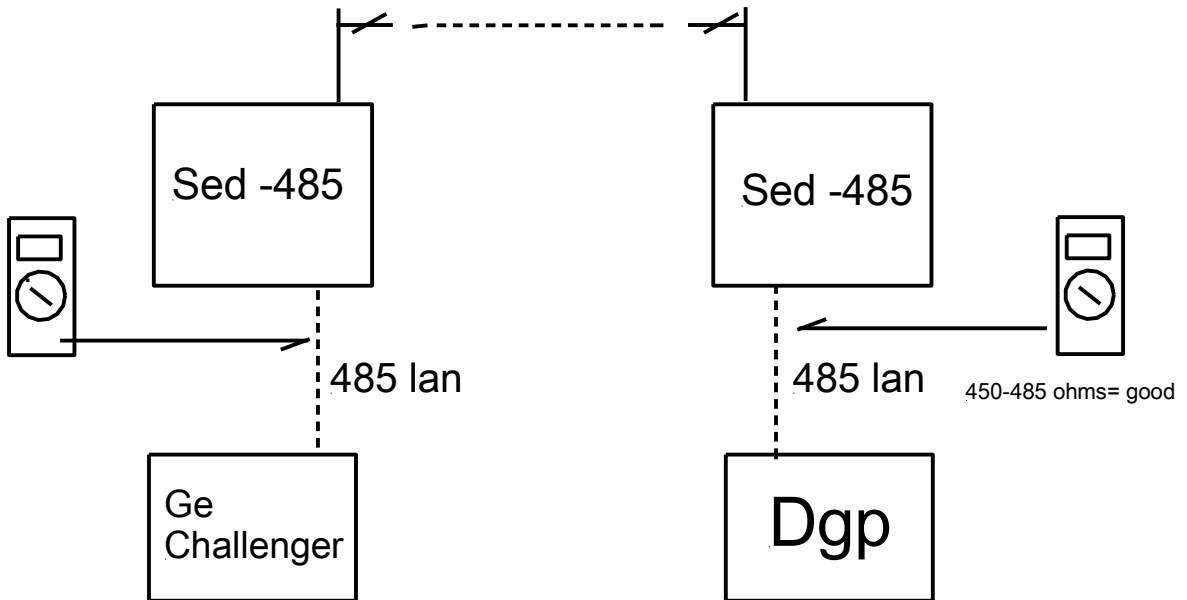
POWER & CONNECTIONS

- 1. If the SED-485 is going to be powered from a plug pack, DO NOT connect the 12V power connection to the GE Challenger™ .
- 2. If you have a 12VDC power from any GE Challenger™ equipment and can supply 12VDC at 300mA, you may power the SED-901-RS485 without the need to connect the AC plug pack and the backup battery.
- 3. Connections:

16VAC:	16VAC 1A plug pack supplied
+BAT-:	12V 7aH SLA battery for backup
RS485 +12V:	+12 on GE Challenger™
RS485 COM:	COM on GE Challenger™
RS485 A:	D+ on GE Challenger™
RS485 B:	D- on GE Challenger™

Pre testing

Tecom challenger Lan set up and balance
Please perform the following



With No power on any the units measure
across the LAN A+B resistance
You should have between 450 ohms and 485 ohms resistance
if your lan is balanced.if you have between 10k and 18k your lan is not balanced
go and remove all term links except for 1 to get a reading of 450 to 485 ohms

Note 225 Ohm indicates they have double links in

LEDS

POWER	Power on
CHARGE	indicates battery charging (if fitted)
LINK	indicates RF link is present
MEMORY	indicated SD card fitted
TX	packet being transmitted
RX	packets being received
CTX1	RS232 port transmitting data
CRX1	RS232 port receiving data
CTX2	RS485 port transmitting data
CRX2	RS485 port receiving data
Signal	1 to 5 Lowest to Highest

