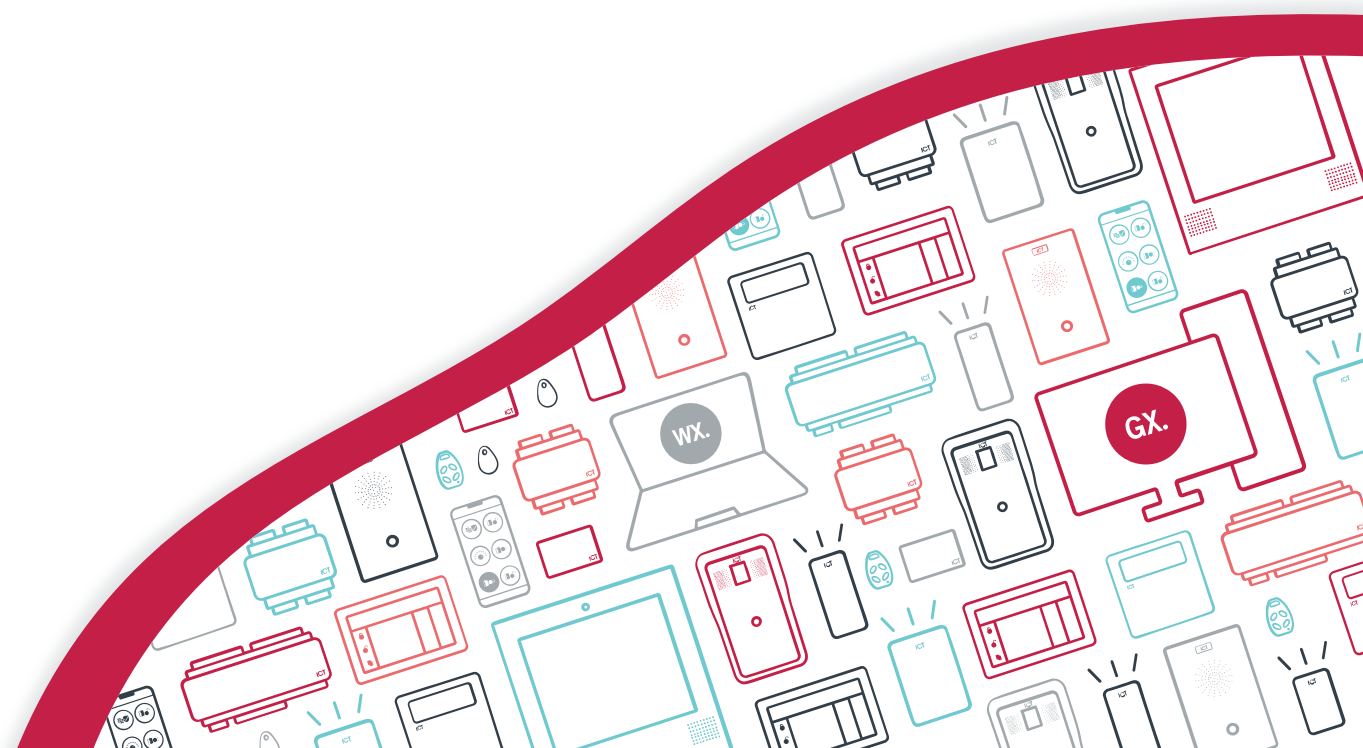
AN-204

Access Level Outputs in Protege GX

Application Note



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Introduction

Many sites have a single entry point which most or all users must pass through in order to gain access to their particular area. Access level outputs are used to identify a single user or a group of users as they pass through a common point, and provide a tailored system response.

Access level outputs can be configured to activate a single output or a group of outputs when a user is granted access to a door or keypad using a specified access level. Each access level can be assigned different outputs to provide a different response.

Typical Access Level Output Usage

Shared Office Spaces

Modern offices tend to have larger shared spaces. The downside to this approach is that there are likely to be times of low but non-zero occupancy, such as early morning, late evening and weekends. Zoned energy management allows systems like lighting and HVAC to be turned on gradually in zones as employees arrive in the morning, beginning with the common zones and those relevant to each individual.

Storage Facilities

Most storage facilities have a common entry point. When each a user enters and is identified by the system, their particular area can be disarmed and unlocked automatically. This allows a single card reader to control many locks or areas.

