



SMARTLINE

WIRELESS INTERFACE SYSTEM



INSTALLATION MANUAL

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2. Overview

Equipment List

A SmartLine Wireless System consists of the following equipment:

1. Master Interface/Receiver Unit
2. Programming LCD Keypad (for programming purposes only)
3. 2 metre **null-modem** cable
4. 12V DC 1.5A Plug Pack
5. Installation Manual
6. Extended Receiver Boards 100-GRX (sold separately)
7. Wireless Devices (sold separately)

Introduction

The **SmartLine Wireless Interface System** is capable of handling all of **SmartLink's Wireless Devices** and connects directly to a range of SmartLink's monitoring software packages.

When a device is **activated** the alarm is **reported** directly to the **monitoring software** via a standard **serial port** which in turn can **send a message to a recipient** in several forms and protocols* (e.g. paging, SMS, DECT, remote displays and even e-mail).

Monitoring Software Compatibility

The SmartLine Wireless Interface is compatible with the following SmartLink Monitoring Software:

1. SmartWatch XP (SmartLink 2002)
2. SmartLink NT
3. SmartLink-4 (DOS)

Master Interface

The **Master Interface** (default Dip Switch Settings – only 1, 5 & 8 ON) can be connected to **SmartLink Monitoring Software** via an available serial port. It can be programmed with *SmartLink Wireless Devices* (500 Wireless Devices) that will be constantly monitored for activity.

The Master interface also serves as a wireless receiver and can be used as a stand alone receiver (with a nominal range of 50 metres) or in parallel with multiple other **Extended Receiver Boards**.

LCD Keypad

The **LCD Keypad** (default Dip Switch Settings – only 5 & 8 ON) are primarily used for programming SmartLine and can be easily connected to the *Master Interface* at any time to allow the addition, removal or modification of *SmartLine Wireless Devices* within the SmartLine Wireless system.

Multiple LCD Keypads can be connected anywhere on the system using the hard-wire cable that connects the receivers, however note that they also draw significantly more current than any other device in the system. For further information on wiring additional keypads using the four-wire cable please contact SmartLink International Pty Ltd.

Extended Receiver Boards

Receiving range can be extended using additional **Extended Receiver Boards (Part No. 100-GRX)** which communicate via a simple hard-wired connection.

SmartLine is only compatible with SmartLink's 40-bit receivers which have a nominal range of 50 metres.

Wireless Devices

SmartLine is compatible with the following **SmartLink Wireless Devices**:

- Single/Three-button Wrist Watch Pendants
- Three-button Box Style Pendants
- Wireless Call Points
- Man-Down Transmitters
- Smoke Detectors
- Door Reeds
- PIRs

Power Supply

The SmartLine system comes with a **12Volt DC 1.5Amp plug pack**. An alternative supply of to 18V is also acceptable.

The **Master Interface** draws approximately **20mA** and each additional **Extended Receiver** draws approximately **15mA** and requires at least **7.5V** to function correctly. **LCD Keypads** draw approximately **80mA** each.

Note: If the total system current drawn is greater than 1.5 Amps an alternative power source must be used.

Extended Receiver Boards should be supplied power via the connector on the Master Interface to ensure a common ground along the bus. The output voltage for the extended receivers is approximately 2V lower than the DC Supply to the Master Interface (therefore nominally 10V).

For systems with multiple **Extended Receivers** it is recommended that the 0V terminals of the **DC Power Supply input** and the **Extended Receiver interface** be connected to provide a common reference.

Master Interface		Max	Typ	Min	Units
V _{IN}	Master Input Voltage	18	12	8	V _{DC}
V _{OUT}	Master Output Voltage (for Extended Receivers)		V _{IN} – 2		V _{DC}
V _{LOW}	Low Voltage Trigger		9		V _{DC}
I _{IN}	Master Supply Current		20		mA

Extended Receiver Board (100-GRX)		Max	Typ	Min	Units
V _{IN}	Extended Receiver Supply Voltage	16	10	7.5	V _{DC}
I _{IN}	Extended Receiver Supply Current		15		mA

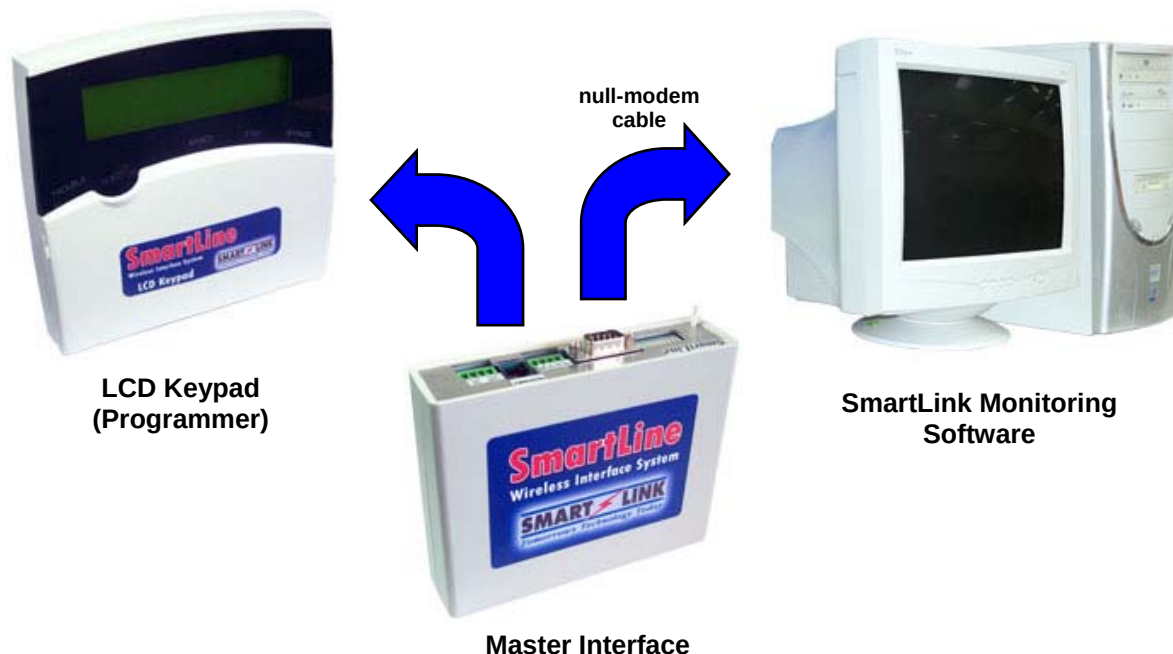
LCD Keypad		Max	Typ	Min	Units
V _{IN}	Keypad Input Voltage			8.5	V _{DC}
I _{IN}	Keypad Input Current		80		mA

Note: When using Category 5 cable to supply the Extended Receivers factor a voltage drop of 1.5mV per metre for each Extended Receiver Board.

