

# SIEMENS



## Room automation stations DXR1.. Balancing procedure

# Table of Contents

- Security best practices .....3
- Cyber security disclaimer .....3
- 1 Before You Begin .....4
- Step 1 - Preparing A Project .....5
- Step 2 - Setting Up Connection .....9
- Step 3 - Discovering Automation Stations ..... 11
- Step 4 - Global Commanding..... 12
- Step 5 - Command Parameters and Balance Individual Automation Stations ..... 14
- Step 6 - Release Existing Commands (optional) ..... 19
- Step 7 - Uploading Report Data .....20
- Step 8 - Creating Reports .....21

## Security best practices



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Network setup must avoid direct connection from Internet to the end device.

- Implement Port security to disallow connection and network participation of unauthorized laptops/devices to a switch.
- Unauthorized access must be prevented by physical security measures. Thus, access to devices (controllers) must be limited to only those person who require it. Equipment can further be monitored via CCTV.
- If possible, physically separate control systems from non-control systems. Apply the concept of least-privilege to minimize impact in case of a compromise of user credentials.
- Ensure that complex and strong passwords are required. Furthermore, ensure that administrator passwords are at least 12 characters and at least 8 for non-administrative users.
- Ensure that username/password are unique for each site within the country/office.
- Ensure that users each have their own individual login accounts. User accounts must not be shared.
- Configure account lockout settings (threshold, observation windows, duration) to protect the system from password guessing or brute force attacks.
- Make sure accounts are removed within a reasonable amount of time after users leave the site.
- Make sure firmware is downloaded only from legitimate / known locations.

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## Cyber security disclaimer

Siemens provides a portfolio of products, solutions, systems and services that includes security functions that support the secure operation of plants, systems, machines and networks. In the field of Building Technologies, this includes building automation and control, fire safety, security management as well as physical security systems.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art security concept. Siemens' portfolio only forms one element of such a concept.

You are responsible for preventing unauthorized access to your plants, systems, machines and networks which should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place. Additionally, Siemens' guidance on appropriate security measures should be taken into account. For additional information, please contact your Siemens sales representative or visit <https://www.siemens.com/global/en/home/company/topic-areas/future-of-manufacturing/industrial-security.html>.

Siemens' portfolio undergoes continuous development to make it more secure. Siemens strongly recommends that updates are applied as soon as they are available and that the latest versions are used. Use of versions that are no longer supported, and failure to apply the latest updates may increase your exposure to cyber threats. Siemens strongly recommends to comply with security advisories on the latest security threats, patches and other related measures, published, among others, under <https://www.siemens.com/cert/en/cert-security-advisories.htm>.

# 1 Before You Begin

## Prerequisites:

- ABT Site (33.2.325.0 or higher)
- ABT Go (36.0.904.0 or higher)
- All needed mechanical documentation (plans and specifications) are available



## CAUTION

### Be aware of the following

- Technician must provide User name (typically **Balancer**)
- Technician must provide Password(s)
- Technician provides necessary connection cable(s)

**Caution:** Duct area is calculated by the application. If the duct area is entered manually but the proper procedure is not followed, the system overwrites the value without informing the user. See substep 5.6 under **Step 5 - Command Parameters and Balance Individual Automation Stations**.

