AN-169

Protege GX ThyssenKrupp HLI Integration

Application Note

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Introduction

High level integration between Protege GX and ThyssenKrupp elevator systems provides the full advantage of a complete destination dispatch solution combined with access control and intruder detection.

Integration with ThyssenKrupp destination-based elevator systems allows access to elevators and floors to be controlled directly from the Protege GX interface. Protege GX communicates with the ThyssenKrupp elevator system via ethernet and ICT card readers are used to facilitate access control. 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.
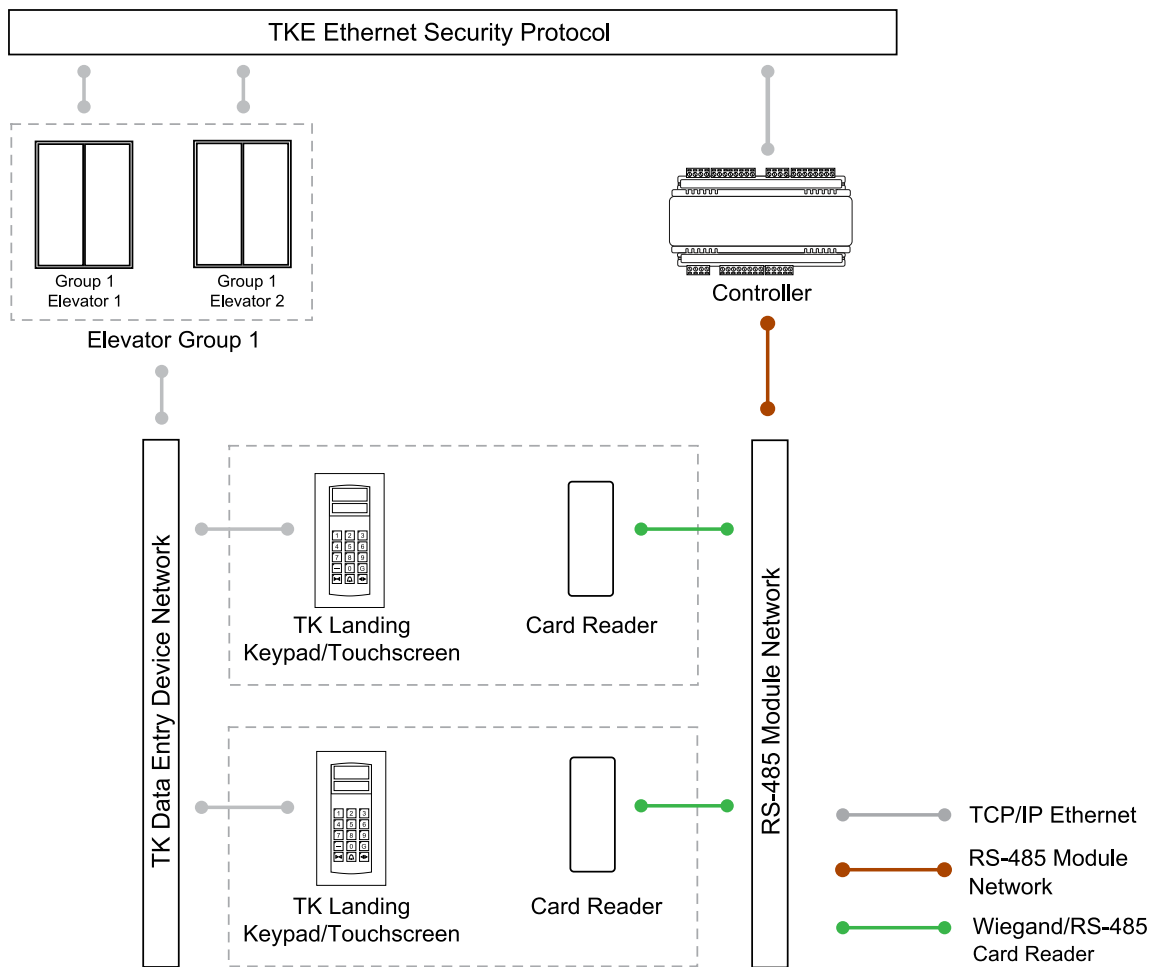
The Protege GX ThyssenKrupp HLI elevator integration supports up to 128 floors.

This integration is a licensed feature.

Prerequisites

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

Software	Version	Notes
Protege GX	4.0.128 or higher	
Protege GX Controller	2.08.582 or higher	
ThyssenKrupp Elevator System	v2r0	This integration has been tested and validated against TKE Controller (American) v2r0. This is the **only** tested and supported version for this integration.

Licensing

The following licenses are required for this integration.

License	Order Code	Notes
Protege GX ThyssenKrupp HLI Integration License	PRT-GX-ELV-HLI-TK	1 license per controller used for this integration
Protege GX Door License	PRT-GX-DOR-1	1 license per ThyssenKrupp Landing Based Kiosk
	PRT-GX-DOR-10	
	PRT-GX-DOR-50	

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.

