

Application Note 88

Protege CBus Integration

Version 1.01



Contents

Protégé System	3
Contact	5
Introduction	7
Application Note Information	9
Protege Components	9
Third Party Software Applications	11
Third Party Hardware	11
Configuring CBus	13
Connecting the C-Bus Hardware	13
Configuring the C-Bus Project	14
Configuring a Button	16
Configuring Protege	17
Connecting the Protege Hardware	17
Creating a Service	18
Setting the Service Options	19
Starting the Service	20
Creating an Automation Point	20
Identify the C-Bus Group & Application Codes	21
Automation Options	22
Controlling a CBus output from an Automation Point	24
Activating the CBus Point	24
Deactivating the CBus Point	25
Controlling a CBus Output from a PGM	26
Activating the CBus Point	26
Deactivating the CBus Point	27
Controlling a PGM from a CBus Input	29
Activating a PGM from a CBus Input	29
Deactivating a PGM from a CBus Input	30
Control AND Status from Protege AND CBus	31
Control a CBus output from a PGM:	32
Control a PGM from a CBus input	32
Controlling Protege Areas	33
Introduction	33
Area Follows PGM Status	35
Testing Your Programming	39
Area Arm On Pulse PGM	41
Area Disarm On Pulse PGM	43

Chapter 1

Protégé System

In This Chapter

Contact.....	5
Introduction	7

Contact

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Chapter 2

Introduction

The Protégé System is a powerful integrated alarm and access control management system designed to provide integration with building automation, apartment complex control and HVAC in one flexible package. Communicating through a proprietary high speed protocol across an encrypted local area network and AES Encrypted Proprietary RS-485 module network using modular-based hardware design, system installers have the flexibility to accommodate any installation from small or large, residential or commercial.

Application notes are provided as is without any implied warranty or intended use and are written by Integrated Control Technology as an aid in programming and connecting devices to the Protégé System.

In This Chapter

Application Note Information	9
Protege Components	9
Third Party Software Applications	11
Third Party Hardware	11

Application Note Information

This application note explains the operation of the Protege System Controller when communicating on a CBus Network.

The Protege system can be configured to operate using a number of Protocols and Port Ranges providing many variations to the information provided here. Where possible the author has attempted to keep the IP and Port configurations as default however in most cases these are changed to suit the networking environment the devices are installed on.

This Application note details connection to CBus using the RS232 Protocol.

Protege Components

This Application Note is based on the following Protege components

Code	Discription	Version
PRT-CTRL	Protege System Controller	3055
PRT-COMM	Protege 2 Port Serial Comm Card	
PRT-SMGT	Protege System Management Suite	437

This application note has been tested with version 2.08 Build 3027 or higher of the controller firmware although the configuration parameters are relevant to versions 2.08 3025/3026. The Protégé System Management Suite User Interface and Server should be Release 437 or higher to take advantage of the configuration parameters.

Third Party Software Applications

This application note uses the following products:

- ▶ C-Bus Toolkit Version 1.10.2 available for download from the ***C-Bus Download Site***
<http://www2.clipsal.com/cis/technical/downloads>

	The following article is based on the current CBUS Toolkit Application at time of publication and is posted as a GUIDE ONLY. This application may change without notice and is not supported by ICT. Please consult the CBUS website for updates, changes or setup procedures.
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Third Party Hardware

This application note is based on the following 3rd Party Hardware;

Product Code	Discription
5500PC	C-Bus Rs232 PC Interface Module
5500PS	C-Bus Power Supply

Configuring CBus



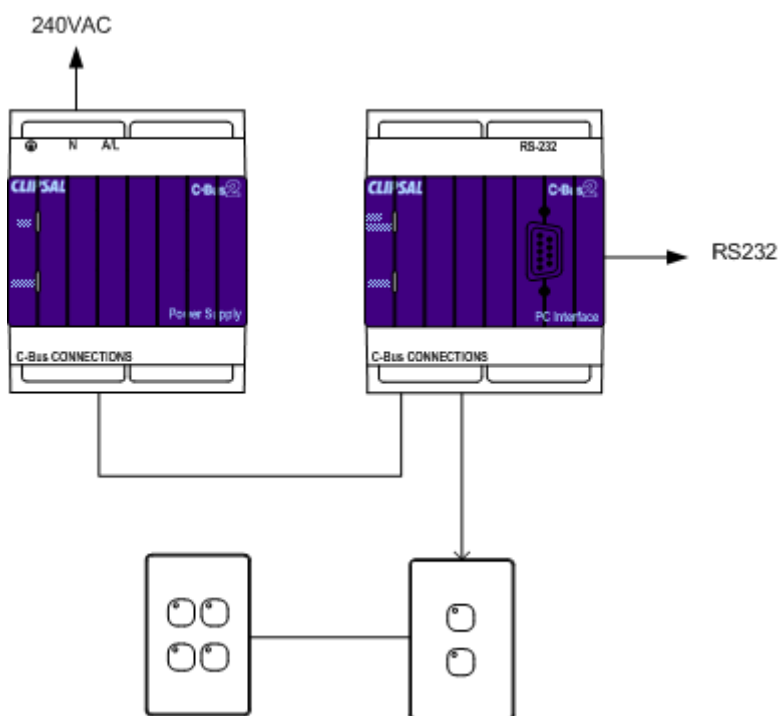
The following section is based on the current CBUS Toolkit Application at time of publication and is posted as a **GUIDE ONLY**.

This application may change without notice and is not supported by ICT. Please consult the CBUS website for updates, changes or setup procedures.

Connecting the C-Bus Hardware

The C-Bus Hardware should be setup and configured as per the installation documentation supplied by the vendor.

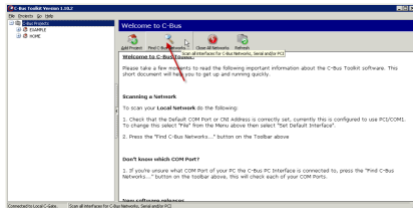
The examples in this application note are based on the following CBus configuration



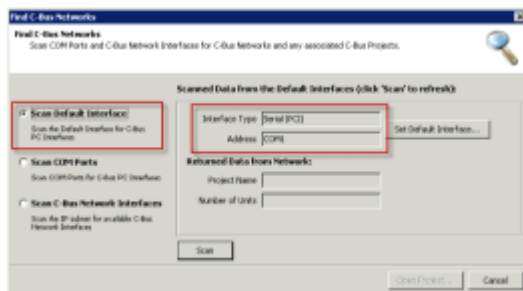
Configuring CBus

Configuring the C-Bus Project

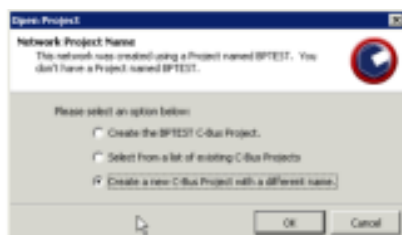
- ▶ Open the C-Bus Toolkit and select the Find **C-Bus Networks** Button