# Step 1 - Preparing A Project

1.1 Open **ABT Site**.

1.2 Click **Settings** to configure the tool settings. Review all items.

Settings – User interface

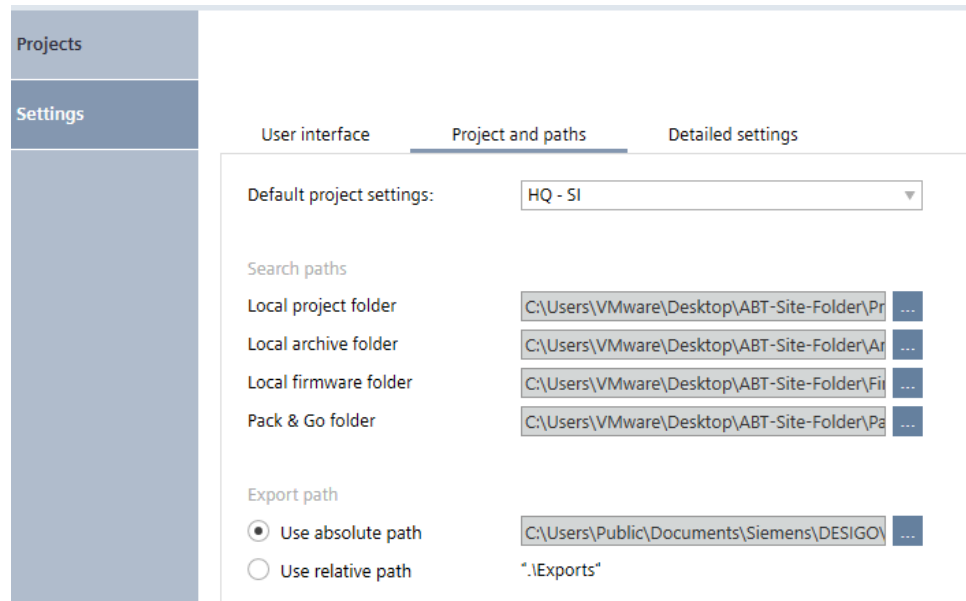
The screenshot shows the 'Settings' window with the 'User interface' tab selected. The settings are as follows:

Setting	Value	Notes
Tool language	English	Restart ABT Site after changing.
Application engineering	English	
Tool operation	Notebook operation	
UDP port number	Show hexadecimal (e.g. 0xBAC0)	
Show splash screen on startup	<input checked="" type="checkbox"/>	
Show workflow help on start	<input checked="" type="checkbox"/>	
Show recently used projects	no	
Browser selection		
<input checked="" type="radio"/> Default external browser		
<input type="radio"/> User-selected browser		

a. **User interface:** (reference the above graphic as you review the choices)

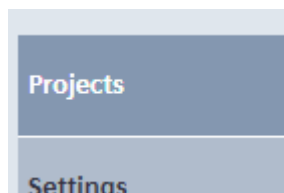
- Tool language - The language setting of the user interface. A restart is required for changes to take effect.
- Application engineering - The language setting for project data, typically same as Tool language. A restart is required for changes to take effect.
- Tool operation - Notebook or Tablet.
- UDP port number - hex or decimal.
- Show workflow help on startup - (optional) When checked as per default setting, the user Help files display automatically when ABT Site opens.
- Show recently used projects - (optional) Leaving at **no** will not hide projects.
- Browser selection - Typical choice = Default external browser.

Settings – Project and paths



- b. **Project and paths:** (reference the above graphic as you review the choices)
- Default project settings: Choose HQ - SI.
  - Local project folder - Path where projects are saved, e.g., C:\sbt\_jobs\
  - Local archive folder - (optional) A path where projects may be archived.
  - Local firmware folder - Leave at default.
  - Pack & Go folder - Path where Pack & Go files are saved.
  - Export path - Choose relative path; Files are saved to the Export folder of the working project. In the example above this would be C:\sbt\_jobs\Exports

