

C-Bus Training Course

Basic Programming

Course Code: BCB005

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Scope

This manual aims to provide an installer with the basic skills needed to program and use C-Bus. A fundamental technical background is required.

The manual includes basic programming information for C-Bus:

- voltage free relays (a common output unit)
- wall switches
- PE cell light level sensors
- PIR occupancy sensors.

It is an ideal preparation before attending the C-Bus Basic Training Course.

Learning Outcomes

By the end of this module, you should have an understanding of the basic programming options for a:

- C-Bus L5512 RVF 12 Channel Voltage Free Relay
- Standard C-Bus Wall Switch
- C-Bus Light Level Sensor
- C-Bus PIR Occupancy Sensor.

1.0 Voltage Free Relay

This section explains the basic programming of the C-Bus L5512RVF 12 Channel Voltage Free Relay. C-Bus output units contain many common elements. These include:

- Channel Assignment
- Advanced tab

Figure 1 shows the panel displayed when editing the L5512RVF. Group Addresses are allocated for each channel on the relay. An existing Group is selected from the drop-down menu.

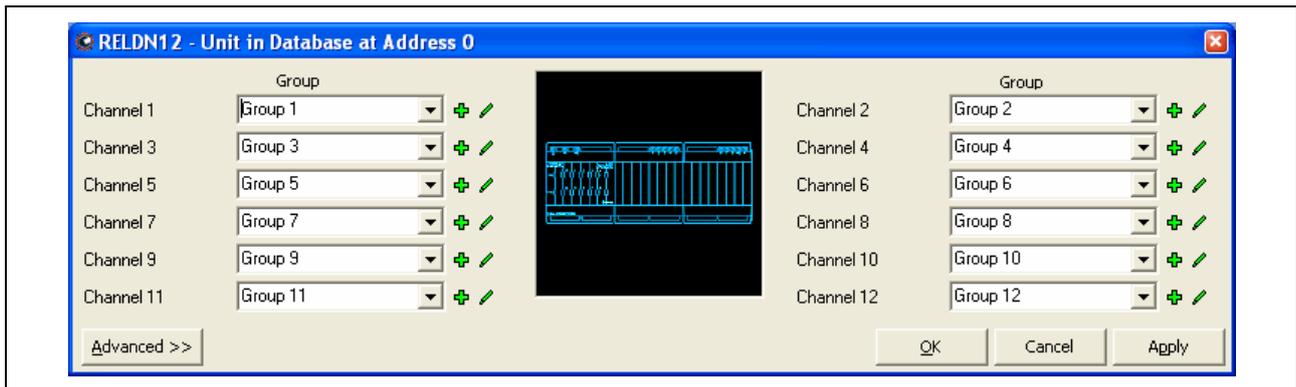


Figure 1 – Editing a Twelve Channel Voltage Free Relay unit

Clicking the  icon to the right of the drop-down menu brings up the Group Add panel displayed in Figure 2. This allows a new Group Address to be added.

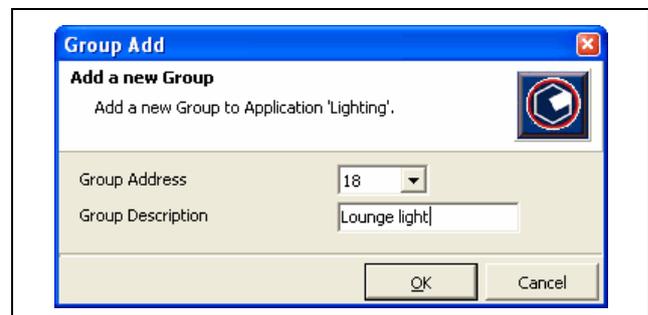


Figure 2 – Adding a new Group Address

Clicking the  symbol brings up the Group Edit panel displayed in Figure 3. This allows the Tag of the currently selected Group Address to be changed.

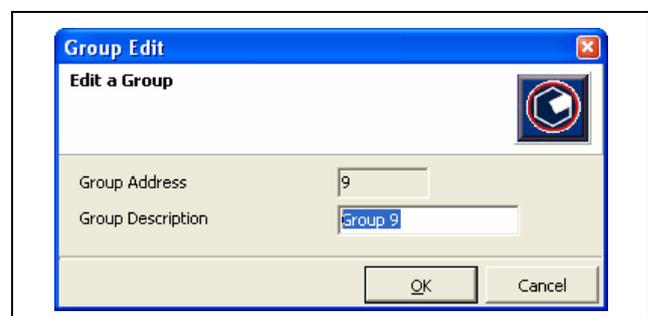


Figure 3 – Changing the Tag name of a Group

2.0 C-Bus Wall Switch

This section explains the basic programming of a 2000 Series Standard C-Bus Wall Switch. C-Bus input units contain many common elements. These include:

- Key Assignment
- Functions
- Advanced tab.

