

## C-Bus Multi Room Audio

### Application Note #1 – Configuring MRA with Toolkit Software

#### Introduction – Project Details

Before we begin, we need to compile a list of each **Source** (an input into the MRA system) and **Zone** (an area where an amplifier will be installed). Throughout this Application Note, we will use an example project.

The tables below show the sources and zones for the example project. These examples are used throughout this series of application notes, to assist with comprehension of the MRA system. In the Inputs table, the left column shows the source name, which is fixed in the MRA world. The middle column shows the type of input, while the right column shows a 'real world' name (or description) applied for easy identification.

#### Inputs (Sources)

Source	Type	Description
Local*	Line-level input on amplifier	iPod
Analogue 1	Line-level input #1 into Matrix Switcher	Cable TV
Analogue 2	Line-level input #2 into Matrix Switcher	DVD
Analogue 4/ AUX**	3.5mm AUX input socket on front panel of Matrix Switcher	AUX
Tuner 1	Internal AM/FM tuner	Radio 1
Tuner 2	Internal AM/FM tuner	Radio 2
Streaming	Internal Streaming Module (deluxe model of Matrix Switcher only)	MP3

\*The local input on the amplifier does not need to be configured for operation, but its position is reserved. There are a total of six additional source inputs to be configured on the Matrix Switcher

\*\*The 3.5mm AUX socket on the front of the Matrix Switcher is internally (electrically) connected to Analogue Input 4. Either the AUX socket OR Analogue input 4 may be used, not both.

Below is a table containing eight zones (or locations) for our example project.

#### Outputs (Zones)

Zone No	Description (location)
Zone 1	Living
Zone 2	Bathroom
Zone 3	Bedroom
Zone 4	Ensuite

Zone No	Description (location)
Zone 5	Patio
Zone 6	Pool area
Zone 7	Dining
Zone 8	Study

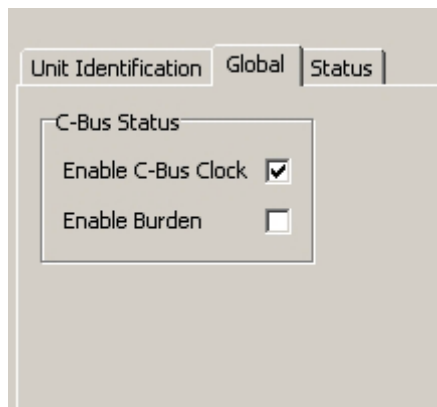
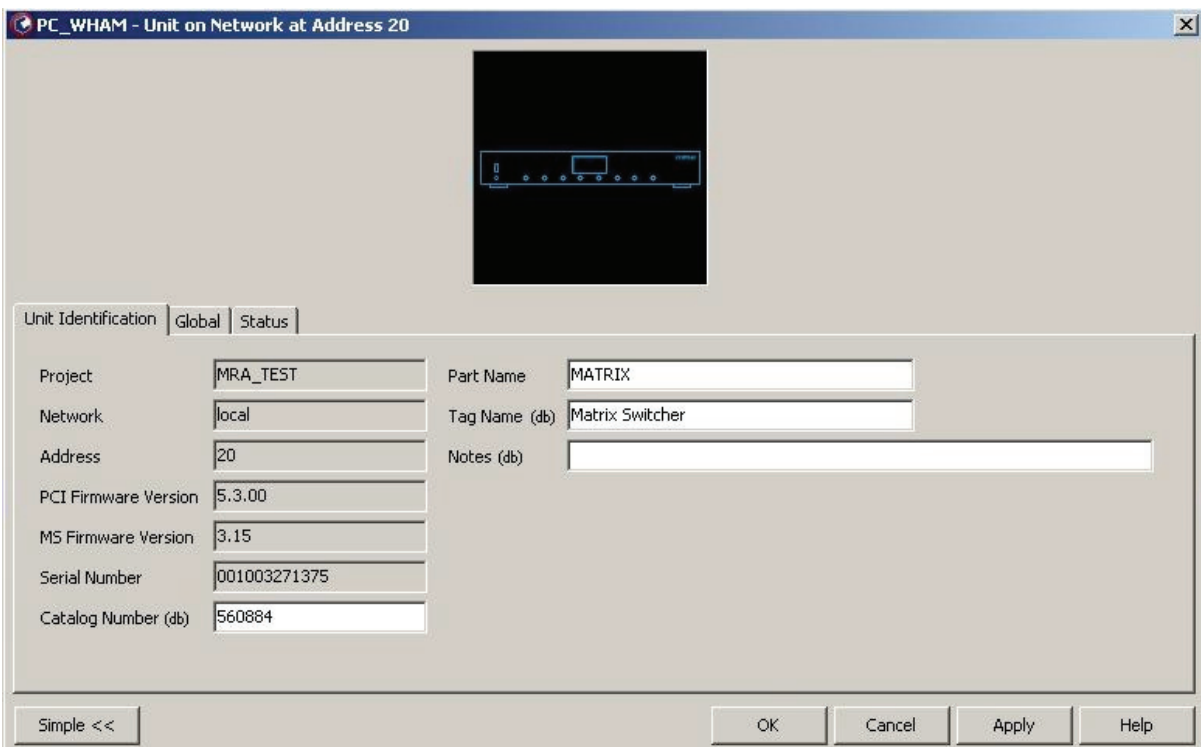
## Toolkit Programming

