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Dallas, Texas, USA

LVM

Touch Screen Centralized Controller



THIS MANUAL MUST BE LEFT WITH THE OWNER FOR FUTURE REFERENCE

Equipment List

A complete LVM system consists of:

- 1 - Touch Screen Centralized Controller
V0CTRL12 (12" screen) or V0CTRL15 (15" screen)
- 1 - LVM Hardware - V0CTRL85 (M-interface)
- 1 - LVM Software (factory installed)
- 1 - LVM Software key dongle
- 1 - Router switch, wireless or wired (not included)

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⚠WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency.

IMPORTANT!

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation. Read all of the information in this manual before operating this equipment.

General

The Lennox VRF Manager (LVM) touch screen centralized control system can monitor and control up to 16 VRF systems with up to 48 outdoor units and 1024 indoor units. See Appendix A.

The system consists of one touch screen centralized controller connected with a minimum of one, maximum of four, LVM hardware devices.

A field-supplied router switch and communication wiring is required.

Lennox VRF Outdoor and Indoor Units

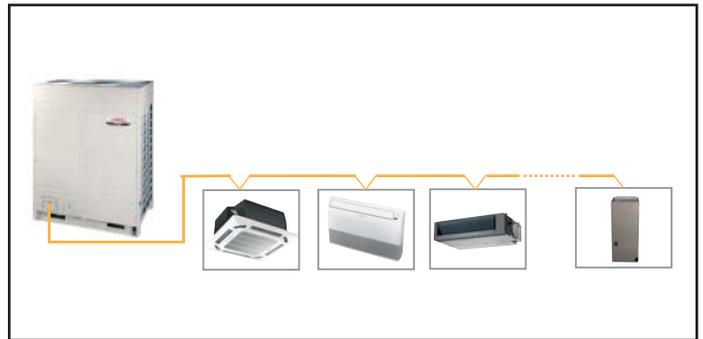


Figure 1. VRF System Example

All Lennox VRF outdoor and indoor units can be connected to the LVM system. The outdoor and indoor units will provide cooling and heating to the building at the direction of the LVM. Refer to the individual unit's manuals for information about that specific unit.

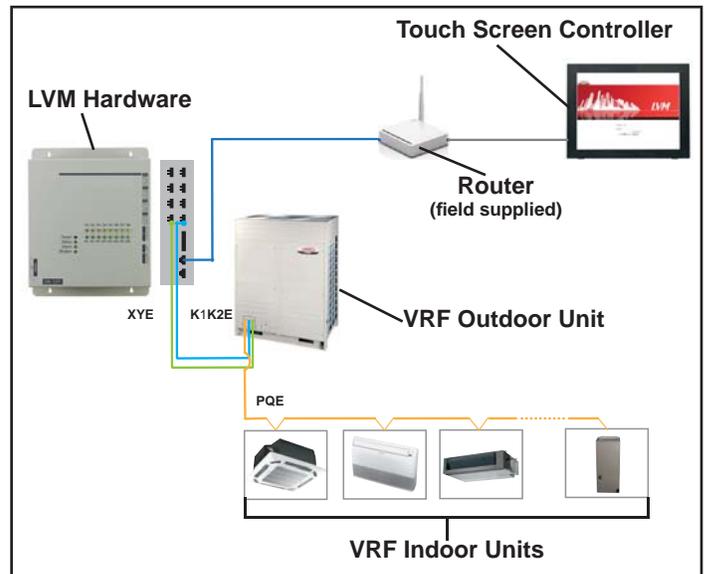


Figure 2. One VRF System Single Module Example

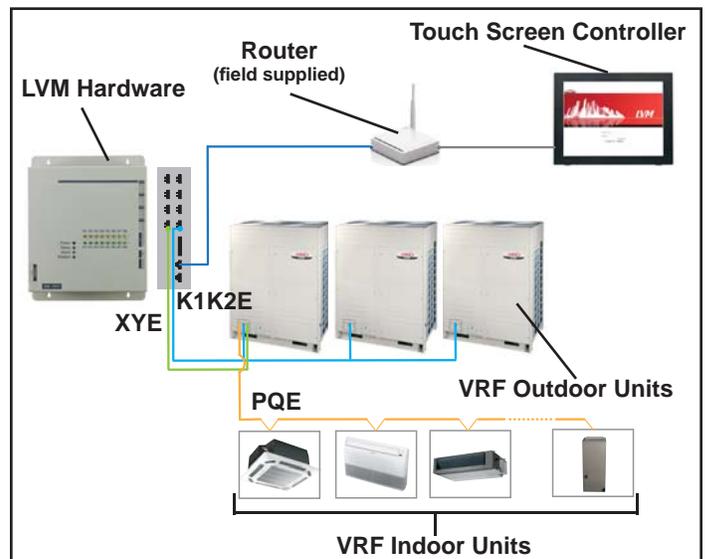


Figure 3. One VRF System Multi Module Example

Dashboard

The LVM dashboard consists of nine screens. Each screen is accessed via tabs below the menu bar. The active tab's label displays blue.

The software version number is located under the Lennox VRF logo at the top right of the screen.

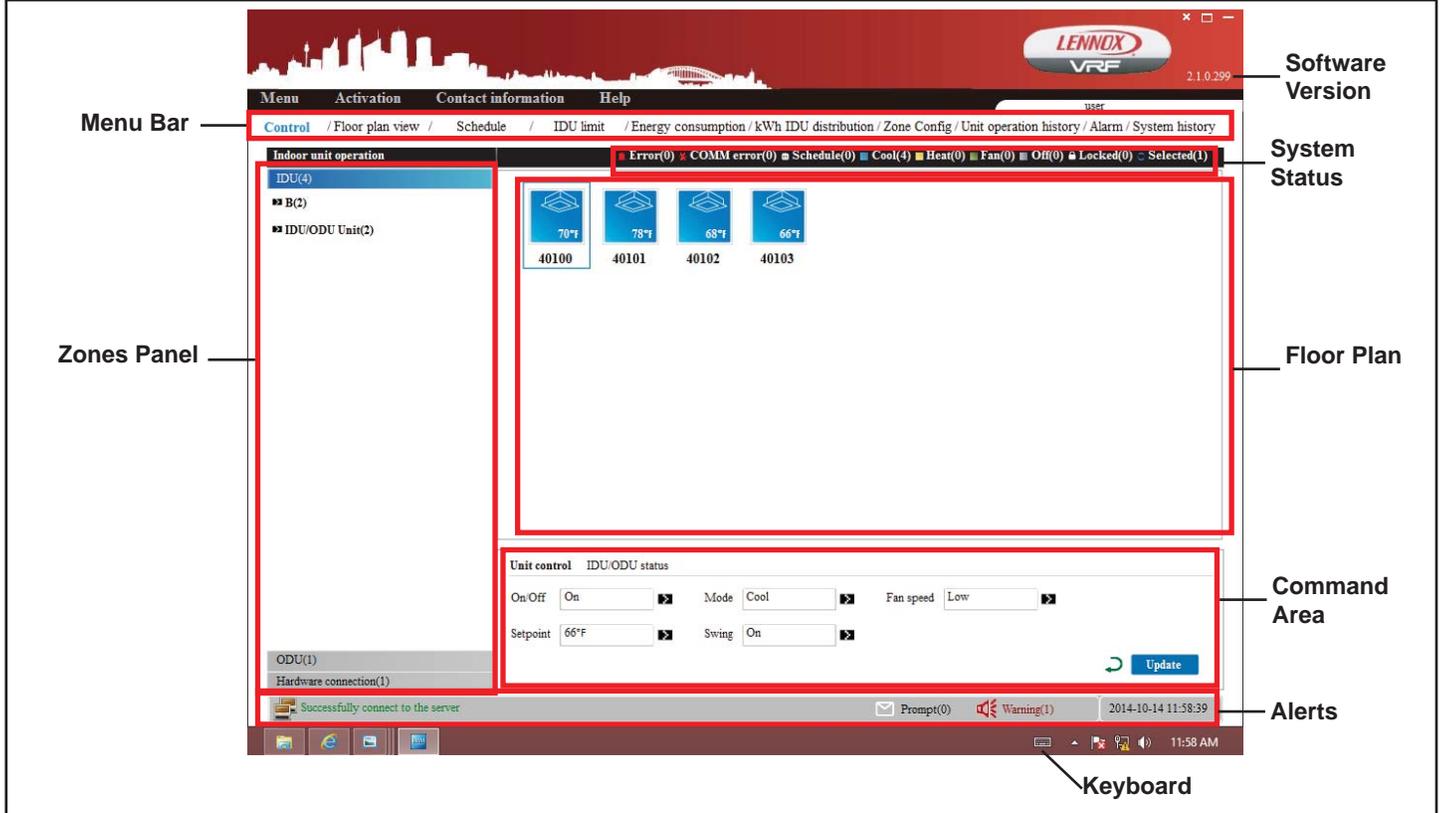


Figure 4. LVM Dashboard

LVM Configuration Screens

- **Control.** Displays connected VRF indoor and outdoor units operation details and control the indoor unit. See page 10.
- **Floor Plan** -- Insert, edit or view the status of connected indoor units. See page 7.
- **Schedule.** Provides scheduling control of the connected indoor units. See page 9.
- **IDU Limit** -- Setup, view and modify indoor unit operational limits. See page 13.
- **Energy Consumption** -- View and monitor energy usage of indoor and outdoor units. Not available.
- **kWh IDU Distribution** -- View and monitor energy use of indoor units connected to a specific outdoor unit. Not available.
- **Zone Configuration** -- Setup and edit zones for individual control of indoor units within the zone. See page 16.
- **Unit Operation History** -- View operation history. See page 19.
- **Alarm** -- Configure email and text notifications of system alarms. See page 22.
- **System History** -- View and export all system

commands over a user-defined period of time. See page 23.

- **System Status** -- “At a glance” view of the status of all units connected to the LVM. Color-coded for the status of the units (blue for cooling, red for heating, etc.)
- **Alerts** -- Displays the connection status and alarm readings from the LVM software. Tap the Warning icon to open a popup screen listing recent alerts. See figure 5.

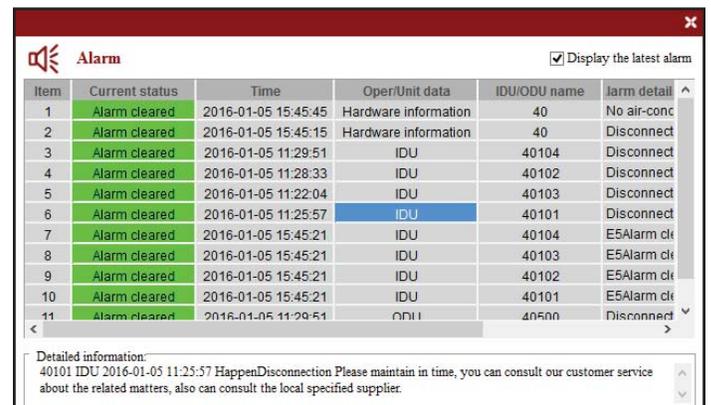


Figure 5. Alarm Notification

Login Screen

- Use the Login screen to access LVM system. See figure 6.
 - Default User Name: user
 - Default Password: user

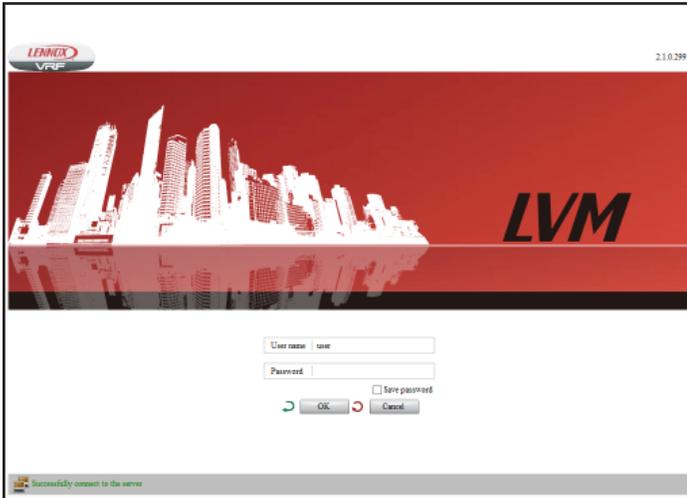


Figure 6. Login Screen

- Wait a few seconds for the system to initialize.
- After initializing, the LVM Control Screen will be displayed.
- To cancel initialization and exit the system, press 'Exit the System'. See figure 7.