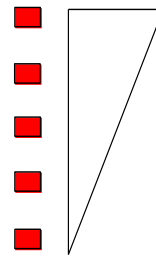
LEDS

TX	■	■	POWER
RX	■	■	CHARGE
CTX1	■	■	LINK
CRX1	■	■	MEMORY

CTX2 ■

CRX2 ■

SIGNAL



MODE SWITCH (Centre top)

- Switch 1 = NOT USED, Leave at OFF position
- Switch 2 = NOT USED, Leave at OFF position
- Switch 3 = NOT USED, Leave at OFF position
- Switch 4 = ON for program mode via serial port @115k 8N1
OFF normal operation

ADDRESS SWITCH (Centre bottom)

NOT USED, Leave all OFF.

PUSH BUTTON SWITCHES (Top right)

- COPY NOT USED
- PROG NOT USED
- TEST NOT USED

TESTING

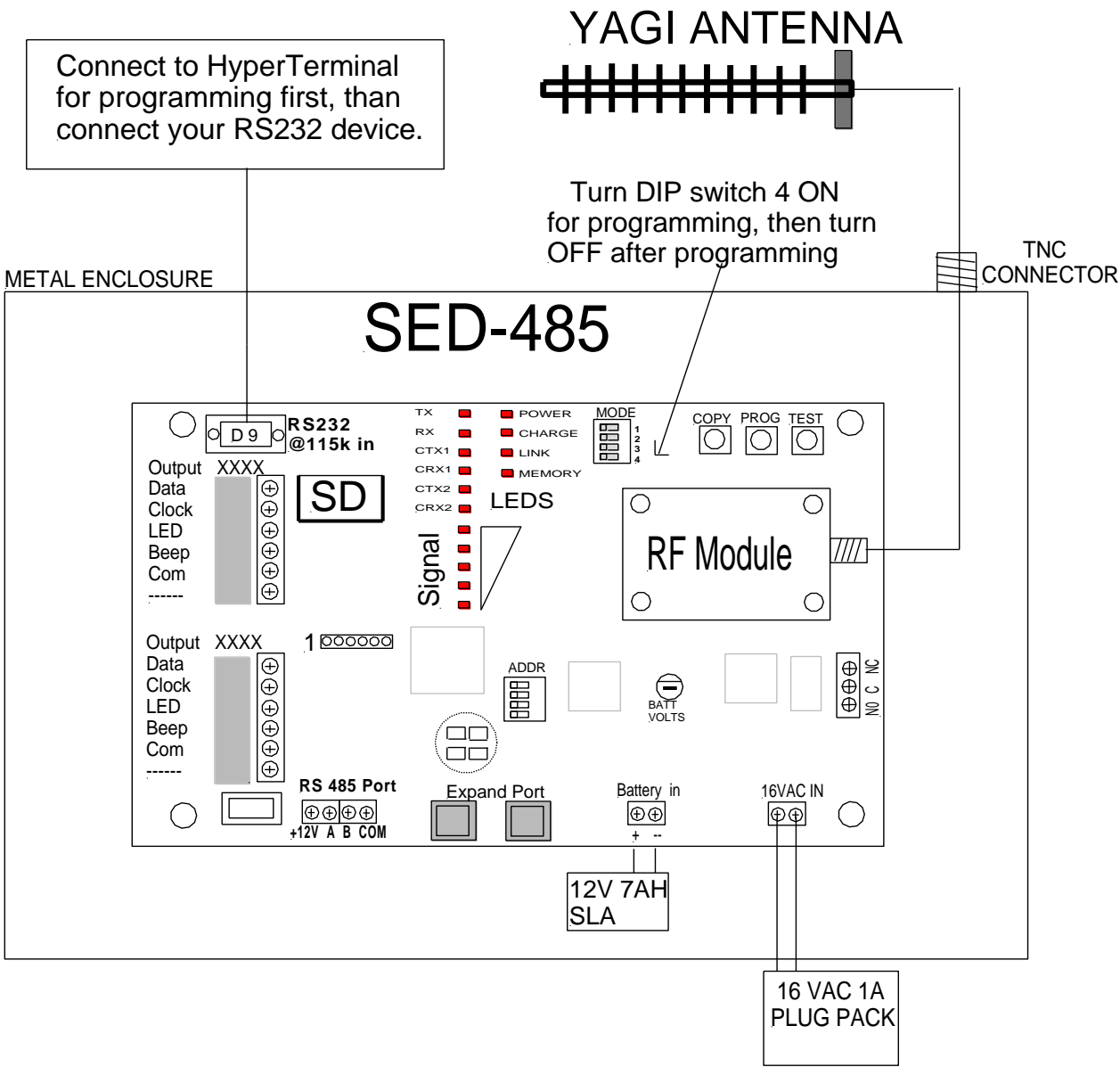
1. Ensure the POWER, CHARGE and SIGNAL LEDs are ON on the SED-485 board.
2. With the GE Challenger™ connected, the TX and RX lights should be on to indicate RS485 data back and forth.
3. Signal strength should be strong, if you drop below 4 bars you will be risking high LAN data errors.
4. If all looks OK start data test.
5. Through the GE Challenger™ code pad:
 - a. Enter Menu Mode
 - b. Go to option 19 installer mode
 - c. Go to option 23 poll errors
 - d. Select number 3 clear
 - e. Check the poll error counter, it should be at 0.
 - f. Wait 5 minutes and then go and select what the SED-485 has been connected to. i.e. RAS or DGP and select that address and check the poll error count, it should be very low, i.e. 1 or 2.
 - g. If it is high, check your signal and retest.