There is an assumed level of understanding of Toolkit programming when using this application note however, we will endeavour to explain as much as possible about the configuration of the system.

After the Toolkit project has been created and the list of C-Bus units have had their respective unit addresses assigned, we will look at configuring the MRA devices.

## Programming the Matrix Switcher

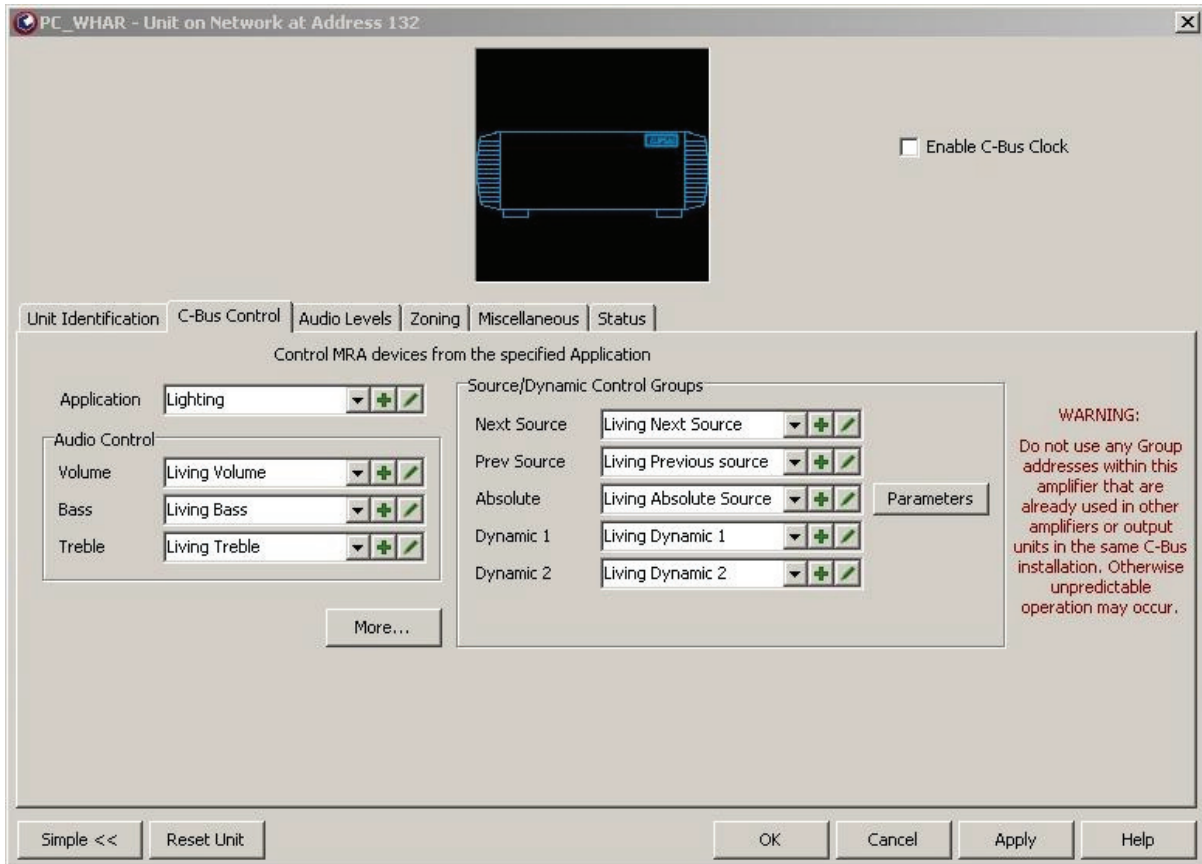
The Matrix Switcher requires very little programming in Toolkit. It is essentially a 'PC Interface' type of device (from a configuration perspective). However, the Matrix Switcher cannot be used as a PC Interface device when programming the C-Bus Network.