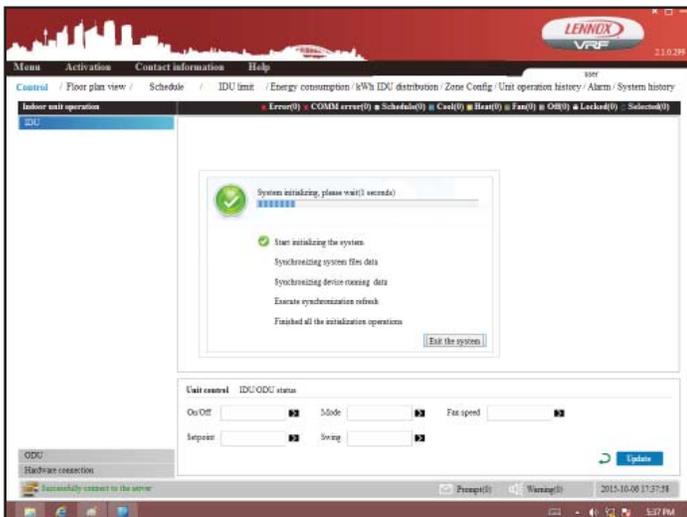


Figure 7. System Initiation

Change User Password

1. Press Menu.
2. Press Modify the password.

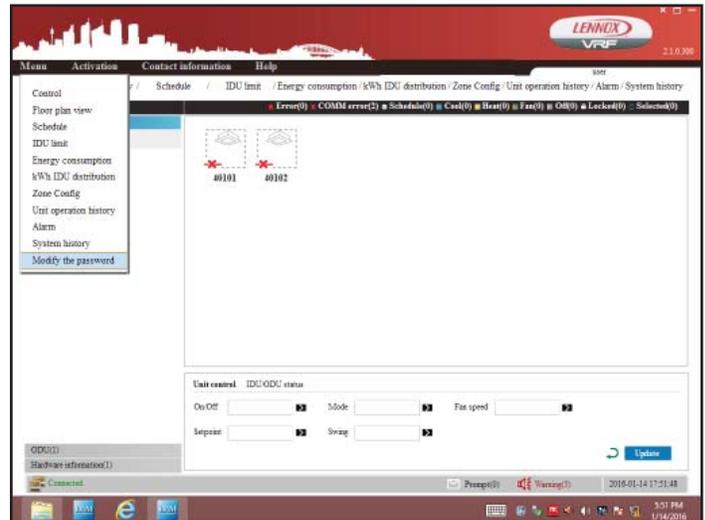


Figure 8. Change User Password

3. Enter current password.
4. Enter new password.
5. Press the Save button.

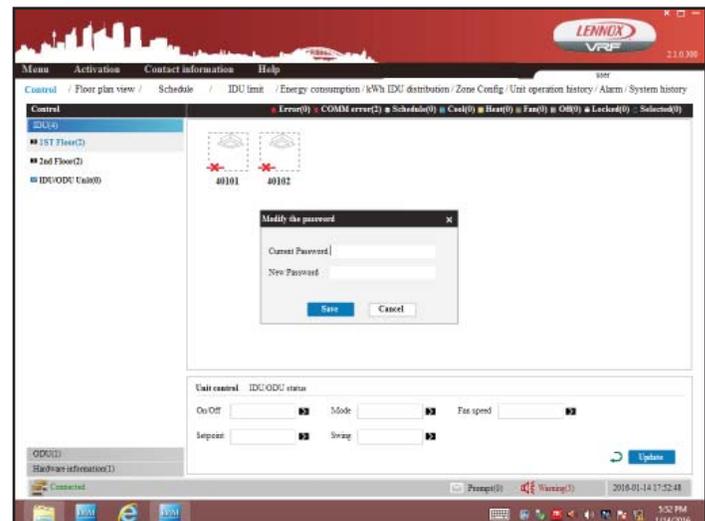


Figure 9. Enter New Password

Control Screen

NOTE - Indoor units connected to a centralized control may also be controlled by a local controller. Indoor units respond to the last command sent. It is recommended that indoor units be controlled from a single source of control, either local controller or centralized controller but not both, to avoid conflicts in commands.

Use the Control screen to view and control the status of any of the connected indoor units. See figure 10.

- To select one or more indoor units, tap each indoor unit you want to control. The selected units will be outlined.
- To deselect a selected indoor unit, tap the unit again.
- The On/Off field must be set to On before other fields can be changed.
- When the Update button is tapped; all current and changed parameters are sent to the selected indoor unit(s).
- Multiple parameters can be changed in a single update.

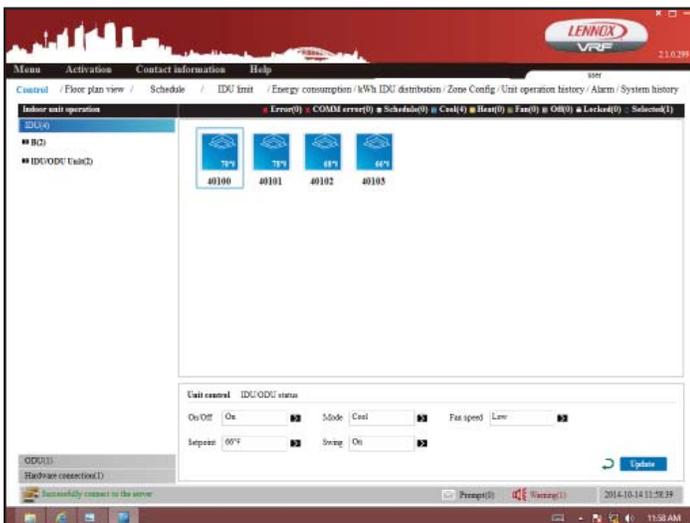


Figure 10. Control Screen

Turn Unit(s) On or Off (Figure 11)

1. Tap the On/Off field.
2. Tap to select either On or Off.
3. Tap the Update button to send the updated command and all other parameters to the selected unit(s).

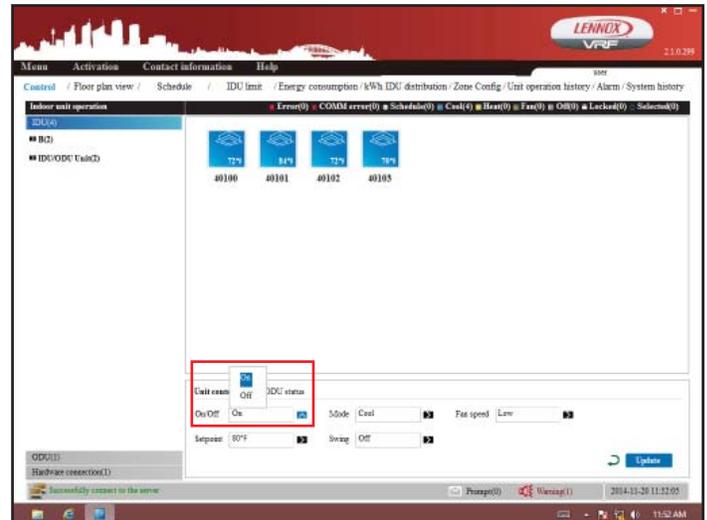


Figure 11. Turn Units On/Off

Set Mode (Figure 12)

1. Tap the Mode field.
2. Tap to select Cool, Heat, or Fan. Do not use Auto mode.
3. Tap the Update button to send the updated command and all other parameters to the selected unit(s).

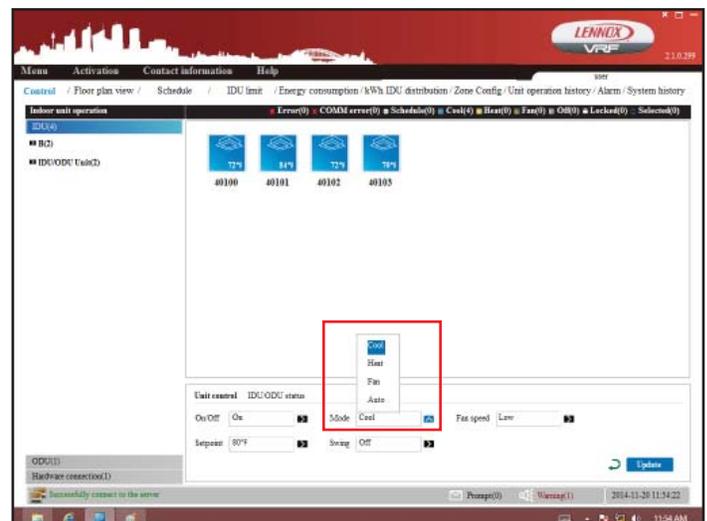


Figure 12. Set Unit Mode

Set Fan Speed (Figure 13)

1. Tap the Fan speed field.
2. Tap to select High, Medium, or Low.
3. Tap the Update button to send the updated command and all other parameters to the selected unit(s).

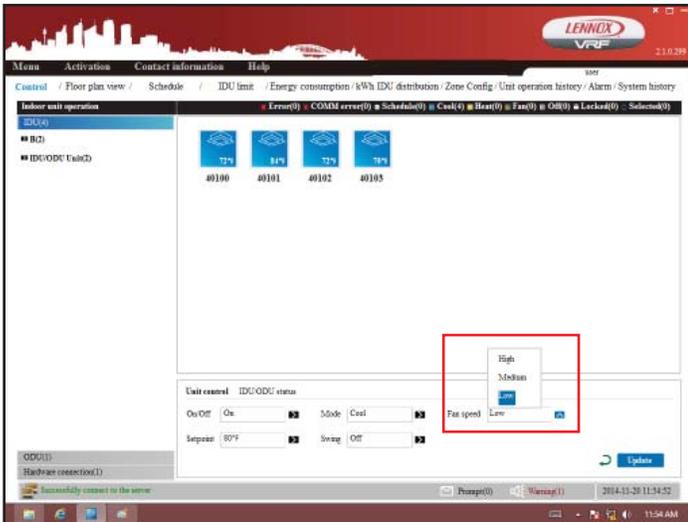


Figure 13. Set Unit Fan Speed

Set Setpoint (Figure 14)

1. Tap the Setpoint field.
2. Tap to select a setpoint between 62° F and 86° F.
3. Tap the Update button to send the updated command and all other parameters to the selected unit(s).

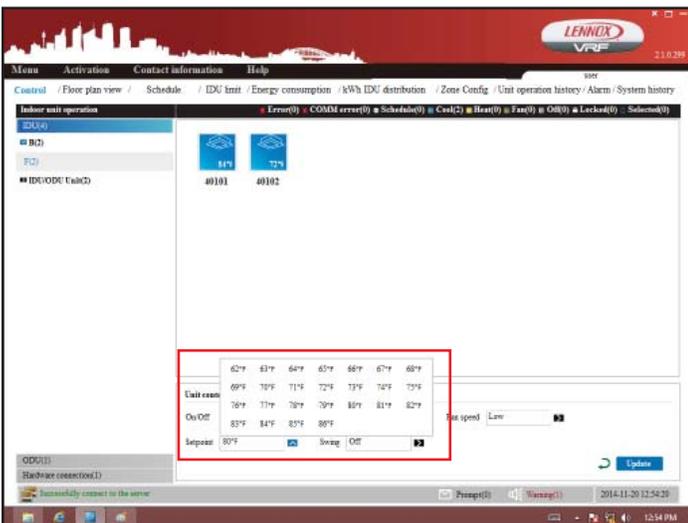


Figure 14. Set Unit Setpoint

Turn Louver Oscillation On or Off (Figure 15)

1. Tap the Louver field.
2. Tap to set the louver swing on or off.
3. Tap the Update button to send the updated command and all other parameters to the selected unit(s).

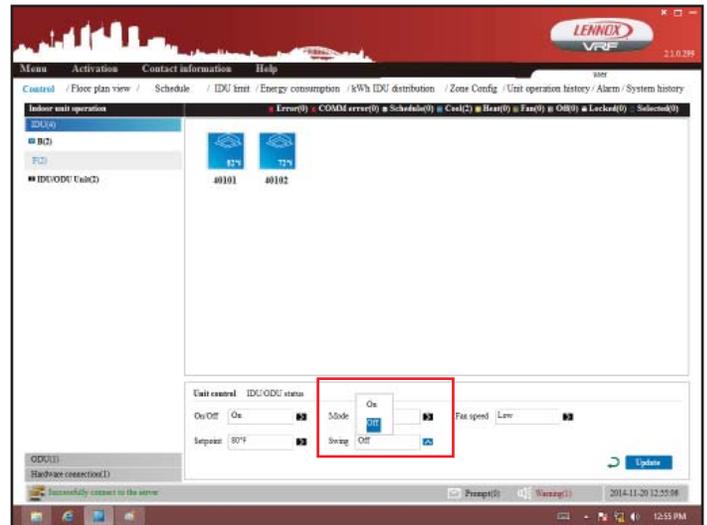


Figure 15. Turn Unit Oscillation On/Off

Floor Plan Screen

Use the Floor Plan screen to insert a floor plan, edit a floor plan and to view the status of all of the connected indoor units. **NOTE** - Zone configuration must be setup prior to using the Floor Plan screen. See page 16.

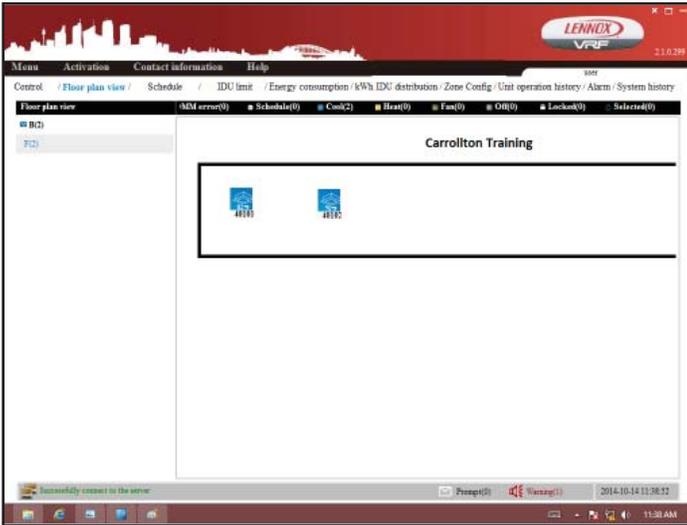


Figure 16. Floor Plan Screen

Import or Replace a Floor Plan Image* (Figure 17)

1. Tap and hold zone name. A small menu displays the following options, Start equipment position change and Replace floor plan. See figure 17.