1.3 Click **Projects**.

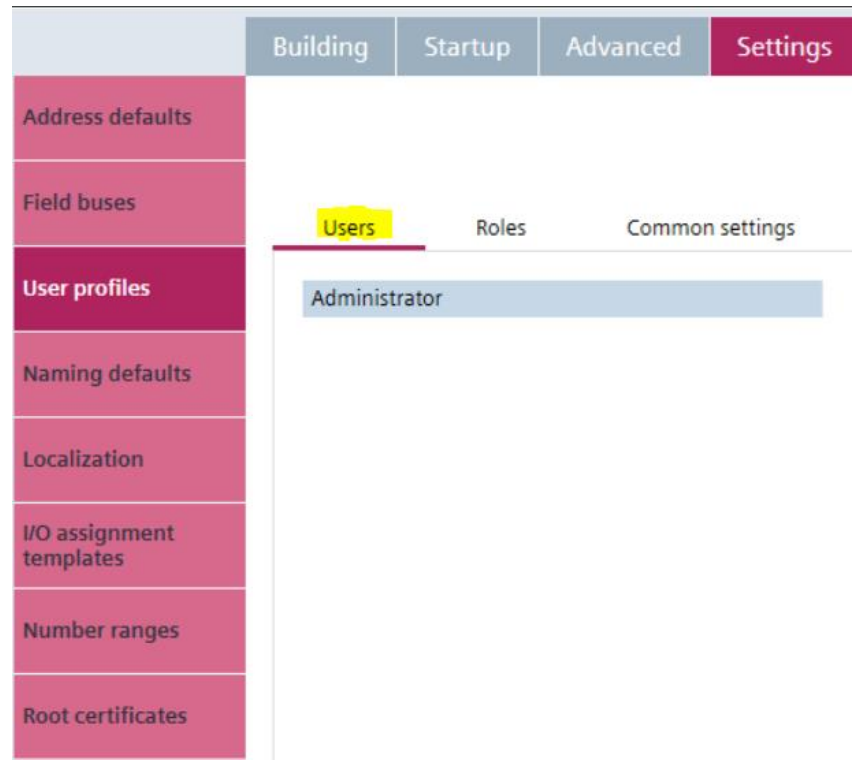


- a. (Optional) Click **Add folder** - provide a name and click **OK**.



- b. Click **Add project** - provide the following:  
 Project name  
 Administrator password (technician may need to enter)  
 Confirm password  
 Project description (optional)
- c. Check the **Root project** check box and click **OK**. (Root project places data / files in the jobs folder.)
- d. Close ABT Site to ensure all changes have been captured.
- e. Open ABT Site.

- f. Select **Projects**, then select the project you created in step **b** and click **Open project**.
- g. Select the **Users** tab under **User profiles** and **Settings**.



- h. Now select **Balancer** and create / enter the correct password for the Balancer role. Technician must supply all necessary passwords.

The screenshot shows a user management interface with three tabs: 'Users', 'Roles', and 'Common settings'. The 'Users' tab is active, displaying a list of users on the left and configuration fields on the right. The 'Balancer' user is selected. The configuration fields include:
 

- User name: Balancer
- Password: \*\*\*\*\* with a 'Change password' link
- Expiration date: (calendar icon)
- Role: Balancers
- Session language: English

- i. (Optional) For the project used for Apogee integration, follow this step. Tick the checkbox next to **Show application number** under **Number ranges** and **Settings**. On the **Naming rules** tab under **Naming defaults** and **Settings**, confirm the Object names selection = **Abbreviated, standard names**.

Note: This step must be done before creating the application template.

The screenshot shows the 'Settings' tab selected in the top navigation bar. On the left, a sidebar lists various settings categories: Address defaults, Field buses, User profiles, Naming defaults, Localization, I/O assignment templates, Number ranges, and Root certificates. The main content area shows the 'Users' tab active, with 'Administrator' listed as the only user.

The screenshot shows the 'Naming rules' sub-tab selected within the 'Settings' section. It displays two settings:
 

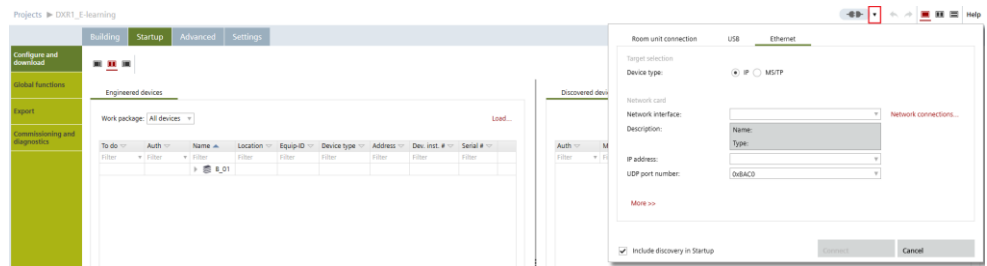
- Object names: A dropdown menu set to 'Abbreviated, standard names'.
- Show room segments: A checkbox that is checked.

- j. Preparing A Project is now complete.



## Step 2 - Setting Up Connection

When the project opens, go to **Startup** page, click ▼ on the top right.



The screen displays the following tabs:

- Room unit connection  
Note: Not used for DXR1.X type devices
- USB
- Ethernet

**2.1** Click the tab for how you will physically connect.

**2.2** If you have not done so already, make the physical connection with a provided cable.

The steps below are not standard balancer procedure steps and should rarely be used. They are provided as a convenience, just in case.