Data Centers

Data centers often allow multiple tenants and contractors to access a single large facility. Maintaining security in this situation can be difficult. Using access level outputs, intruder detection areas can be disabled and the appropriate equipment cabinets unlocked as required, based on the users who are currently in the area.

After-Hours Cleaning

Commonly cleaners require additional lighting circuits to be switched on to do their job, such as supply closets and access corridors. When a cleaner logs in to the keypad to disarm the building after hours, all of these lights can be switched on automatically. When they rearm the building as they leave, the lights are switched off.

Prerequisites

Hardware and software requirements:

- An operational Protege GX system
- A Protege GX controller

Basic Programming Overview

The following instructions outline the steps required to utilize access level outputs in Protege GX:

1. Define the outputs or output groups that will be activated by each group of users.
2. Select or create the relevant access level in **Users | Access Levels**.
3. In the **General** tab, use the **Configuration** options to define how the access level outputs will operate. The following options are available.
   - **Time to Activate Output**: The access level outputs will be activated for the period (in seconds) defined here.

This option overrides the **Activation Time** in the output programming and **Output Time** in the output group.

- **Reader Access Activates Output**: When this option is enabled, the access level outputs can be activated when the user gains access to a door.
- **Keypad Access Activates Output**: When this option is enabled, the access level outputs can be activated when the user logs in to a keypad.
- **Activate Output Until Access Level Expiry**: When this option is enabled, the access level output will be deactivated when the access level expires in the user record.

  This feature is useful for short-term access levels such as in booking systems. For example, a user might be assigned access to a particular meeting room for an hour. When they first enter the room, the lighting is activated. When the access level expires, the lights turn off.

- **Toggle Access Level Output**: When this option is enabled, the state of the access level outputs will be toggled whenever the user gains access.

  For example, when a user badges their card at a reader for the first time, the output will turn on. When they badge at the reader a second time, the output will turn off.

4. If the access level outputs are to be activated by reader access, add the door(s) associated with the reader to the **Doors** or **Door Groups** tab. This is required even if access is granted through a different access level.

   Output activation will only occur when door access is valid in this access level, and can be restricted by the **Schedule** and **Access Direction** options. This restriction does not exist for activation via keypad.

5. Add the outputs that will be controlled to the **Outputs** or **Output Groups** tab.

   Only one output group can be included per access level. Adding further output groups will generate a health status warning on the controller.

6. Repeat the above steps for each access level that needs to activate outputs. Different outputs can be assigned to each access level to provide a customized response for each group of users.
7. Navigate to **Users | Users** and assign the access levels to users.

   If the outputs are to be activated by keypad access, the relevant access level must be the **first** access level assigned to the user record. In contrast, when a users accesses a door, **all** outputs in any access level that includes that door will be activated.

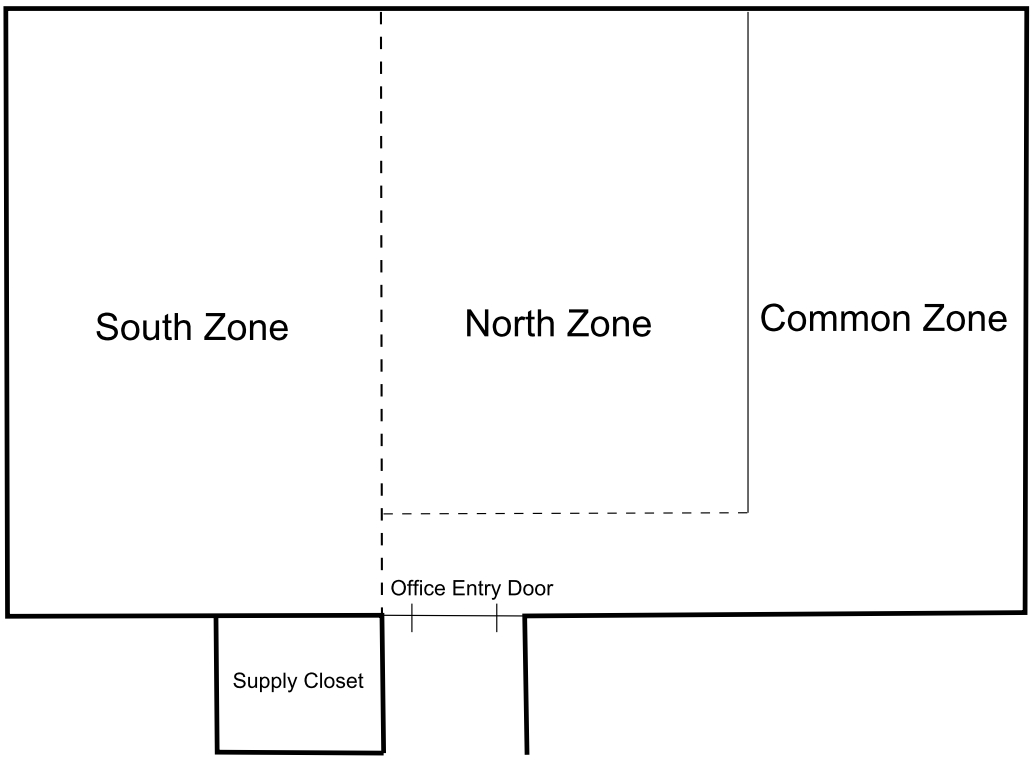
8. Enable access level output functionality in the relevant expander modules.
   - For every door that will activate the outputs, enable **Activate Access Level Output** in **Expanders | Reader Expanders | Reader 1/2** or **Expanders | Smart Readers | Reader**.
   - For every keypad that will activate the outputs, enable **Activate Access Level Output** in **Expanders | Keypads | Options 1**.