## Programming the Amplifier

There are three MRA Amplifier models. However, they are all very similar to program in Toolkit. The amplifiers not only control the volume of a zone, but also the bass and treble for that zone. Amplifiers relay messages to the Matrix Switcher regarding which source to select. These messages originate at a switch or touchscreen.

In Toolkit, after the general unit information for the amplifier has been programmed (on the Unit Identification tab), we can look at the specific information for programming the MRA control.



In our example, we will program the amplifier to communicate on the Lighting Application.



We need to assign groups for the volume, bass and treble (control of bass and treble is optional, but it is a good idea to assign groups regardless).

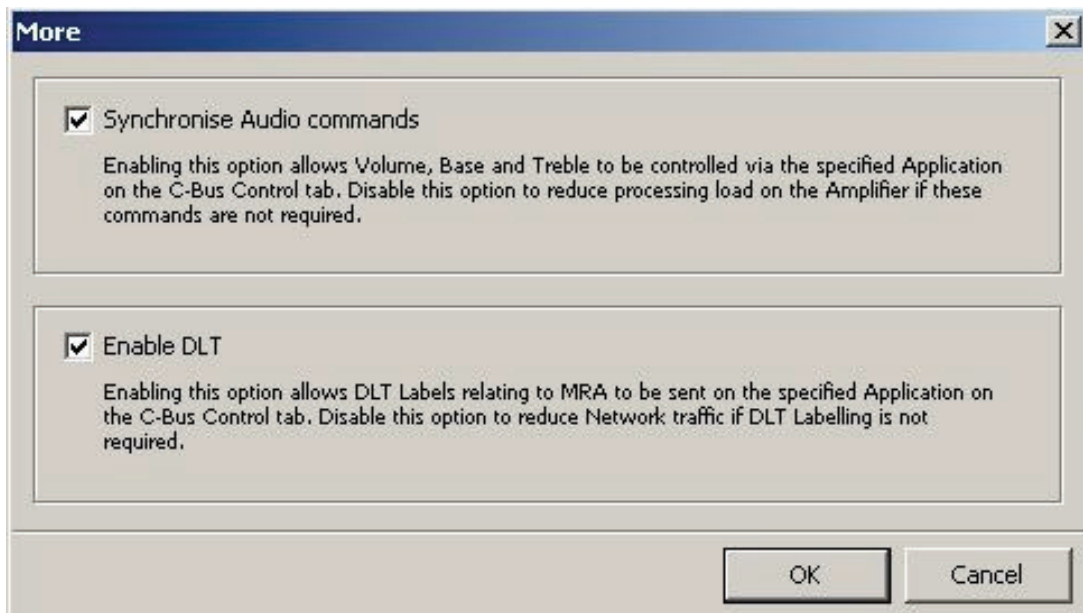
**Note:** When a group is assigned to volume, bass, or treble, the level of that group relates to the level set by the amplifier. For example, if the volume group is set at 50%, then the volume is 50%. If you switch a zone on (100%) from Off, the amplifier recognises this and sets the volume to the most recent amplifier setting.



Click the More button indicated below.

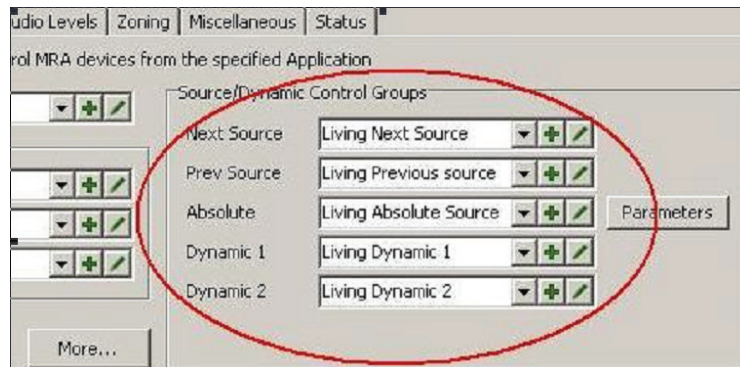


There are pre options for controlling audio. For this example, check the Synchronise Audio Commands checkbox. We will also need to enable the DLT control, as we will be configuring DLTs to control the amplifier. If the installation does not have DLT style switches installed for control of MRA, then this option should not be checked.