- Under **Target selection** select the Device type that you want to work with. (This may or may not be the device you are physically connected to.)
- USB
  - IP device (not used for DXR1.X devices)
  - MS/TP device (not used for DXR1.X devices)
  - PTP device: Point (PC) To Point (DXR1.X) connection. This is the only way that you want to connect the DXR1.X with USB port.
- Ethernet connection
  - IP device
  - MS/TP device
- Network interface: Select the PC network card from the dropdown.
- IP address: Select the network card IP address from the dropdown. This is only needed if more than one IP address is setup for the selected network card.
- UDP port number configured for the network: typically 0XBAC0.
- Click **Connect**.
  - **Note:** If downloading application for multiple devices (IP and MSTP) simultaneously, you need to perform the following steps, and then click **Connect**.

a. Click **More >>** on the bottom left.

Room unit connection    USB    **Ethernet**

Target selection

Device type:     IP     MS/TP

Network card

Network interface:    ASIX AX88772C USB2.0 to Fast Ethernet Ad...    Network connections...

Description:    **Name: Ethernet 2**  
Type: Ethernet

IP address:    192.168.251.126

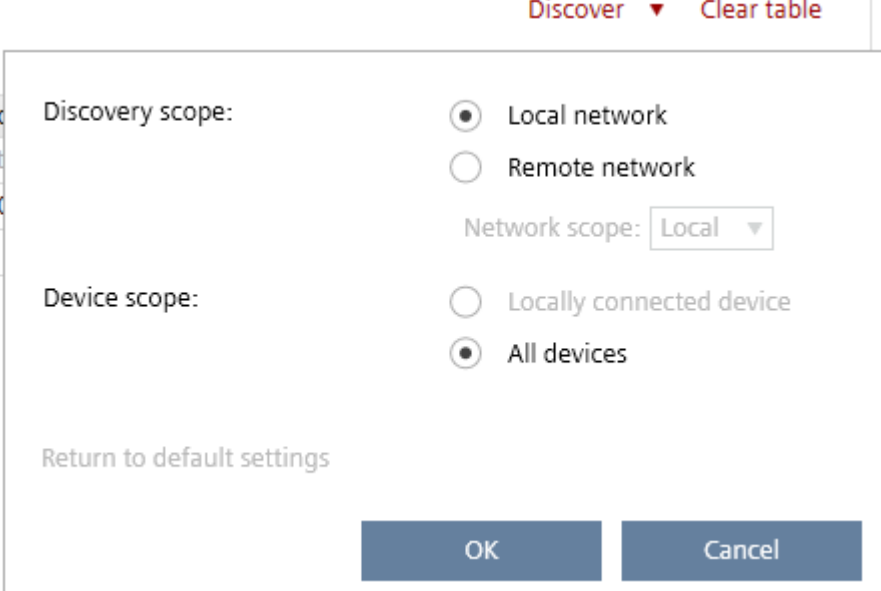
UDP port number:    0xBAC0

**More >>**

– b. Tick the checkbox beside **Encountering failures on simultaneous loads?** to avoid download failures.

## Step 3 - Discovering Automation Stations

3.1 Under **Startup**, click **Configure and Download**. **Discovered devices** tab displays.



The screenshot shows a dialog box titled "Discovery" with a "Discover" button and a "Clear table" link. The dialog contains the following settings:

- Discovery scope:**
  - Local network
  - Remote network
- Network scope:** Local (dropdown menu)
- Device scope:**
  - Locally connected device
  - All devices

At the bottom, there is a "Return to default settings" link and two buttons: "OK" and "Cancel".

3.2 Opens the **Discovery** dialog box. You can choose to discover devices in the **Local network** or the **Remote network**. **Locally connected devices** displays only connected devices based on the network specified. Default is **All devices**.

