



**AN-241**

# Protege GX MCE Elevator Integration

Application Note



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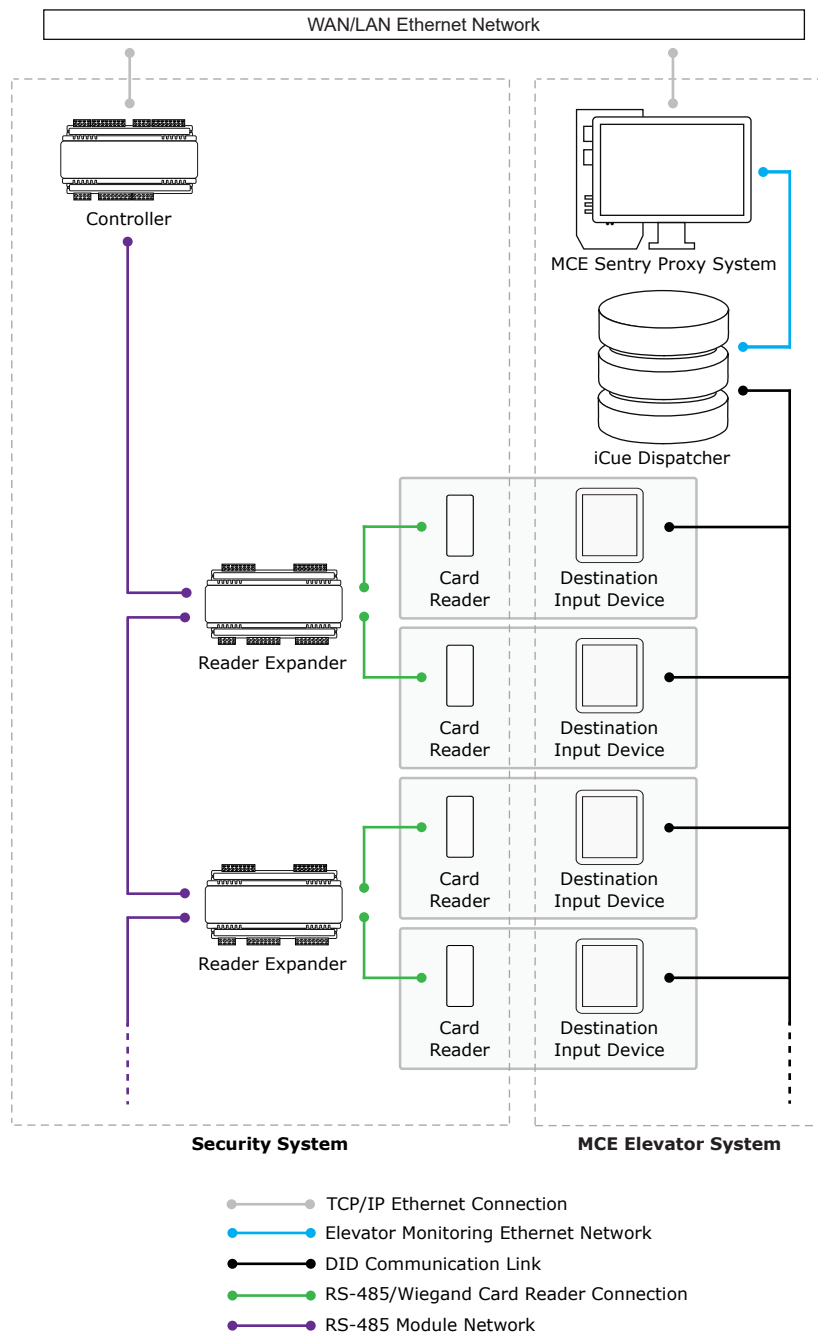
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# Introduction

MCE (Motion Control Engineering) HLI elevator integration is a licensed feature that enables you to use Protege GX in conjunction with the MCE elevator system.

The MCE elevator system provides elevator controllers and operating panels, while ICT card readers and the Protege GX system controls access to the floors within the building. To the end user, this integration is as simple as presenting a card at a card reader and selecting the floor they wish to travel to.

