AN-336

Programming Function Outputs in Protege GX and Protege WX

Application Note

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Contents

Introduction

Function outputs provide a method for controlling outputs based on the state of a door. When the door is unlocked, up to three function outputs or output groups can be activated, each with its own activation time and settings. Function outputs are convenient for a number of purposes:

- Accessibility features such as automatic door pumps and chair lifts
- Bypass shunts for integration with third-party intruder systems
- Automatic lights
- Activating further automation when the door is unlocked

Function outputs operate independently of the door's lock outputs, which makes them a more flexible alternative to additional lock outputs for controlling outputs based on door activity. For more information on additional lock outputs, see Application Note 285: Programming Additional Lock Outputs in Protege GX.

Prerequisites

Protege GX Requirements

Component	Version
Protege GX software	4.3.317.10 or higher
Protege GX controller	2.08.1238 or higher

Protege WX Requirements

Component	Version
Protege WX controller	4.00.1141 or higher

Configuring Function Outputs

To program function outputs on a door, complete the following steps:

1. Create the outputs or output groups that will be activated by the door.
2. Navigate to **Programming | Doors** and select the relevant door.
3. Open the **Function outputs** tab.
4. To program the first function output, select either a **Function 1 output** or **Function 1 output group**.
5. Set the **Function 1 activation time** (in seconds). This defines how long the output(s) will remain activated once triggered. When this time is set to 0, the function output will be activated indefinitely. For more information, see Understanding the Activation Time (next page).

   This setting overrides the **Activation time** defined in the output programming.

6. The first two checkboxes determine how the function output will be triggered:
   - If neither of these settings are enabled, the function output will be activated every time the door is unlocked by any method. For example, the function output will be activated when the door is unlocked by access, REX/REN, operator command, schedule, area or programmable function.
   - The **Activate on access** and **Activate on REX/REN** settings restrict the function output to operate only when the door is unlocked using that method. The function output will no longer be activated when the door is unlocked by any other method.

     You can enable one or both of these options.

7. **Deactivate on door open** and **Deactivate on door close** instruct the function output to deactivate immediately when the door is opened or closed respectively.
8. **Recycle time on access** and **Recycle time on REX/REN** allow users to extend the activation time of the function output using access or REX/REN.

   When the function output time is recycled the lock output activation time is recycled as well. This requires some additional configuration.

   To use **Recycle time on access**, you must:
   - Enable **Activate on access** (above).
   - Enter the command `RecycleDoorTimeOnAccess = true` in the **General** tab.

   To use **Recycle time on REX/REN**, you must:
   - Enable **Activate on REX/REN** (above).
   - Enable **Always allow REX** and **Recycle REX time** in the **Inputs** tab, **General options** section.
   - Enter the command `AlwaysAllowREN = true` in the **General** tab.

   The lock output activation time cannot be recycled using the REN input. This is a known limitation.

9. If further function outputs are required, configure the **Function 2 output** and **Function 3 output**. Each function output can have different settings.
10. Click **Save**.

Understanding the Activation Time

Activation Time > 0

With the **Function 1-3 activation time** set to a number greater than 0:

- When the door is unlocked normally (timed unlock), the function output will be activated for the programmed activation time.
- When the door is latch unlocked, the function output will be activated until the door is locked again. After the door is locked the function output will remain on for the programmed activation time, and then will be deactivated.

  When multiple lock outputs are in use, the function output timer will not start until all lock outputs are deactivated.

Activation Time = 0

With the **Function 1-3 activation time** set to 0:

- When the door is unlocked normally (timed unlock), the function output will be activated indefinitely.

  Since the output will not turn off automatically, you must program another method to deactivate the output when the relevant conditions are met. For example, you could configure the output to deactivate when:
  - The door is opened or closed (using the **Deactivate on door open/close** settings)
  - A specific input is triggered (using an input and input type)
  - A user triple badges at the door (using the **Reader 1/2 arming mode** on the reader expander)
- When the door is latch unlocked, the function output will be activated until the door is locked again. The function output turns off immediately when the door is locked.

  When multiple lock outputs are in use, the function output will not be deactivated until all lock outputs are deactivated.

Deactivate on Door Open/Close

When the **Deactivate on door open** or **Deactivate on door close** option is enabled:

- While the door is not latch unlocked, the function output will be deactivated immediately when the door is opened/closed respectively.
- While the door is latch unlocked, the function output will not be deactivated when the door is opened/closed. It will remain on until the timer expires or the door is relocked.