   Wait for the programming to be downloaded to the controller, then use **Update Module** to update the expander.

9. When a user accesses a door or logs in to a keypad, the outputs programmed in their assigned access levels will be activated.

Scenario: Zoned Energy Management

One useful application of access level outputs is zoned energy management in shared office spaces. In this scenario, we have an office space that has been divided into three zones: north, south and common space (e.g. break room, entry corridor).



When each employee badges at the door to enter the office area, we want to activate the utilities (lighting and HVAC) for the zone where they work, as well as the common area. No office employees can activate the lights in the supply closet, which is used for the second scenario below (see page 9).

It is assumed that the following records have already been created:

- Outputs for the lighting and HVAC in each zone of the office space
- The Office Entry Door
- User records for employees

The access level outputs can be controlled by any other method after they have been activated by this feature. For example, you could use motion detectors to monitor user occupancy, and turn off the utilities in each zone if there has been no movement for a certain period. For an example of this type of monitoring, see Application Note 307: Programming a Man Down Switch in Protege GX.

Creating the Output Groups

First, it is necessary to create output groups that include the utilities for each zone of the office space.

1. Navigate to **Groups | Output Groups**.
2. Click **Add** to create a new output group with the name Office Utilities North/Common.
3. Click **Add** and add all of the outputs which are used in the north and common zones of the office space, such as lighting and HVAC.
4. Click **Save**.
5. Repeat the above steps to create Office Utilities South/Common.

Creating and Assigning the Access Levels

When each employee enters the office area, only the outputs relevant to them should be activated. This means that we need two access levels: one for employees who work in the north zone, and another for those in the south zone.

1. Navigate to **Users | Access Levels**.
2. Click **Add** and create a new access level with the name Office Staff North.
3. In the **General** tab, enable **Reader Access Activates Output**. The other options are not required for this scenario.
4. In the **Doors** tab, add the Office Entry Door. This is required to activate the access level outputs, even if the user has access to this door from another access level.

   It may be preferable to set the **Access Direction** to Entry to ensure that the user will only activate the utilities when they enter the office, not when they leave. Access to exit can be granted through another access level or REX input.
5. In the **Output Groups** tab, add Office Utilities North/Common.
6. Click **Save**.
7. Repeat the above steps to create the Office Staff South access level, including the Office Utilities South/Common output group.
8. Now the access levels can be assigned to users. Navigate to **Users | Users** and multi-select all of the users who work in the north zone of the office.
9. In the **Access Levels** tab, add the Office Staff North access level and click **Save**.
10. Repeat to assign the Office Staff South access level.

Configuring the Reader Port

It is necessary to enable access level outputs at the reader port that controls the Office Entry Door.