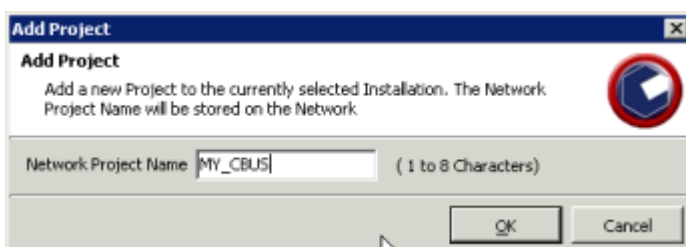
- ▶ Ensure the PC COM Port is correct and select the SCAN option to search for the C-Bus network



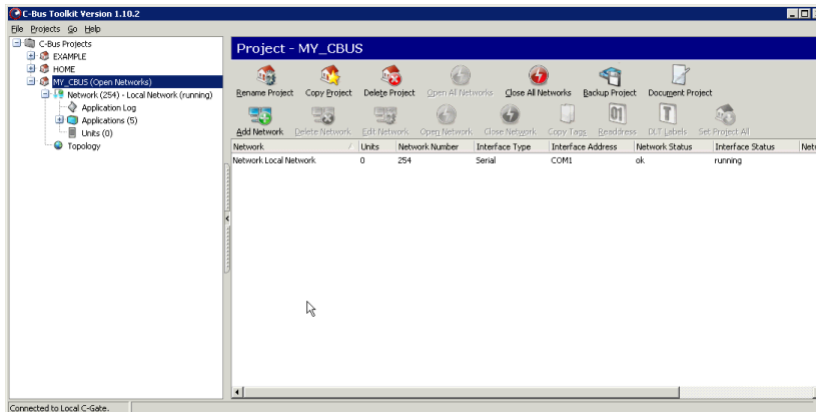
- ▶ Select the Create New Project Option



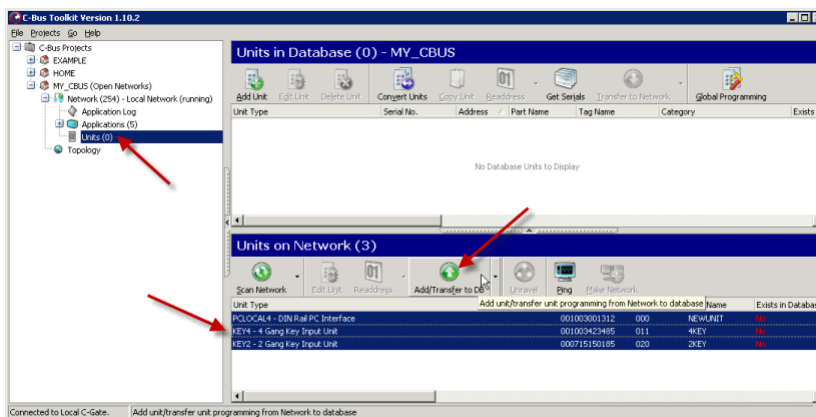
- ▶ Give the Project a Name



- ▶ A new C-Bus Project will be created



- ▶ From the Units Icon, All modules on your C-Bus network should now be identified
- ▶ Select all the modules and **Add/Transfer them to the DB**



Configuring a Button

- ▶ Select the unit you want to define and assign a **Group-Code** to the button.

The screenshot shows the 'KEY2 - Unit in Database at Address 20' configuration window. At the top, there are two sections for 'Key 1 Group' and 'Key 2 Group'. The 'Key 1 Group' section is highlighted with a red box and shows 'Group 0' selected in the dropdown and 'On/Off' in the 'Function' dropdown. The 'Key 2 Group' section shows '<Unused>' selected. In the center, there is a graphic of a button with two circular indicators. Below this, there are tabs for 'Unit Identification', 'Global', 'Power Fail', 'Key Functions', 'Blocks', and 'Status'. The 'Unit Identification' tab is active, showing fields for Project (MY_CBUS), Network (Local Network), Address (20), Firmware Version (1.2.67), Serial Number (000715150185), Catalog Number (db) (5032N), Part Name (2KEY), Application (Lighting), Area (<Unused>), Tag Name (db) (NEWUNIT), and Notes (db). At the bottom, there are buttons for 'Simple <<', 'Reset Unit', 'OK', 'Cancel', 'Apply', and 'Help'. A note at the bottom says 'Press F10 to scan a Product Barcode'.

- ▶ Apply and save all settings to the DB & Physical unit.

The screenshot shows the 'Save Location' dialog box. It has a title bar 'Save Location' and a subtitle 'Unit Programming Information - Save'. There are two checked checkboxes: 'Save to Database' and 'Save to Physical Unit'. At the bottom, there are buttons for 'OK', 'Cancel', and 'Help'. A mouse cursor is pointing at the 'OK' button.

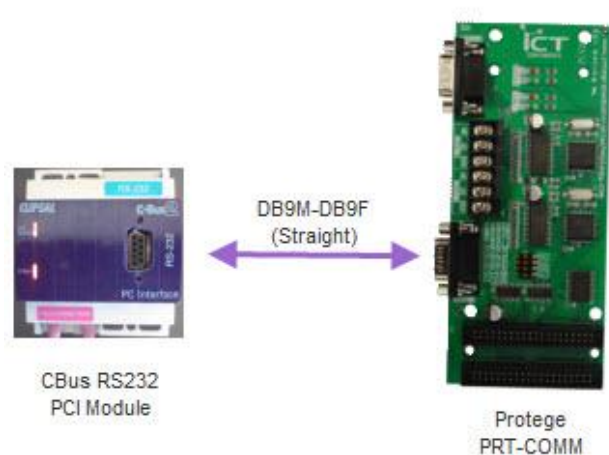
Configuring Protege

In This Chapter

Connecting the Protege Hardware	17
Creating a Service	18
Creating an Automation Point	20
Controlling a CBus output from an Automation Point	24
Controlling a CBus Output from a PGM	26
Controlling a PGM from a CBus Input.....	29
Control AND Status from Protege AND CBus	31

Connecting the Protege Hardware

Connect the Protege PRT-COMM to the Clipsal unit using a STRAIGHT-THROUGH cable.



As this Application Note uses Port 1 on the PRT-COMM, ensure the dip switches are set as follows;

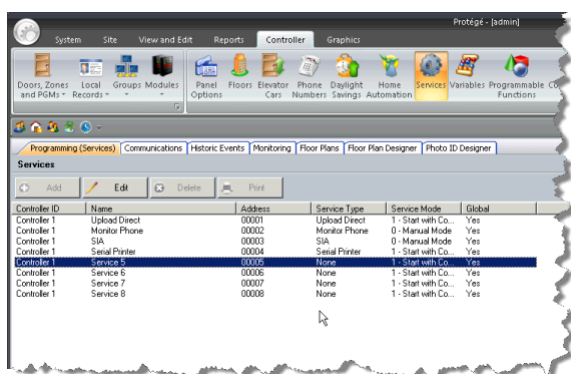
DIP 1	ON
DIP 2	OFF
DIP 3	OFF
DIP 4	OFF



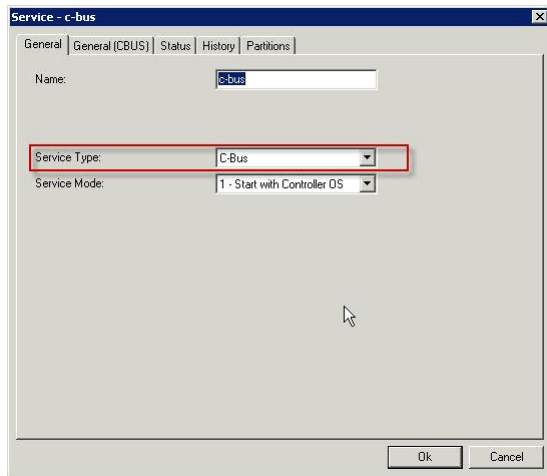
WARNING: Connecting or Disconnecting the PRT-COMM while the Protege controller is powered up may cause damage to the hardware.