When a user scans their access card at the ICT card reader a request is sent to Protege GX to verify that the user has permission to access the selected floor. Once the user's access has been verified, a message is sent to the MCE system which calls an elevator to transport the user to the selected floor, quickly and efficiently.



The Protege GX MCE HLI elevator integration supports up to 128 floors.

This integration is a licensed feature.

# Prerequisites

Before attempting this integration, ensure that the following requirements have been met.

## Software Requirements

The following software must be installed and operational to configure this integration.

Software	Version	Notes
Protege GX	4.2.201 or higher	
MCE Sentry Proxy System	2.1.7	This is the <b>only</b> tested and supported version for this integration.

## Hardware Requirements

The following Protege GX controllers support this integration.

Product Code	Firmware Version
Protege GX Controller	2.08.768 or higher

It is the responsibility of the installation professional to verify the version of the proposed third-party system and supported components with the version listed in this document. ICT will not accept responsibility for the failure to verify integrated system versions and requirements.

## Licensing Requirements

The following licenses are required for this integration.

License	Order Code	Notes
Protege GX MCE Elevator High Level Interface License	PRT-GX-ELV-HLI-MCE	1 license applied to the server

# Floor Mapping

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Before beginning to program the elevator integration, it is important to correctly map the layout of the elevator system. All elevator-accessible floors need to be identified and mapped in sequential order from bottom to top. You need to identify which (if any) floors have rear doors, and which (if any) floors are considered 'below ground' in the elevator system programming. This is essential for Protege GX to correctly map floors for event reporting and 'home floor' functionality.

## Floor Relay Numbering

Each floor accessed by the elevator system needs to be programmed in Protege GX, with a unique **Floor relay** number assigned. The floor relay number tells the controller where the physical floor is located, creating a map in Protege GX of accessible floors.

Floor relay numbers must be **unique**, programmed in **numerical order** (starting at 1), and beginning at the **lowest accessible floor**, including any basement floors.

The lowest accessible floor must be assigned a floor relay of **1**, as shown in the example below.

Physical Floor	Floor Relay Number
Basement 2	1
Basement 1	2
Ground Floor	3
Level 1	4

## Skipped Floor Numbers

Numbers are commonly skipped in floor labels due to superstitions surrounding specific numbers, and technicians may also skip these in the elevator controller programming. Where this occurs a placeholder floor record must be created in Protege GX to maintain the required sequential floor relay numbering, as in the example below.

Physical Floor	Elevator System Floor Relay	Floor Relay Number
Ground	0	1
Level 1	1	2
...	...	...
Level 12	12	13
N/A	Not programmed	14 (Placeholder)
Level 14	14	15

In this example a placeholder floor record is added with relay number 14 to maintain the sequential numbering and represent the skipped programming in the elevator system. Had the sequence been maintained in the elevator system (i.e. Level 14 programmed with elevator system floor relay 13) no placeholder floor would be required.

## Floors with Rear Doors

For some floors it may be possible to exit the elevator at the rear as well as the front. Each 'rear floor' must also be programmed in Protege GX.

The rules for programming rear floors are as follows:

- The **Floor relay** number of the rear floor must be equal to that of the corresponding front floor.
- Each rear floor must be programmed with the command **Rear**.
- The controller must be programmed with the command **HLI\_128\_FLOORS = true**.

The **Rear** and **HLI\_128\_FLOORS = true** commands are supported in controller firmware version 2.08.1158 or higher. For earlier firmware versions, rear doors must be programmed with relay numbers from 65-128.

The table below demonstrates front and rear floor relays in a building with 50 aboveground floors and two basement floors.

Physical Floor	Front Floor Relay	Rear Floor Relay
Basement 2	1	1
Basement 1	2	2
Ground Floor (no rear access)	3	-
Level 1 (no rear access)	4	-
Level 2	5	5
...	...	...
Level 48	51	51
Level 49	52	52

It is not necessary to program rear floor records for any floors that do not have rear access, but you may want to do this to keep the programming tidy.