**FOLLOW STEPS BELOW IF YOU INTEND TO USE THE
SED-485 AS RS232 WIRELESS LINK**

STEP BY STEP GUIDE FOR RS232

1. Connect the coax antenna cable to the TNC connector on top of the metal enclosure.
2. You must first configure the pair of SED-485 prior to use as RS232 wireless link. Connect the Male 9-Pin D-Connector from your PC / laptop with HyperTerminal to the RS232 port on top left of the board for programming.
3. On the top of the SED-485 board, turn DIP switch 4 to ON to enable programming.
4. Connect the supplied plug pack to 16VAC input and power on the unit.
5. Refer to page 10 on how to change the operation of comms port, baud rate and transmission power to suit your application. Note both units must be programmed to the same settings.
6. Once all programming is done, turn DIP switch 4 to OFF position. Swap your serial connection from your programming PC / Laptop to your RS232 device.
7. Power cycle the unit.
8. Repeat the same procedure for the other unit. Once done you should be able to see LINK LED and signals LEDS on both sides and you can perform your RS232 link test.
9. Connect a 12V backup battery to the BATT port for battery backup for both units if necessary.

CONNECTION DIAGRAM FOR RS232



NOTE : YOU SHOULD ONLY ENTER THIS MODE IF YOU NEED TO MAKE CHANGES



The SED-485 can be configured via a serial port. To do this you will require a Laptop or PC with a serial port. Connect a PC or Laptop to the Serial Port on the SED-485 Board. **TURN DIP SWITCH 4 ON TO ENABLE PROGRAM MODE and power reset the unit.** Open Windows HyperTerminal on any PC or laptop, set your Serial Port for **115k 8N1**. This should allow you to directly communicate with the SED-485. Once connected, press **ENTER**, you are then required to enter a password **zxcvbnm** then press ENTER.

If you press ENTER you will be given a list of command options:

Command Options:

REBOOT

SYSTEM ID=***** [0 to 30000]

TX POWER=* [0 to 4]

CHANNEL=* [0 to 9]

BAUD RATE=* [1 to 9]

COMMS PORT=* [0 or 1]

If you type ?p it will show you the programmed settings in the SED-485

SED-901 RS485 R1.01 02Dec2010

System ID = 7895

TX power = 100mW (2)

Channel = 6

Baud rate = 9600 (4)

Comms port = RS485 (0)

NOTE:

BOTH UNITS MUST HAVE EXACTLY THE SAME PROGRAMMING SETTINGS IN ORDER TO WORK

AFTER ANY CHANGES MADE YOU MUST POWER RESET THE UNIT TO ALLOW THE CHANGES TO TAKE EFFECT!!!