Creating a Service

- From "Controller | Services" options, Select a free service and select the C-Bus Service Type.



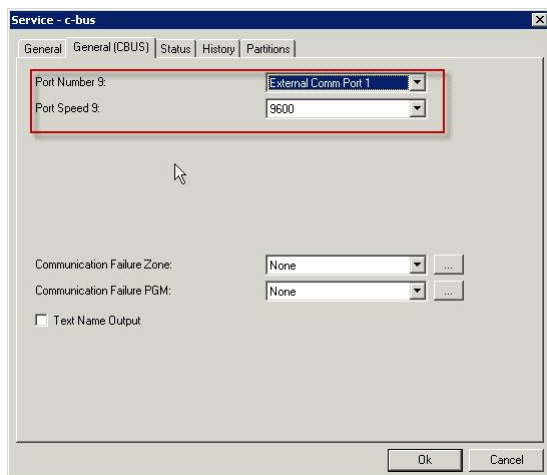
- ▶ Setting the Service Mode to "1 - Start With Controller OS" will automatically start the service if the controller is reset. (Recommended)



- ▶ You will be prompted to close & reopen the service window. Select OK, then reopen the C-Bus service.

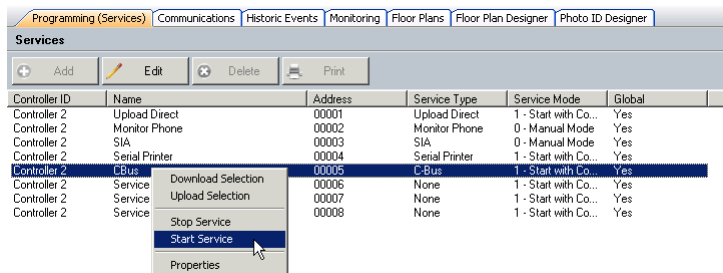
Setting the Service Options

- ▶ Select the Port you have connected the RS232 module to.
- ▶ Set the Port Speed to 9600 (C-Bus Default)

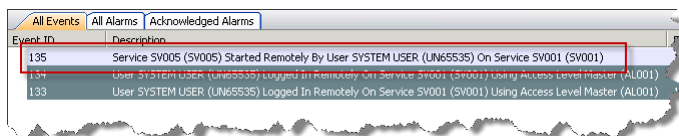


Starting the Service

- ▶ Start the service by Right-Clicking and selecting the **Start Service** Option.



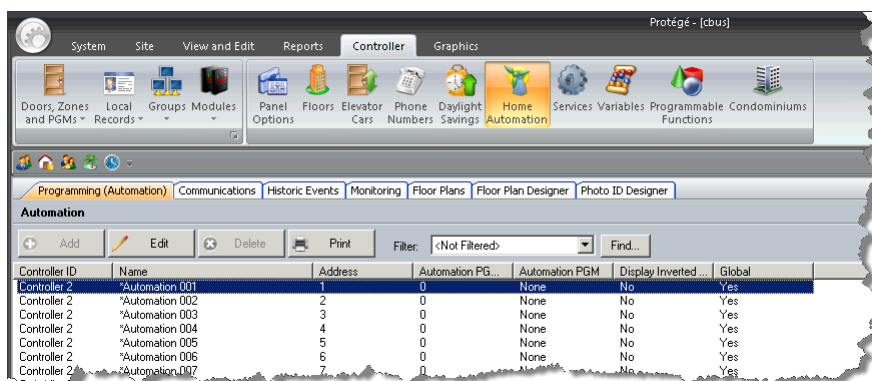
- ▶ Ensure you get the "Service Started event" in the protege event log.



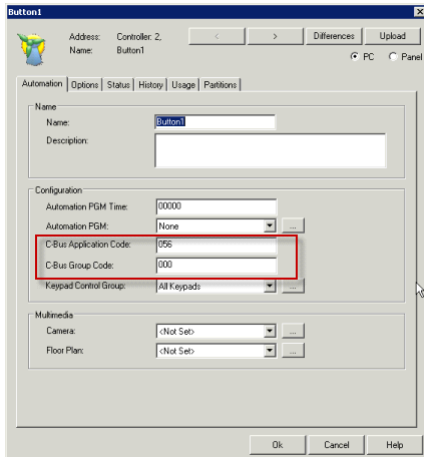
A service **CANNOT** be modified once it is running. To modify the service, it must be in the **HALTED** state.

Creating an Automation Point

From the "Controller | Home Automation" section, select an Automation point to modify.

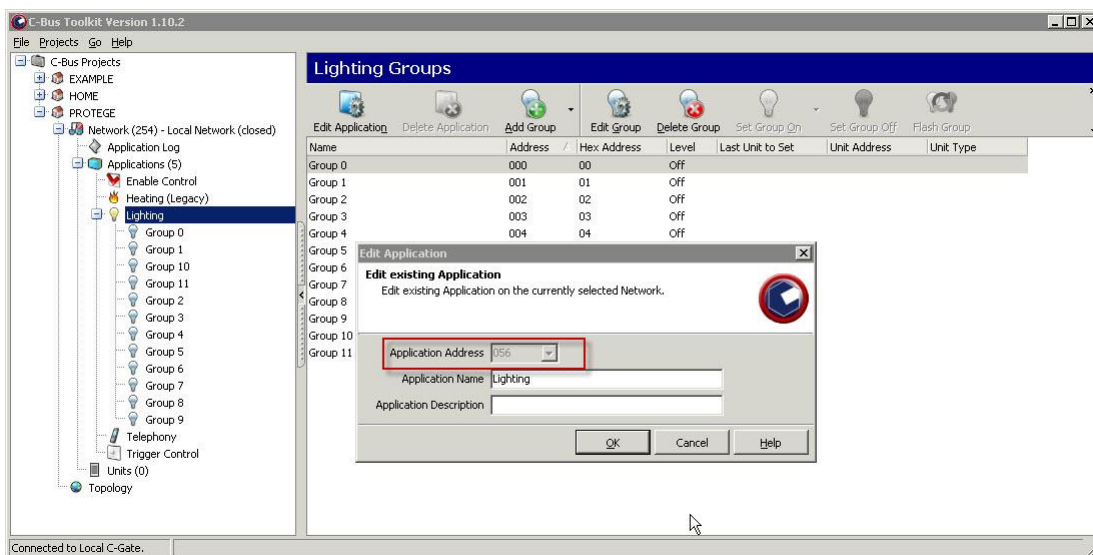


- ▶ Name the Automation Point
- ▶ Assign the Application & Group Code for the CBus point you wish to View or Control