The Master Interface monitors the power supply voltage. Should the voltage drop **below 9V** a DC **power failure message** (to **Client Account 9918**) will be sent to the monitoring software. This can be used to monitor a backup battery or cases of excessive current loading on the power supply.

3. Hardware Setup

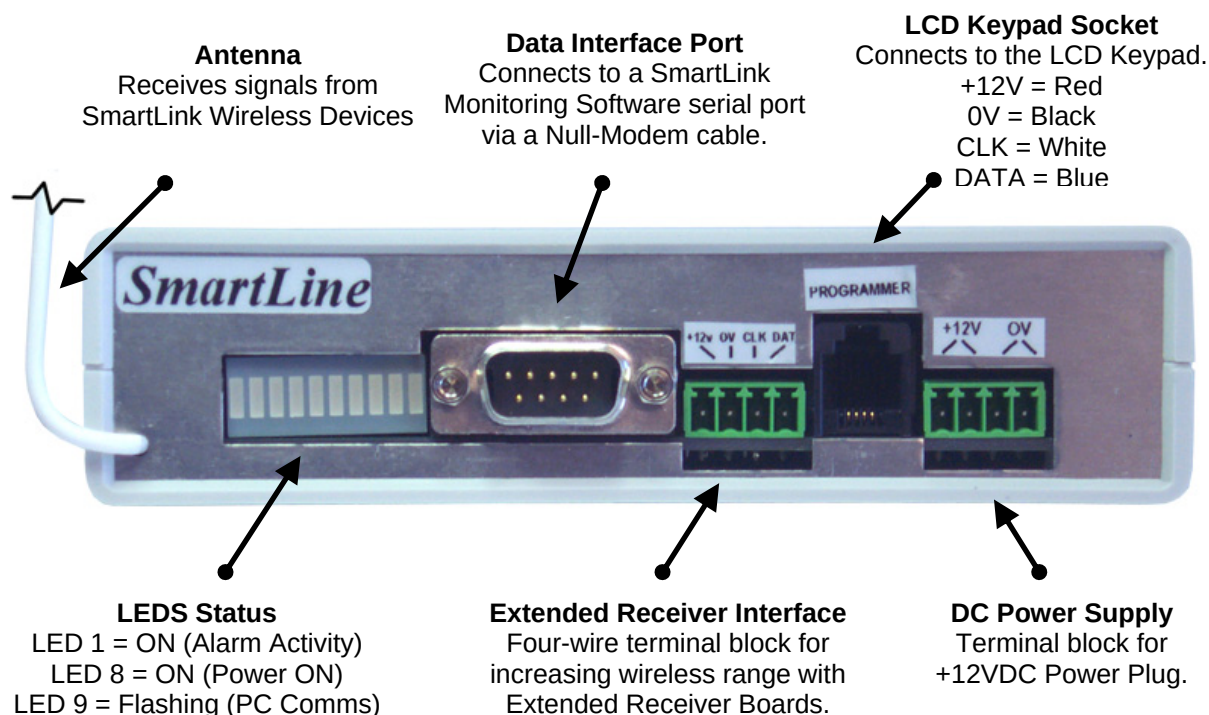
Basic System Configuration



Master Interface

The Master Interface serves as the hub of the system. It stores all Device and Client information in memory and communicates all alarms to the Monitoring Software. It has a built-in wireless receiver meaning it can directly monitor wireless devices for activity. Range can be extended by interfacing with Extended Receiver Boards.

The main visible features on the SmartLine Master Interface can be identified as:



4. Wireless Coverage

Maximising Receiver Range

In order to maximise the receiving range of your Wireless Devices it is recommended that you mount the Master Receiver in a central position within your desired coverage area with as minimal physical obstructions as possible. The longest range is normally produced with a line-of-sight configuration (i.e. no physical obstruction between the wireless transmitting device and the receiver).

Extending Range

Extended Receiver Boards can be used to expand coverage. The coverage areas of both the Master Interface and the Extended Receiver Board(s) can be overlapped as desired (see Figure 1) or independently arranged (see Figure 2) or a combination as required.