SYSTEM ID=[0 to 30000] Default=7895 or has been changed by Sec Eng

This sets the RFID tag. You would only change this if you have more than 1 set of SED-485 operating in the same area.

To change, type SYSTEM ID=XXXXX (XXXXX = 5 numeric digits, 0 to 30000).

TX POWER= [0 to 4] Default= 100mw (2)

This sets the power transmission level.

If you are not using over a long distance, you should set it to a mid level.

Settings 0 = 1mW
 1 = 10mW
 2 = 100mW
 3 = 500mW
 4 = 1000mW

To change, type TX POWER=X (X = 0 to 4).

MY CHANNEL=[0 to 9] Default = 6

This sets the Radio channel ID. You would only change this if you have more than 1 set of SED-485 operating in the same area.

To change, type MY CHANNEL= X (X = 0 to 9).

BAUD RATE= [0 to 9] Default= 9600 (4)

This sets the baud rate in baud per second (bps). Set to your required baud rate according to your system configuration, i.e. set to 4800 (3) if you use GE Challenger™.

Settings: 1 = 1200 2 = 2400 3 = 4800
 4 = 9600 5 = 19200 6 = 38400
 7 = 57600 8 = 115200 9 = 230400

To change, type baud rate=x (X = 1 to 9).

COMMS PORT=[0 to 1] Default= RS485 (0)

This sets the communication protocol. You can choose to use either RS485 or RS232.

Settings 0 = RS485
 1 = RS232

To change, type comms port=x (X = 0 or 1).

HOW TO DEFAULT THE UNIT TO FACTORY SETTING

To default the SED-485 - hold **COPY, PROG and TEST** buttons down altogether for 3 seconds. When you do this, the signal display will go blank and the LEDs will turn on one by one, **the unit has now defaulted.**

TECHNICAL SUPPORT

Contact Sec-Eng Systems for technical support

Phone 02-9524 9952

Mon – Fri 8.30AM to 5.00PM AEST

WWW.SECENG.COM.AU

Each RF module is compliant under the following:

DECLARATION OF CONFORMITY

MANUFACTURER'S NAME/ADDRESS:

Max Stream, Inc 355 South 520 West Suite 180 Lindon, UT 84058 USA

LABORATORIES: UltraTech EMC Labs Inc. {ITI (UK) accredited test facilities}

3000 Bristol Circle Oakville, Ontario, Canada L6H 6G4

EQUIPMENT TYPE / ENVIRONMENT: Radio Communications Equipment

TRADE NAME / MODEL NO.: 9XTEND, Model XT09

GRANTEE'S NAME: Max Stream, Inc

RF OUTPUT POWER: 29.83 dBm e.i.r.p peak maximum

Tx FREQUENCY RANGE: 915.750 – 927.265 MHz

Rx FREQUENCY RANGE: 915.750 – 927.265 MHz

Emission Designation: 221K1F1D Duty Cycle: 100%

YEAR OF MANUFACTURE: 2005 COUNTRY OF MANUFACTURE: USA

STANDARD(S) TO WHICH CONFORMITY IS DECLARED: Australian/New Zealand Standard AS/NZS 4771:2000 – Technical characteristics and test conditions for data transmission equipment operating in the 900 MHz, 2.4 GHz and 5.8 GHz bands and using spread spectrum modulation techniques.

SEC-ENG HARDWARE SPECIFICATIONS

Radio transmission: Type 915-928 MHz Module, C-Tick N15131

Power output: 1000mW

Type: Spread spectrum frequency hopping

Security: Code locked 48 bit key encryption. Propriety per pair

Current draw: On transmission 250 mA

Austel compliance N3884 on complete product SED-485