



LATS HVAC User's Manual

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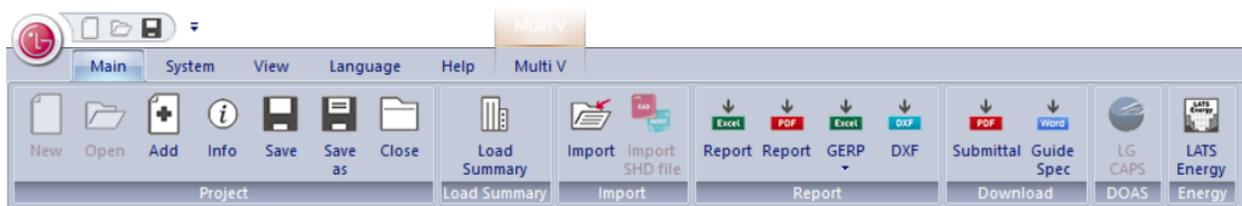
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Program Requirements

- Windows 7/8/10 32/64bit
- MS office 2007 SP3-2019 (Excel, Access mandatory)
- **Serial number:** latshvac
- All projects must be saved on physical drives (LATS-HVAC is not compatible with shared drives)

Introducing LATS-HVAC

Main Tab



- **New:** Create new project.
- **Open:** Open existing project file.
- **Add:** Add systems from another project.
- **Info:** Check project file information.
- **Save:** Save project file.
- **Save as:** Save duplicate of project file.
- **Close:** Close project file.
- **Load Summary:** Import Excel file with room information or manually input information. (See page 19-20 for more information.)
- **Import:** Import old project files from programs such as LATS Multi V, LATS Multi F and LATS ERV.
- **SHD File Import:** Import project files (.shd) from LATS CAD and LATS Revit.
- **Report:** Create report in Excel or PDF format.
- **GERP:** Automatically compile and create equipment list in Excel or DXF file. Equipment schedules are also under this tab.
- **DXF:** Create Tree/Schematic diagram in DXF file format.
- **Submittal:** Download submittal for the models selected in the project file.
- **Guide Spec:** Download guide specs for the models selected in the project file.
- **LG CAPS:** Open LG CAPS software. (LG CAPS must be installed on your computer)
- **LATS Energy:** Open LATS Energy link. (Must log in to EP in order to use it)

System Tab



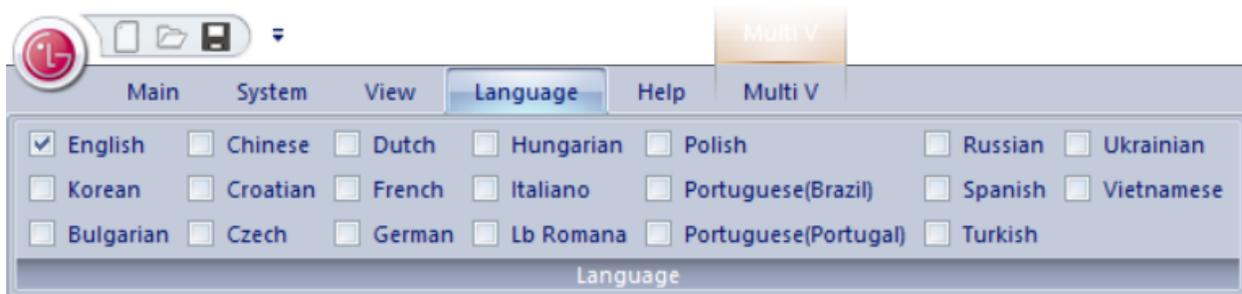
- **New:** Create new system within the same project file.
- **Copy:** Create a duplicate of the system in a new project tab.
- **Delete:** Delete selected system tab.
- **Rename:** Rename system tab.
- **System Setting:** Change or review system setting.
- **System Check All:** Run system check for all systems.

View Tab



- **System Tree:** Show or hide System Tree window.
- **Log Viewer:** Show or hide Log Viewer window.
- **Properties:** Show or hide Properties window.
- **Overview:** Show or hide Overview window.
- **System Detail Information:** Show or hide System Detail Information window.