Overlapped Coverage

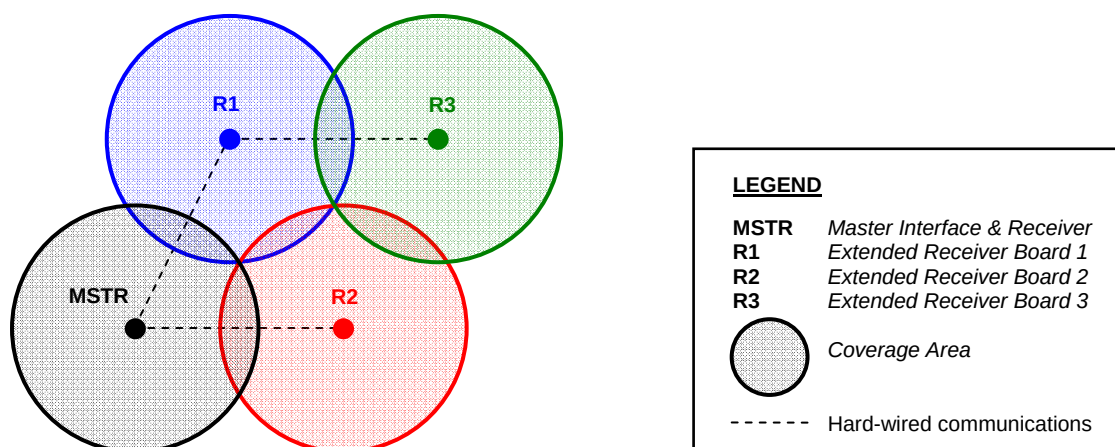


Figure 1 – Overlapped Coverage

Independent Coverage

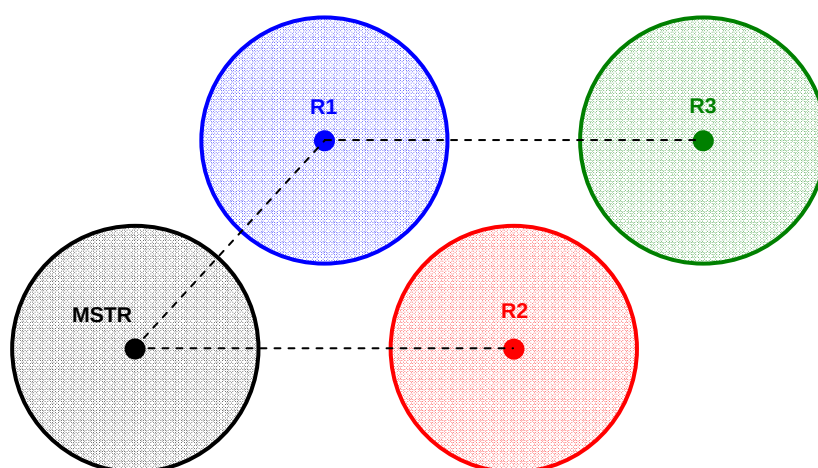


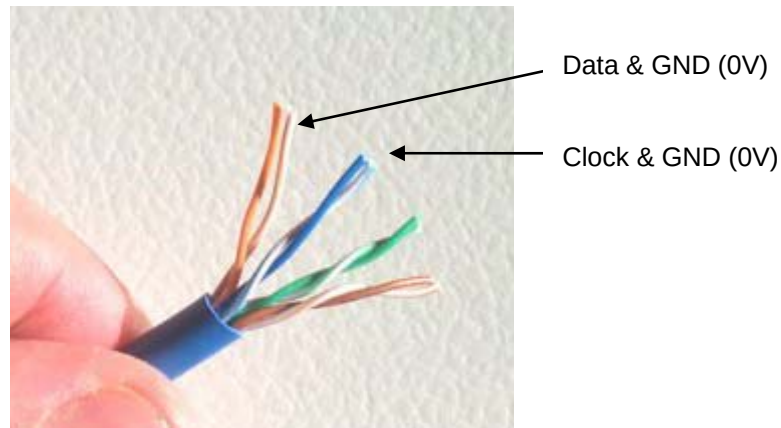
Figure 2 – Independent Coverage

Cable requirements

Communication between the Master Interface and Extended Receiver Boards is achieved via a four line bus consisting of Data, Clock, 12 Volts and Ground (0V). To ensure data integrity along the bus it is recommended that **Category 5 (CAT-5)** twisted pair cable be used for cabling between the Master Interface and Extended Receiver Boards. **Signals can be maintained over distance of up to 200* metres.**

* Distance may vary depending on environmental conditions. Distances of up to 500 metres between receivers are possible under ideal conditions.

DO NOT use shielded cable. For environments where external interference may be factor or when data integrity over longer distances is desired, use a single twisted pair for each of the Data and Clock lines (see Diagram below).



Wiring Diagram

Extended Receiver Boards should be hard-wired to the Master Interface in the following manner (both daisy chain and star configurations are acceptable):

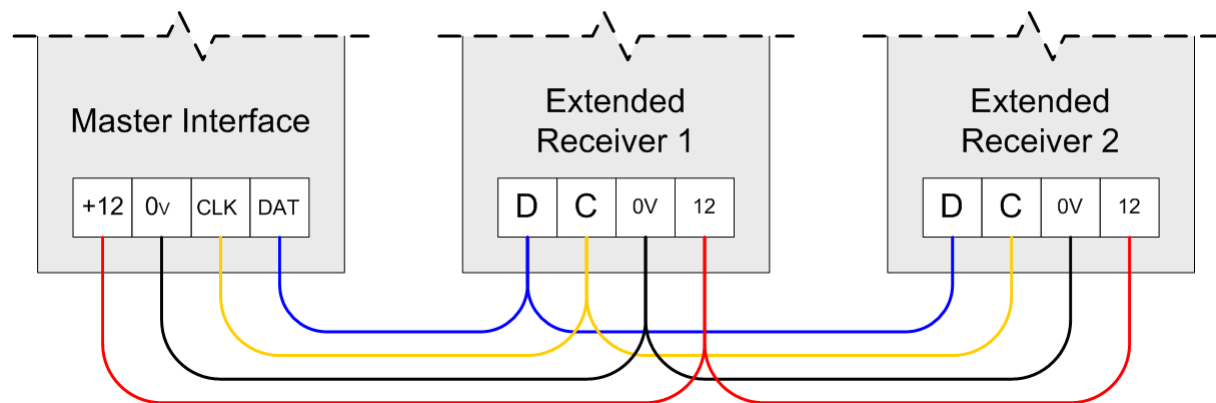


Figure 3 – Extended Receiver Wiring Diagram

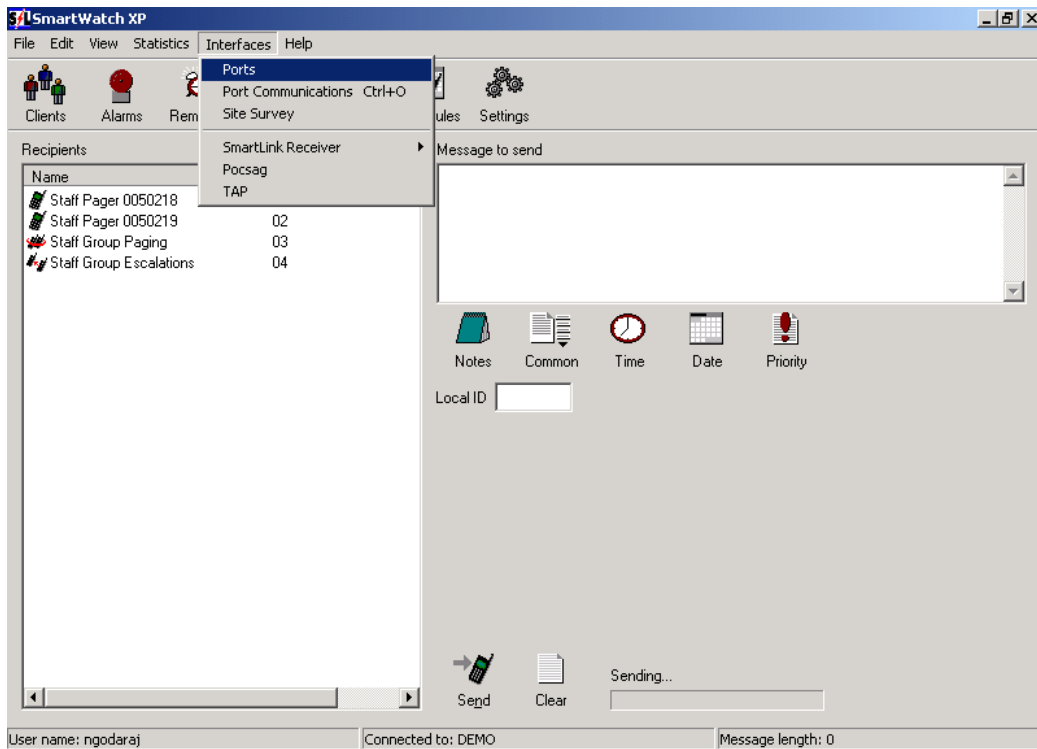
Provided enough power is supplied to each of the boards, the SmartLine system can handle up to 200 extended receiver boards to a single Master Interface.

Note: For systems with multiple **Extended Receivers** it is recommended that the 0V terminals of the **DC Power Supply input** and the **Extended Receiver interface** be connected to provide a common reference.