Identify the C-Bus Group & Application Codes

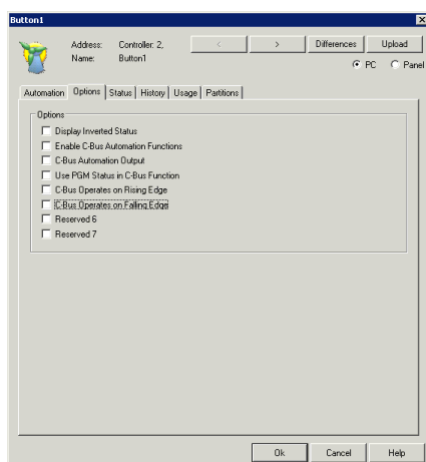
- ▶ The Application and Group code are used within Protege to define the the C-Bus input or Output to control or view.
- ▶ From within the CBus toolkit application, Selecting **Edit Application** will show the Application Code (Application Address)



The Clipsal C-Bus application number is used to link this automation point to a C-Bus Application that is communicating with the system controller via a PRT-COMM and Serial Communications Interface. For example if you want to link this automation point to activate when a Lighting, Switching and Load Control application command is generated for a particular Group Address set the Application Type to 056 (056 or \$38 Hex is the Lighting, Switching and Load Control application, refer to the *Clipsal C-Bus Application Specifications* and related documents.

The Clipsal C-Bus group address is the number used to identify the group within the C-Bus network. This typically ranges from 0-255. A group allows any PGM in the Protégé System to either control a C-Bus group as the result of a change within the system or to change based on a C-Bus group being activated. For example when a user press's a Goodbye Button on a C-Bus keypad this can activate a PGM that is used to ARM an Area in the Protégé System. The PGM's can also be used to allow doors to Unlock/Lock based on the C-Bus events that occur.

Automation Options



Option 1 - Automation Display Inverted

- ▶ Enabled the Automation display will show the automation status as inverted. Set this option when a PGM or PGM Group operates inverted to the normal state.
- ▶ Disabled the Automation will display in the normally open state.

Option 2 – Enable C-Bus Automation Functions

- ▶ Enabled the Automation point will be included in the C-Bus processing and used to control or be controlled by a C-Bus automation point.
- ▶ Disabled the Automation point is not used for C-Bus.

Option 3 - C-Bus Automation Output

- ▶ Enabled the Automation point will generate a C-Bus message on the C-Bus system when the status of the Automation point changes. For example manually controlling the Automation point will send the Application Id and Group Address to the C-Bus interface.
- ▶ Disabled the Automation point is will be updated based on the C-Bus message and group. For example if this option is disabled and a C-Bus message is received that match's the programmed settings the automation point will activate the PGM.

Option 4 – Use PGM Status In C-Bus Functions

- ▶ Enabled the Automation point will use the programmed PGM directly rather than using the automation point status or setting. This allows any PGM in the system to be programmed for the automation point without it actually being controlled by the automation point.
- ▶ Disabled the Automation point status will be used for C-Bus operations.

Option 5 – C-Bus Functions Operate On Rising Edge

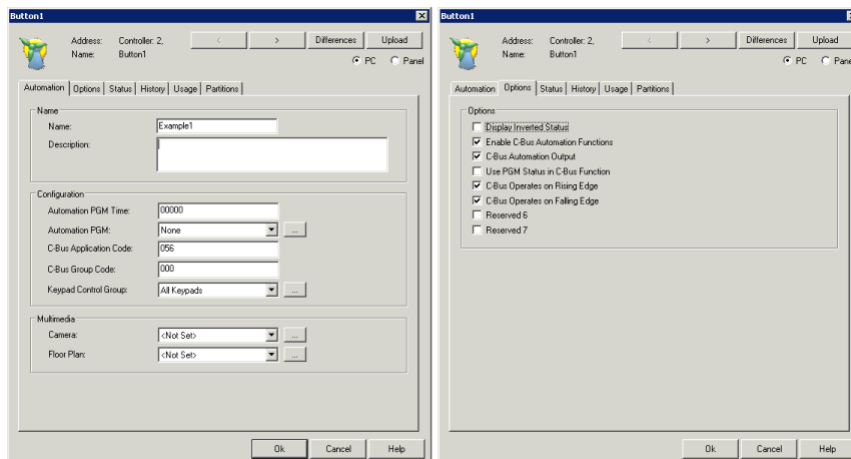
- ▶ Enabled the C-Bus processing will only activate on the rising edge of a change in the Automation Point or PGM state. For example the Automation point changing from Off to On.
- ▶ Disabled the C-Bus processing will ignore any change from Off to On.

Option 6 – C-Bus Functions Operate On Falling Edge

- ▶ Enabled the C-Bus processing will only activate on the falling edge of a change in the Automation Point or PGM. For example the Automation point changing from On to Off.
- ▶ Disabled the C-Bus processing will ignore any change from On to Off.

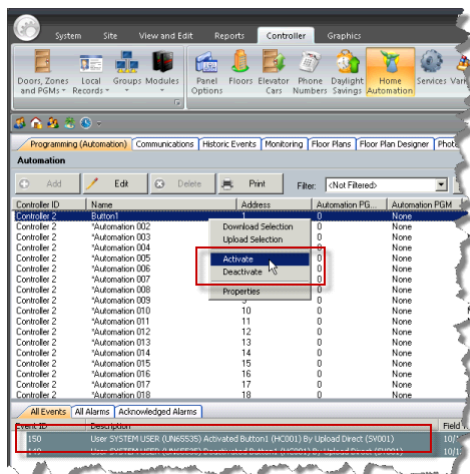
Controlling a CBus output from an Automation Point

The Following example show how to configure an Automation point to Activate & Deactivate a CBus point Directly.

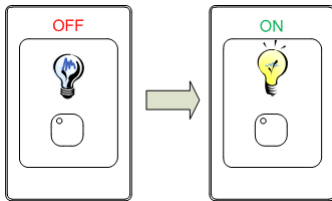


Activating the CBus Point

- Right-Click on the Automation Point and select "Activate"

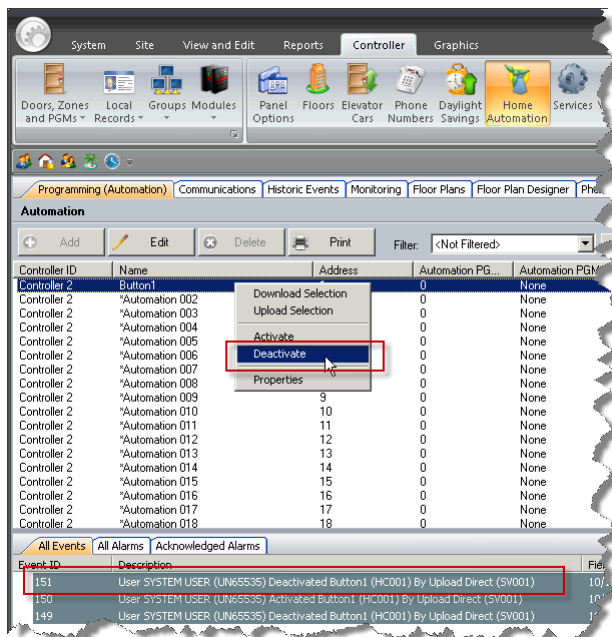


- ▶ The Event log should indicate the Automation Point has been Activated
- ▶ The Associated CBus output/s will activate.