Language Tab



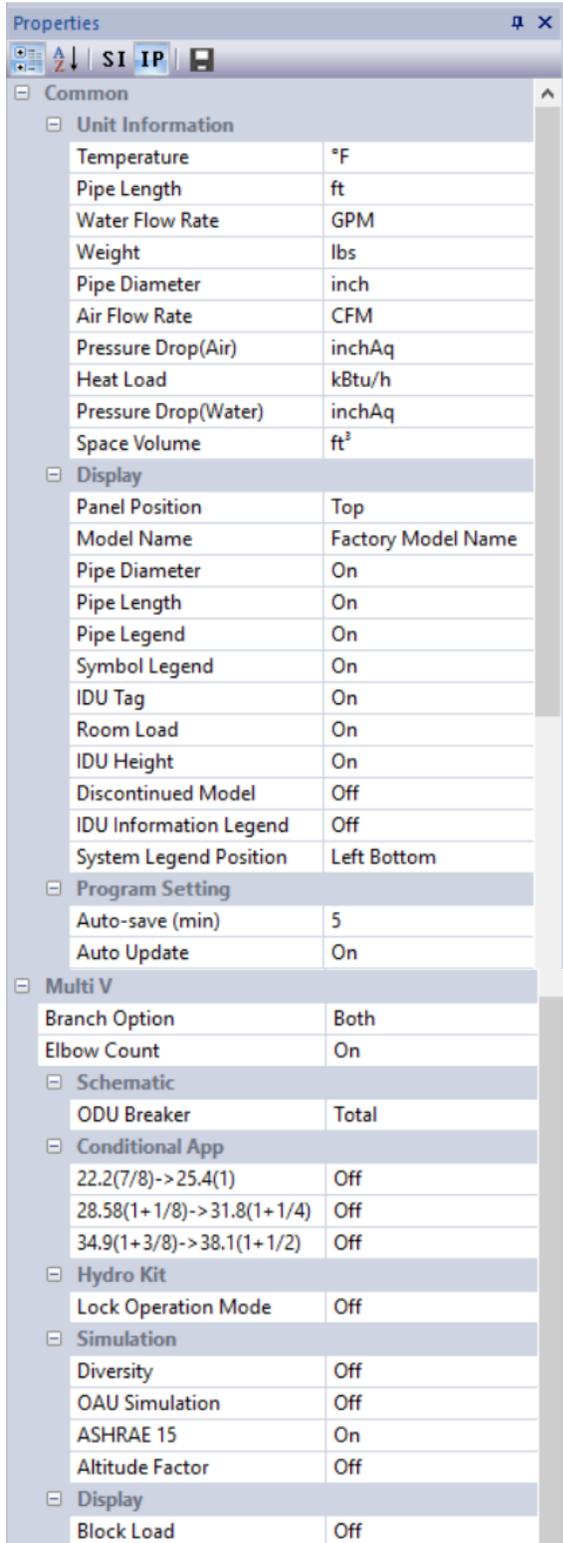
Change language from the Language tab. Simply click on one of the boxes and it will automatically change the language for you.

Help Tab



- **About LATS:** View installed LATS HVAC version.
- **LATS Help:** Link to the User's Manual.
- **View Update Info:** Opens LATS HVAC update log.
- **Project File Info:** Displays LATS HVAC program version of the project.

Properties Window



- **Unit Information:** To change all units at once, click on the SI or IP button located on the top of the Properties window.

You may also manually change each unit from the drop-down menu that shows when you click on it.

- **Panel Position:** Change the panel (where IDU and pipe accessories are dragged) position to Top or Right side of the tree diagram.

- **Model name:** Always set it to 'Buyer Model Name'.

- **Pipe Legend/Pipe Diameter/Pipe Length:** Turn **on** to show pipe legend/pipe diameter/pipe length on tree diagram.

If you turn it **off**, your tree diagram for reports would not show those.

- **Symbol Legend:** Turn **on** to show legend for Thermostat, Group Control and Dry Contact icons.

- **IDU Tag/Room Load/IDU Height:** Turn **on** to show indoor unit tags, room loads and indoor unit height difference from outdoor unit on tree diagram.

- **Discontinued Model:** Turn **on** to show and select discontinued models.