Figure 4 shows the panel displayed when editing a C-Bus wall switch. Group Addresses are allocated for each input (where there are multiple inputs). An existing Group is selected from the drop-down menu.

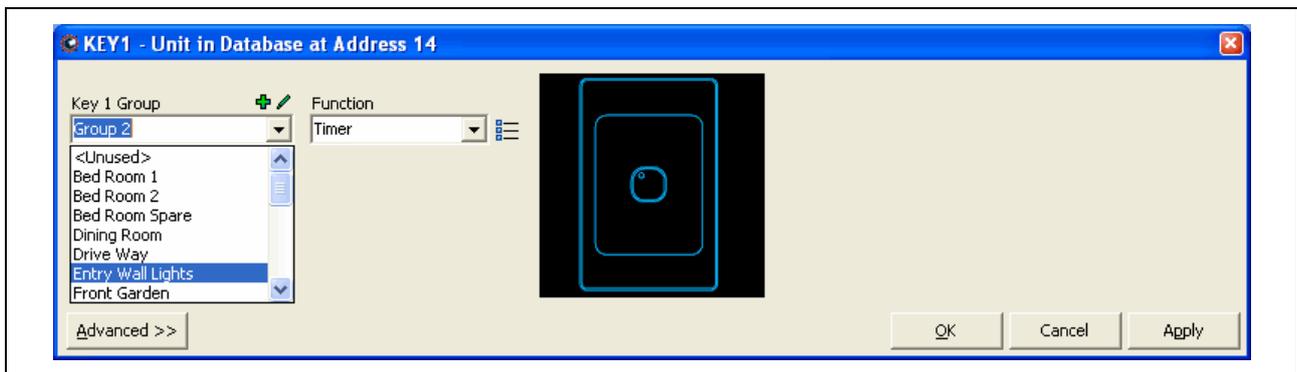


Figure 4 – Editing a 2000 Series Standard C-Bus Wall Switch

As when programming an output unit, clicking the  icon to the right of the drop-down menu, brings up the Group Add panel displayed in Figure 2. This allows a new Group Address to be added.

2.1 Functions

Each input has a Function drop-down menu, through which a key function is assigned. Available functions vary depending on the type of input unit and Application Address. Table 1 provides a list of these functions together with their action. An assigned function is triggered when an input is activated. Most inputs are activated by pressing a button, but certain input units are triggered by other events, such as a change in lighting level or infrared radiation.

| Function | Action |
|-------------|---|
| On | Set on |
| Off | Set off |
| On/Off | Alternate between set on and off |
| Dimmer | <p>Dim up or down, according to the dimmer function mode, which is set by clicking the  properties button. There are two dimmer modes, Toggle and Memory.</p> <p>Toggle: A quick button press alternates between set on and off. The dimmer switch does not remember a specific brightness level. A long button press alternately dims up and down.</p> <p>Memory: A quick button press alternates between a set to the previous dim level, and set off. A long button press alternately dims up and down.</p> |
| On Up | A quick button press alternates between set to the previous dim level and set off. A long button press dims up. |
| Off Down | A quick button press alternates between set to the previous dim level and set off. A long button press dims down. |
| Timer | <p>Initiate a count down timer, according to the timer function mode, which is set by clicking the  properties button. A set off command is issued when the timer expires. There are two timer modes, Toggle and Retrigger.</p> <p>Toggle: A button press alternates between set on and set off. A button release starts the timer.</p> <p>Retrigger: A quick button press issues a set on command and starts (or restarts) the timer. A long button press issues a set off command.</p> |
| Bell Press | Set on until a button is released, then set off. |
| Dimmer Up | Dim up. |
| Dimmer Down | Dim down. |
| Soft Up | A quick button press issues a ramp to preset level command (Recall 1). A long button press dims up. |
| Soft Down | A quick button press issues a ramp off command. A long button press dims down. |
| Preset 1 | A quick button press issues a set to preset level command (Recall 1). A long button press ramps off. |