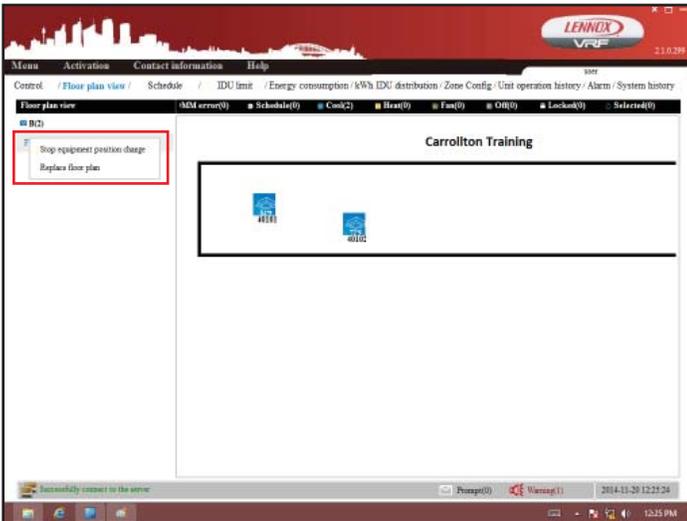


Figure 17. Import or Replace Floor Plan

2. Tap Replace floor plan. The options for floor plans display (if this is the first time to import a floor plan image, the current floor plan display will be blank). See figure 18.

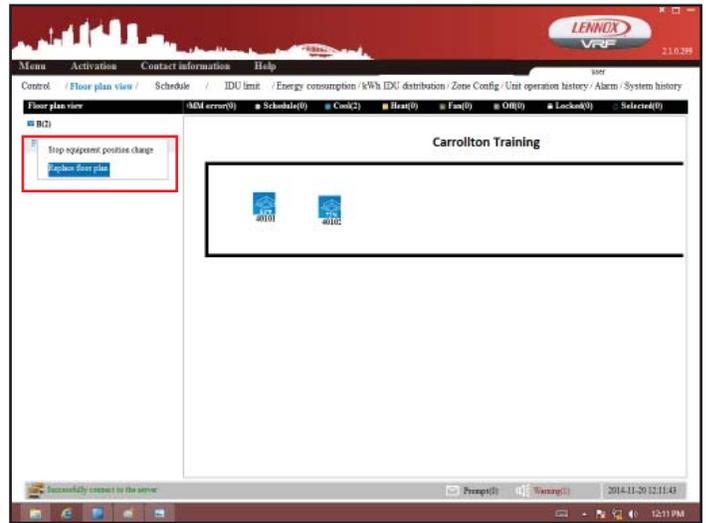


Figure 18. Replace Floor Plan

3. Tap to select the desired floor distribution plan image file. See figure 19.

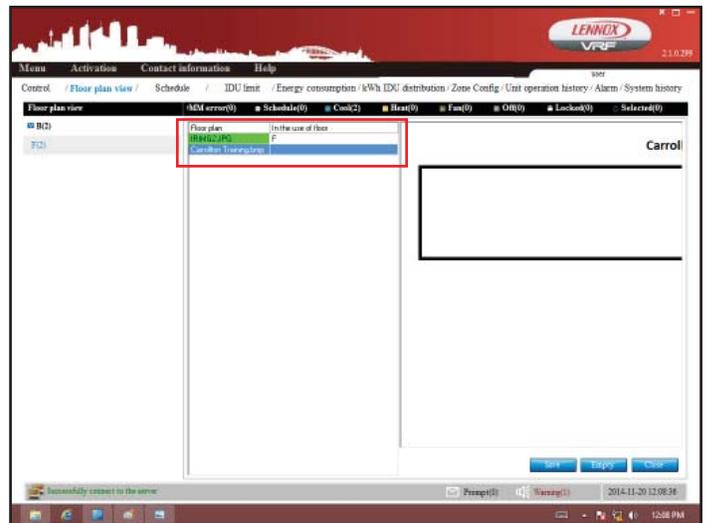


Figure 19. Select File

4. Tap the Save button. The floor plan will be saved to the zone. See figure 20.

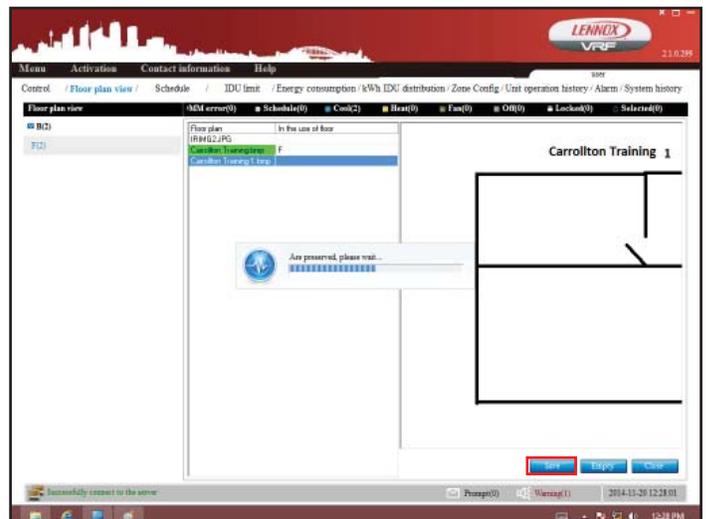


Figure 20. Save Floor Plan

5. Tap Close to return to the floor plan display.
6. Continue with the steps to Move Indoor Units to setup the floor plan to match your building.

Move Indoor Units

1. Tap and hold the floor plan you want to change until a menu displays. See figure 21.
2. Tap Enable ODU/IDU position modifying.

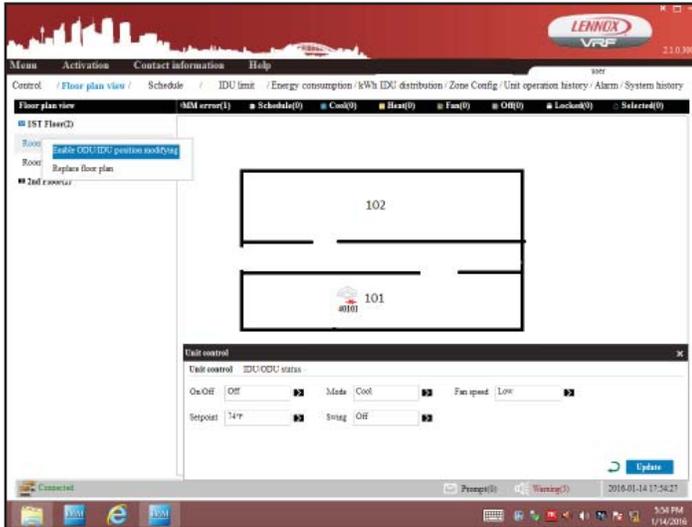


Figure 21. Enable IDU Positioning

3. To move a indoor unit to a new location within this floor plan, select the text under the indoor unit icon not the icon. Tap and hold the text and drag to the new position.

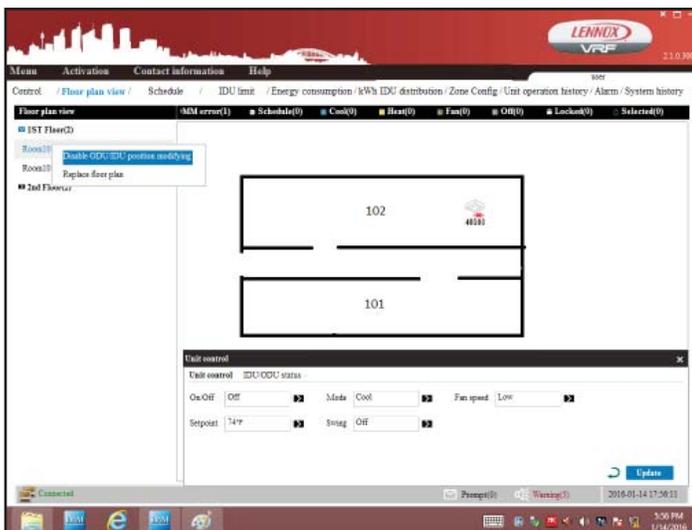


Figure 22. Reposition Indoor Unit

4. Tap Stop equipment position change.

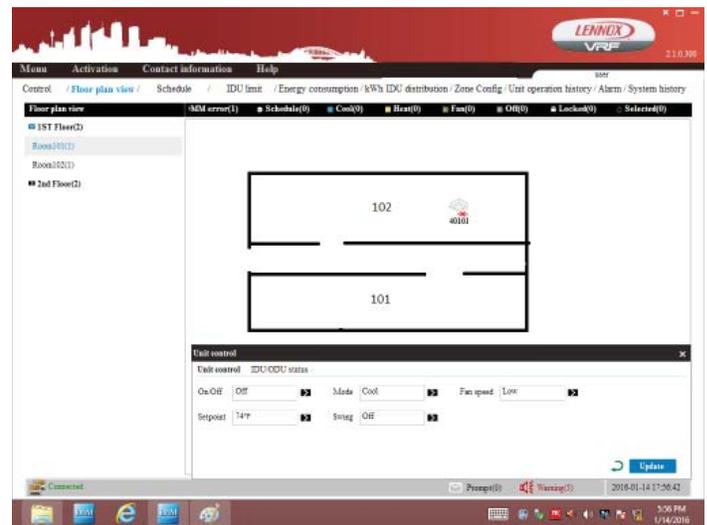


Figure 23. Save Indoor Unit Position

*All floor plan image files (.bmp or .jpg) must be stored on the touch screen tablet in the following folder:

D:/Program Files/IMM/Map

Schedule Screen

Use the Schedule screen to setup, view, and modify indoor unit operation schedules.

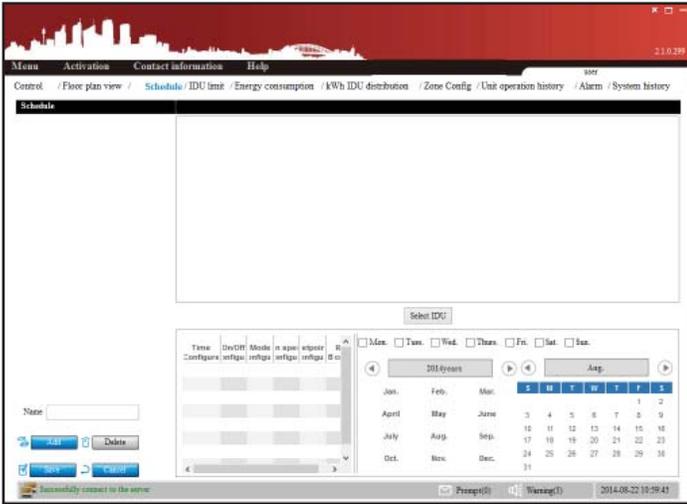


Figure 24. Schedule Screen

Create a Schedule

1. Tap the Add Button on the bottom left of the screen.
2. Tap the name field and provide a name for the schedule. See figure 25. Tap virtual keyboard on the bottom right on the Windows Taskbar to input the name.
3. Continue the scheduling process by assigning indoor units to the schedule.

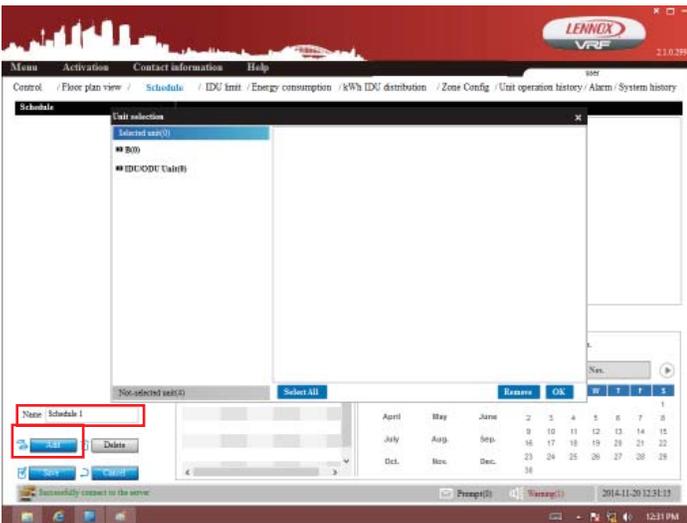


Figure 25. Create a Schedule

Add Indoor Units To a Schedule

Only indoor units that are not currently assigned to a schedule can be added. To assign an indoor unit to a new schedule, first remove the indoor unit from the schedule it is currently assigned to. See instructions on page 10 to remove indoor units from a schedule.