1. Navigate to **Expanders | Reader Expanders** and select the relevant reader expander.
2. In the **Reader 1** or **Reader 2** tab (as required for your door), scroll down to the **Misc Options** section.
3. Enable **Activate Access Level Output**.
4. Click **Save**.
5. Wait for the change to be downloaded to the controller, then right click on the reader expander record and click **Update Module**.

Testing the Programming

For testing, we have programmed two users: Sam McCoy and Alison O'Brien, who work in the north and south zones of the office respectively.

1. Sam McCoy arrives at the office first and badges his card to gain access.

   ```
   Door Office Entry Door Unlocked By Access
   User Sam McCoy Granted Entry To Office Entry Access Level Office Staff
   North Reading Mode Card Input
   ```
2. The utility outputs for the north and common zones turn on.

   ```
   Output Office North Lights On By Output Group Office Utilities
   North/Common
   Output Office North HVAC On By Output Group Office Utilities North/Common
   ```

```
Output Office Common Lights On By Output Group Office Utilities
North/Common
Output Office Common HVAC On By Output Group Office Utilities North/Common
```

3. Later, Alison O'Brien gains access and enters the office.

```
Door Office Entry Unlocked By Access
User Alison O'Brien Granted Entry To Office Entry Access Level Office
Staff South Reading Mode Card Input
```

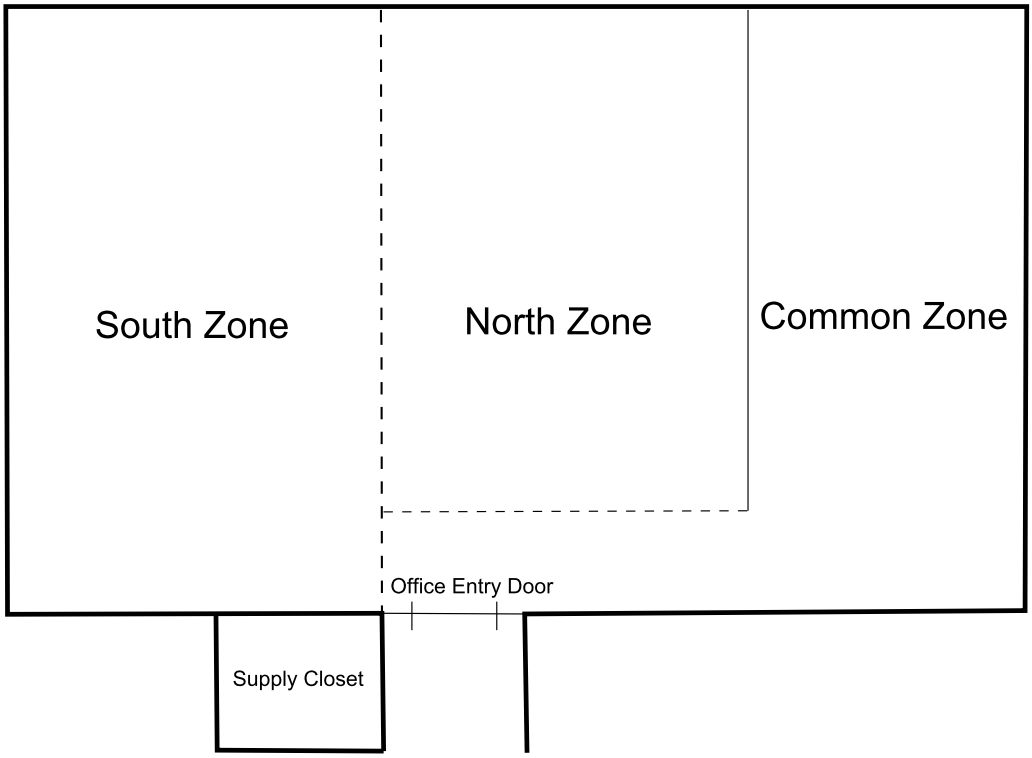
4. The utility outputs for the south zone turn on. If they were deactivated, the utilities for the common zone are activated again.

```
Output Office South Lights On By Output Group Office Utilities
South/Common
Output Office South HVAC On By Output Group Office Utilities South/Common
Output Office Common Lights On By Output Group Office Utilities
South/Common
Output Office Common HVAC On By Output Group Office Utilities South/Common
```

Scenario: After-Hours Cleaning

In contrast to the office workers, the building's cleaners need all lights and HVAC in the office space to be switched on when they enter the area. They also require the supply closet to be unlocked, as it is not access controlled.