### Rear Floor Relays 65-128

For sites with up to 64 floors the rear floor relays can be programmed from 65-128 without using the **Rear** command. To calculate the rear floor relay, add 64 to the front floor relay.

This is a legacy programming option which provides backward compatibility for existing installations and controller firmware versions prior to 2.08.1158, but is not recommended for new installations. It supports a maximum of 64 floors and is not available if the controller has been configured to support 128 floors.

The table below demonstrates front and rear floor relays in a building with 50 aboveground floors and two basement floors where the **Rear** command is not used and rear floor relays start at 65.

Physical Floor	Front Floor Relay	Rear Floor Relay
Basement 2	1	65
Basement 1	2	66
Ground Floor (no rear access)	3	-
Level 1 (no rear access)	4	-
Level 2	5	69
...	...	...
Level 48	51	115
Level 49	52	116



# Programming Steps

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The following instructions outline the steps required to configure the integration within Protege GX. These include:

- Enabling the MCE HLI in the controller configuration.
- Creating a schedule to assign to the required floors.
- Creating floors for each physical floor within the building.
- Creating a default floor group and assigning the required schedules.
- Configuring the kiosks (DOPs).
- Configuring the turnstile (DOP) for the ground floor.
- Configuring the in-car reader (COP).
- Program the reader expanders for elevator operation.
- Configuring access levels to define floors access for users.

## Programming Scenario

In this application note we will set up a simple scenario that demonstrates how to implement this integration in Protege GX. This will give you an idea of what to expect when it comes to setting up your own integration.

In this scenario we are implementing MCE elevator integration in a building where:

- There are ten floors in the building accessible by the elevator, one of which is a basement floor.
- The ground floor is freely accessible at all times.
- All other floors are freely accessible during the hours of 8am-5pm, Monday to Friday.
- There are two elevators for staff access and one elevator for service/maintenance access. Each elevator is able to access all physical floors.
- A kiosk is located on every floor but the ground floor.
- A turnstile is located on the ground floor.
- An in-car reader is located inside the service/maintenance elevator.

## Enabling the MCE HLI

1. Navigate to **Sites | Controllers** and select the controller to be used for the integration.
2. Open the **Configuration** tab and scroll down to the **Elevator HLI** section.
3. Set the **Elevator HLI type** to MCE, then configure the required options:
  - **Network adaptor:** Only Cable is supported for this integration.
  - **MCE sentry IP:** The IP address of the MCE Sentry interface that the controller is connected to.
  - **MCE sentry port:** The TCP port that the controller and MCE Sentry interface will use to communicate.
  - **Default floor group:** A floor group including all floors accessible by the MCE system, as well as their unlock schedules. This is used as the MCE system's building security map.  
Leave this <Not set>. We will create and assign this floor group later in the programming (see page 11).
  - **Enable elevator HLI debug:** When this option is enabled, system debug messages will be logged in the event log for troubleshooting.

This option may be useful for initial configuration and troubleshooting but should be disabled during normal operation to save event storage.

4. Click **Save**.

## Configuring up to 128 Floors

By default the controller supports up to 64 floors for this integration. However, with some additional configuration the integration can support up to a maximum of 128 floors.

This feature requires controller firmware version 2.08.1158 or higher.

1. Navigate to **Sites | Controllers** and select the controller to be used for the integration.
2. Expand the **Commands** field and enter the following commands:
  - **HLI\_MAX\_FLOORS = X**  
Where **X** is the total number of floors in the building. This can be a value from 1-128.
  - **HLI\_128\_FLOORS = true**  
This command is required to enable the controller to support using the **Rear** command for rear floors.
3. Click **Save**.

## Creating a Schedule

As the ground floor is the only one that is freely accessible at all times, we need to create a schedule to apply to the other floors.

1. To create a new schedule, navigate to **Sites | Schedules** and click **Add**.
2. Enter a **Name** for the schedule.
3. From the **Time periods and groups** section, check the Monday through Friday boxes of Period 1.
4. Set a **Start time** of **08:00** and an **End time** of **17:00**.
5. Click **Save**.