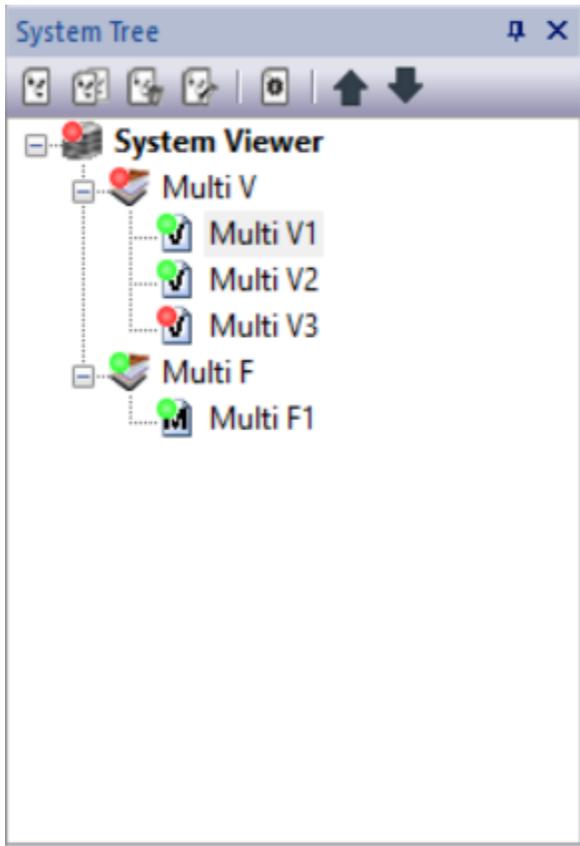
- **IDU Information Legend:** Turn **on** to show the legend with indoor unit information on tree diagram.

- **System Legend Position:** Change the position of legend with system information to bottom left or top right.

- **Auto-save/Auto Update:** Turn **on** auto-save to save projects automatically and auto update to run program updates automatically.
- **Branch Option:** Set the system to show or hide certain pipe accessories.
- **Elbow Count:** Turn **on** to show elbow counts on tree diagram
- **Schematic (ODU Breaker):** Always set it to 'Each' for North America region.
- **Conditional App:** Turn **off** to keep US standard pipe sizes under conditional application (conditional application upsizes pipe diameters)
- **Hydro Kit Operation mode lock:** Allows the system to pass system check for hydro kits that exceed combination ratio over 100%.
- **Diversity:** If turned **on**, IDU capacity is only corrected by design temperatures and not dependent on corrected ODU capacity. On is recommended in **cooling load dominant** regions.
If turned **off**, ODU capacity is corrected by design temperatures, combination ratio, and piping. It will be proportionally divided out to the IDUs as well. Off is recommended in **heating load dominant** regions.
- **OAU Simulation:** Turning **on** will include OAUs in simulation. Turning it **off** will exclude OAUs from simulation.
- **ASHRAE 15:** Turn **on** to calculate minimum room volume based on 26.0 lbs / 1000 ft³.
- **Altitude Factor:** Turn **on** to make sure Altitude Factor is applied for the project.
- **Block Load:** Turn **on** to use Block Load for tree diagram.

Note that you have to click on **Save** button located on the top of the Properties window to save any changes you make.

System Tree Window



From System Tree Window, you can see the overview of your entire project and systems. You can switch to different system by double clicking on it. And by using the icons located on the top of the window, you may also create new system, duplicate selected system, delete selected system, rename selected system, and view selected system settings.

-  Create new system
-  Create duplicate of selected system
-  Delete selected system
-  Rename selected system
-  View selected system settings
-  Change order of system

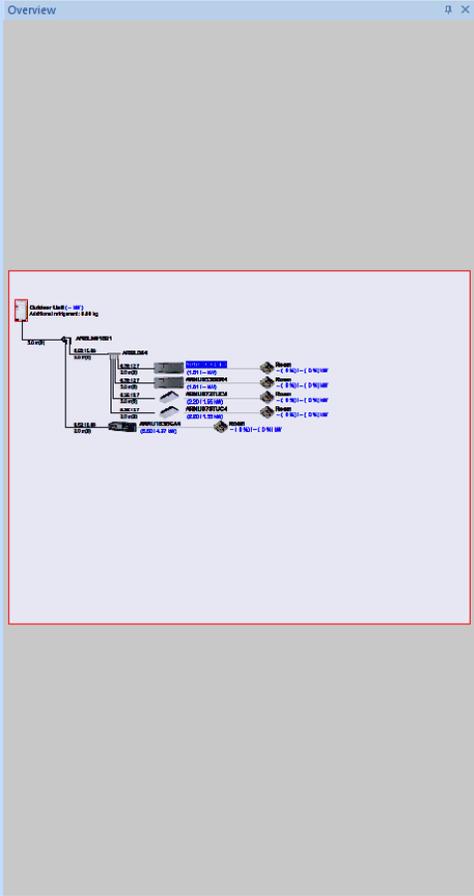
If your system fails to pass System Check, it will show red light on the project icon. If it passed, the light color would be green.