Floor Mapping

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.

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

The following programming steps are required for ThyssenKrupp HLI integration with Protege GX:

- Enable the ThyssenKrupp HLI
- Program floors and floor groups
- Program the Thyssenkrupp kiosks
- Program the reader expander

Programming Scenario

For this application note we have set up a simple scenario that demonstrates how to configure ThyssenKrupp integration within 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 ThyssenKrupp integration in a building that has:

- Floor 1 as the lowest physical level serviced by an elevator.
- Floor 1 freely accessible at all times.
- All other floors requiring valid credentials for access.
- Two ThyssenKrupp elevator groups, with Group 1 servicing Floors 1 through to 7 and Group 2 servicing Floor 1 and Floors 8 through to 14.
- Two kiosks per floor, except for Floor 1 that has two kiosks per elevator group (total of four kiosks).
- Elevators that only allow for front access when entering/existing floors.
- Landing based kiosks only.
- ICT card readers used for validating access.

Enabling ThyssenKrupp HLI

The ThyssenKrupp HLI integration must be enabled in the controller.

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 ThyssenKrupp.
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**.

Adding the Floor Records

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 fourteen floors in Protege GX, starting from the first floor.

While doing this we need to make sure that we maintain some simple naming conventions. For this example we are going to use short / 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:

- **TK FL01** (ThyssenKrupp Elevator HLI, first floor)
- **TK FL02** (ThyssenKrupp Elevator HLI, second floor)

Adding the Floor Groups

Floor groups are used to associate the floors with the ThyssenKrupp kiosks.

As there are two existing ThyssenKrupp elevator groups that each service a different group of floors in our scenario, we need to create two floor groups.

1. To create a floor group, navigate to **Groups | Floor groups** and click **Add**.
2. For the first floor group, enter Group 1 Elevator Access for the **Name**.
3. Click **Add** and select TKFL01 through to TKFL07.
4. Click **Ok**.
5. Following our example, set the schedule for TK FL01 to Always and set the remaining floor schedules to **Never**.
6. Click **Save**.
7. Repeat the steps above to create the Group 2 Elevator Access floor group and ensure that the following floors are added with the appropriate schedule applied:
   - TK FL01 - Always
   - TK FL08 - Never
   - TK FL09 - Never
   - TK FL10 - Never
   - TK FL11 - Never
   - TK FL12 - Never
   - TK FL13 - Never
   - TK FL14 - Never

Landing Based Kiosks

ThyssenKrupp landing based kiosks are programmed as door records in Protege GX.

One door license is required for each landing based kiosk programmed (see page 5).

1. To create a kiosk record, navigate to **Programming | Doors** and click **Add**.

2. Enter a **Name** for the kiosk.

3. In the **Elevator HLI** section, enable the **Door used for elevator HLI** option.
    - **Operator panel type**: Only the DOP option is supported by this integration. This represents floor based kiosks.
    - **DOP ID**: The unique ID of the kiosk which has been configured in the Thyssenkrupp system.
    - **Floor group**: The floor group that can be accessed from the kiosk. This allows specified floors to be unlocked on schedule for this kiosk.

      As this is the first kiosk for the TK FL01 floor, we need to assign it to the to the Group 1 Elevator Access floor group
    - **Floor**: Defines which floor the kiosk is located on.
    - **Group number**: The group number for this DOP that has been configured in the ThyssenKrupp system.

      The combination of DOP ID, Floor and Group number must be unique.

4. Click **Save**.

In order to match the programming in our scenario, use short / abbreviated names that represent the type of device and where it is located. For example:

- **TK KIOSK 1 FL01** (TK Kiosk, Kiosk 1, Floor 1)
- **TK KIOSK 2 FL01** (TK Kiosk, Kiosk 2, Floor 1)
- **TK KIOSK 1 FL12** (TK Kiosk, Kiosk 1, Floor 12)

We can now configure the kiosks required for each floor in our scenario . Following the example, we need to create a total of thirty kiosks - two each for floors TK FL02 through to TK FL14 and four for TK FL01.

Programming Antipassback

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**.

Reader Expander Configuration

As ICT card readers are used to validate access, we need to link the ThyssenKrupp kiosks to the reader expanders connected to the Protege GX system. This allows the card readers to be treated as part of the ThyssenKrupp elevator system.

To assign a ThyssenKrupp kiosk to one of the two reader expander ports:

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 kiosks.

4. Set the **Reader mode** to Elevator so that the reader is treated as part of the ThyssenKrupp elevator system.

5. Click **Save**.

6. Wait for the programming to be downloaded to the controller, then right click on the reader expander record and click **Update module**.

7. To link more kiosks, simply repeat the steps above.

Note: As setting **Reader mode** to Elevator disables the **Reader door** option, assign the door before setting the reader mode.

Configuring Access Levels

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.

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.

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

Assigning Home Floors to Access Levels

Setting a home floor on an access level is **not** supported by this integration.