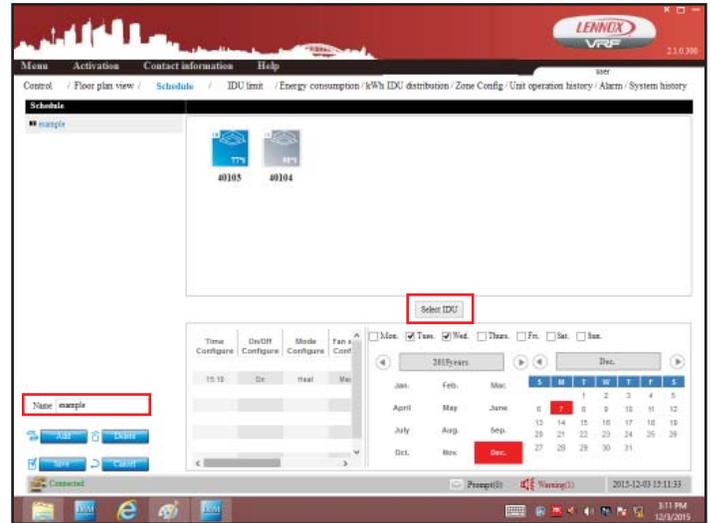


Figure 26. Add Indoor Units to Schedule

4. Tap the schedule to be modified from the list on the left column. Tap the Select IDU button to add.
5. On the bottom left of the popup window, Tap the 'Unit not selected' (next to the Select All button). All indoor units not assigned to other schedules will display. See figure 27.

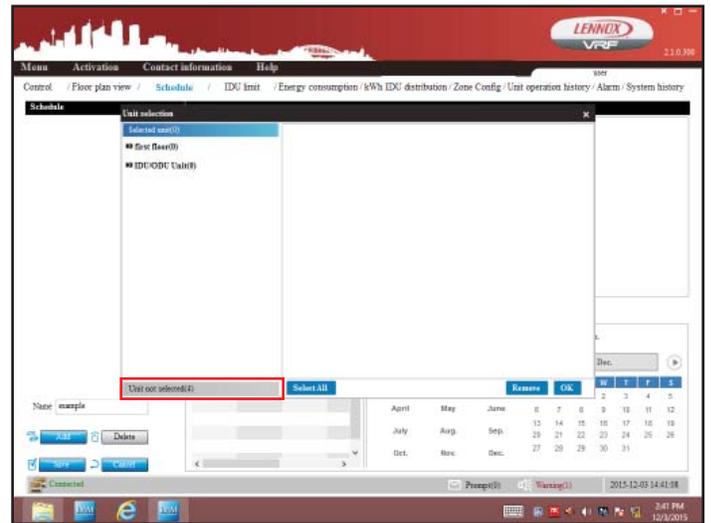


Figure 27. Identify Indoor Units Not In a Schedule

6. Tap each unit to be added to the schedule. A blue box displays around the indoor unit when it is selected. See figure 28.

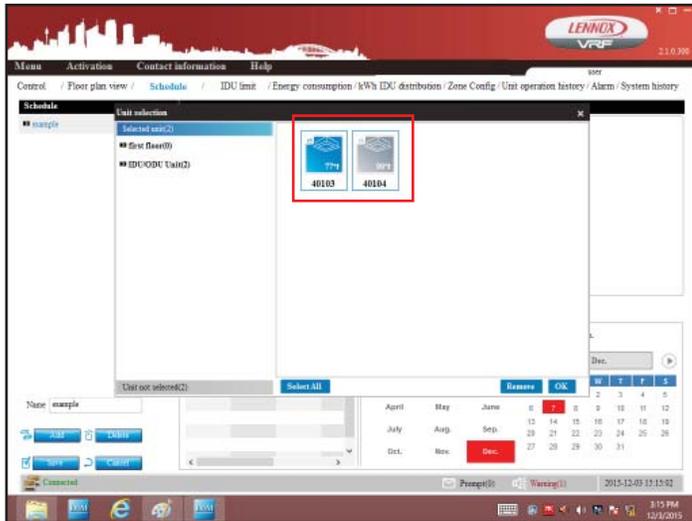


Figure 28. Select Indoor Units to Add

7. Tap the Add button in the lower right of the window. The selected indoor units are added to this schedule. The indoor units are not available to be added to other schedules. See figure 23.
8. Tap the Save button to save the schedule.

Remove Indoor Units From a Schedule

Before an indoor unit can be assigned to a new schedule, the indoor unit must be removed from an existing schedule if currently assigned. Follow these steps to remove an indoor unit from a schedule.

1. Tap the schedule to be modified from the list on the left column. Tap the Select IDU button to modify the assigned indoor units. See figure 29.

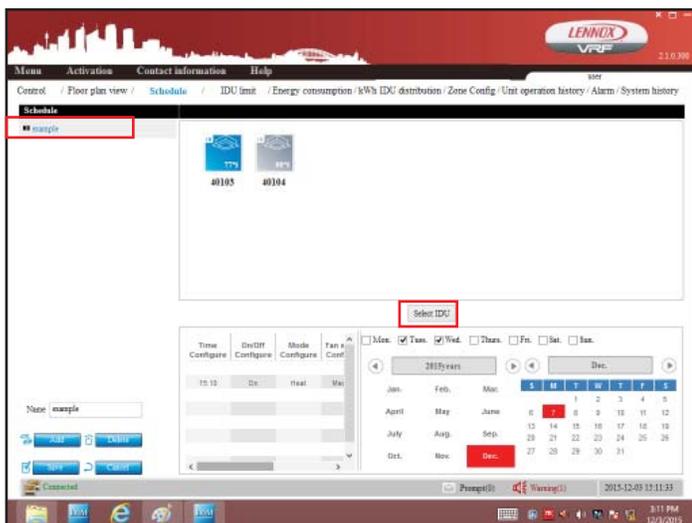


Figure 29. Remove Indoor Units from Schedule

2. The indoor units that are currently assigned to the selected schedule will display in a popup window. Tap each unit to be added to the schedule. A blue box will appear around the indoor unit when it is selected. See figure 30.

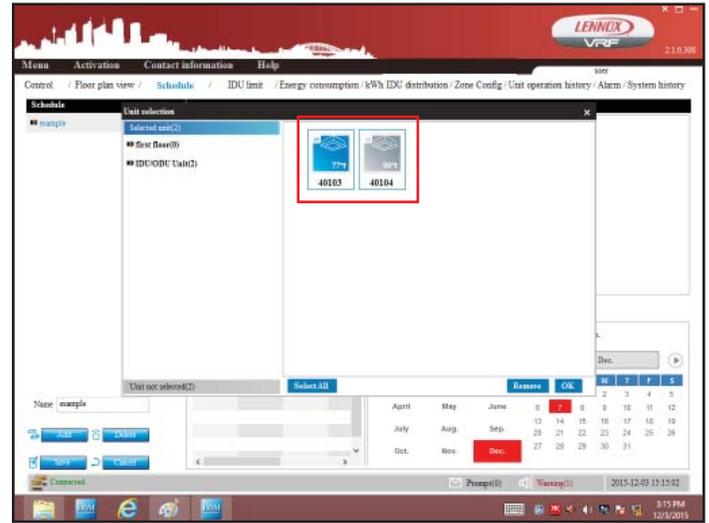


Figure 30. Select Indoor Units to Remove

3. Tap the Remove button in the lower right of the window to remove the selected units from the schedule. See figure 31.

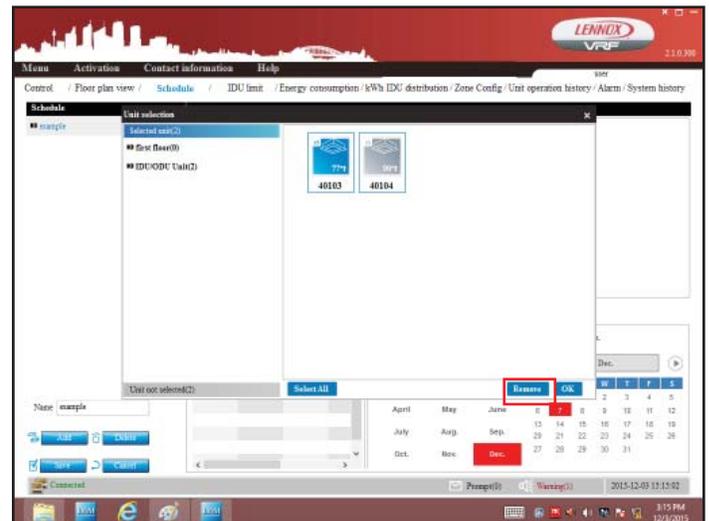


Figure 31. Complete Removal of Indoor Units

4. Tap the Save button to save the schedule.

Edit a Schedule

1. Tap the schedule to be modified from the list on the left column. See figure 32.

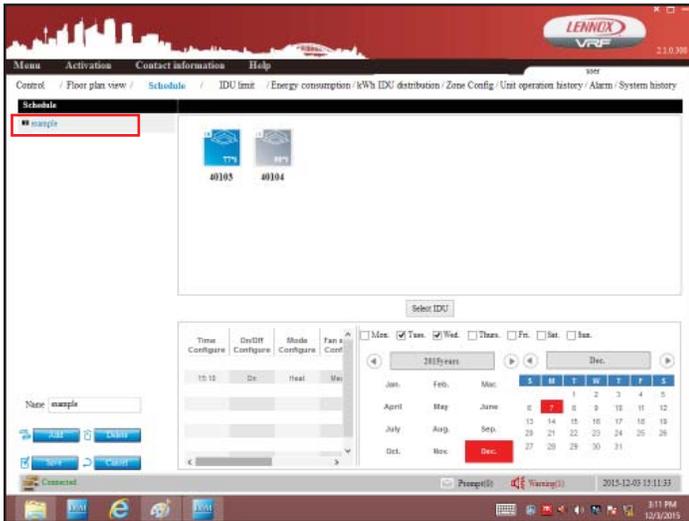


Figure 32. Select Schedule to Edit

2. Make any changes to the schedule using the fields on the bottom right of the screen. See figure 33.

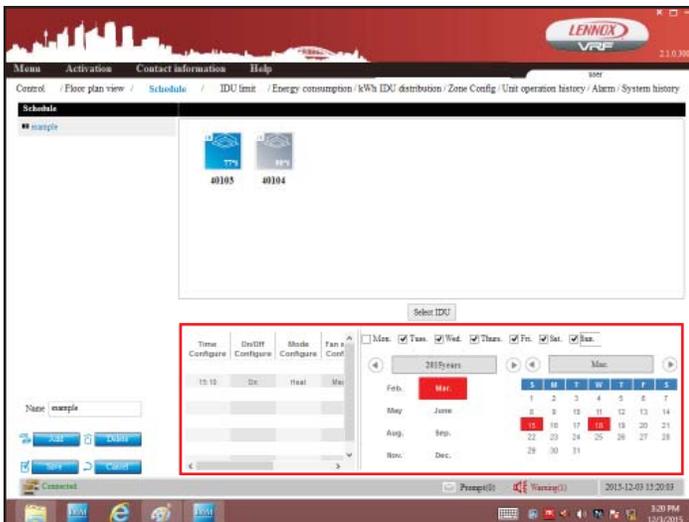


Figure 33. Make Changes to Schedule

3. Tap the Save button to save the schedule.

Delete a Schedule

1. Tap the schedule to be deleted from the list on the left column. See figure 34

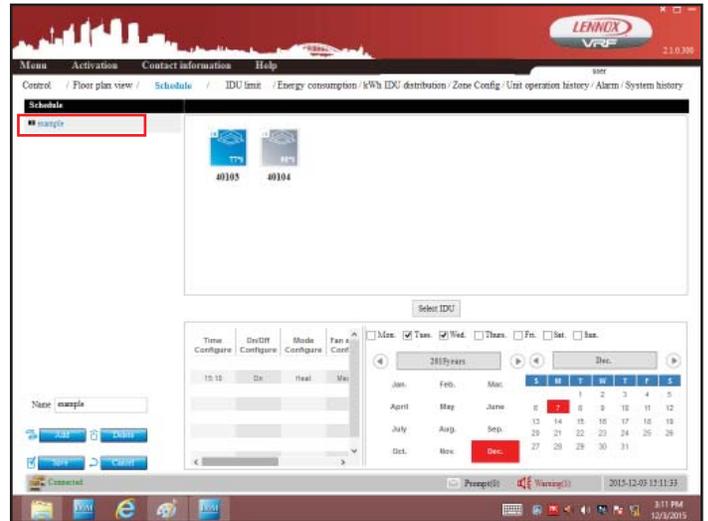


Figure 34. Select Schedule to Delete

2. Tap the Delete button on the bottom left of the screen. See figure 35.

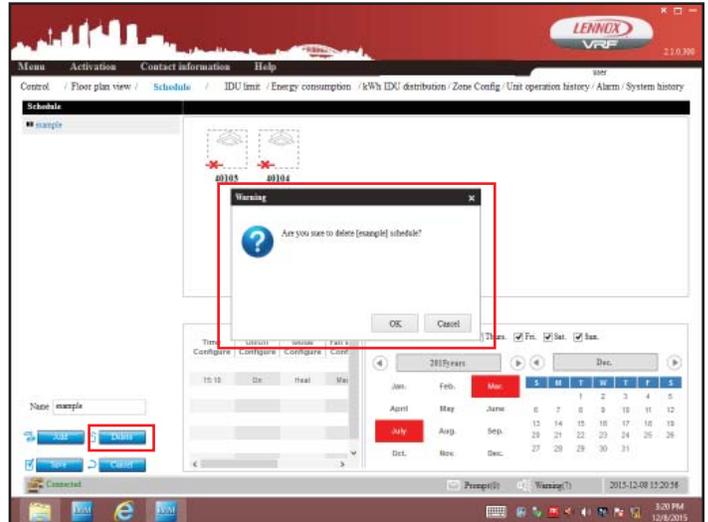


Figure 35. Delete Schedule

3. Confirm the deletion. The schedule will be removed from the right hand column.

Schedule Error Message

If the error message below displays during scheduling, one or more of the fields at the bottom of the Schedule window were left blank.