Once the devices have been discovered you have several options available. You can:

- Command parameters on several automation stations (**Step 4**)
- Command parameters and balance individual automation stations (**Step 5**)
- Upload report data and create reports (**Steps 7 and 8**)

## Step 4 - Global Commanding



**Note**

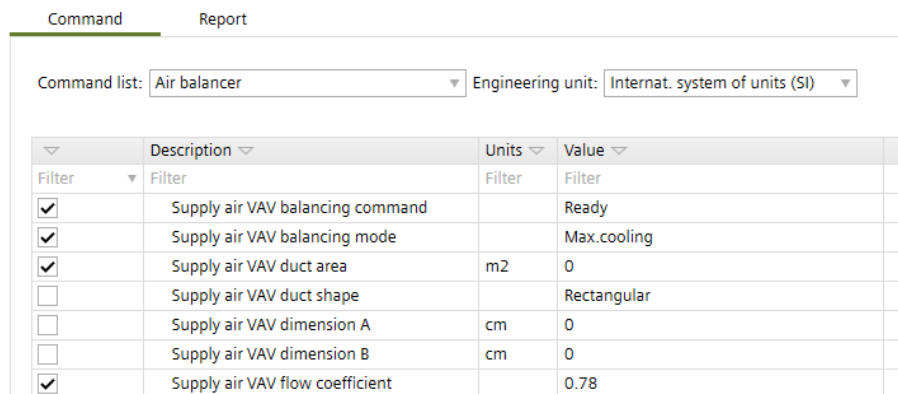
The purpose of global commanding is to setup the automation stations for balancing. After balancing is complete the commands must be released. Releasing commands is covered in **Step 6 Release Existing Commands**.

4.1 Click the **Command** tab.



4.2 Select **Air Balancer Commanding List** from the Command list dropdown and tick the checkboxes next to parameters to be previewed and eventually commanded.

Example:



- 4.3 Click the **Discovered devices** tab.
- 4.4 Select the automation station(s) to be commanded.
- 4.5 Click **Preview**. (Columns can be re-ordered to customize the display. Click a column header and drag it to the desired location.)  
The selected parameter displays below the selected automation station(s) in the Discovered automation stations list.
- 4.6 View the current values of the previewed parameters.
- 4.7 Determine if additional commanding is needed. Enter or select values to be commanded in the value field<sup>(7)</sup> for each parameter.

Command
Report

Command list: 
Engineering unit:

(7)

Filter	Description	Units	Value
<input checked="" type="checkbox"/>	Supply air VAV balancing command	Filter	Ready
<input checked="" type="checkbox"/>	Supply air VAV balancing mode		Max.cooling
<input checked="" type="checkbox"/>	Supply air VAV duct area	m2	0
<input type="checkbox"/>	Supply air VAV duct shape		Rectangular
<input type="checkbox"/>	Supply air VAV dimension A	cm	0
<input type="checkbox"/>	Supply air VAV dimension B	cm	0
<input checked="" type="checkbox"/>	Supply air VAV flow coefficient		0.78

- 4.8 Click **Commit** to issue the command or **Cancel** to clear the preview.

Engineered devices
Discovered devices 1

Commit Cancel

Discover ▼ Clear table

Auth	Message	Status	Name	Location	Equip-ID	Serial #	Device type	Address	Parameter	Value	Units	Object
Authorized	Configured	Operational	AS_01	B_01	01	1601020492	DXR1.E10PL-1	(DHCP) 192.168.251.100 : 0xBAC0	Supply air VAV balancing command	Ready		8_01R0segm_01HVW
									Supply air VAV max.air vol.flow f.cool.	100	m3/s	8_01R0segm_01HVW
									Supply air VAV min.air vol.flow f.cool.	50	m3/s	8_01R0segm_01HVW

## Step 5 - Command Parameters and Balance Individual Automation Stations

### Set up ABT Go app

- a. The first time the ABT Go app starts the **Account** view automatically. Else:

Go to **Account**.

 >  **Account**

- b. Enter **Name**

Enter **Mobile phone** (i.e. +41771234567).

Enter **Email address**. (i.e. abc@xyz.com)

Enter **Company**.

This information will be added in exported data (i.e. reports).

- c. Go to **Settings**.

 >  **Settings**

- d. Set ABT Go app **Language**.

Set **System of units** (not used for DXR1.X).

- e. Set or change connection method.

Go to **Connection**.

 >  **Connection**

- f. Tap **Device AP** or **Network** or **MS/TP** or **USB**. The illustration changes accordingly.