Log Viewer Window

Log Viewer Window logs the actions made in the project and shows the messages.



Overview Window



Overview window will show you the full view of the project. You can see the entire system.

System Detail Check Box Window

System Detail Information		
System Detail Information		
Current Pipe Information		
Total pipe length	49.2 / 3280.8 ft	
Longest Pipe Length		
Real Length	29.5 / 492.1 ft	
Equivalent Length	39.4 / 574.1 ft	
Longest pipe length after 1st branch	19.7 / 131.2 ft	
Correction Factor		
Rated capacity of Outdoor Unit	168.0 kBtu/h	189.0 kBtu/h
Temperature & Combination Ratio	0.76	0.91
Pipe Length	0.99	1.00
Defrosting Factor	-	1.00
Altitude Factor	0.99	0.99
Total Correction Factor	0.75	0.90
Corrected Capacity of Outdoor unit	126.0 kBtu/h	170.2 kBtu/h
Amount of Refrigerant		
Additional Refrigerant	11.80 lbs	
Total refrigerant	38.30 lbs	
Design Conditions(°F/°F(%))		
Indoor DBT/WBT(RH)	75.0/59.7(40.8)	70.0/60.5(58.2)
Outdoor DBT/WBT(RH)	95.2/78.9(49.5)	1.0/0.5(86.0)

This System Detail Information window will show and simultaneously update detail information about a system including pipe information, correction factors, refrigerant amount and design conditions.

Project Window

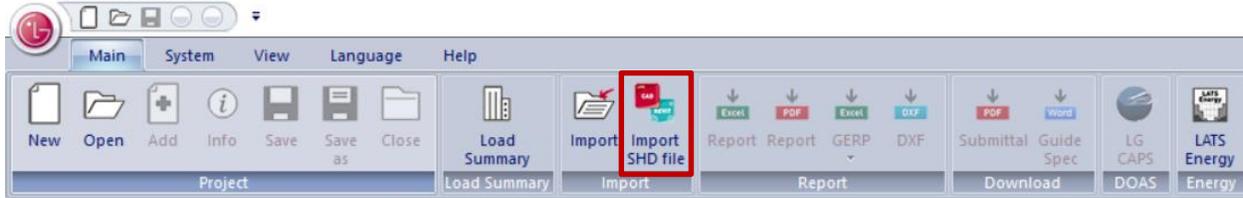
The screenshot displays the Project Window software interface. At the top, there is a menu bar with tabs for Multi V1, Multi V2, Multi V3, Multi F1, and Multi V4 (active). Below the menu bar is a toolbar containing various HVAC components like coils, fans, and pipes. The main workspace shows a schematic for 'Multi V4' with an 'Outdoor Unit (-kBlu/h)(-kBlu/h)' and 'Additional Refrigerant: 0.00 lbs'. A pipe labeled '9.8 ft(0)' connects the outdoor unit to a 'Y-Branch' which splits into two 'Stand-by' boxes. At the bottom, there are control options: Thermostat (selected), Group Control, and Dry Contact. A data table is also present.

Indoor Units	: 0 of 13
Combination Ratio	: 0.0 of 40.0 (0%)
Total Pipe	: 9.8 of 3280.8 ft
ODU Factory charge	: 0.00 lbs
Additional Refrigerant	: 0.00 lbs
Total refrigerant	: 0.00 lbs
Minimum room volume (Based on 26.0 lbs / 1000.0 ft³)	: 0.00 ft³
Evaporate Temp.	: Standard(43°F)