Tap the OK button and enter the missing information. See figure 36.

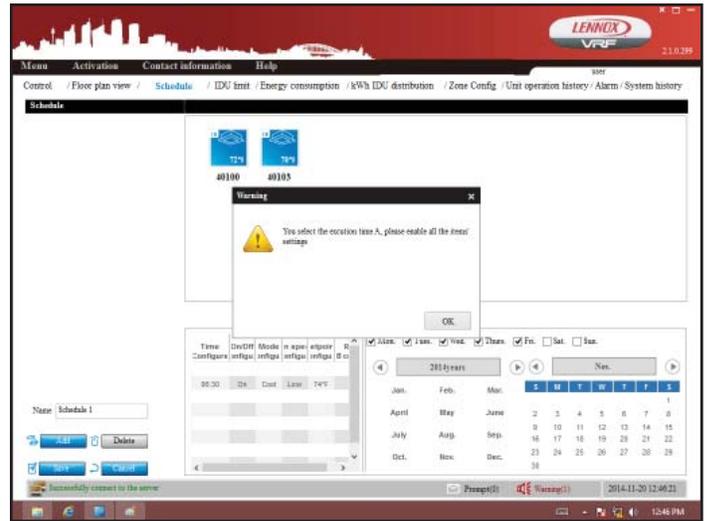


Figure 36. Error Message Schedule Not Complete

IDU Limits Screen

Use the IDU Limits Screen screen to setup, view, and modify indoor unit operation limits. The limits set on this screen apply to this LVM and all local controllers (except V0STAT54. non-programmable remote controller).

NOTE – In the cases where a group of indoor units is controlled by a single local controller, any action on this screen must be applied to all indoor units in the group.

NOTE – In the cases where an indoor unit or a group of indoor units is controlled by a V0STAT51 and there is a local schedule programmed for the associated indoor unit(s), lock functions from the LVM should not be used.

Setup or modify operation limits

1. Tap the IDU Limit view.
2. Tap the zone in the Zone panel, left side of screen, that contains the indoor units you want to limit. **NOTE** - Limits are applied to the local controller rather than directly to the indoor unit. See figure 37.

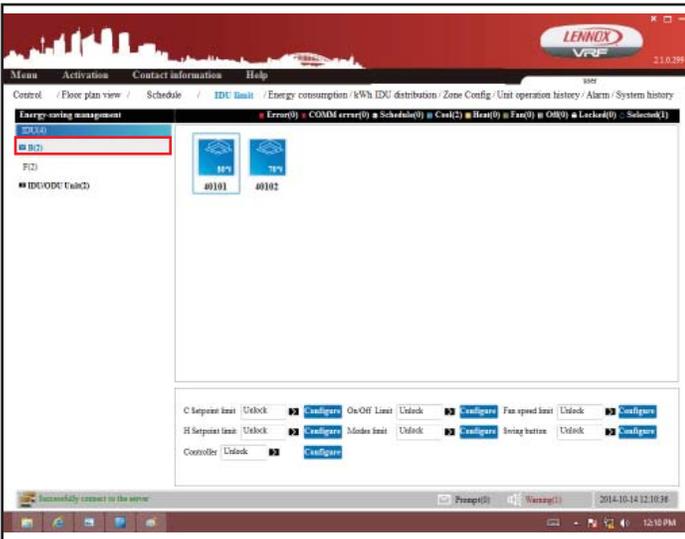


Figure 37. Set Indoor Unit Limits

3. Tap each indoor unit the limits should be applied to. The selected units will be outlined. To deselect, tap again. See figure 38.

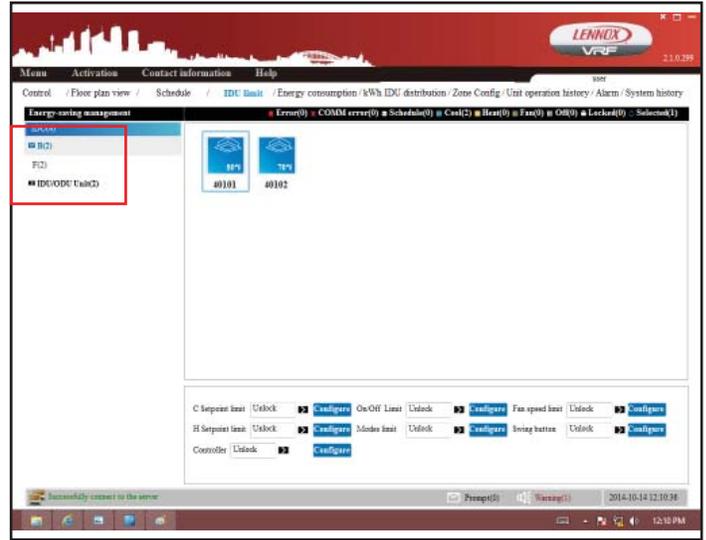


Figure 38. Select Indoor Units

Set Cooling Setpoint Limits

This setting limits the cooling setpoint a user can select using the indoor unit's local controller.

1. Tap the C Setpoint limit field to modify the Cooling setpoint limit. See figure 39.
2. Tap to select a setpoint between 62° F and 86° F.
3. Tap Lock to set the selected setpoint limit or Unlock for no limit.
4. Tap the Configure button to the right of the C Setpoint limit field to send the updated command to the selected unit(s).

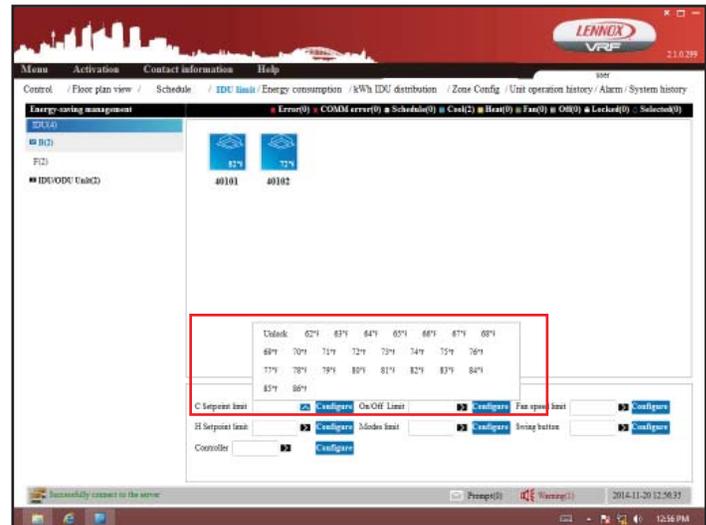


Figure 39. Set Cooling Setpoint Limits

Set On/Off Limits

This setting limits the user's ability to turn on or off the indoor unit using its local controller.

1. Tap the On/Off limit field.
2. Tap to select Forced On or, Off, or tap Unlock for no limit.
3. Tap the Configure button to the right of the On/Off limit field to send the updated command to the selected unit(s).

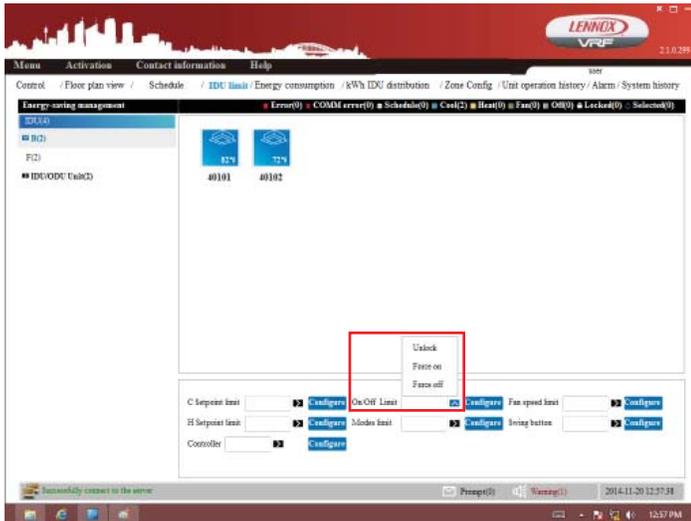


Figure 40. Set On/Off Limits

Set Fan Speed Limits

This setting limits the user's ability to change the indoor unit fan speed using the indoor unit's local controller.

1. Tap the Fan speed field.
2. Tap to select High, Medium, or Low Fan Speed or tap Unlock to for no limit.
3. Tap the Configure button to the right of the Fan limit field to send the updated command to the selected unit(s).

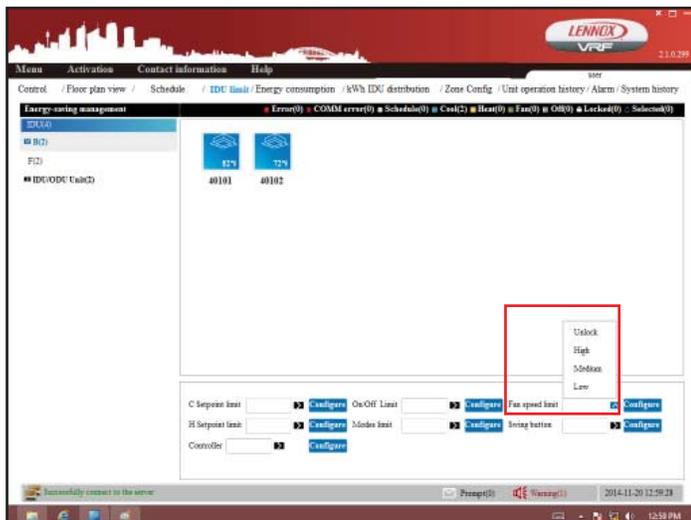


Figure 41. Set On/Off Limits

Set Heating Setpoint Limits

This setting limits the heating setpoint a user can select using the indoor unit's local controller.

1. Tap the H Setpoint limit field to modify the Heating setpoint limit.
2. Tap to select a setpoint between 62° F and 86° F
3. Tap Lock to set the selected setpoint limit or Unlock for no limit.
4. Tap the Configure button to the right of the H Setpoint limit field to send the updated command to the selected unit(s).

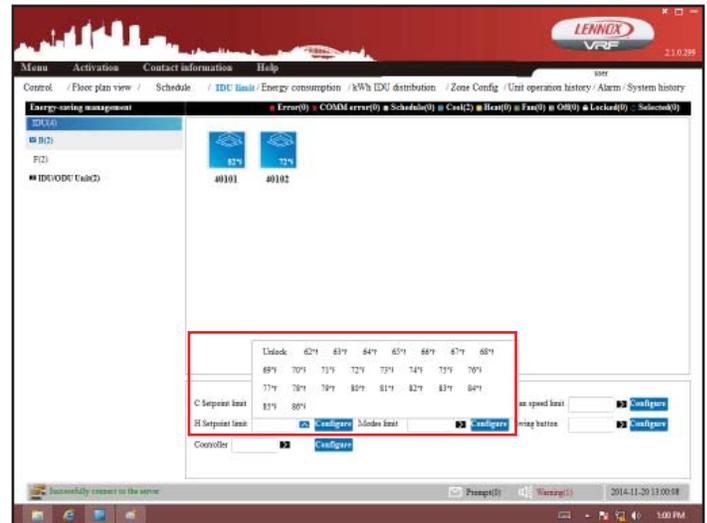


Figure 42. Set Heating Setpoint Limits

Set Modes Limits

This setting limits the user's ability to change the indoor unit mode using the indoor unit's local controller.

1. Tap the Modes limit field.
2. Tap to select Cool or Heat, or tap Unlock to for no limit.
3. Tap the Configure button to the right of the Modes limit field to send the updated command to the selected unit(s).

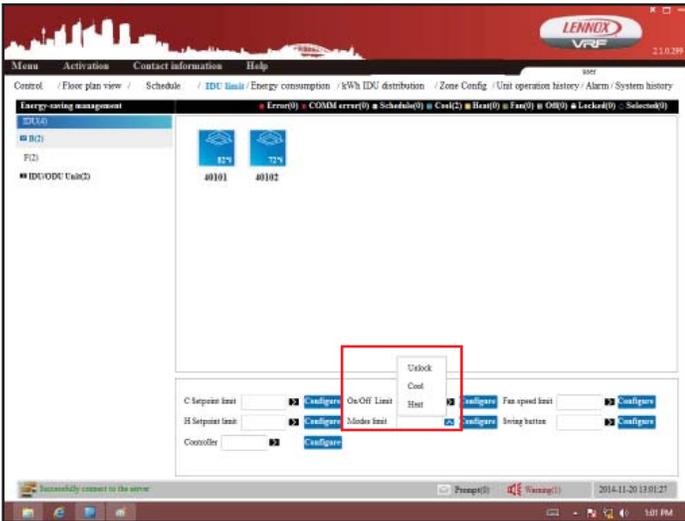


Figure 43. Set Mode Limits

Set Louver Swing Limits

This setting limits the user's ability to change the indoor unit louver swing using the indoor unit's local controller.

1. Tap the Swing button field.
2. Tap to select Unlock or Locked. Locked restricts the user from changing the louver swing setting of the indoor unit. Unlocked allows the user to change the louver swing settings.
3. Tap the Configure button to the right of the Swing button field to send the updated command to the selected unit(s).