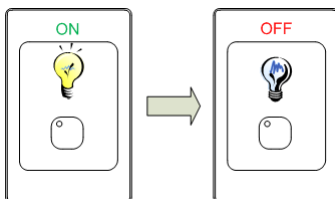


Deactivating the CBus Point

- ▶ Right-Click on the Automation Point and select "Deactivate"

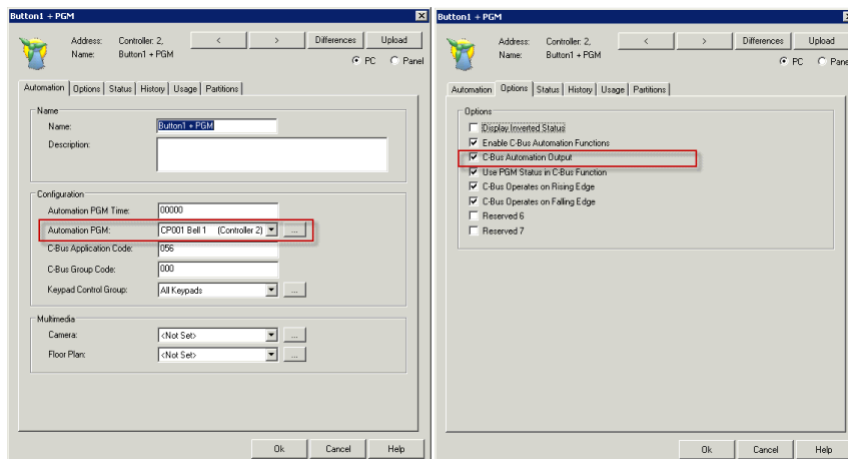


- ▶ The Event log should indicate the Automation Point has been Activated
- ▶ The Associated CBus output/s will activate.



Controlling a CBus Output from a PGM

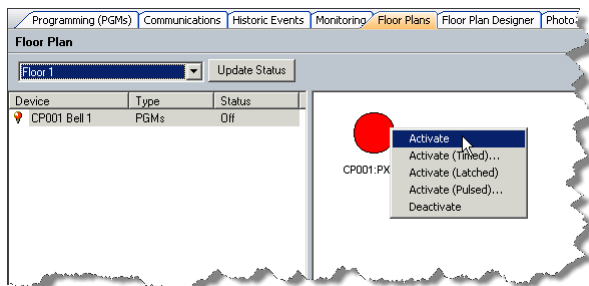
In the following example, We will **ACTIVATE** the the CBus Output mapped to Application Code 056, Group Code 000 by Activating Controller Bell 1 PGM on the Protege.



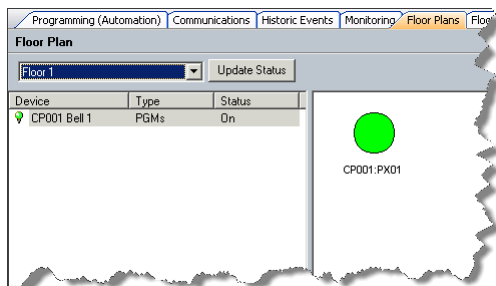
In the following examples, the PGM is activated from a dynamic floor plan however the PGM may be activated by ANY means to trigger the CBus event.

Activating the CBus Point

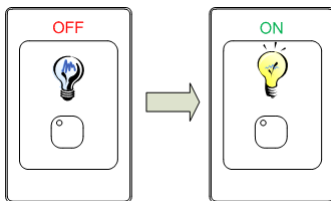
- ▶ Create a floorplan to display the PGM Status.
- ▶ Activate the PGM by Right-Clicking the Object on the Floorplan.



- The PGM State will change to ON.

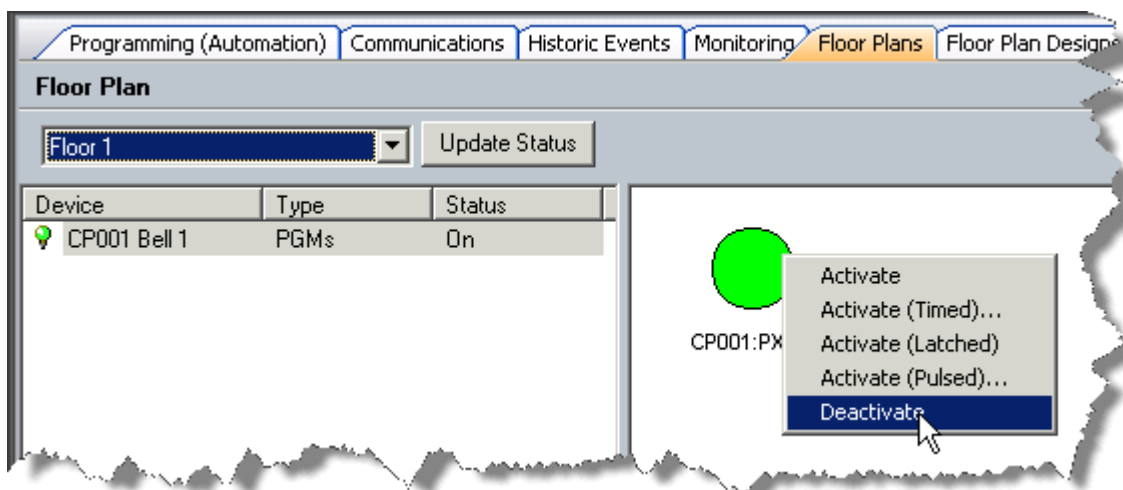


- The CBus point will Activate.

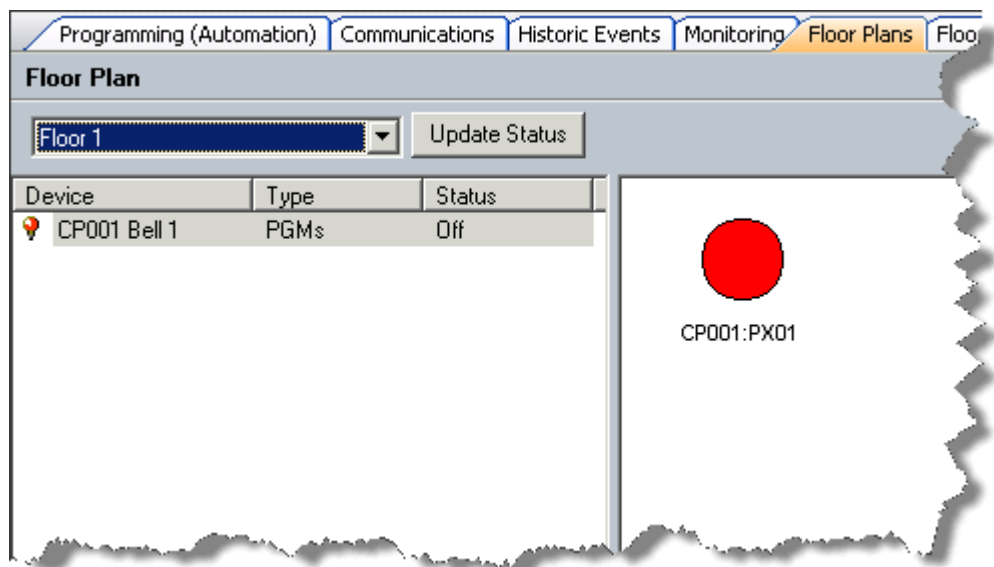


Deactivating the CBus Point

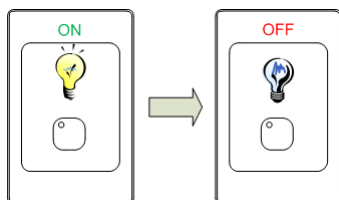
- Create a floorplan to display the PGM Status.
- Deactivate the PGM by Right-Clicking the Object on the Floorplan.