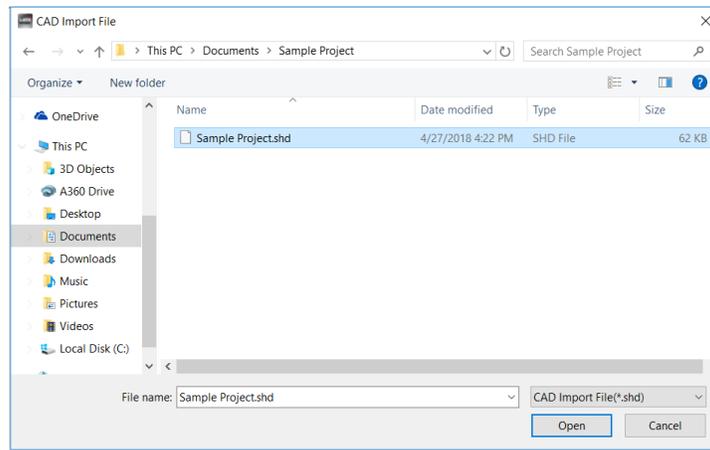
This is the actual project window that shows up when you create a new project. You can either drag and drop desired model or pipe accessories from the top menu into the Stand-by box or double click on it to select what to insert. You may also right click on it to see different actions such as deleting or inserting more.

Import LATS CAD project

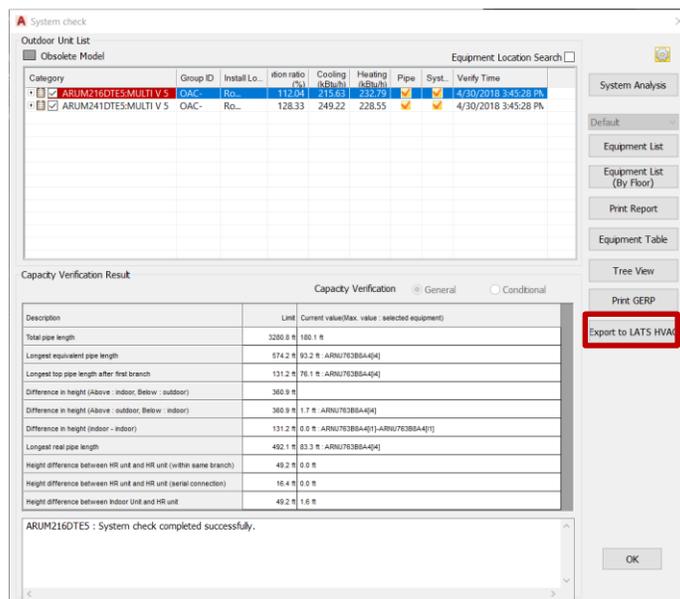
1. Click 'Import CAD' from Main tab.



2. Find LATS CAD or LATS Revit project (.shd)



Note: LATS CAD and LATS Revit projects can be exported as .shd file format from program 'System Check' window.

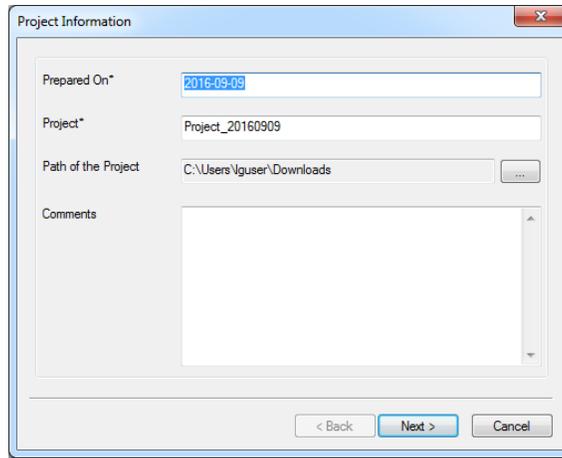


Creating a project

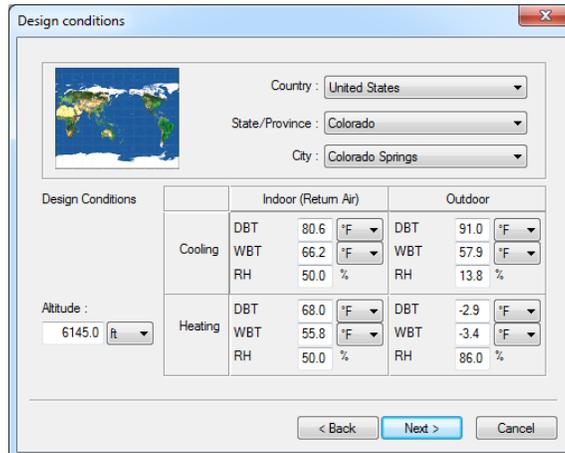
1. Click 'New' from Main tab.