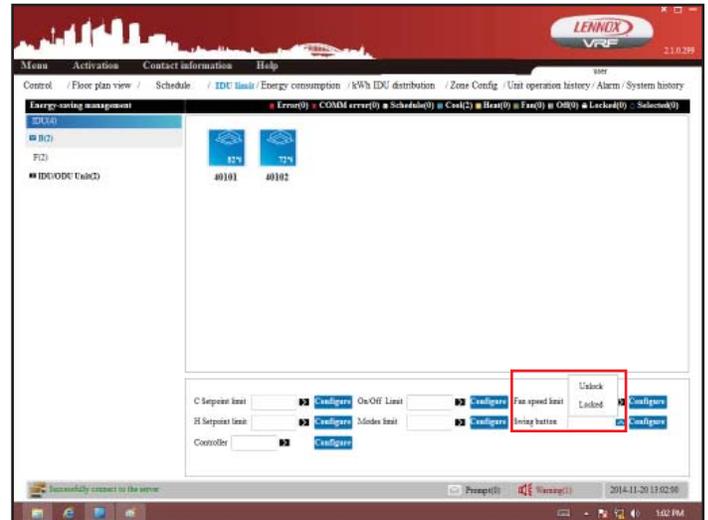


Figure 44. Set Louver Swing Limits

Set Controller Limits

This setting limits the user's ability to change the indoor unit settings using the indoor unit's local controller.

1. Tap the Controller field.
2. Tap to select Unlock or Locked.
3. Tap the Configure button to the right of the Controller field to send the updated command to the selected unit(s).

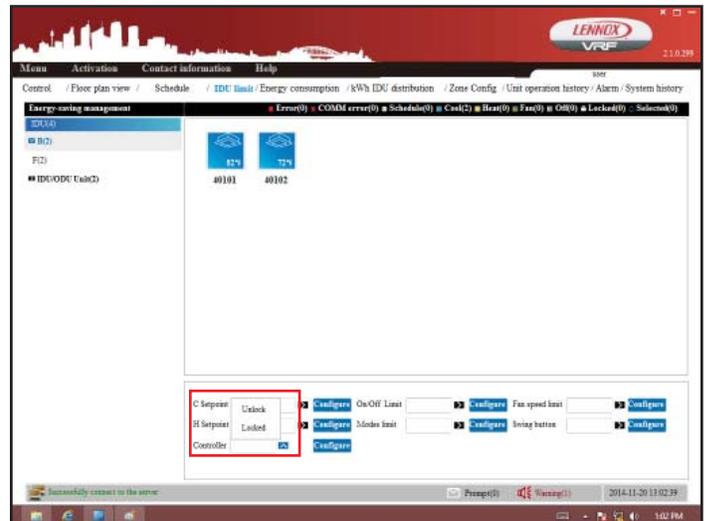


Figure 45. Set Controller Limits

Zone Configuration Screen

Use the LVM Zone Configuration screen to setup zones for control and to assign indoor units to specific zones. The zones are assigned by levels, with LVL1 being the highest and LVL2 below it. LVL1 is used to assign broad areas like an office floor, while the lower levels are used to assign specific areas like offices or conference rooms.

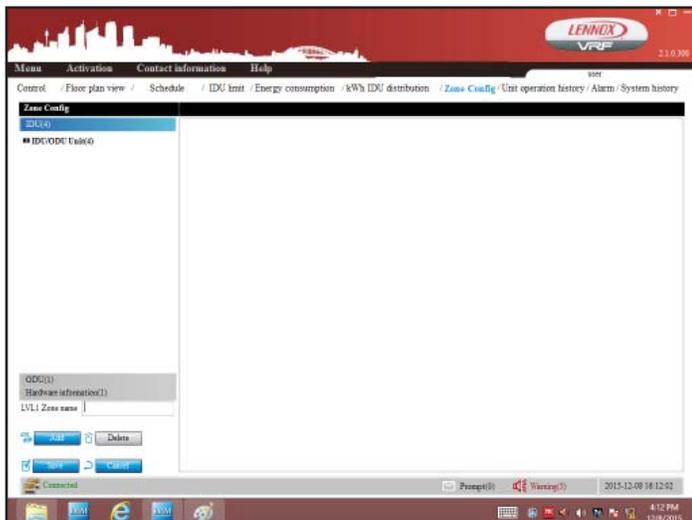


Figure 46. Zone Configuration Screen

Setup Level 1 Zones

1. Tap the Add button.
2. Tap the 'LVL1 Zone Name' field on the bottom of the right column and enter the name of your zone.
3. Tap virtual keyboard on the bottom right on the Windows Taskbar to input the level 1 zone name.
4. Tap Save. See figure 47.

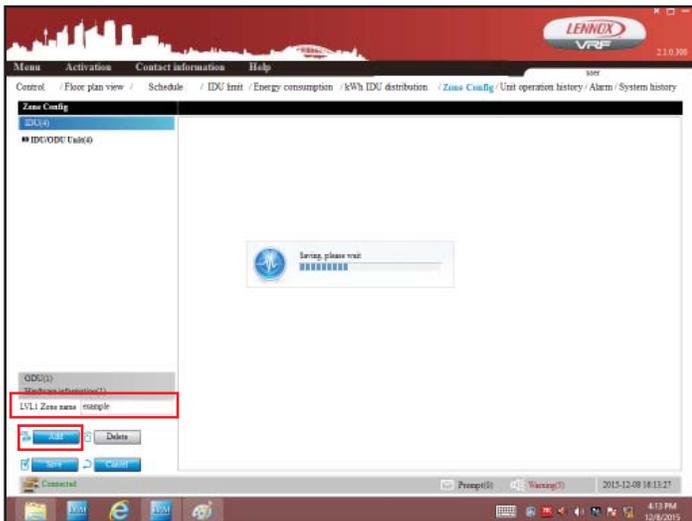


Figure 47. Save Level 1 Zone Name

Setup Level 2 Zones

1. Tap the LVL1 zone name and tap the Add button. This will change the name field to 'LVL2 Zone Name'.
2. Tap virtual keyboard on the bottom right on the Windows Taskbar to input the level two zone name.
3. Tap Save. See figure 48.

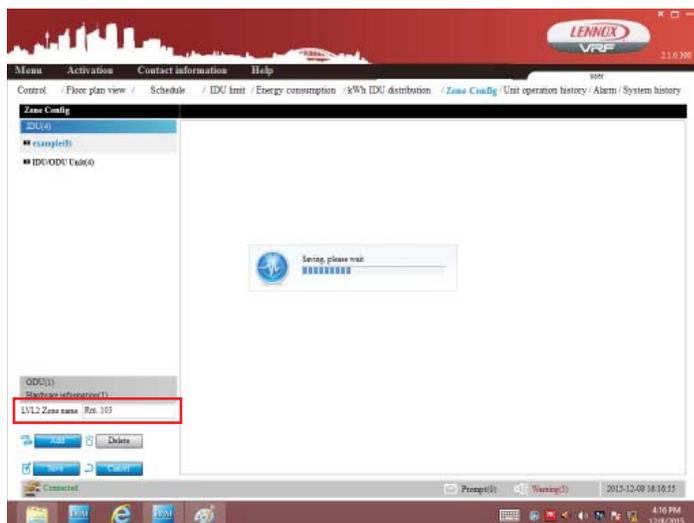


Figure 48. Save Level 2 Zone Name

Add Indoor Units to Zone

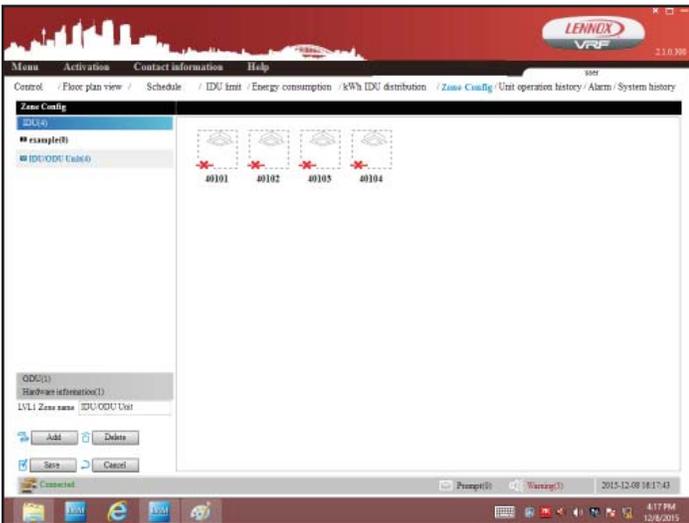


Figure 49. Add Indoor Units to Zone

1. Tap the 'IDU/ODU Unit' screen to view any unassigned unit. Tap each unit you wish to assign to a zone. This will place a box around the selected unit. See figure 50.

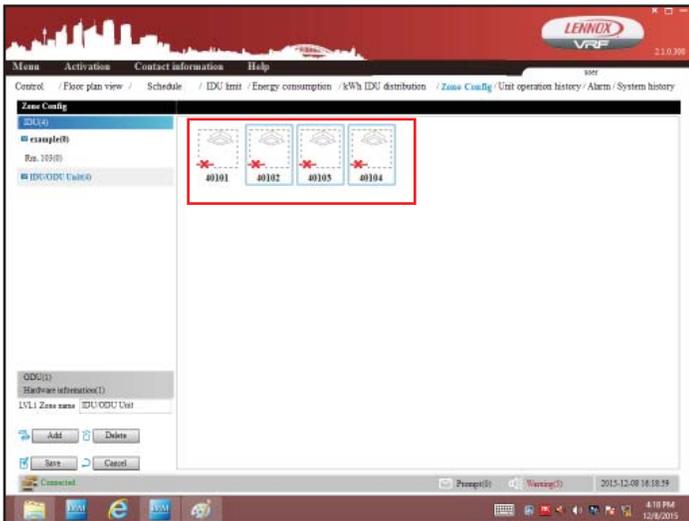


Figure 50. Select Indoor Units to Add

2. Tap and hold the subzone until a menu displays. Tap Selected IDU to add [zone name]. This will assign that IDU to that zone and make it unavailable for any other zones. See figure 51.

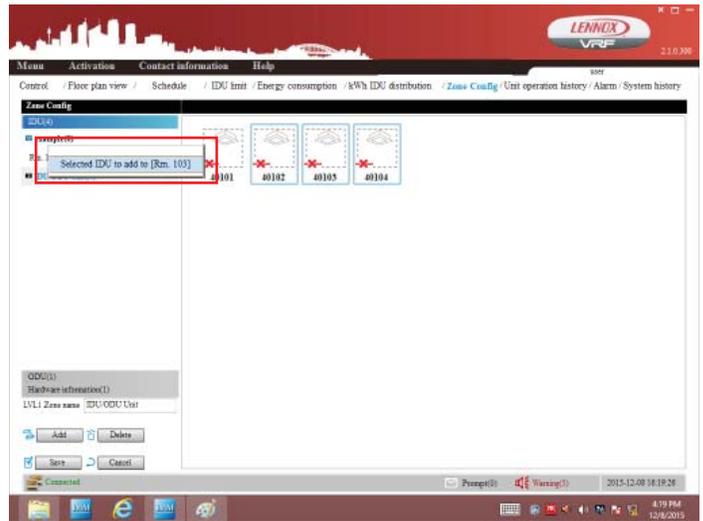


Figure 51. Add the Units

3. Tap the Save button.

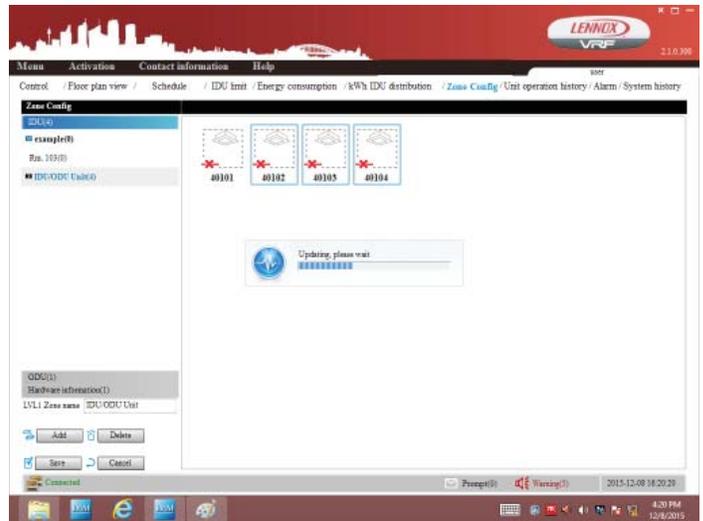


Figure 52. Save the Indoor Units

Remove Indoor Units from Zone

1. Remove the indoor unit by tapping on the zone name and selecting the units to be removed.
2. Tap and hold the units. A menu will display.
3. Tap Selected IDU to add to "IDU/OUT Unit" to unassign the indoor units and make them available again on the IDU/ODU Unit tab. See figure 53.