## Adding the Floors

Each floor accessed by the elevator system needs to be configured in Protege GX with a floor relay number assigned. This tells the controller where the physical floor is located, creating a map of accessible floors.

1. Navigate to **Programming | Floors**.
2. Add a floor record for each elevator-accessible physical floor, assigning the **Floor relay** for each floor as explained in the Floor Mapping section (see page 6).
3. If the floor is a 'rear floor' add the **Rear** command in the **Commands** field.

The **Rear** command is supported in controller firmware version 2.08.1158 and above. The controller must also be programmed with the **HLI\_128\_FLOORS = true** command.

4. Click **Save**.

For our scenario we want to create ten floors in Protege GX, starting from the basement floor. While doing this we need to ensure that we implement some simple naming conventions. For this example we are going to use abbreviated names that represent the type of elevator HLI integration the floor belongs to, and where the floor is located in the building. For example:

- **MCE FLB1:** MCE Elevator HLI Floor Basement
- **MCE FLG:** MCE Elevator HLI Floor Ground
- **MCE FLO2:** MCE Elevator HLI Floor 2

We will assign the floor relays as follows:

Physical Floor Location	Floor Name	Floor Relay
First Basement Floor	MCE FLB1	1
Ground Floor	MCE FLG	2
First Floor	MCE FL01	3
Second Floor	MCE FL02	4
Third Floor	MCE FL03	5
Fourth Floor	MCE FL04	6
Fifth Floor	MCE FL05	7
Sixth Floor	MCE FL06	8
Seventh Floor	MCE FL07	9
Eighth Floor	MCE FL08	10

## Creating the Default Floor Group

1. Navigate to **Groups | Floor groups** and click **Add**.
2. Enter MCE Floors for the **Name**.
3. Click **Add** and select the floors.
4. Select all of the floors in this building and click **Ok**.
5. For each floor in the floor group assign the appropriate schedule. For this example, assign Always as the schedule for the following floors:

- MCE FLG

Set the **Floor Access 8.00 - 17.00 M-F** schedule for the following floors:

- MCE FLB1
- MCE FL01
- MCE FL02
- MCE FL03
- MCE FL04
- MCE FL05
- MCE FL06
- MCE FL07
- MCE FL08

6. Click **Save**.
7. Navigate to **Sites | Controllers** and select the controller used for the integration.
8. In the **Configuration** tab, expand the **Elevator HLI** section and set this floor group as the **Default floor group**.
9. Click **Save**.

# Adding the Kiosks

We can now configure the MCE Kiosks for the floors outlined in our programming scenario (see page 9).

As per our previous naming convention, we are going to use short/abbreviated names. For example, **MCE DOP FL01** (MCE Elevator HLI DOP Floor 1).

1. Navigate to **Programming | Doors** and click **Add**.
2. Enter a **Name** for the DOP.
3. In the **Elevator HLI** section, complete the following fields:
  - **Door used for elevator HLI:** Select this check box to enable elevator HLI functionality for this door.  

When enabled, only options relevant to elevator configuration are displayed.
  - **Controller:** Select the controller used to control the elevator HLI.
  - **Operator panel type:** Defines whether this door will be configured as a DOP (Destination Operating Panel) or a COP (Car Operating Panel). Select DOP to configure the MCE kiosk.
  - **DOP ID:** The unique ID of the DOP which has been configured in the MCE system as per MCE Jobprint documents, which are specific to each MCE installation.
  - **Floor group:** The floor group that specifies the individual floors the kiosk can physically access by default, taking into account any schedules on those floors. This should be assigned to the MCE Floors group created previously.
  - **Floor:** Specifies the floor where the kiosk is located.
  - **DOP sends elevator call:** Ensure this option is **disabled** as it is only relevant for configuring MCE turnstiles.