| Function | Action |
|-----------|---|
| Preset 2 | A quick button press issues a set to preset level command (Recall 2). A long button press ramps off. |
| Trigger 1 | A quick (short) release triggers a Control Group Action Selector (stored in Recall 1), which is set by clicking the  properties button. This can be used to remotely trigger a scene in another C-Bus unit. The Trigger 1 and Trigger 2 functions are only selectable when the Application Address type is set to Trigger Control. |
| Trigger 2 | As per Trigger 1, but uses Recall 2 to store the Control Group Action Selector. |
| Unused | No action. |
| <Scene> | Execute a Scene (this is covered in the Advanced Programming module). A Scene is selectable on particular input unit types only, such as the Neo. |
| <Custom> | Execute a customised function, using the parameters defined in the Button (Key) Functions and Blocks tabs (covered in the Advanced Programming module). |

Table 1 – Functions which can be assigned to an input

3.0 C-Bus Light Level Sensor

The C-Bus Light Level Sensor is a device used to measure ambient light, and transmit messages over the C-Bus network in response to changing levels. It is designed to operate within the range of 40 to 1600 lux.

The sensor is capable of controlling the level of a group from 0 to 100%, or switching it on or off when a light level threshold is crossed. The sensor can be enabled or disabled from a Group Address.

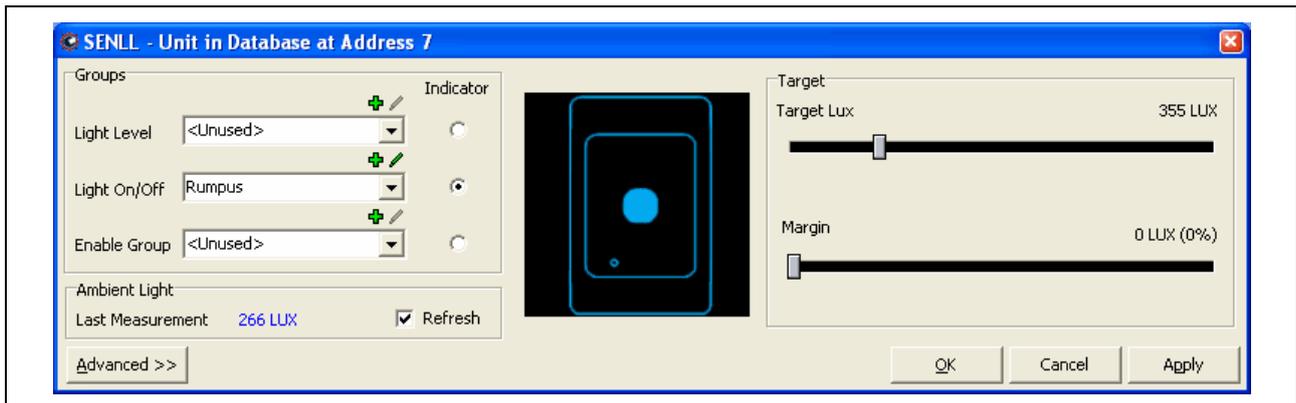


Figure 5 – Editing a PE Light Level Sensor unit

3.1 Groups

Three group control options are available for the C-Bus Light Level Sensor. Figure 5 shows these options which appear in the Groups section when editing the unit with the C-Bus Toolkit software. The Indicator radio button lets you select which action controls the LED indicator on the sensor.

Available options are:

- Light Level – a group typically associated with a dimmer or analogue output module. The level is ramped up when the ambient lighting level falls below the defined Target Lux threshold.
- Light On/Off – a group typically associated with a relay output module. The group is switched on when the ambient lighting level falls below the defined Target Lux threshold.
- Enable Group – a group typically associated with an input unit. When this option is used, the PE Light Level Sensor will only issue C-Bus commands when the group is switched on.

3.2 Ambient light

This is used when connected to a live network. When the Refresh option is checked, the approximate lighting level as read by the sensor is displayed.

3.3 Target

There are two values which determine the level at which the sensor responds to a change in ambient lighting levels:

- Target Lux — the threshold lux level below which any “Light Level” or “Light On/Off” group is activated. When used with dimmers you can think of this as the level of lighting that you would like to maintain.
- Margin — the level of variation from the Target Lux level at which the threshold operates. This can be used to prevent constant switching of relay levels when the ambient light level varies regularly (perhaps due to passing clouds). It means that a “Light On/Off” group can be set to turn on at a level below the Target Lux, and turn off at a level above the Target Lux.