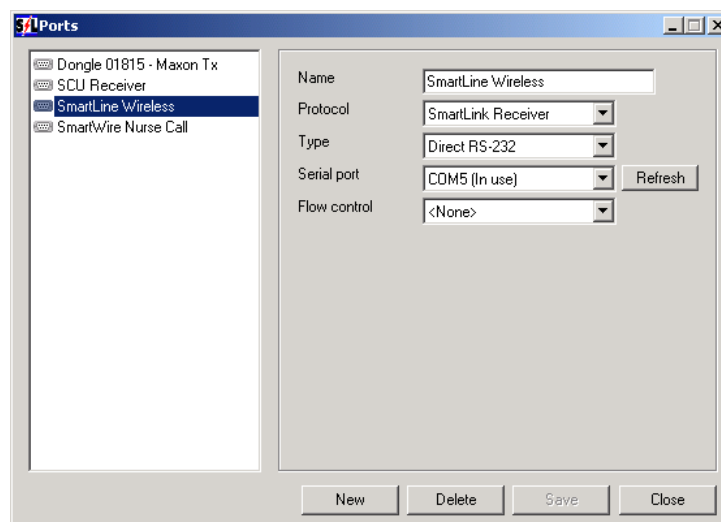
5. SmartWatch XP Monitoring Software Setup

Setting up the Port

1. Ensure you are logged on as **Maintenance User** (see SmartWatch XP Help for details).
2. Select **Ports** from the **Interfaces** Menu.

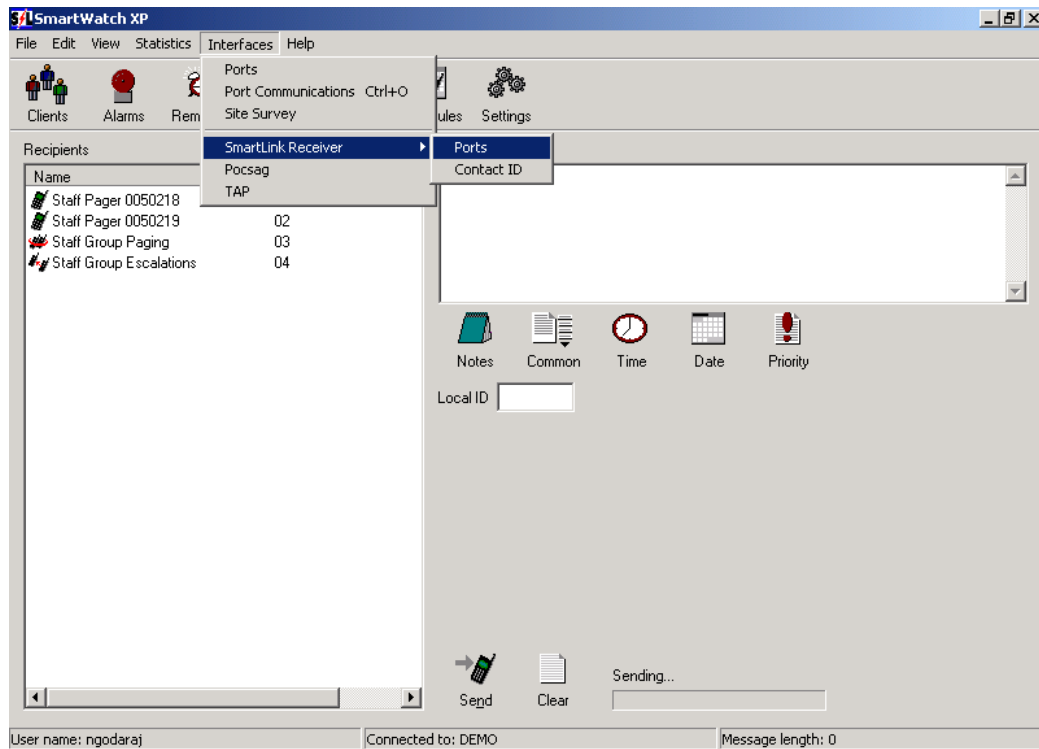


3. Click **New** and type **SmartLine Wireless** as the **Name**.

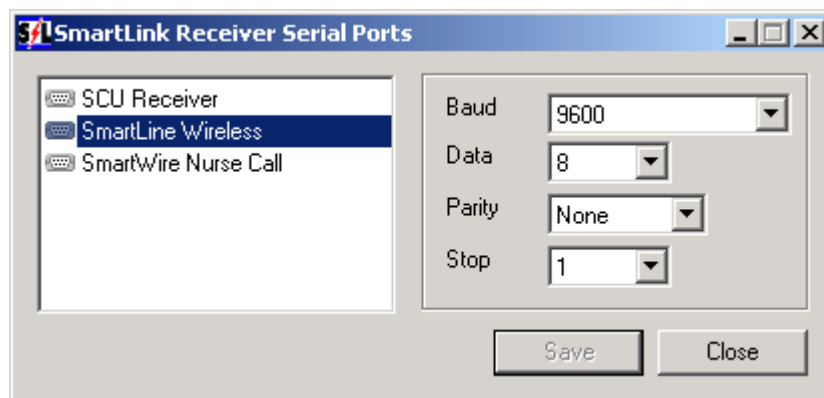


4. Select **SmartLink Receiver** as the **Protocol**.
5. Select **Direct RS-232** as the **Type**.
6. Select an available **COM** for the **Serial Port** and ensuring your Master Unit is connected to that port.
7. Select **<None>** as the **Flow control**.
8. Click **Save**, then **Refresh** and **Close** when completed.

9. Now select **SmartLink Receiver** and then **Ports** from the **Interfaces** Menu.



10. Click/Highlight **SmartLine Wireless**.



11. Select **9600** as the **Baud** rate, **Data=8**, **Parity=None** & **Stop=1**.
12. Click **Save** and then **Close** when completed.

System Client Code (Client Code 9918)

Low supply voltage conditions are reported to the SmartLink Monitoring software on **Client Code 9918**. To save confusion it is recommended that the system administrator enters a new Client with code **9918** named **SmartLine Master Interface**.

All additional clients entered on SmartLine must be replicated on the monitoring software. Note that slot information is **NOT** sent to the monitoring software and is for device programming purposes only.

Setting up SmartLink Clients

SmartLink Clients in SmartWatch XP are records describing customer or sites for whom SmartLink devices such as Medi-Call Diallers Units, SmartWire Nurse Call and SmartLine Wireless Call Points etc. are installed and registered with SmartWatch XP. The alarm information will come in through the ports configured as SmartLink Receivers.

Simply click **Clients** (or **SmartLink Clients** under the **Edit Menu**).