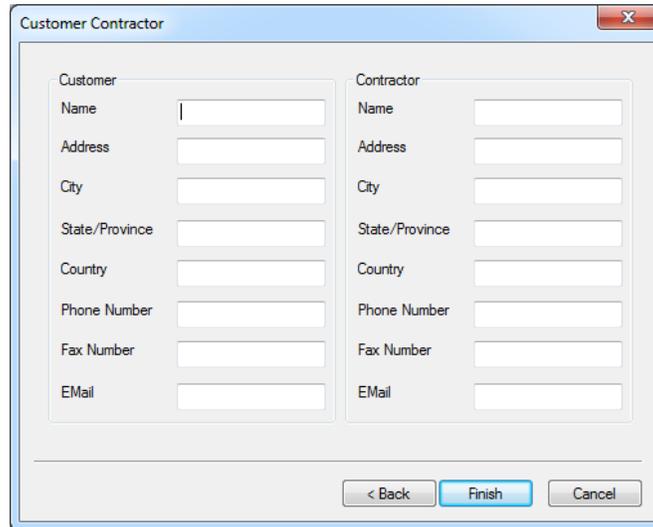
2. Input date, project name, folder to save on, and any descriptions for the project.



3. Choose country, state, and city for correct design condition. You may also change indoor and outdoor cooling/heating temperatures accordingly. Altitude will be automatically changed per state/city selection but you may adjust accordingly as well.

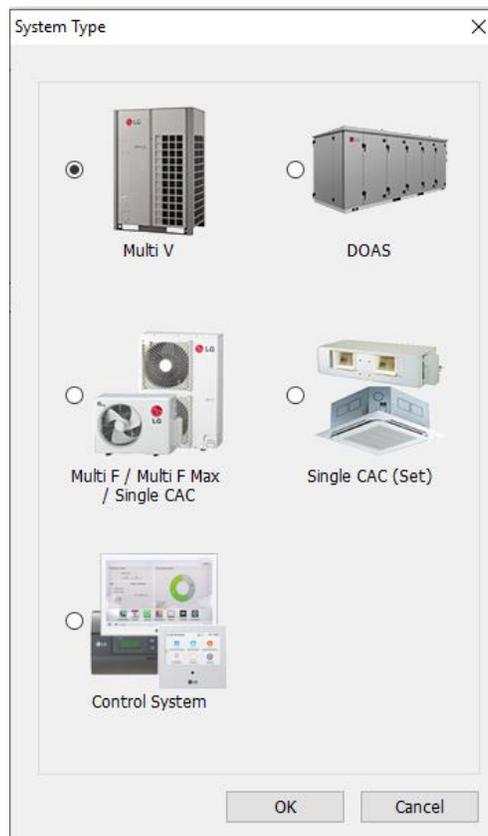


4. Input any customer/contractor information for the project. Information put here will be printed in report.



The 'Customer Contractor' dialog box is a standard Windows-style window with a title bar and a close button. It is divided into two columns: 'Customer' and 'Contractor'. Each column contains a vertical stack of text labels followed by a text input field. The labels are: Name, Address, City, State/Province, Country, Phone Number, Fax Number, and EMail. At the bottom of the dialog, there are three buttons: '< Back', 'Finish', and 'Cancel'.

5. Select system type that the project will be built on. There are five options: Multi V, DOAS, Multi F / F Max / Single CAC, Single CAC (Set) and Control System.



The 'System Type' dialog box is a standard Windows-style window with a title bar and a close button. It contains five radio button options arranged in a grid. Each option consists of a radio button, an image of the system type, and a text label below it. The options are: 'Multi V' (with an image of a vertical HVAC unit), 'DOAS' (with an image of a large metal cabinet), 'Multi F / Multi F Max / Single CAC' (with an image of two outdoor HVAC units), 'Single CAC (Set)' (with an image of a ceiling-mounted unit), and 'Control System' (with an image of a control panel). At the bottom of the dialog, there are two buttons: 'OK' and 'Cancel'.

6. Finally, set the system and ODU type. After creating new project, project window will look different according to your selection of system type.
 - a. If you have selected **Multi V** as system type, please go to **Multi V** section of the manual.