- g. Tap . Follow the appendant task and Tap  as needed.

Opens the Network view.

The connection method is set.

The ABT Go app settings are set. Next time the ABT Go app opens the **Devices** view directly.

### Discover device on ABT Go

- a. Go to **Devices**.

 >  **Devices**

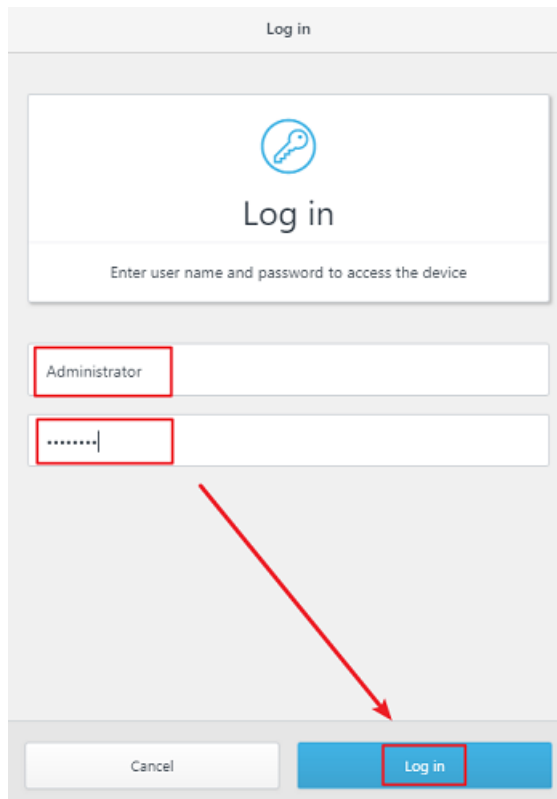
Searching the network starts automatically.

- b. Tap  to start / stop discovering devices.

- c. Identify the device in the list.

- d. 1. Tap on device in the list.  
2. Device view opens.

### Command parameters and balance individual automation stations

**5.1** Open **ABT Go**, enter username and password, and click **log in**.

Log in

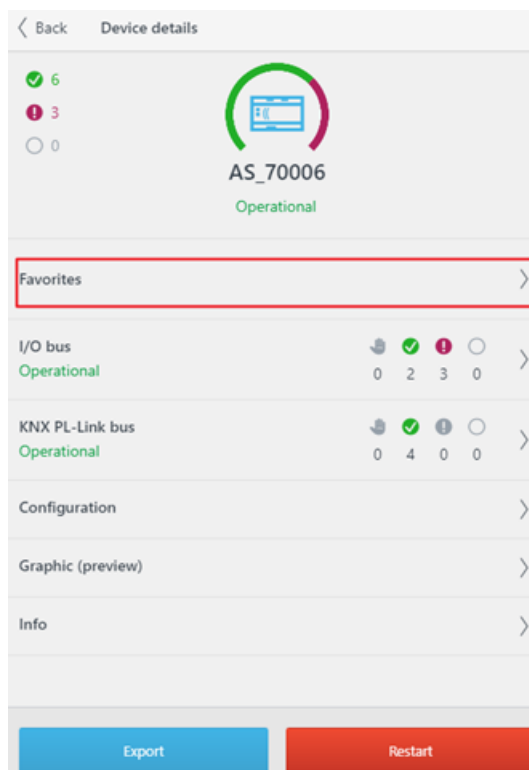
Log in

Enter user name and password to access the device

Administrator

.....

Cancel Log in

**5.2** Click **Favorites**.

< Back Device details

6  
3  
0

AS\_70006  
Operational

Favorites

I/O bus  
Operational  
0 2 3 0

KNX PL-Link bus  
Operational  
0 4 0 0

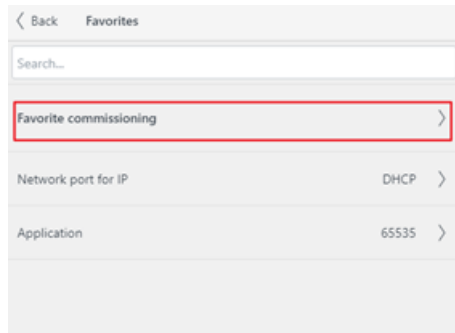
Configuration

Graphic (preview)