This scenario uses the same office layout as the first scenario:



When a cleaner logs in to the keypad to disarm the Office Area, the utilities for all three zones will be activated. In addition, the lights in the supply closet will be switched on and the lock with deactivate. When the cleaner logs in to the keypad again to rearm the area, all outputs will be deactivated.

This scenario uses the outputs and output groups programmed in the previous scenario. In addition, output records are required for Supply Closet Lights and Supply Closet Lock, a keypad record for Office Keypad, and an Office Area record.

Creating the Output Group

The cleaners require an output group that includes all utilities in the office space.

1. Navigate to **Groups | Output Groups**.
2. Click **Add** to create a new output group with the name Office Utilities All.
3. Click **Add** and add all of the outputs which are used in the north, south and common zones of the office space, such as lighting and HVAC.
4. Click **Save**.

The supply closet outputs will be added to the cleaners' access level separately.

Creating the Cleaners' Access Level

When a cleaner logs in to the keypad to disarm the area, all office utility outputs should be activated, as well as the lighting and lock outputs for the supply closet. These outputs should be deactivated when the cleaner logs in a second time to rearm the area.

1. Navigate to **Users | Access Levels** and add a new access level with the name Office Cleaners.
2. In the **General** tab, enable the following options:
   - **Keypad Access Activates Output**
   - **Toggle Access Level Output**
3. If required, add relevant records in the **Menu Groups** and **Disarming Area Groups** tabs to allow the cleaners to disarm the Office Area from the keypad.

   These permissions may be provided by a different access level.
4. In the **Outputs** tab, add the Supply Closet Lights and Supply Closet Lock outputs.
5. In the **Output Groups** tab, add the Office Utilities All output group.
6. Click **Save**.
7. Navigate to **Users | Users** and select each cleaner's user record.
8. In the **Access Levels** tab, add the Office Cleaners access level ensuring that it is the first access level in the list, and click **Save**.

Configuring the Keypad

Finally, access level outputs must be enabled at the relevant keypad.

1. Navigate to **Expanders | Keypads** and select the Office Keypad.
2. In the **Options 1** tab, enable **Activate Access Level Output**.
3. Click **Save**.
4. Wait for the change to be downloaded to the controller, then right click on the keypad record and click **Update Module**.

Testing the Programming

To test this scenario, we have programmed a user record for Amanda Sisko, who is a cleaner. Before Amanda arrives, all office staff have left, the utilities have been deactivated and the office area has been armed.

1. Amanda Sisko logs in to the keypad to disarm the area.
   ```
   User Amanda Sisko Logged In At Office Keypad Using Office Cleaners
   ```
2. The supply closet lights and lock are activated.
   ```
   Output Supply Closet Lights On By Access Level Office Cleaners
   Output Supply Closet Lock On By Access Level Office Cleaners
   ```
3. All office utilities are toggled on.
   ```
   Output Office North Lights Toggle By Output Group Office Utilities All
   Output Office North HVAC Toggle By Output Group Office Utilities All
   Output Office South Lights Toggle By Output Group Office Utilities All
   Output Office South HVAC Toggle By Output Group Office Utilities All
   Output Office Common Lights Toggle By Output Group Office Utilities All
   Output Office Common HVAC Toggle By Output Group Office Utilities All
   ```

4. Amanda disarms the office area and completes her job. When it is time to leave, she logs in to the keypad again to rearm the area.

   ```
   User Amanda Sisko Logged In At Office Keypad Using Office Cleaners
   ```

5. The supply closet lights and lock are turned off.

   ```
   Output Supply Closet Lights Off By Access Level Office Cleaners
   Output Supply Closet Lock Off By Access Level Office Cleaners
   ```

6. All office utilities are toggled off.

   ```
   Output Office North Lights Toggle By Output Group Office Utilities All
   Output Office North HVAC Toggle By Output Group Office Utilities All
   Output Office South Lights Toggle By Output Group Office Utilities All
   Output Office South HVAC Toggle By Output Group Office Utilities All
   Output Office Common Lights Toggle By Output Group Office Utilities All
   Output Office Common HVAC Toggle By Output Group Office Utilities All
   ```

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