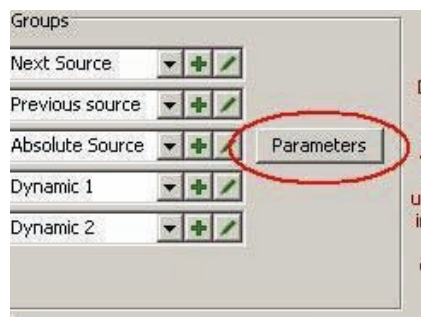


Assign groups for Next source, Previous source, Absolute Source, Dynamic 1 and Dynamic 2 (again, while these may not all be required, it is a good idea to assign them at this point).

**Hint:** The DLT is an excellent choice for controlling MRA! You can use a DLT for source selection, volume, and also to control the source. A great example of this is to control the radio tuner and change the station. The DLT displays the radio station name for you!

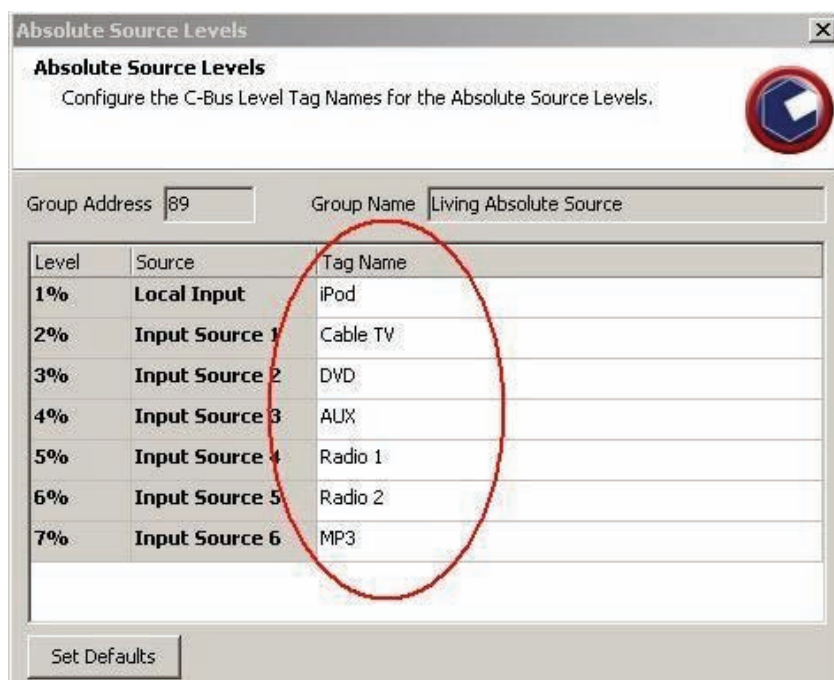


Note the Parameters button located next to the Absolute Group box.



Click this option to enter the names for each of the sources (identified in the table on page 1 of this Application Note) as indicated below. By setting the absolute source group to a particular level, it's possible to select the source without cycling through using the next or previous commands.

For example, A C-Bus device can send out a preset command on the Living Absolute Source group at a particular percentage level. When the group is at this level, the corresponding source is selected.