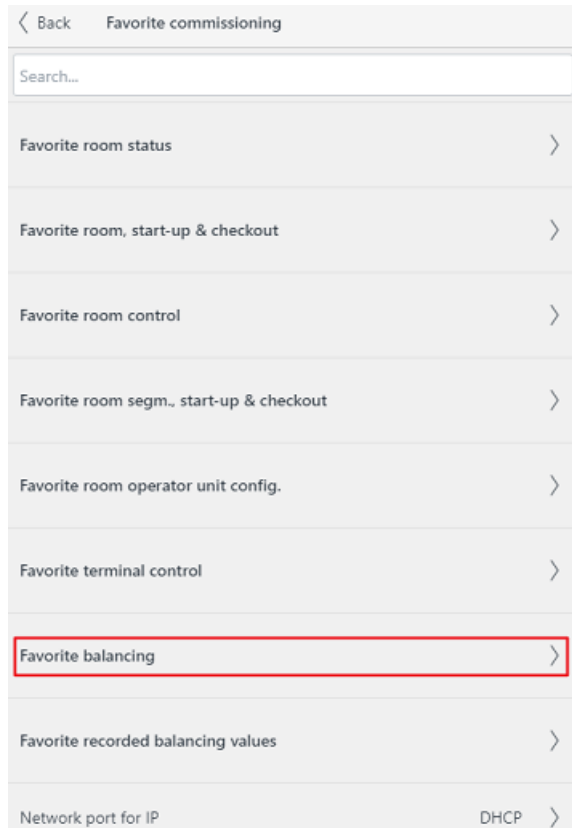
Info

Export Restart

**5.3** Click **Favorite commissioning**.



**5.4 Select Favorite balancing.**



**5.5 (Optional) Verify or set airflow setpoints.**



Favorite balancing	
Supply air VAV max.air vol.flow f.cool.	500 m3/h >
Supply air VAV min.air vol.flow f.cool.	120 m3/h >
Supply air VAV max.air vol.flow f.heat.	100 m3/h >
Supply air VAV min.air vol.flow f.heat.	50 m3/h >
Supply air VAV max.air vol.flow f.vent.	100 m3/h >
Supply air VAV min.air vol.flow f.vent.	0 m3/h >

#### 5.6 Verify/set duct area.

- a. Locate **Supply air VAV duct shape**. Set Supply air VAV duct shape by selecting from the following options and then set the related parameters:
  - i. Round (Set **Supply air VAV dimension A**)
  - ii. Flat oval (Set **Supply air VAV dimension A** and **Supply air VAV dimension B**)
  - iii. Rectangular (Set **Supply air VAV dimension A** and **Supply air VAV dimension B**)
  - iv. Direct entry (Set **Supply air VAV duct area**)
 

**Note:** When setting a value less than 1, enter a leading zero and decimal (like 0.566)



#### CAUTION

##### CAUTION:

Duct area is calculated by the application. To manually enter a different value, you must first set the duct shape object (**VavSuDuctShape**) to **Direct entry** and then manually enter the desired duct area value in the duct shape object, **Supply air VAV duct shape**.

If the user manually enters a duct area value without first setting VavSuDuctShape to Direct entry, the value may appear to be accepted by the application but it will be overwritten by the system without informing the user!