- The PGM State will change to **OFF**.

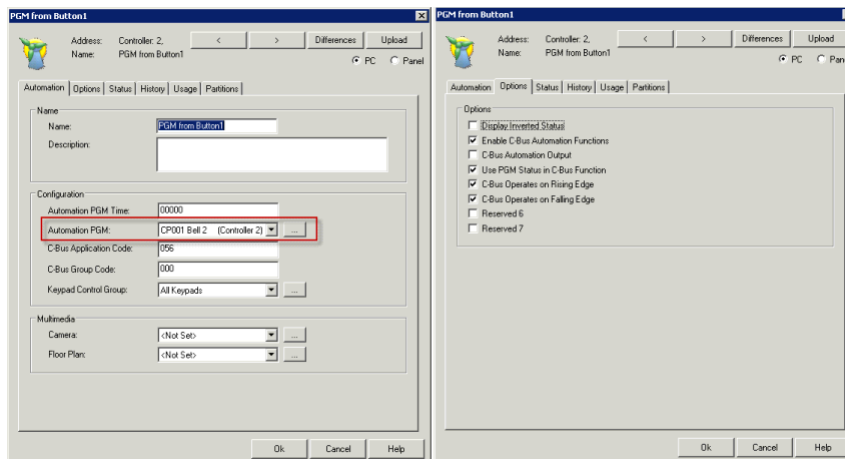


- The CBus point will **Deactivate**.



Controlling a PGM from a CBus Input

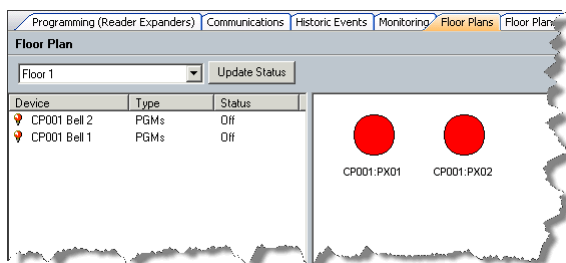
In the following example, We will **ACTIVATE** the "Controller Bell 2" PGM by Pressing the CBus input mapped to Application Code 056, Group Code 000.



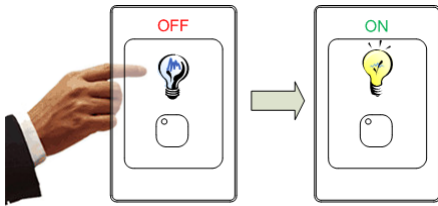
In the following examples, the PGM is activated from a dynamic floor plan however the PGM may be activated by ANY means to trigger the CBus event.

Activating a PGM from a CBus Input

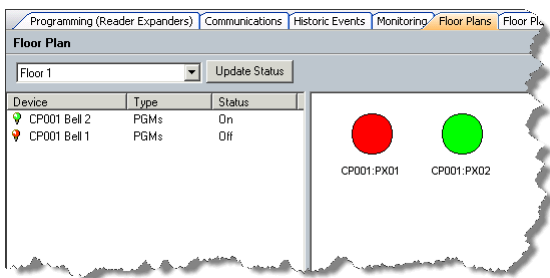
- Note the status of the PGM is **Inactive**.



- ▶ **Activate** the CBus Input by pressing the associated button.

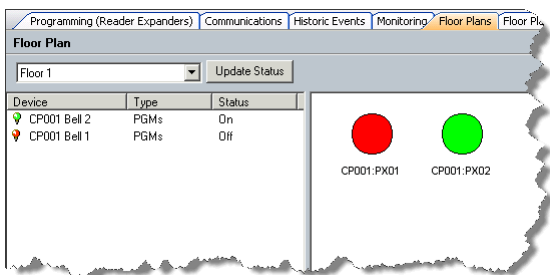


- ▶ The CBus input will change to the **ACTIVE** state
- ▶ The Associated PGM will change to the **ACTIVE** state

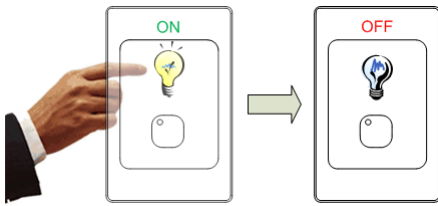


Deactivating a PGM from a CBus Input

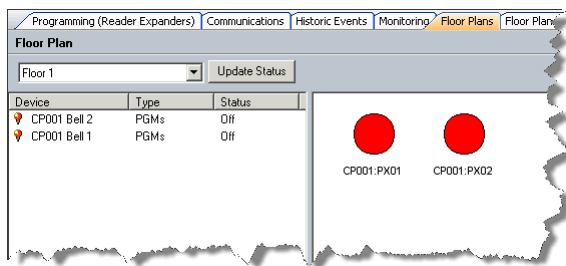
- ▶ Note the status of the PGM is **Active**



- ▶ **Deactivate** the CBus Input by pressing the associated button on the CBus control module



- ▶ The CBus input will change to the **INACTIVE** state
- ▶ The Associated PGM will change to the **INACTIVE** state