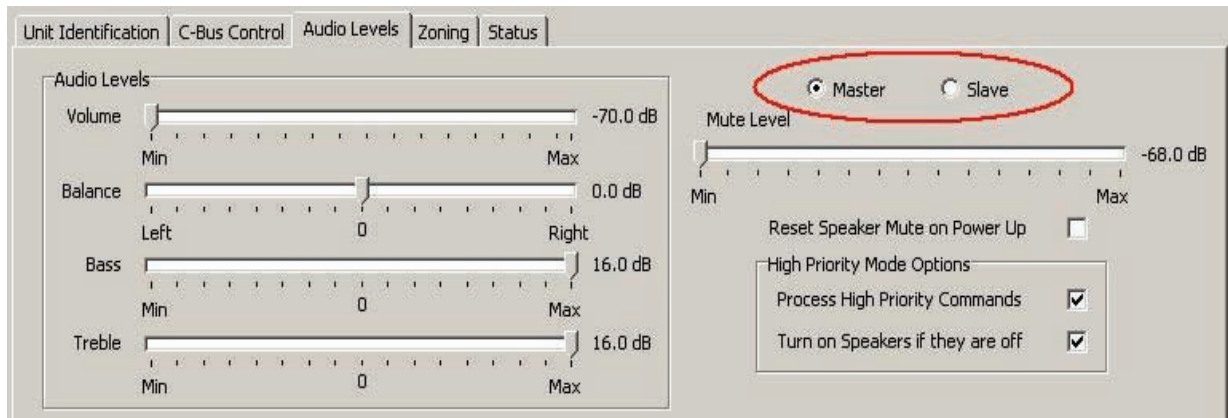


## Audio Levels Tab

The Audio Levels tab lets you adjust the levels of volume, balance, bass and treble, live online while programming. The Master/Slave option is available for the situation where more than one amplifier is connected to a zone of the Matrix Switcher.

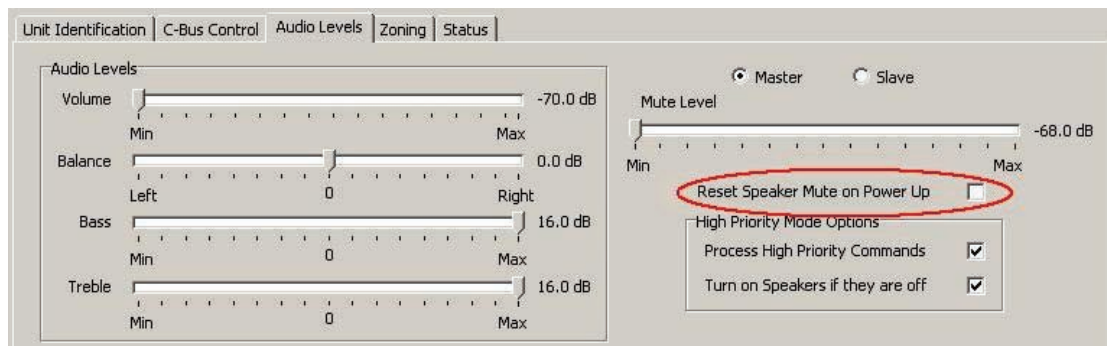
For example, you may want to have a zone for the bedroom and have the ensuite connected to the same zone, but have individual volume control. This is typical Master/Slave programming where the bedroom amplifier acts as the master (it will respond to commands for source selection, etc.) without sending out duplicate (unnecessary) information out onto the bus.

Unless more than one amplifier is configured for a zone, then the amplifier should be set as a master.



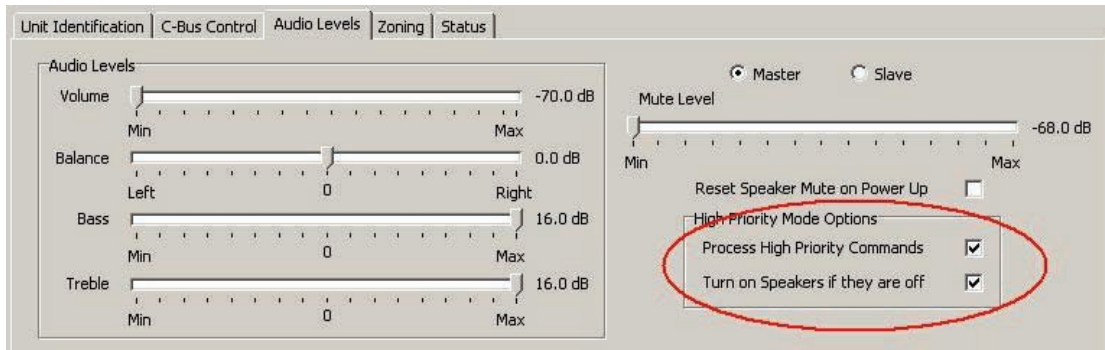
The Mute Level slider sets up the mute level of the amplifier during configuration. This is usually set to the minimum, but there may be a requirement to have this level set somewhere above off.

There is an option to reset a muted zone (switch the mute off) when the zone powers up. This is necessary for those instances where a zone may be muted then switched off and when switched back on, the user believes the zone not to be working (due to the muted state).