4.0 C-Bus PIR Occupancy Sensor

Currently there are three types of C-Bus PIR Occupancy Sensor; two indoor models and an outdoor model. Each has the following features:

- passive infrared movement detection
- threshold adjustment on the physical unit
- timer expiry actions, software adjustable from 0 to over 18 hours
- separate day-time and night-time movement facilities
- a sunset switch facility
- a security pulse facility.

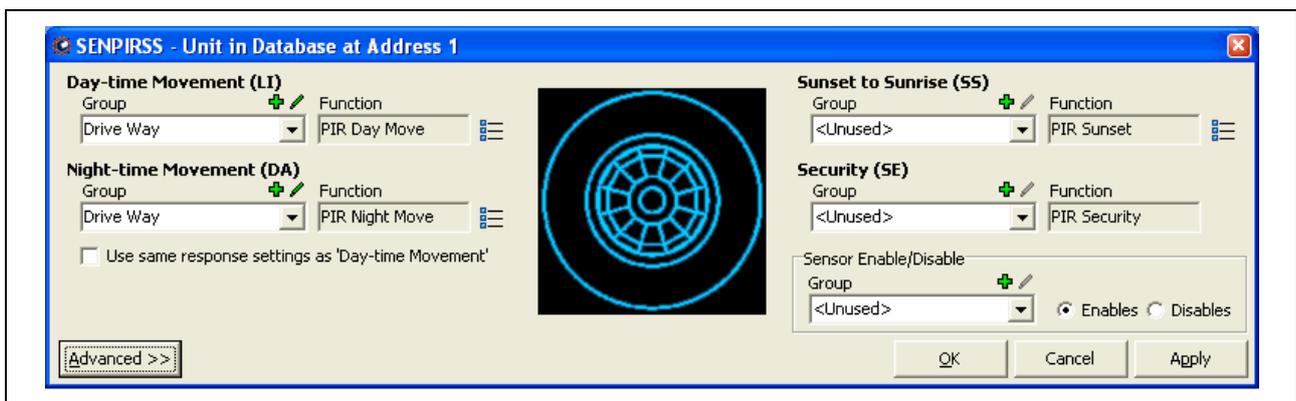


Figure 6 – Editing a PIR Occupancy Sensor

4.1 Adjusting the Light Level Sensor

The light level sensor must be adjusted to ensure it triggers the programmed load at the correct light level, as described in Table 2.

| | | |
|----|--|--|
| 1. | Rotate clockwise to avoid activation of load when natural light is adequate. | |
| 2. | To activate the load at dusk, set adjustment to this area. | |
| 3. | To activate the load at night, set adjustment to this area. | |
| 4. | To have the load activated day and night, set in this position. | |

Table 2 – Adjusting a light level sensor

4.2 Day Time Movement Detection

This activates a group whenever the ambient lighting level is above the threshold set on the light level sensor, and movement is detected. The selectable group is located next to the PIR Day Move function. A timer can be used to perform an action (such as switch a group off) a definable period of time after movement is detected. Timer options can be seen in Figure 7. They are accessed via the  properties button.

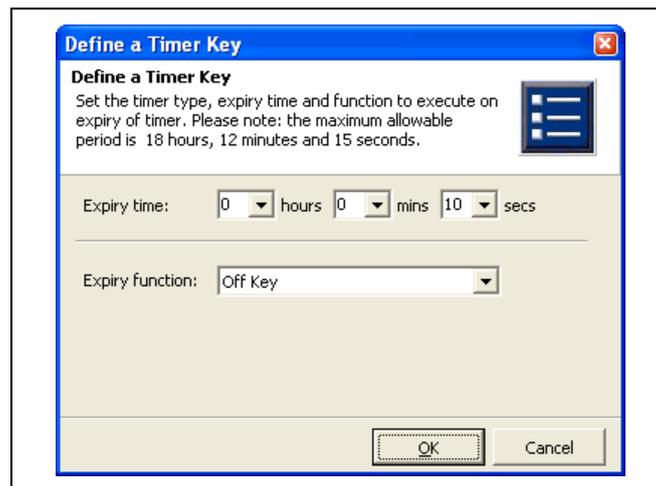


Figure 7 – Timer options

4.3 Night Time Movement Detection

This activates a group whenever the ambient lighting level is below the threshold set on the light level sensor, and movement is detected. The selectable group is located next to the PIR Night Move function. A timer can be used to perform an action (such as switch a group off) a definable period of time after movement is detected. Timer options are accessed via the  properties button.