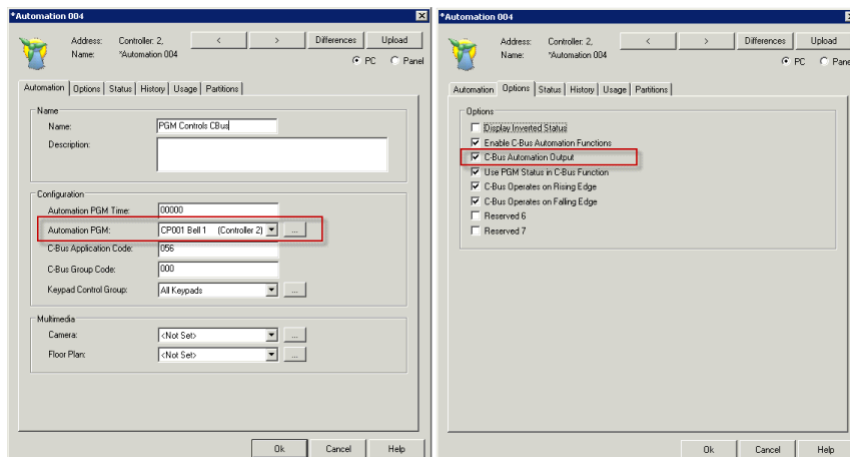


Control AND Status from Protege AND CBus

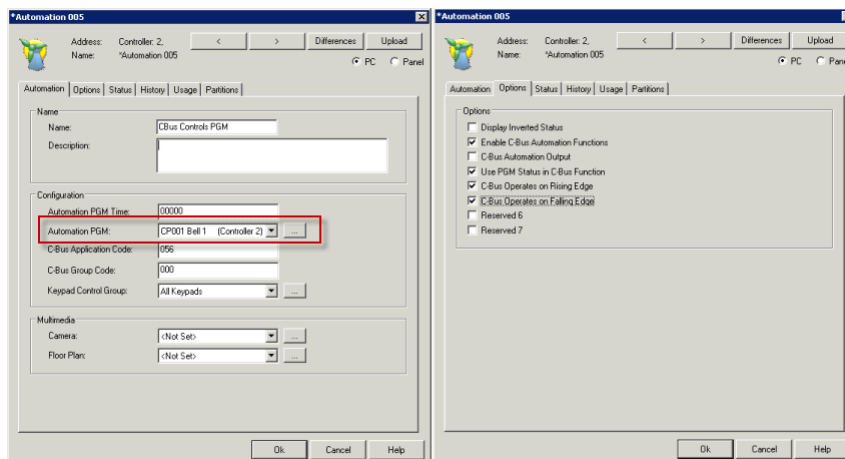
If there is a requirement for a user to be able to control a CBus point from a Protege PGM *AND* control the Protege PGM from CBus then TWO automation points must be set up.

- ▶ Automation Point 1 will be configured to "Control a CBus output from a PGM".
- ▶ Automation Point 2 will be configured to "Control a PGM from a CBus input".
- ▶ Both Automation points will be linked to a common Protege PGM.

Control a CBus output from a PGM:



Control a PGM from a CBus input



- This configuration will enable Bi-Directional control and status between a CBus point and a Protege PGM.

Pressing the button on the CBus module will activate the PGM.

Activating the PGM will enable the CBus Point.

Chapter 4

Controlling Protege Areas

In This Chapter

Introduction	33
Area Follows PGM Status	35
Testing Your Programming.....	39
Area Arm On Pulse PGM.....	41
Area Disarm On Pulse PGM.....	43

Introduction

The following programming shows how a CBus application can control the arming and disarming of an area so it follows the status of a CBus point. In many cases the follow function is not viable because an area may need to be controlled from another source (keypad, touch screen or reader). It may also be required that there is an arm point and a disarm point so that if either of these are activated that the area will arm or disarm but will also allow the area to be controlled by a user on a keypad, touch screen or card reader.

This section will cover programming from the Protege System Management Suite only and will not show keypad programming.

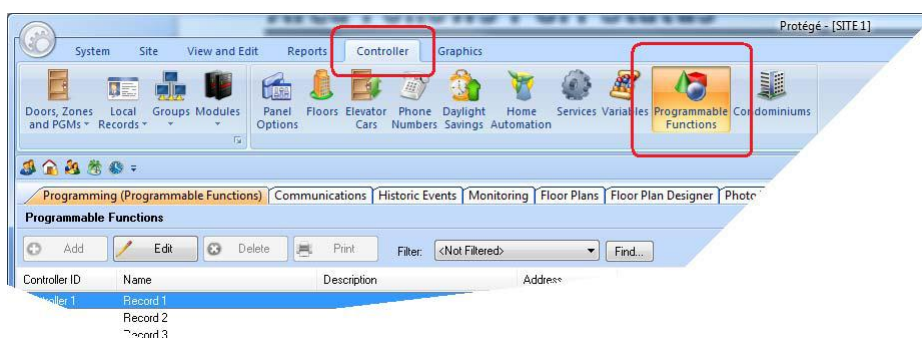
The PGM's used for the following exercise will be AE001:01 and AE001:02 these are commonly spare unless analog expanders are used.

Programmable functions are used extensively in the following examples to link the CBus PGM being controlled to the resulting activation in the area. It is recommended that the section in the Protege Controller Reference Manual and the Online help system is reviewed in detail.

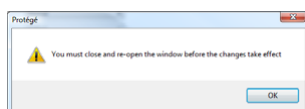
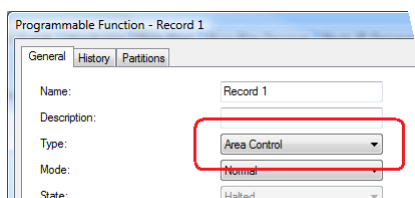
Area Follows PGM Status

When an area is used in a programmable function in the follow state the area will 'Follow' the PGM it is linked to, this will mean that any changes in the PGM will be mimicked by the area. Any changes to the area status (Disarm or Arm from a keypad) will be effective until the programmable function checks the state of the area against the PGM (approximately 30 seconds). In many cases this is not the desired action. If external control is also required please see the area pulse on arming and area pulse on disarming. This allows the area to be controlled by two PGMs each having a specific function (Arming/Disarming).

Open the Protege System Management Suite. Select the communications tab and connect to your controller.

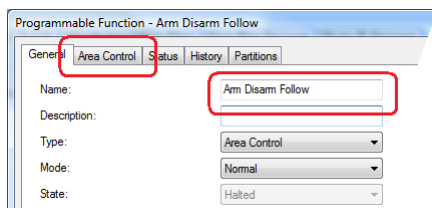


- From the controller tab select the programmable functions. In this example we will use programmable function 1 for the follow arming to arm area 1 and programmable function 2 and 3 for the pulse on/off arming of area 2. DO NOT USE AREA 1 for both programmable functions as they will not work and the programmable functions will interfere with the area control.

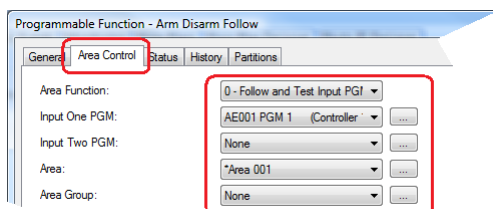


Controlling Protege Areas

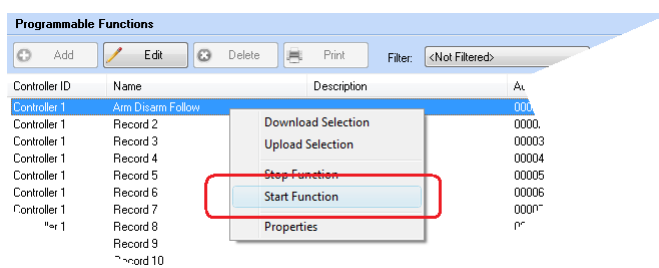
- Select the first programmable function. Change the type to 'Area Control' and select the OK button, you will be prompted by the software to close the screen, this allows the system to redraw the configuration settings. Once this is completed open the programmable function again.



- When you open the function again you will see the Area Control tab is now available. Before selecting the tab complete the name with a descriptive name of the programmable functions action.



- Select the Area Control tab as shown and complete the configuration parameters above ensuring that Input Two PGM and Area Group are set to NONE. Once you have completed the programming select the OK button.