The next two options both apply to the high priority broadcasts (covered in greater detail in the Application Note #2 – Configuring MRA with MARPA software).

The Process High Priority Commands checkbox (see following page) offers the ability to not have the zone output the high priority commands such as a doorbell. An example where not processing high priority commands may be desirable is in a child’s bedroom. The second checkbox offers the ability to switch the speakers on if they are off. Also, you may not want to broadcast a doorbell into a zone when it is off (for example, the back patio), but may want it to when the zone is on.



The zoning tab offers the ability to manually set the zone configuration relationship of an amplifier and a Matrix Switcher. Switching off the automatic assignment of amplifiers to Matrix Switchers is highly discouraged. It is very unusual to not allow the Matrix switcher to control this functionality. This level of configuration is not covered in this application note.

### Remote Tab (Desktop Amplifier Only)

The Desktop Amplifier can be controlled with the infrared (IR) remote control. There are two types of IR control that can be used. It is possible to specify NEC infrared codes to create a custom control setup. For additional information refer to MARPA software Help.

### Programming a DLT Switch

The DLT switch (like the amplifier) has some unique features when used with the MRA system. It is suggested that you use the following example until you become familiar with the behaviour of the DLT.

The DLT uses the Lighting Application for control of MRA. The amplifier can translate certain lighting messages sent out by the DLT, onto other applications used in MRA. These are covered in the MARPA Application note.

Assign groups and functions to the switches to control the volume (use a dimmer as the function).



**Note:** The same method can be used for bass and treble control with a dimmer used to ramp the level up or down.

### Next source (Use an On/Off as the function)

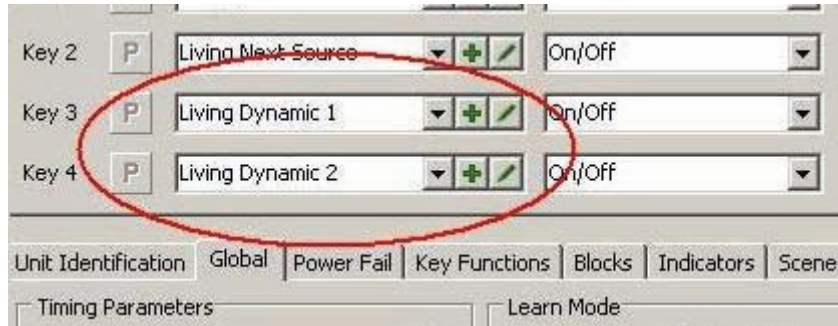
A source is the feed coming into the Matrix Switcher. Typical sources include radio tuners, CD players and cable TV.



## Dynamic Controls

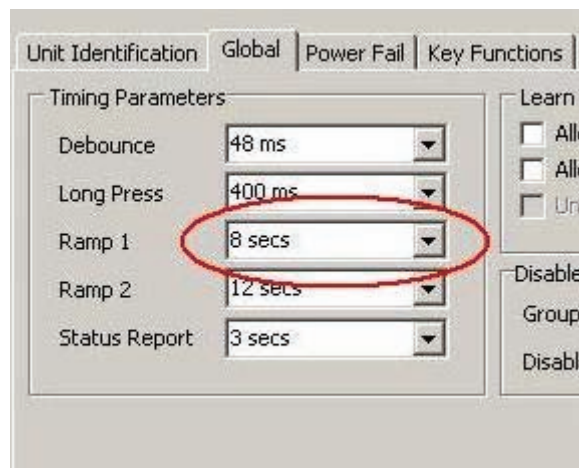
Depending on the source being controlled, the behaviour of the dynamic controls changes. A typical example of this is when a tuner is selected as the source. The dynamic control would be used to change (and display) the radio station.

Dynamic controls 1 and 2 (Dynamic 2 is very important, particularly for radio control) with the On/Off command being used for the function.



Note that volume is configured as a dimmer (volume up/down with a long press with on/off on a short press).

Finally, the ramp time for the volume control should be set to a minimum of 8 seconds (default is 4 seconds). Adjust the Ramp 1 time as indicated below.



All other configuration can be performed from MARPA.

Configuration of devices such as key switches should use the same functionality outlined for the DLT.

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For further assistance in using this product, consult your nearest Clipsal Integrated Systems (CIS) Sales Representative or Technical Support Officer.

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