#### 5.7 Balancing procedure

- a. Set **Supply air VAV balancing mode**. Select from the following options

- i. MxCool - Maximum Cooling
  - ii. MxHeat - Maximum Heating
  - iii. MxVent - Maximum Vent
  - iv. MnCool - Minimum Cooling
  - v. MnHeat - Minimum Heating
  - vi. MnVent - Minimum Vent
  - vii. Manual - (Set **Supply air VAV smoke ctrl.air flow setp.** to the desired airflow setpoint)
- b. Set **Supply air VAV balancing command** to **Balancing**. The airflow setpoint is set to the appropriate value based on the Supply air VAV balancing mode, the Supply air VAV balancing state is set to Balancing and the control program will be overridden for balancing operation.
  - c. Allow time to let airflows stabilize. The automation station will modulate dampers to achieve the defined airflow setpoint.
  - d. Measure airflow externally with a capture hood or other device.
  - e. Set **Supply air VAV air volume flow at hood** with the value determined from the previous step. The control program will calculate and update **Supply air VAV calc. flow coefficient**.
  - f. Set **Supply air VAV balancing command** to **Calibrate**. The value of **Supply air VAV calc. flow coefficient** will be set to **Supply air VAV flow coefficient**.
  - g. (Optional) - Repeat parts **d** through **f** if the calculated airflow does not meet the specified accuracy.
  - h. Set **Supply air VAV balancing command** to **Record**. All Recorded parameters will be updated.
  - i. (Optional) - Set **Supply air VAV balancing mode** to a different mode and repeat parts **b** through **h** if required to confirm accuracy at a different airflow setpoint.
  - j. Set **Supply air VAV balancing command** to **Balanced**. The Supply air VAV balancing state is set to Balanced and the control program will return to normal operation.

**5.8** Back to devices list.

**5.9** Repeat items **5.1** through **5.8** for all other automation stations.

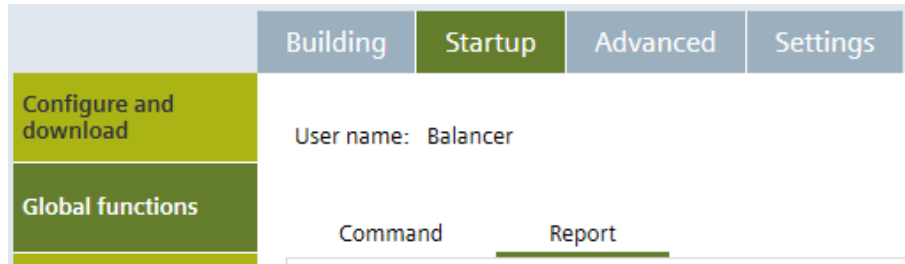
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## Step 6 - Release Existing Commands (optional)

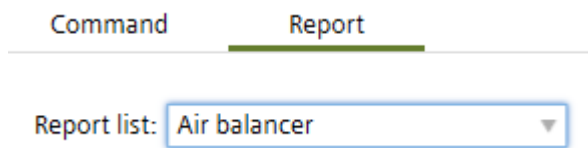
- 6.1 All remaining commands will display below the automation stations in the grid editor of the **Discovered devices** tab.
- 6.2 Select the automation stations and/or individual parameters.
- 6.3 Click **Release**.
- 6.4 Now repeat steps 4, 5, and 6 until all equipment is balanced.

## Step 7 - Uploading Report Data

7.1 Click the **Report** tab.



7.2 Select **Air Balancer** from the Report list dropdown. The table will display a list of parameters to be uploaded. This table is read only.



7.3 Click the **Discovered devices** tab.

7.4 Select the automation station(s) to upload report data.

7.5 Click **Upload report data**. A report data file will be created for each selected automation station.

The status of the upload for each automation station is displayed in the Log and Job viewer.

## Step 8 - Creating Reports



### Note

Because report data was uploaded and stored in the project, report creation does not require an online connection. Therefore reports can be created anytime or anywhere.

- 8.1 Open the project and click **Global functions**.
- 8.2 Click the **Discovered devices** tab.
- 8.3 Select the device from device list, then click **Create uploaded data reports**.
- 8.4 Select **Air balancer** from the dropdown list of **Select report**, and select the automation station(s) from the table and click **OK**.  
The Reports engine will launch, displaying the formatted report with the uploaded data values for the selected automation stations.

Device name	Date modified
AS_72008	11/12/2019 9:56 AM
AS_72009	11/13/2019 9:13 AM

- 8.5 The report engine offers several features:
  - a. Print - This will print the report as displayed.
    - i. Click **Print** to launch standard print dialog.
  - b. Export - This will export the data allowing it to be manipulated and added with other data so that reports can be created as needed.
    - ii. Click Export report to launch the windows file save dialog.
    - iii. Specify a location and file name to save the report data.
    - iv. Specify the desired file format type.
    - v. Click **Save**.
- 8.6 To create other reports click the Startup component and repeat parts 3 through 5 as needed
- 8.7 To close individual reports, click Reports then click the **X** next the report name.
- 8.8 When you are finished with reports, close the project and then close ABT Site.

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