		Indoor (Return Air)			Outdoor		
Cooling	DBT	80.6	°F		DBT	91.0	°F
	WBT	66.2	°F		WBT	57.9	°F
	RH	50.0	%		RH	13.8	%
Heating	DBT	68.0	°F		DBT	-2.9	°F
	WBT	55.8	°F		WBT	-3.4	°F
	RH	50.0	%		RH	86.0	%

- b. If you have selected **DOAS** as system type, please go to **DOAS** section of the manual.

		Indoor (Return Air)			Outdoor		
Cooling	DBT	75.0	°F		DBT	91.0	°F
	WBT	58.6	°F		WBT	57.9	°F
	RH	40.8	%		RH	13.8	%
Heating	DBT	70.0	°F		DBT	-2.9	°F
	WBT	59.8	°F		WBT	-3.4	°F
	RH	58.2	%		RH	86.0	%

- c. If you have selected **Multi F / F Max / Single CAC** as system type, please go to **Multi F / F Max / Single CAC** section of the manual.

		Indoor (Return Air)		Outdoor	
Cooling	DBT	80.6	°F	DBT	91.0
	WBT	66.2	°F	WBT	57.9
	RH	50.0	%	RH	13.8
Heating	DBT	68.0	°F	DBT	-2.9
	WBT	55.8	°F	WBT	-3.4
	RH	50.0	%	RH	86.0

- d. If you have selected **Single CAC (Set)** as system type, please go to **Single CAC (Set)** section of the manual.

Design Conditions

Room information: Floor/Room Name: []

Room Design Condition: Cooling DBT: 27.0 °C, Heating DBT: 20.0 °C, WBT: 19.5 °C, RH: 50.0 %, Heating WBT: 13.8 °C, RH: 50.0 %

Requirement info: Total cooling load: 0.0 kW, Sensible cooling: 0.0 kW, Heating load: 0.0 kW, Airflow Rate: 0.0 CMM, ESP: 0.0000 kg/cm²

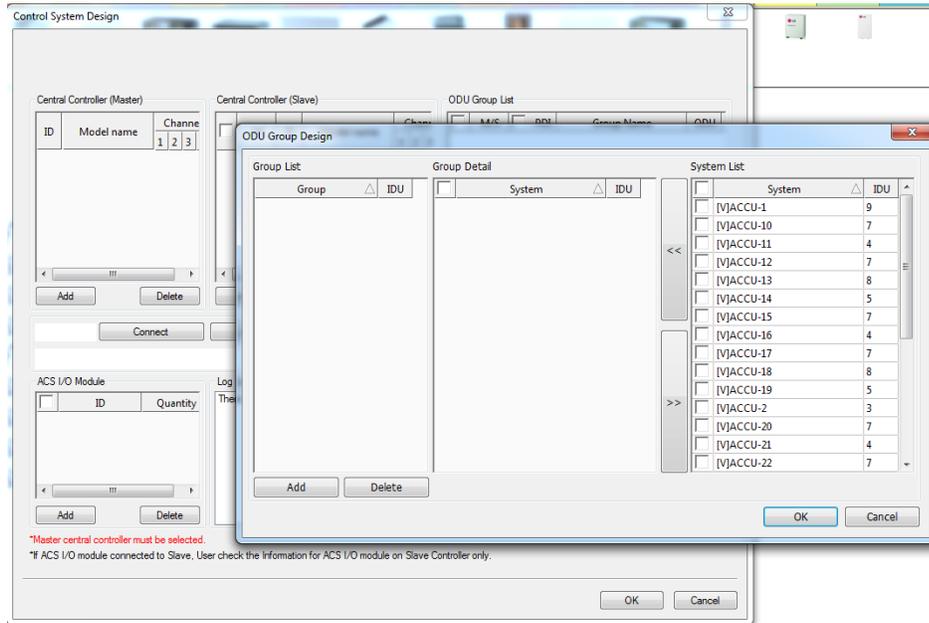
System Information

Region: N America, Product Type: Ceiling Cassette, Hz/Ref/Type: 60Hz / R410A / Heat Pump, Product Name (ODU): LT-C1260CA, Product Name (DDU): []

Simulation results

Product name:	LT-C1260CA	Rated	Corrected
Airflow Rate:	0.0 CMM		
Total Cooling Capa:	3.52	0.00	kW
Sensible Capa:	2.75	0.00	kW
Heating Capa:	0.00	0.00	kW
SPF:		0.00	
Cooling Power:	1.20	0.00	kW
Heating Power:	0.00	0.00	kW
Motor type:			
additional refrigerant charge:	0.00		kg