4.4 Sunset to Sunrise

The PIR sensors have a PIR Sunset function, which can switch lights on at sunset. The selected group is switched off after a timer expires or sunrise, whichever occurs first. Timer options are accessed via the  properties button.

4.5 Security Features

PIR Sensors also have a security feature which sends a short pulse intended to drive a buzzer or light to indicate movement at any time, irrespective of the light threshold.

4.6 Functions Tab

The Functions tab (Figure 8) is accessible when the “Advanced >>” button is used to display the advanced options. It allows the user to configure the C-Bus PIR Occupancy Sensor in the same way as a Standard C-Bus Wall Switch.

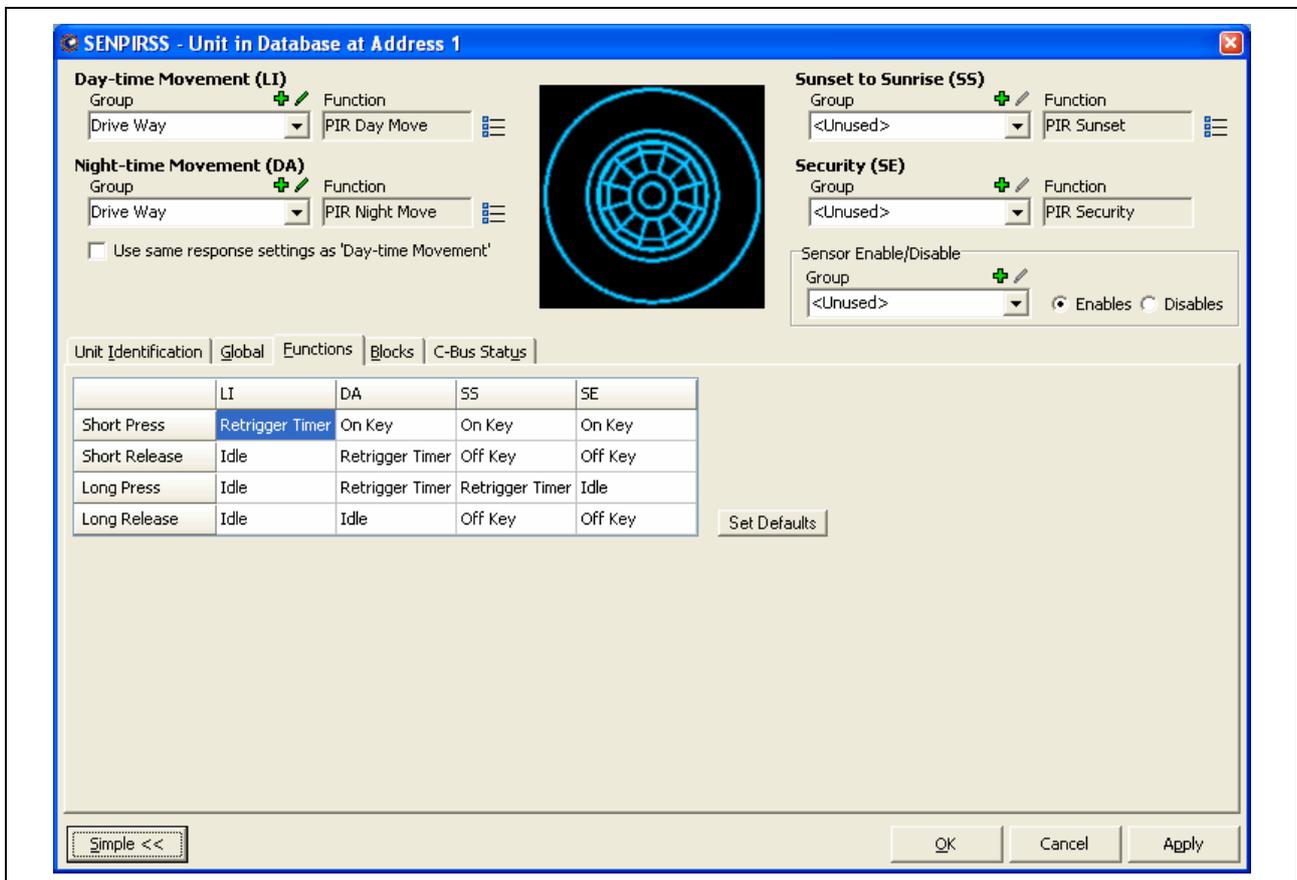


Figure 8 – The Functions tab