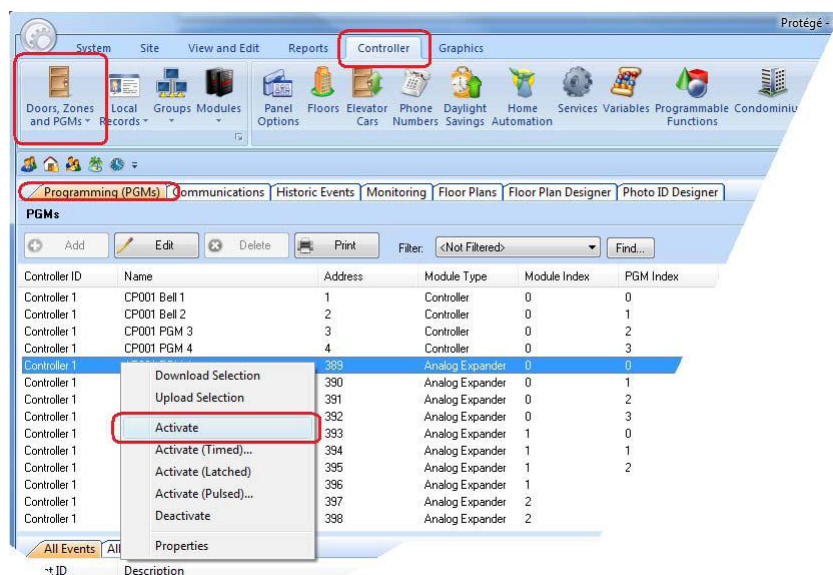
- ▶ Once the programming for the function is completed you need to start the function. Starting a function allows the PLC internal to the controller to run the programmed settings, much like running a program, once it is run it will remain running until it is stopped and will automatically be started if it was stopped when the controller is restarted for any reason.
- ▶ Start the Programmable Function by right clicking the function from the list and select start function.



Once you have started a programmable function YOU CAN NOT edit the settings in the controller and must STOP the function download any changes and then restart the function.

Testing Your Programming

Once you have your programmable function running successfully you will be able to test the operation very easily by controlling the PGM you have used (AE001:01) for the Input PGM One in the programmable function.



Select the controller tab and then PGMs from the Doors, Zones and PGM's icon. From the PGM programming list right click on the AE001:01 PGM and select activate. You will see that your area will begin to arm a short time later. Allow the area to complete the arming cycle and then select deactivate from the menu and you will observe the area begin a disarm cycle.

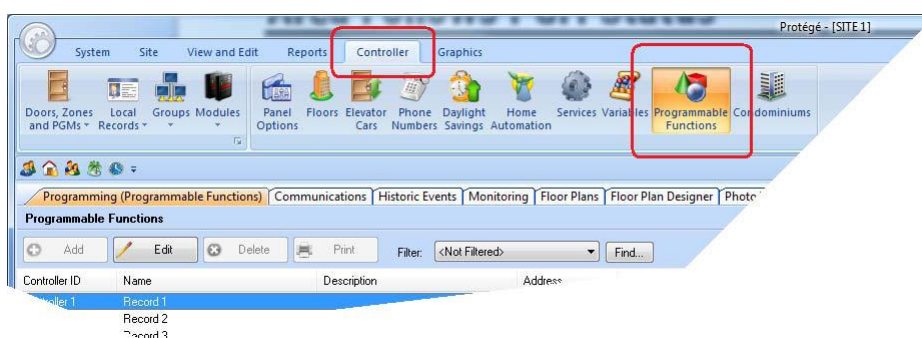


It is recommended that when you are testing to select the Log Events option in the PGM configuration that will allow the activation and deactivation of a PGM to be presented in the event window.:

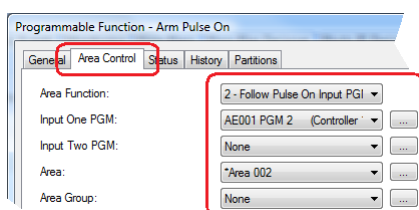
Area Arm On Pulse PGM

The following two programmable function assignments allow you to control the area from two separate PGM's. One used to arm the Area and the other used to disarm the Area. Activating either one when it is in the resulting state will yield no change in the area status. This level of control is ideal for when an area needs to be controlled from the Cbus system using an operator panel, touchscreen etc.

Open the Protege System Management Suite. Select the communications tab and connect to your controller.



- From the controller tab select the programmable functions. In this example we will use programmable function 2 for the pulse on arming to arm area 2 and programmable function 3 for the pulse on disarming. DO NOT USE AREA 2 for both programmable functions as they will not work and the programmable functions will interfere with the area control.



Controlling Protege Areas

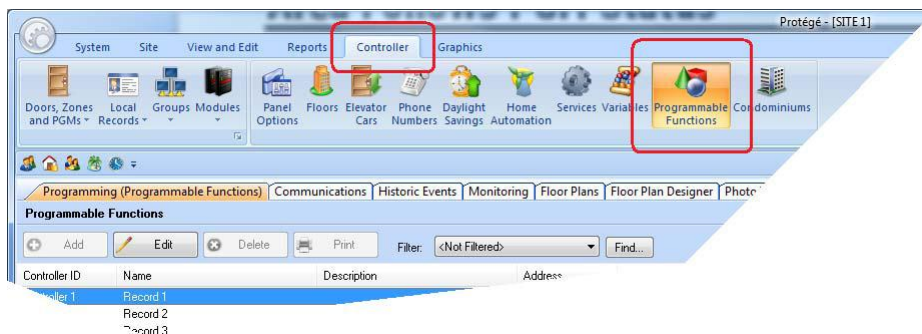
- ▶ Follow the steps to add a new function as shown in the previous section. In this example we have named this Arm Pulse On. Complete the entries above paying special attention to the function which is Follow Pulse On Input PGM meaning that the area will arm (turn on) when the PGM turns on.
- ▶ Once programmed select ok and start the function as shown in the previous example.
- ▶ Now before you test your application open the PGM output AE001:02 and change the activation time to 3 seconds. This will mean that when you arm the area the pgm will only turn on for this period of time allowing you to turn it on again to re-activate an arming cycle.



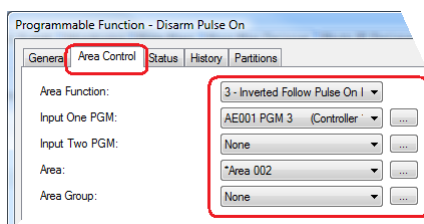
Now test your configuration by activating the PGM using the timed option from the menu for 3 seconds. If your programming is correct the area will arm however when the PGM deactivates will remain armed.

Area Disarm On Pulse PGM

The disarm programming is once again another programmable function however the operation is inverted. Instead of arming the area the function needs to disarm the area when the PGM is activated.



- From the controller tab select the programmable functions. In this example we will use programmable function 3 for the pulse on disarming to disarm area 2. Area 2 should only be assigned to programmable function 2 and 3.



Controlling Protege Areas

- ▶ Follow the steps to add a new function as shown in the previous section. In this example we have named this Disarm Pulse On. Complete the entries above paying special attention to the function which is Inverted Follow Pulse On Input PGM meaning that the area will arm (turn on) when the PGM turns on.
- ▶ Once programmed select ok and start the function as shown in the previous example.
- ▶ Now before you test your application open the PGM output AE001:03 and change the activation time to 3 seconds. This will mean that when you arm the area the PGM will only turn on for this period of time allowing you to turn it on again to re-activate an arming cycle.



Now test your configuration by activating the PGM using the timed option from the menu for 3 seconds. If your programming is correct the area will Disarm however when the PGM deactivates will remain Disarmed. Ensure the area is already armed.