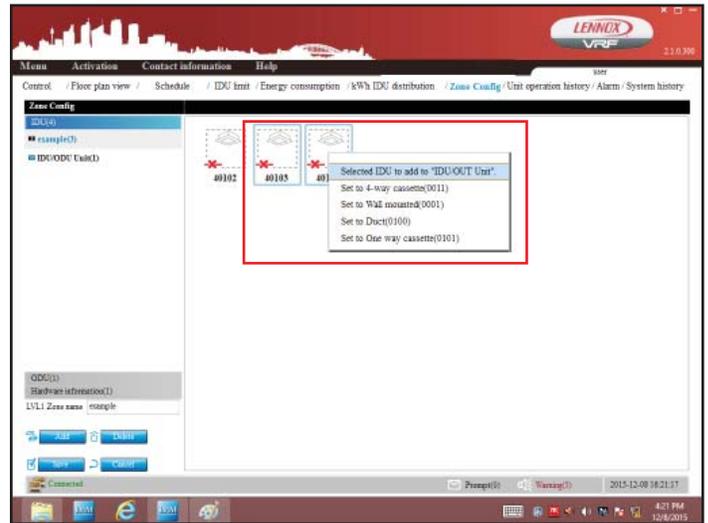


Figure 53. Save the Indoor Units

Unit Operation History Screen

Use the Unit Operation History screen to view operation history. See figure 54.

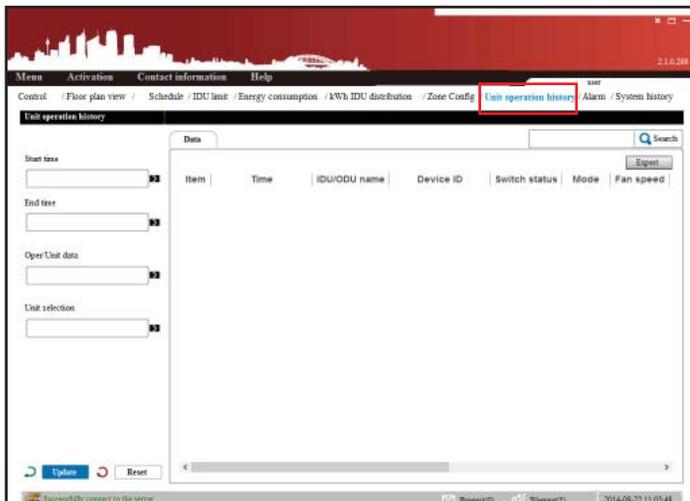


Figure 54. Unit Operation History Screen

View operation history

1. Tap the Start time field. A calendar displays. See figure 55.
2. Tap to select the start date of the operation history report.
3. Tap the Hour field drop-down arrow to select a start time for the report. Note: 0 hours = 12:00 AM (midnight).
4. Tap the OK button.

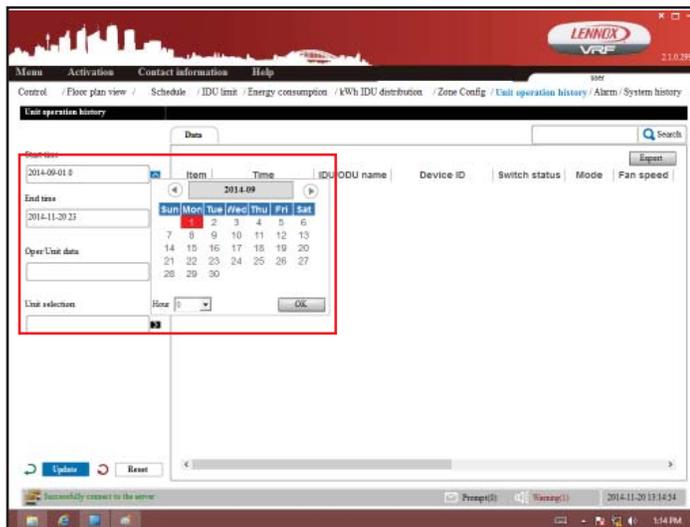


Figure 55. Select Start Time

5. Tap the End time field. A calendar displays. See figure 56.
6. Tap to select the end date for the operation history report.
7. Tap the Hour field drop-down arrow to select an end time for the report. Note: 23 hours = 11 PM.
8. Tap the OK button.

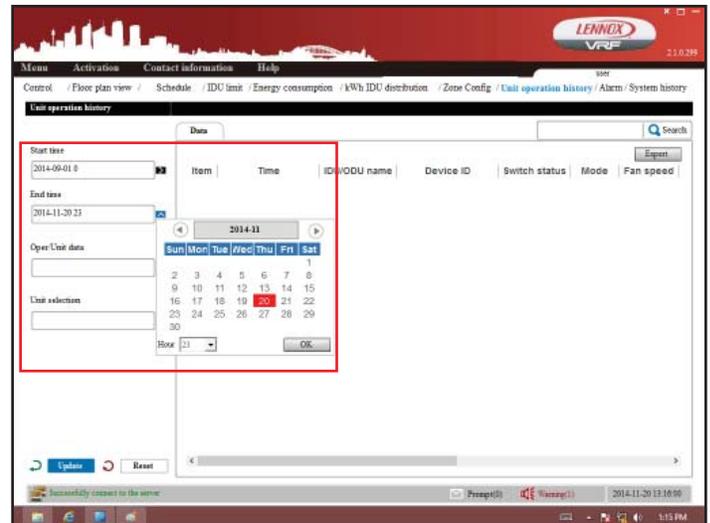


Figure 56. Select Stop Time

9. Tap the Oper/Unit data field. A menu displays. See figure 57.
10. Tap the type of data you want to include in the report.

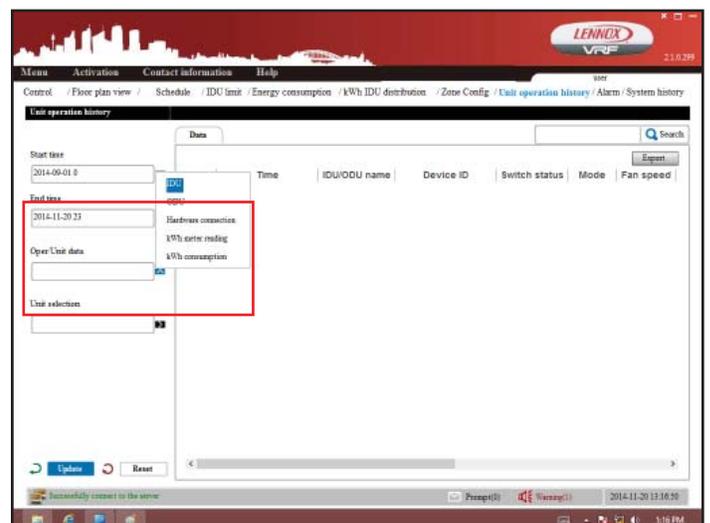


Figure 57. Select Data to Include

11. Tap the Unit selection field. A menu displays. See figure 58.

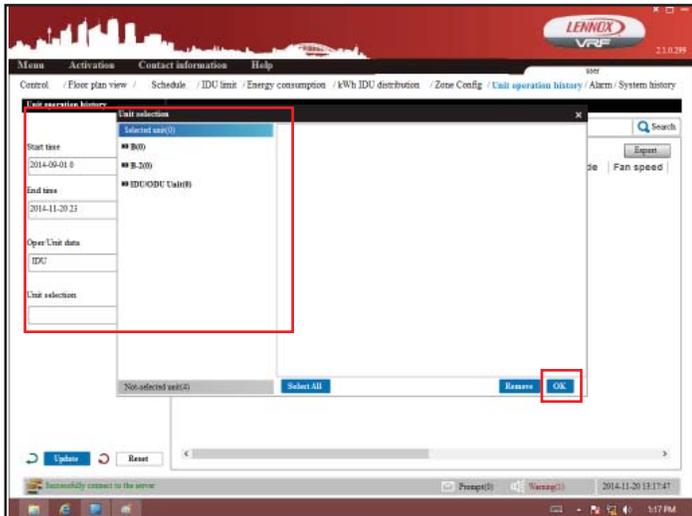


Figure 58. Select Units to Include

12. Tap the zone you want to include in the report. The indoor units in this zone will display. See figure 60.

13. Tap the indoor unit(s) you want to include in the report and tap the Add button. Tap the Select All button to include all indoor units in the floor plan.

14. Tap the OK button.

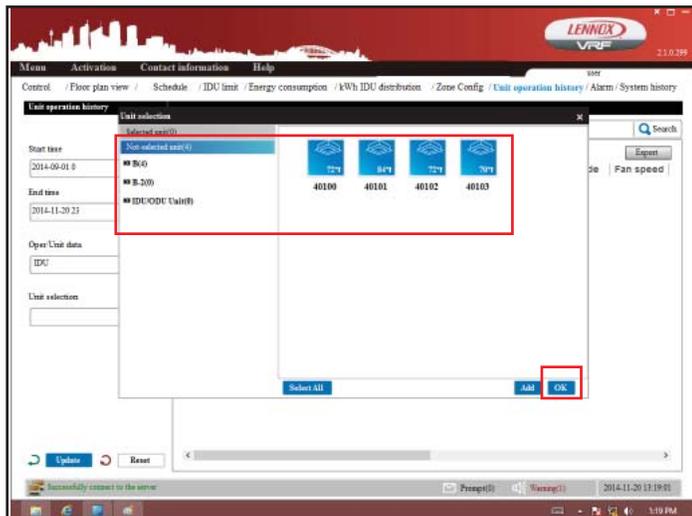


Figure 59. Select Indoor Units to Include

15. Tap the Update button.

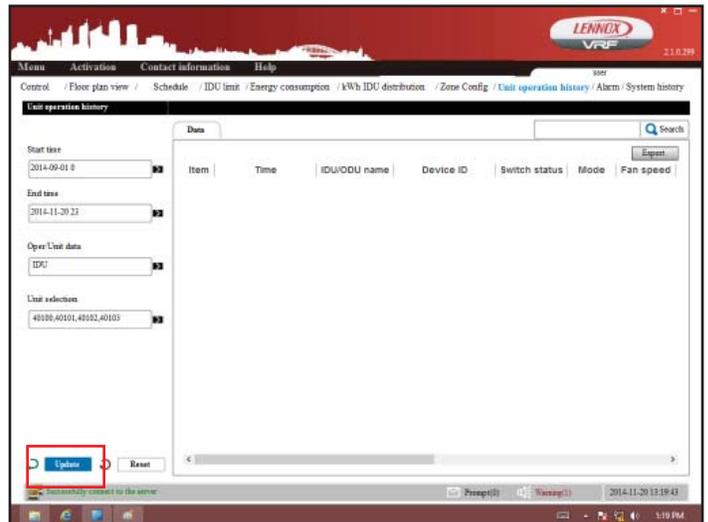


Figure 60. Generate Report

16. Report generation could take several minutes. A status bar will display. See figure 61.

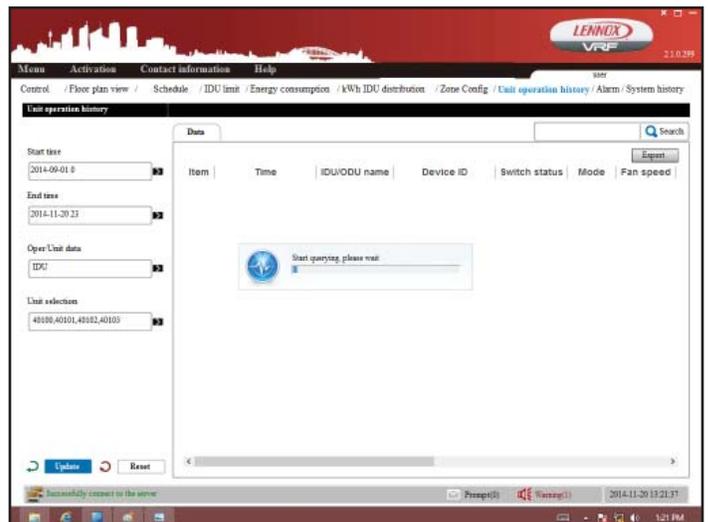


Figure 61. Report Generation Progress Bar

17. The operation report displays. See figure 62.
18. **Search.** Enter a search term in the Search field to search the report. Tap the Search field and then tap the Keyboard icon in the system tray (bottom of screen) to display the keyboard.
19. **Export.** Tap the Export button to export the report to a .csv or Excel file.

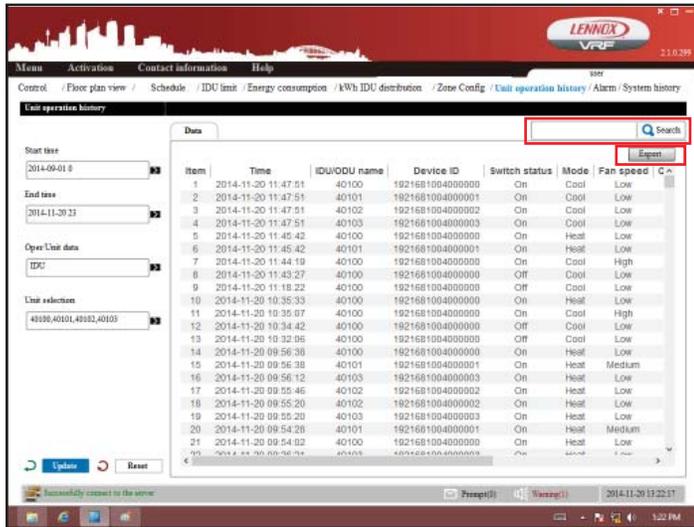


Figure 62. Report Shown

Alarm Notifications

The LVM system can send email notifications of system faults using a third-party software. The Alarm screen on the LVM dashboard is inactive.