Repeat this process to create DOPs corresponding to each floor within the building, remembering to assign the relevant Floor and Floor Group. In the scenario setup for this application note, the DOPs will be programmed as follows:

DOP Name	Operator Panel Type	DOP ID	Floor Group	Floor
MCE DOP FLB1	DOP	Provided by the MCE elevator system.	MCE Floors	MCE FLB1
MCE DOP FL01	DOP		MCE Floors	MCE FL01
MCE DOP FL02	DOP		MCE Floors	MCE FL02
MCE DOP FL03	DOP		MCE Floors	MCE FL03
MCE DOP FL04	DOP		MCE Floors	MCE FL04
MCE DOP FL05	DOP		MCE Floors	MCE FL05
MCE DOP FL06	DOP		MCE Floors	MCE FL06
MCE DOP FL07	DOP		MCE Floors	MCE FL07
MCE DOP FL08	DOP		MCE Floors	MCE FL08

## Configuring the Turnstile

As we have a turnstile operating on the ground floor, we need to create a record for it in Protege GX.

As per our previous naming convention, we are going to use a short/abbreviated name. For example **MCE TURN FLG** (MCE Elevator HLI COP Turnstile Ground Floor).

1. Navigate to **Programming | Doors**.
2. Click **Add**.
3. Enter a **Name** for the turnstile.
4. From the **Elevator HLI** section, fill in the following fields:
  - **Door used for elevator HLI**: Select this check box to enable elevator HLI functionality for this door.  
When enabled, only options relevant to elevator configuration are displayed.
  - **Controller**: Select the controller which is used to control elevator HLI.
  - **Operator panel type**: Select DOP to configure the MCE turnstile.
  - **DOP ID**: Configures the unique ID of the turnstile as per MCE Jobprint documents, which are specific to each MCE installation.
  - **Floor**: Defines the floor where the turnstile is located. When a user badges at a turnstile reader, the Elevator Destination Floor set for the access level (that grants access to the floors of the building) determines the floor requested as part of the automatic call registration.
  - **DOP sends elevator call**: When enabled, allows the turnstile to send a call to the MCE interface. This option must be **enabled** for the door to be enabled as a turnstile.
5. Click **Save**.

Optionally, you can program antipassback for the turnstile to prevent users from passing their cards to unauthorized parties. For more information, see [Programming Antipassback](#) (page 15).

## Configuring the In-Car Reader

As we have a service elevator that is only accessible by service and maintenance staff, there is a reader installed inside to prevent unauthorized users from gaining access.

As per our previous naming convention, we are going to use a short/abbreviated name. For example **MCE COP SERV** (MCE Elevator HLI COP Service Elevator).

1. Navigate to **Programming | Doors** and click **Add**.
2. Enter a Name for the **COP**.
3. From the **Elevator HLI** section, fill in the following fields:
  - **Door used for elevator HLI**: Select this check box to enable elevator HLI functionality for this door.  
When enabled, only options relevant to elevator configuration are displayed.
  - **Controller**: Select the controller which is used to control elevator HLI.
  - **Operator panel type**: Select COP to configure the in-car reader.
  - **COP ID**: Configures the unique ID of the in-car reader as per MCE Jobprint documents, which are specific to each MCE installation.
  - **Floor group**: Defines the floor group in Protege GX containing the floors that the elevator can physically access by default, taking into account any schedules on those floors. This should be assigned to the **MCE floors** group created previously.
  - **Elevator car**: Defines the elevator car in the MCE elevator system that the in-car reader is located in.
4. Click **Save**

# Programming the Reader Expander

Protege GX door records that are associated with an MCE elevator car, kiosk or turnstile can be assigned to a reader expander's reader port to enable the reader associated with those door records to be treated as part of the MCE elevator system.

These door records can be assigned to either of the two reader ports on a reader expander. For this example we are going to assign one of the MCE kiosk door records to a reader expander port.

1. Navigate to **Expanders | Reader expanders** and select the relevant reader expander.
2. Select either the **Reader 1** or **Reader 2** tab.
3. Set the **Reader door** to one of the door records used for MCE elevator integration. In this example we have assigned MCE DOP FL01 to reader port 1.
4. Set the **Reader mode** to Elevator so that the reader is treated as part of the MCE elevator system.
5. Click **Save**. Repeat the above steps for the remaining MCE elevator door records.