The screenshot shows the 'SmartLink Clients - Edit' window. On the left is a list of clients with columns 'Name' and 'Code'. 'Mrs Brown' with code '1234' is selected. The main form area contains the following fields and controls:

- Name:** Text field with 'Mrs Brown'.
- Code:** Text field with '1234'.
- Phone:** Text field with '95960770'.
- Address:** Text field with '475 Nepean Highway, Brighton VIC 3186'.
- Recipient:** Dropdown menu with 'Staff Group Escalations' selected.
- Maintenance:** Dropdown menu with 'Staff Group Escalations' selected.
- Expect Check-in:** A checkbox labeled 'Expect Check-in every' followed by a text field for 'days'.
- Notes:** A large text area.
- Zones:** Eight dropdown menus labeled 1 through 8. The values are: 1 Medical Pendant, 2 Medical Pendant, 3 Smoke Detector, 4 Dementia, 5 Patient, 6 Wet Area, 7 Staff Assist, 8 Duress Pendant.
- Contacts:** A table with columns 'Name', 'Association', 'Phone 1', and 'Phone 2'. It is currently empty.
- Buttons:** 'Add', 'Edit', and 'Remove' buttons are to the right of the Contacts table. 'New', 'Delete', 'Save', and 'Close' buttons are at the bottom of the window.

IMPORTANT: The Name and Code fields are the minimum required to add a SmartLink Client. Each Client must have a unique Code between 0001 to 9999. Some Codes are fixed in to various other SmartLink Products and Systems. If you are unsure which codes are available, simply increment starting 0001 and consult your hardware manuals for further details.

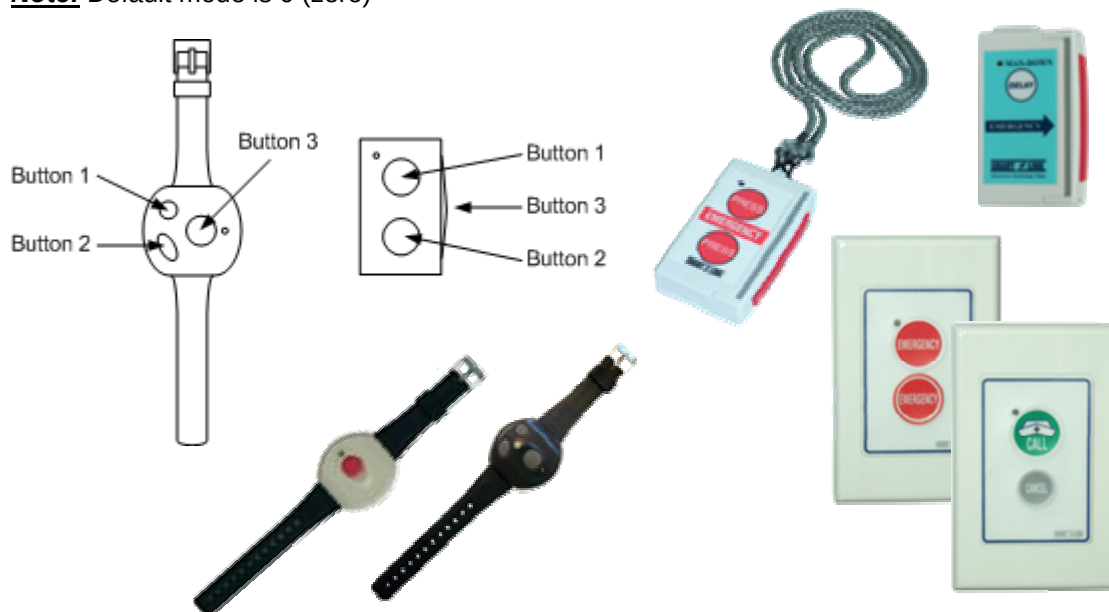
1. To add a new SmartLink Client, simply click **New**.
2. Enter a **Name** to appear on the main Clients list and on the client alarms screen.
3. Enter a Client **Code** as the unique four digit identifier for the selected client.
4. Enter the **Phone** number for the location if applicable. Leave this field blank for systems that do not require telephone number.
5. Enter the **Address** for the location if applicable. Leave this field blank for systems that do not require an Address.
6. Select the **Recipient** to which messages regarding Call/Emergency activations and Cancels will be sent if applicable.
7. Select the **Maintenance** to which system and maintenance messages eg. Low Battery, Mains Fail, etc (see SmartLink Call Types) are sent.
8. Check the **Expect Check-In** box and enter a period in days if the client equipment is required to call in within the specified period (primarily for Medi-Call Dialler units only).
9. Use **Notes** to annotate pertinent facts regarding this Client.
10. Enter a description for each of the **Zone** Fields. Zone (or Channel) names should match the actual SmartLink Devices. For example, Medi-Call Diallers and SmartLine Wireless Systems can handle up to 8 separate wireless devices which can be programmed to report on each of the available zones. **NOTE: The Medi-Call Unit's Red (Help) Button default reporting to Zone (Channel) 6. Refer to the Medi-Call Installation Manual as to how this can be changed for particular applications.**
11. Click **Save** and then **Close** when completed.

6. Wireless Devices

Pendants

Three button pendants shall all use the alarm types defined for Buttons 1, 2 and 3 for the selected mode.

Note: Default mode is 0 (zero)



Detectors

Detectors shall use the alarm type defined for Button 1 for the selected mode. Device tamper corresponds with the alarm type defined for Button 3.



Reed Switches

Reed Switches shall use the alarm types defined for Buttons 1 and 2 for the selected mode. Device tamper corresponds with the alarm type defined for Button 3.



7. Device Modes

Device Modes

Each Device shall have an allocated 'mode of operation' that shall define the communication to the monitoring software for each of the devices buttons (or activity).