Additional Features

Accessibility Features

Many buildings have accessibility devices to accommodate people with disabilities, such as door openers and chair lifts. You can restrict their usage to only specific users so that they are not activated unnecessarily.

To restrict a function output to disabled access only, enter the following command in the door programming:

`ActivateOnADAFx = true`

where **x** is the number of the function output.

- When this command is enabled, this function output will only be activated when the door is unlocked by a user with the **User operates extended door access function** option enabled (**Users | Users | Options**).
- If the door is unlocked by a user without this option or by another method such as REX or operator control, this function output will not be activated.

This command can be used together with **Activate on REX/REN** to activate the function output using a REX/REN button as well as disabled access. The **Activate on access** option overrides this command.

Users may also need the ability to recycle the activation timer for a function output after it has been activated. For example, this can allow users to hold the door open using the door pump.

To configure this, enter the following command:

`RecycleOnADAFx = true`

where **x** is the number of the function output.

The `RecycleDoorTimeOnAccess = true` command must also be enabled.

Deactivate on Door Forced

By default the **Deactivate on door open** option does not take into account the door forced condition, so that the function output is not deactivated when the door is forced open. If the function output must be deactivated when the door is forced open, enter the following command:

`DeactivateOnForceFx = true`

where **x** is the number of the function output.

The **Deactivate on door open** option must also be enabled.

Programming Examples

For these programming examples, we will assume that you have a controller online and programmed with at least two doors and some spare outputs available. A status page will be useful to monitor the events and output status.

Example 1: Automatic Door Pump

Consider a door which has a door pump or automatic door opener. When a user unlocks the door using an access reader or REX button, the door pump should activate for 10 seconds to open the door, then deactivate to close it.

We would expect the door pump to open the door when a user enters or exits, but not when the door is unlocked by remote methods - e.g. on schedule or by operator command. In addition, if a user badges or presses the REX button again when the door is already open or unlocked, the door pump should stay open for a longer time or reactivate.

1. In **Programming | Outputs**, select a spare output and name it Door 1 Pump.
2. Navigate to **Programming | Doors** and select RD1 DR1.
3. In the **Function outputs** tab, set the **Function 1 output** to Door 1 Pump.
4. Set the **Function 1 activation time** to 10 seconds.
5. Enable the following:
   - **Activate on access**
   - **Activate on REX/REN**
   - **Recycle time on access**
   - **Recycle time on REX/REN**
6. To recycle the function output time, some additional options must be configured.
   - Navigate to the **General** tab and expand the **Commands** field. Enter the following command:

     ```
     RecycleDoorTimeOnAccess = true
     ```
   - Navigate to the **Inputs** tab and scroll down to the **General options**. Enable **Always allow REX** and **Recycle REX time**.
7. Click **Save**. Wait for the settings to be downloaded to the controller.
8. To validate the programming:
   - Badge a card to unlock the door. The door pump output should be activated for 10 seconds.
   - Badge the card and wait a few seconds, then badge again. You should observe that the door pump output stays on for an extended period of time.
   - Repeat the above testing using the REX button.
   - From Protege GX, right click on the door and latch unlock it. The door pump should not be activated.
   - Badge the card again. The door pump should be activated for 10 seconds.
   - Press the REX button. The door pump should be activated for 10 seconds.

Example 2: Bypass Shunt

Another door has a shunt mechanism, which is required to bypass a third-party intruder detection system when the door is unlocked. This ensures that the alarm is not activated when the door is opened legitimately by access.

When a user badges their card or uses the REX button, the shunt output should turn on for 45 seconds to allow them to use the door. However, if the user closes the door within this period, the shunt output should turn off immediately.

1. In **Programming | Outputs**, select a spare output and name it Door 2 Shunt Output.
2. Navigate to **Programming | Doors** and select RD1 DR2.
3. In the **Function outputs** tab, set the **Function 2 output** to Door 2 Shunt Output.
4. Set the **Function 2 activation time** to 45 seconds.
5. Enable the following:
   - **Activate on access**
   - **Activate on REX/REN**
   - **Deactivate on door close**
6. Click **Save**. Wait for the settings to be downloaded to the controller.
7. To validate the programming:
   - Badge a card to unlock the door. The shunt output should turn on for 45 seconds.
   - Badge the card again and open the door position input. Close the door position input again, and observe that the shunt output turns off immediately.
   - Repeat the operations using the REX button.

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