NOTE - Email alarms are setup outside of the LVM software client.

Setup Alarm Notifications

1. Go to Desktop and locate the Email Alarm shortcut. See figure 63.

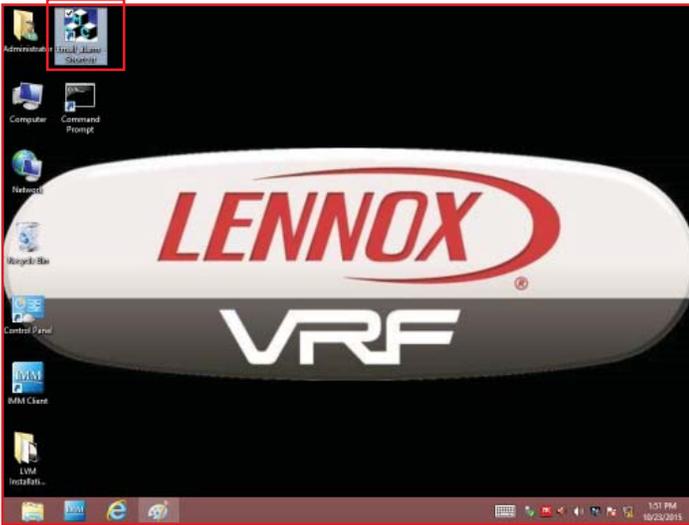


Figure 63. Email Alarm Shortcut

2. Double-tap the shortcut and wait for the window to open See figure 64.
3. Tap the Project name field and enter a project name. This will be the text of the Subject Line of the email alarm. Tap virtual keyboard on the bottom right on the Windows Taskbar to input the email address.
4. Tap the Receive email field and enter in each email address, separated by a comma, for the alarm to be sent. The email alarm system can send email alarms as text messages (ex. 5554041234@txt.att.net). Tap virtual keyboard on the bottom right on the Windows Taskbar to input the email address.
5. Tap the Alarm time and enter the starting and end times for the alarm email notifications to be sent. The first box controls when the emails will begin and the second box controls when the emails will stop each day. For example, 0-23 will send the alarm emails all 24 hours while 7-18 will send the emails only between 7 AM and 6 PM). Any system faults that occur outside of the alarm time period will be emailed at the beginning of the next alarm time period.

6. Tap the Send days field to enter the number of times an email for an unresolved system fault will repeat. Enter 1 to have one email per system fault sent. Enter 2, etc. to have multiple emails for the same system fault sent, one email per day.
7. Tap the Saving Setting button to save the email alarm settings.
8. Tap the Exit button to close the screen.

Edit Alarm Notifications

1. Go to Desktop and locate the Email Alarm shortcut. See figure 63.
2. Double-tap the shortcut and wait for the window to open See figure 64.
3. Make changes as needed.
4. Tap the Saving setting button to save the email alarm settings.
5. Tap the Exit button to close the screen.

NOTE - Tap the Getting setting button at anytime prior to saving the settings to cancel any changes and revert back to the previous alarm settings.

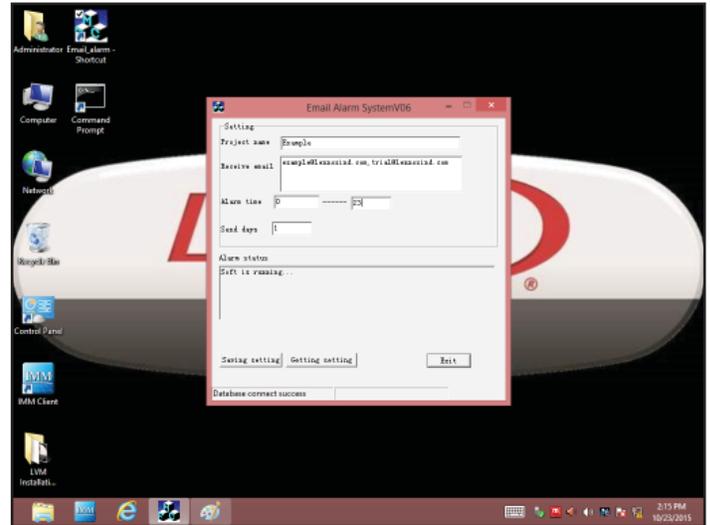


Figure 64. Email Alarm Screen

System History Screen

Use the System History screen to view and export system commands. See figure 65.

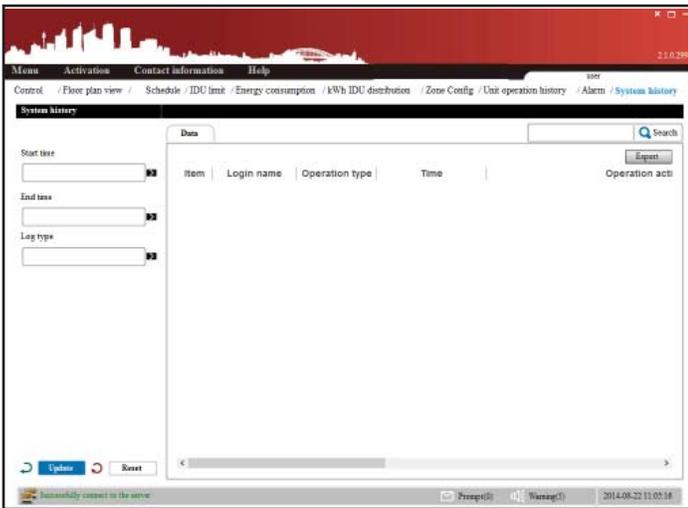


Figure 65. System History Screen

View System History

1. Tap the Start time field. A calendar displays. See figure 66.
2. Tap to select the start date of the system history report.
3. Tap the Hour field drop-down arrow to select a start time for the report. Note: 0 hours = 12 AM (midnight).
4. Tap the OK button

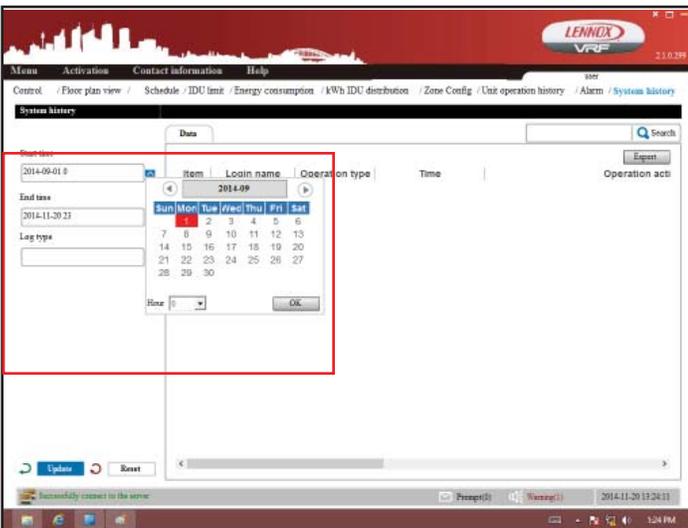


Figure 66. Select Start Date

5. Tap the End time field. A calendar displays. See figure 67.
6. Tap to select the end date of the the operation history report.
7. Tap the Hour field drop-down arrow to select an end time for the report. Note: 23 hours = 11 PM.
8. Tap the OK button.

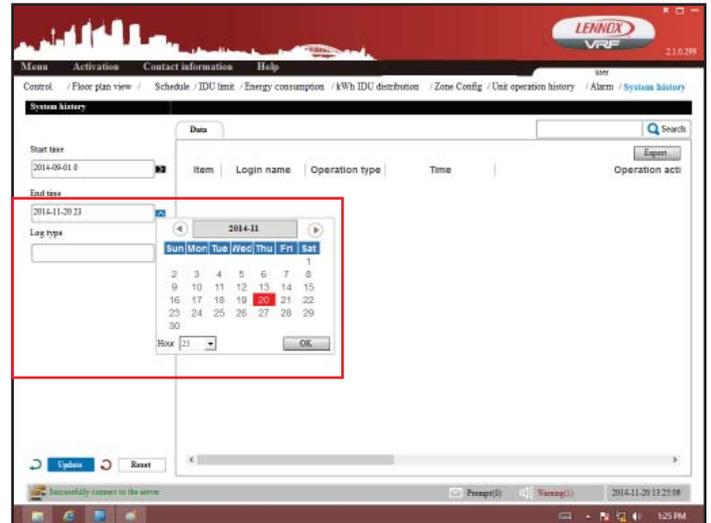


Figure 67. Select End Date

9. Tap the Log type field. A menu displays. See figure 68.
10. Tap the log type you want to include in the report.

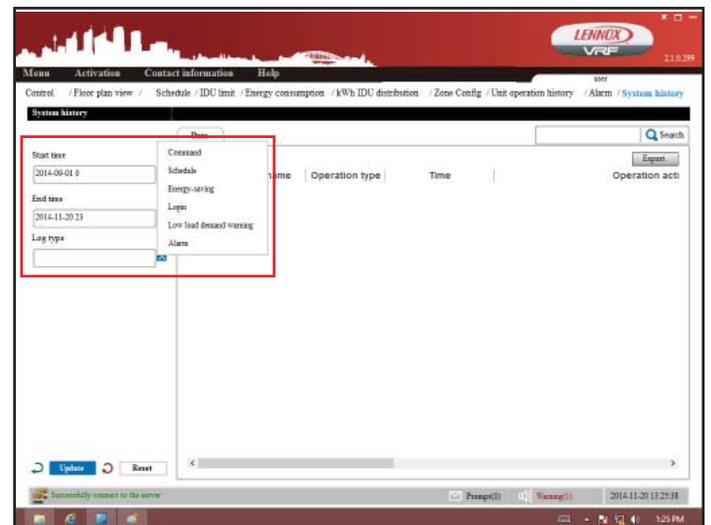


Figure 68. Select Log Type

11. Tap the Update button. This could take several minutes.
12. Report generation could take several minutes. A status bar will display. See figure 69.

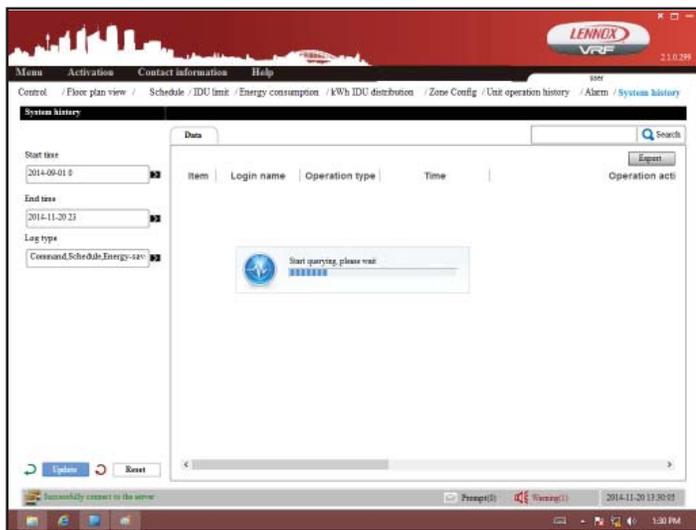


Figure 69. Report Generation Progress Bar

13. The operation report displays. See figure 70.

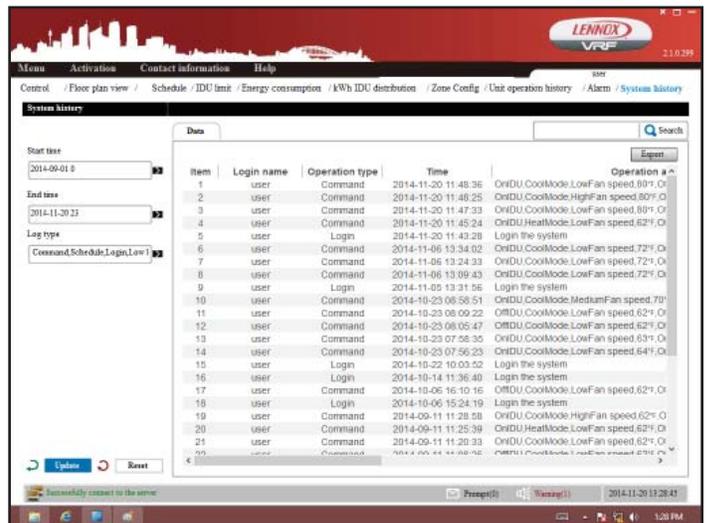


Figure 70. Report Shown

14. **Search.** Enter a search term in the Search field to search the report. Tap the Search field and then tap the Keyboard icon in the system tray (bottom of screen) to display the keyboard.
15. **Export.** Tap the Export button to export the report to a .csv or Excel file.

Appendix A

LVM Maximum System Connections

- Maximum 1 M-Interface device per Touchscreen
- Four XYE/K1K2E connections per M-Interface device
- Maximum 4 Systems per XYE / K1K2E connection
- Maximum 16 Systems (4 systems per connection x 4 connections on each M-Interface = 16 systems)
- Maximum 48 Outdoor Units (Max 3 ODU / system... 3 ODU x 16 systems = 48 ODUs)
- Maximum 1024 Indoor Units (Max 64 IDU / system... 64 IDU x 16 systems = 1024 IDUs)