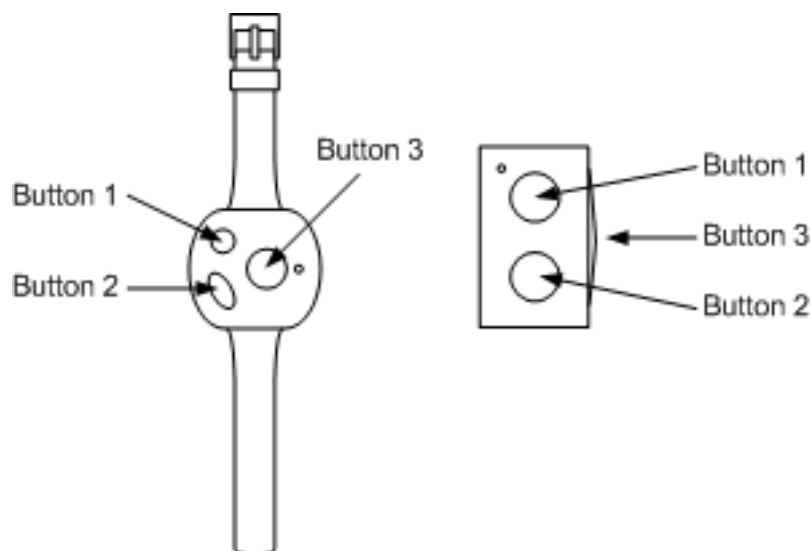


Table 1 – Device Modes

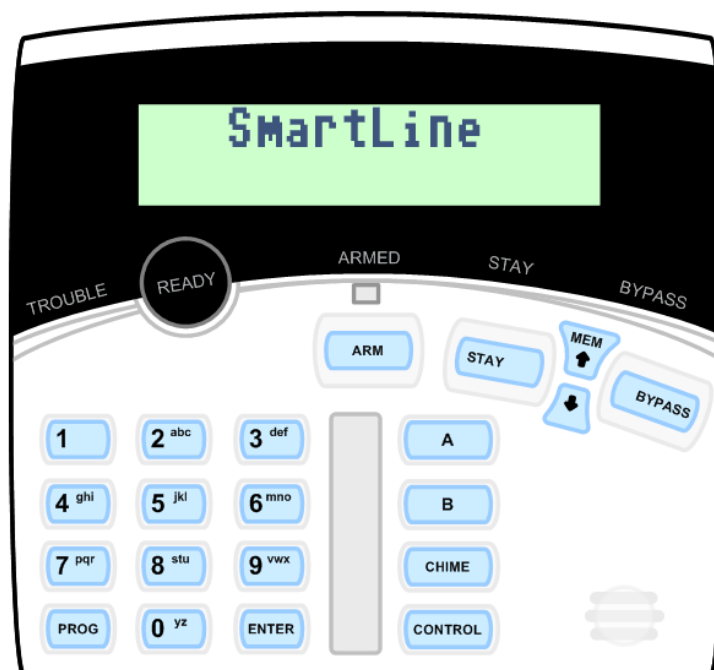
Mode	Button 1	Button 2	Button 3
0	Call	Call	Call
1	Call	Cancel (Call/Emergency)	Emergency
2	Emergency	Emergency	Emergency
3	Emergency	Cancel (Call/Emergency)	Call
4	Nurse Present	Cancel Nurse Present	Call
5	Call	Call	Cancel (Call)
6	Emergency	Emergency	Cancel (Emergency)
7	Cancel (Call)	Cancel (Call)	Call
8	Nurse Present	Cancel Nurse Present	Emergency
9	Call	Cancel (Call/Tamper)	Tamper
10	Emergency	Cancel (Emergency/Tamper)	Tamper
11	Call	Call	Tamper
12	Emergency	Emergency	Tamper
13	Nurse Present	Cancel (Nurse Present/Tamper)	Tamper
14	Call (Zone 5)	Call Cancel	Call (Zone 7)
15	Call (Zone 7)	Call Cancel	Call (Zone 5)
16	Call (Zone 5)	Call Cancel	Call (Zone 6)
17	Call (Zone 6)	Call Cancel	Call (Zone 5)

Note: Modes 14 to 17 have fixed Channel/Zone allocation and are used for generating different calls with Button 1 and Button 2. All other modes have a Channel/Zone that can be specified in the **Add Client** programming option.

8. Programming

Normal Operation

The SmartLine Master Interface is programmed via a 2-line LCD keypad. In normal operation the keypad should display the main screen with **SmartLine** across the top line:



Programming Options

To scroll through the programming options press the **PROG** button on the keypad. The options available are:

Add Client	<i>Enter a Channel, Mode and Client Code into a memory slot</i>
Learn Slot	<i>Program a wireless device into a memory slot (Slot 1 to 500)</i>
Find Slot	<i>Determine which memory slot a wireless device is programmed into</i>
Clear Slot	<i>Remove a wireless device from a memory slot without removing the Client data</i>
RSSI Slot	<i>Relative Signal Strength Indication (dBm) – determine the wireless signal strength for a device programmed into a memory slot</i>
Erase Slot	<i>Erase device and data based on memory slot location</i>
Erase Client	<i>Erase a device and data based on Client Code</i>
Erase All	<i>Erase all devices and data from the Master Interface's memory</i>
DC Voltage	<i>Monitor the current supply voltage</i>

Adding a New Device

When adding a new device there are two programming procedures:

1. Add a Client (thus associating it with a slot)
2. Learn (store) a new wireless device into the same slot

Note: Only **one Device** can be associated **per Slot**. The same Device can **NOT** be stored in multiple slots. Devices can **share Client Codes** provided they are given **different channels** (zones).

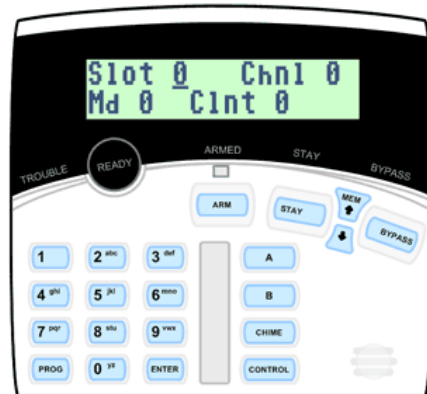
Adding a Client

1.



At the **Main screen** press **PROG** once to scroll to the **Add Client screen**.

2.



Ready for a new entry via the **Add Client screen**.

3.



Enter a **Memory Slot** between 1 and 500 then press **ENTER**.

If a **Memory Slot** has had data entered previously this will be automatically displayed on the screen.

4.



Enter a **Channel (Zone) Number** between 1 and 8 then press **ENTER**.

5.



Enter an **Operation Mode** (see **Device Modes on page 11** for details on available modes) then press **ENTER**.

6.



Enter a **Client Code** between 0001 and 9999 then press **ENTER**.

7.



If the Client was added correctly the cursor will return to the **Memory Slot** location.

The Slot is now ready to have a device associated with it. Press **PROG** to go to the **Learn Slot** screen.

8.



Error: If the **Client Code** and **Channel** combination has already been allocated to another **Memory Slot** a long tone will indicate that the Channel must be changed and the cursor will return to the **Channel** location.

9. To retry entering a Slot, Channel, Mode or Client Code number, press **BYPASS**.

To scroll to the next menu option, press **PROG**. Press **PROG** multiple times to scroll through to the **Main** screen.

Learning a Device into a Slot

1.



Press the **PROG** button to scroll through the options until the **Learn Slot** screen is displayed.

2.



Enter the **Memory Slot** number that you wish to program a **Device** into.

When you have entered the desired Slot and are ready to learn a device press **ENTER**.

3.



The keypad will beep repeatedly, allowing 30 seconds for a **Device** to be activated (e.g. holding down the help button).

4.



When a Device is accepted into the slot, **Learned** will be displayed on the second line with three short beeps.

5.



Error: If a Device has already been assigned to another slot the text **Assigned to XX** will be displayed on the second line with one long beep.

6.

To return to the Main screen, press **ENTER** without entering a Slot number.

To retry entering a Slot number, press **BYPASS**.

To scroll to the next menu option, press **PROG**.

To exit the 30 second learning window before time-out, press **ENTER**.