**Note:** As setting the Reader mode to Elevator disables the ability to change the door configured for that reader port, assign the door *before* changing the Reader mode.

## Configuring Access Levels

Access levels determine user access to the elevator system. Access levels link floors and floor groups to users, defining which floors the user has access to and when. An access level can contain a single floor, providing users with access to that floor only, or any number of floors as required by the site and user configuration. Access levels also define which kiosks, turnstiles and in-car readers each user has access to and when. Users will only be able to access COPs/DOPs that are assigned to their access level, via the associated Protege GX door records.

1. Navigate to **Users | Access levels** and create or edit access levels.
2. You can assign either individual floors in the **Floors** tab or floor groups in the **Floor groups** tab.
3. In both cases you can select a **Schedule** which defines when the user has access to those floors.
4. In the **Doors** or **Door groups** tab you can assign the door records of the COPs and DOPs which represent the kiosks, turnstiles and in-car readers that this access level will allow users to access.
5. You can also select a **Schedule** which defines when the user has access to those COPs/DOPs.

**Important:** If schedules are defined in both the access level programming and the floor group/door group programming, these schedules must *both* be valid for the user to be granted access.

## Assigning Home Floors to Access Levels

Setting a home floor on an access level allows users with that access level assigned to automatically travel to that floor when they call an elevator.

To assign a home floor to an access level:

1. Select the desired access level in **Users | Access levels**.
2. In the **General** tab, expand the **Elevator HLI** section.
3. Set the **Elevator destination floor** to the desired home floor for that access level.
4. Click **Save**.

# Programming Antipassback

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Optionally, you can use antipassback with operating panels in HLI elevator integrations. For example, you could enable hard antipassback on a turnstile to prevent users from entering the turnstile then passing their card back to someone on the other side.

The operation is the same as standard door antipassback: the system tracks which area each user is in based on their access activity, and reports an antipassback violation if the user is not recorded in the correct area required to enter or exit the door.

## Requirements for Elevator HLI Antipassback

- This feature is available in controller firmware version **2.08.1297 or higher**.
- Antipassback should only be used on turnstiles, security gates or similar operating panels with **entry and exit readers** to record movement into and out of the area. When the user enters the turnstile, the system will update their user area and call an elevator based on their home floor or selection. When the user exits the turnstile, it will update their user area without calling an elevator.
- User area tracking is based on the **inside and outside area** programmed in the door record, **not** the floor that the user has selected. For example, the outside area might be the ground floor reception. When a user accesses the turnstile, it grants entry to the elevator lobby and calls an elevator.

Antipassback should not be enabled for operating panels which are only used to select a floor (such as car operating panels), as the user could be going to any floor instead of entering a specific physical area such as a lobby.

- User credentials must be processed by the Protege GX controller, not the elevator system.
- The **Reader 1/2 elevator** in the reader expander programming must be <not set>.

## Programming Antipassback for a Turnstile

1. Navigate to **Programming | Door types** and add a new door type.
2. Set the **Entry passback mode** to control entry through the turnstile and **Exit passback mode** to control exit. The options are:
  - **Hard passback:** Access will be denied if a user attempts to enter/exit the turnstile from the wrong area.
  - **Soft passback:** Access will be granted even if a user attempts to enter/exit the turnstile from the wrong area, but a 'Soft Passback Violation' event will be logged.
3. Optionally, enable **Entry/Exit passback is qualified with door opening**. This will prevent the user's antipassback status from being updated unless they actually pass through the turnstile after badging.
4. Program any other settings required for this door type such as the **Entry/Exit reading mode**, then click **Save**.
5. Navigate to **Programming | Doors** and select a door record which represents a turnstile, security gate or other operating panel.
6. Set the **Door type** to the one programmed above.
7. Set the **Area inside door** and **Area outside door** for the turnstile.
8. Click **Save**.

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