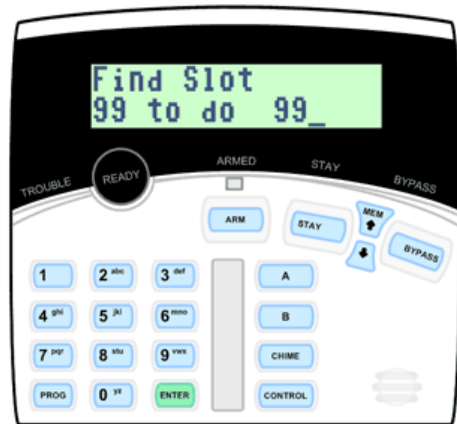
Finding a Slot

1.



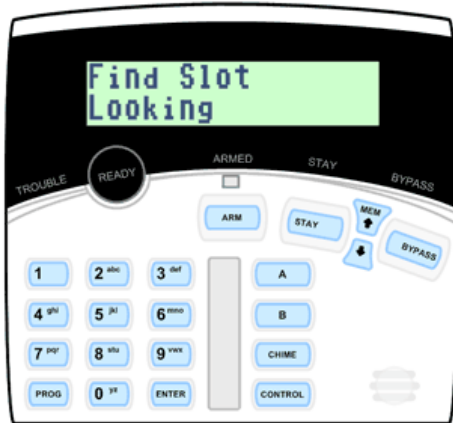
Press the **PROG** button to scroll through the options until the **Find Slot** screen is displayed.

2.



Press **99** then **ENTER** to confirm the operation.

3.



The keypad will beep repeatedly, allowing 30 seconds for a **Device** to be activated (e.g. holding down the help button).

4.



When a Device is acknowledged as being present in an existing slot, **Assigned to XX** will be displayed on the second line where the **XX** is the **Memory Slot** location.

5. To return to the Main screen, press **ENTER** without entering a Slot number.

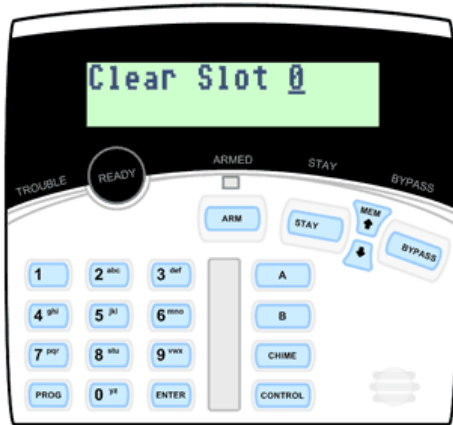
To retry entering a Slot number, press **BYPASS**.

To scroll to the next menu option, press **PROG**.

To exit the 30 second 'looking' window before time-out, press **ENTER**.

Clearing a Slot

1.



Press the **PROG** button to scroll through the options until the **Clear Slot** screen is displayed.

2.



Enter the **Memory Slot** number that you wish to clear (remove the wireless device only) then press **ENTER**.

3.



The display will prompt for confirmation before clearing the slot.

4.



Press **99** then **ENTER** to confirm the operation and clear the slot.

Note: Only the Device programmed into the slot will be cleared. The Client data will remain. A new device can now be programmed into the slot without having to re-enter the Client data.

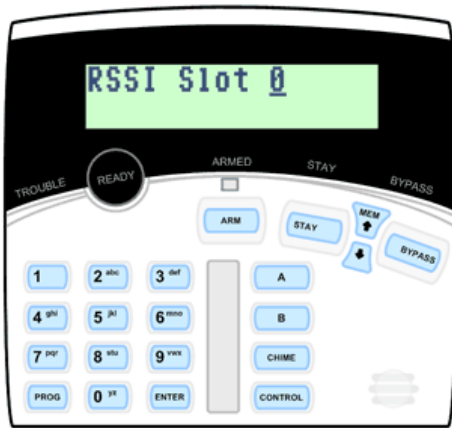
5. To return to the Main screen, press **ENTER** without entering a Slot number.

To retry entering a Slot number, press **BYPASS**.

To scroll to the next menu option, press **PROG**.

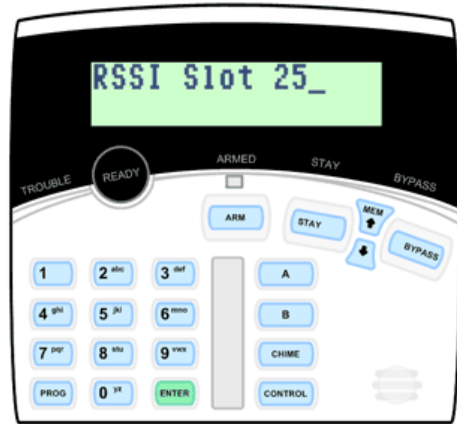
Relative Signal Strength Indication (RSSI)

1.



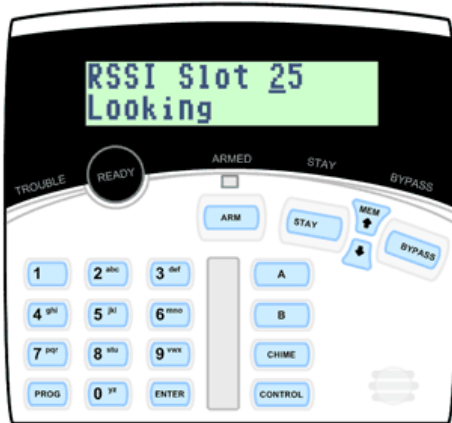
Press the **PROG** button to scroll through the options until the **RSSI Slot** screen is displayed.

2.



Enter the **Memory Slot** number that you wish to monitor then press **ENTER**.

3.



The SmartLine system is now waiting for activation of the device programmed into the chosen slot.

4.



When a device is activated within range of any receiver (including the Master Unit) the RSSI for that device will be displayed on the bottom line.

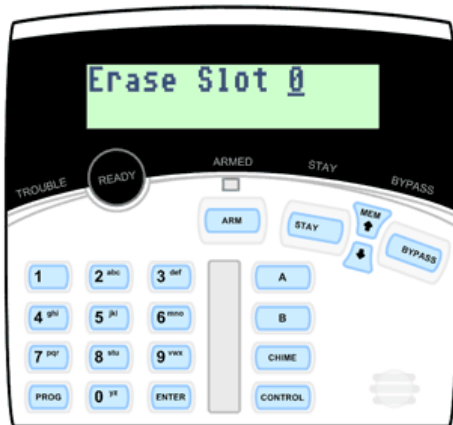
To stop measuring RSSI for a device press **ENTER**.

Relative Signal Strength Indication (RSSI) is an effective way to determine the functional range of your receivers. As you move the device further away from a receiver the RSSI should decrease.

This feature can be used for a number of surveying functions such as determining weak signal areas, correct placement of receivers and fault finding.

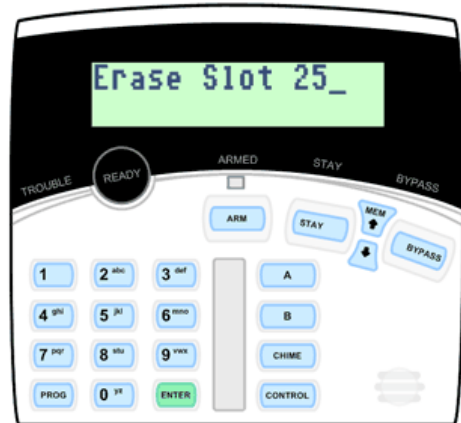
Erasing a Slot

1.



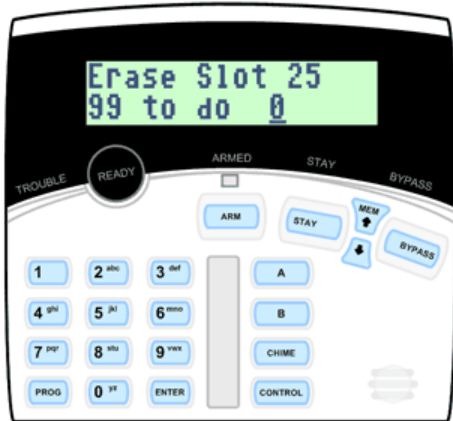
Press the **PROG** button to scroll through the options until the **Erase Slot** screen is displayed.

2.



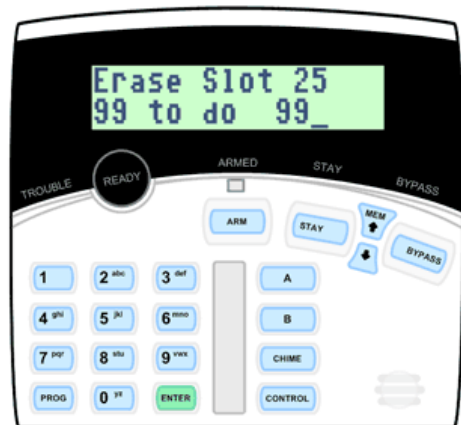
Enter the **Memory Slot** number that you wish to erase followed by pressing **ENTER**.

3.



The display will prompt for confirmation before erasing the slot.

4.



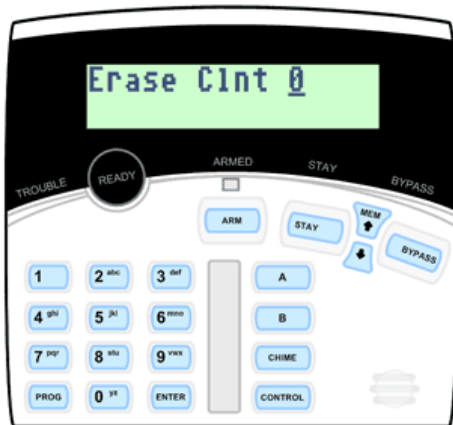
Press **99** then **ENTER** to confirm the operation and erase the slot.

Note: The slot and ALL Client data associated with the slot will be erased.

5. To return to the Main screen, press **ENTER** without entering a Slot number.
To retry entering a Slot number, press **BYPASS**.
To scroll to the next menu option, press **PROG**.

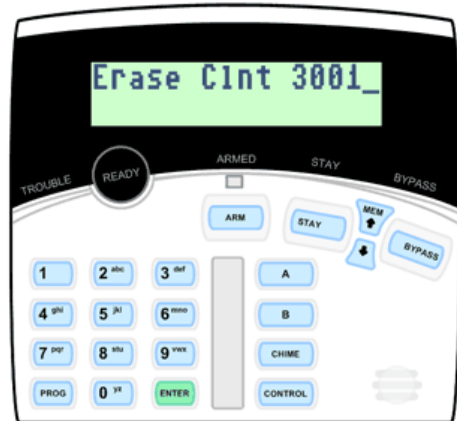
Erasing a Client

1.



Press the **PROG** button to scroll through the options until the **Erase Client** screen is displayed.

2.



Enter the **Client Code** that you wish to erase followed by pressing **ENTER**.

3.



The display will prompt for confirmation before erasing the slot.

4.



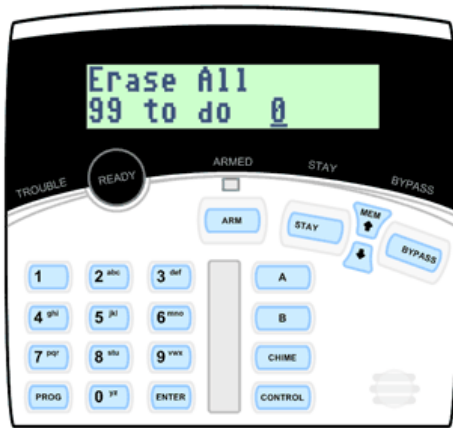
Press **99** then **ENTER** to confirm the operation and erase the slot.

Note: The Client Code and data associated with it will be erased. The Device programmed into the slot will remain.

5. To return to the Main screen, press **ENTER** without entering a Slot number.
To retry entering a Slot number, press **BYPASS**.
To scroll to the next menu option, press **PROG**.

Erase All

1.



Press the **PROG** button to scroll through the options until the **Erase All** screen is displayed.

2.

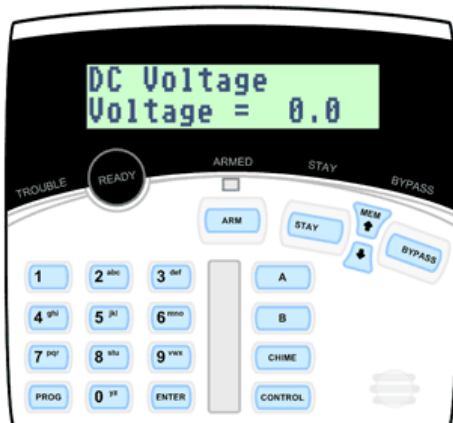


Press **99** then **ENTER** to confirm the operation and erase ALL devices and data from memory.

Warning: All devices and Client Data will be erased from the SmartLine system and can **NOT** be restored!

DC Supply Voltage

1.



Press the **PROG** button to scroll through the options until the **DC Voltage** screen is displayed.

2.



The **DC Voltage** screen will refresh regularly with the current supply voltage.

3. To return to the **Main** screen, press **ENTER** or **PROG**.

Note: The SmartLine system uses a 12V supply. This option can be used to monitor the current DC supply voltage level when running from a backup supply or battery.

Changing LCD Screen Contrast

1. INCREASE



To **Increase** the **Screen Contrast** hold down **CONTROL** then press **STAY**.

2. DECREASE



To **Decrease** the **Screen Contrast** hold down **CONTROL** then press **BYPASS**.

Changing the Buzzer Frequency (Tone)

1. INCREASE



To **Increase** the **Buzzer Frequency** hold down **CONTROL** then press **A**.

2. DECREASE



To **Decrease** the **Buzzer Frequency** hold down **CONTROL** then press **B**.



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