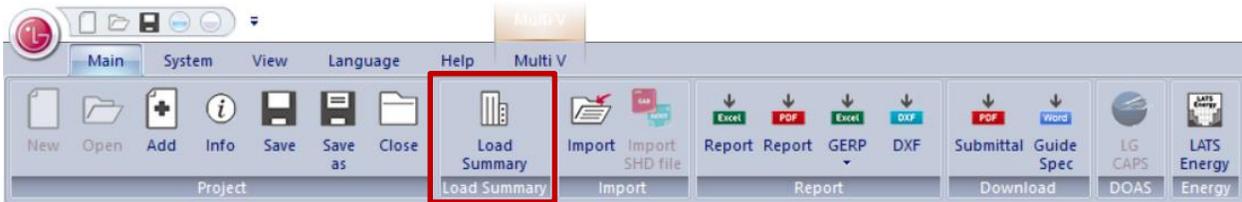
- e. If you have selected **Control system** as system type, please go to **Control system** section of the manual.



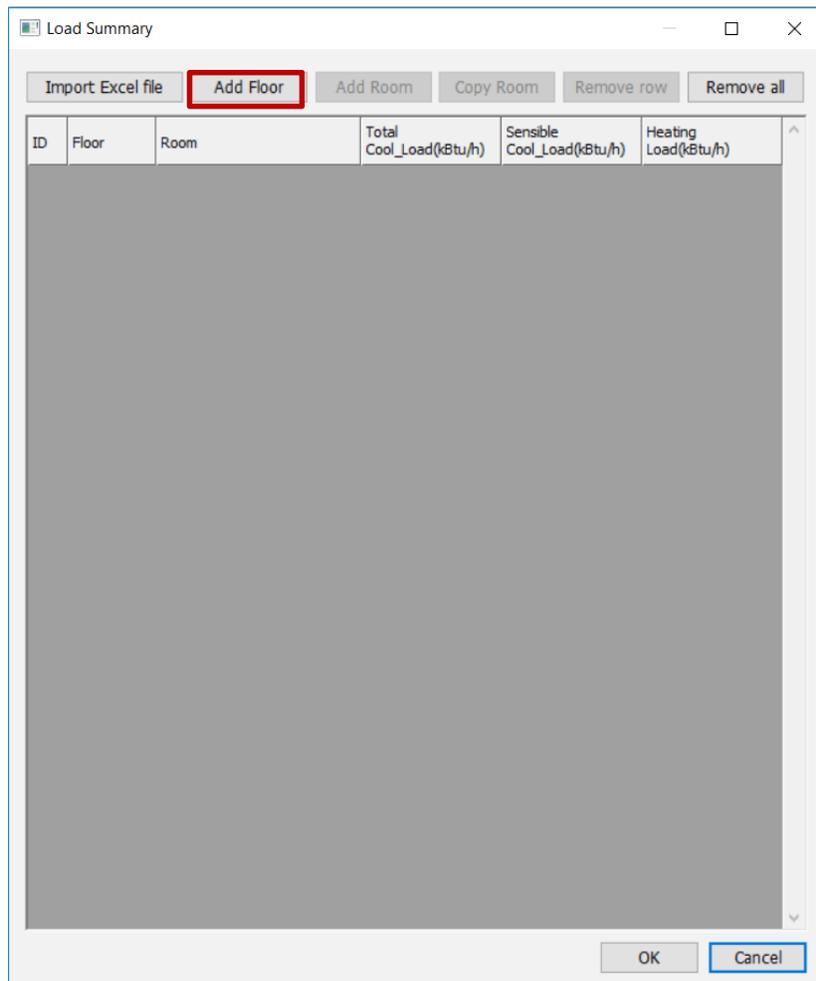
Loading Room Information

There are two ways to insert room information: one is to click on 'Load Summary' button from Main tab and the other is to double click on 'Room' icon that appears next to IDU models when inserted.

1. Click on 'Load Summary' from Main tab.



2. Click 'Add Floor' and start inserting information. 'Add Room' is the button to add rooms in the selected floor area.



- If you wish to import Excel file with room information, click on 'Import Excel' button. Note that Excel file should not have header included and that column A should be floor, column B is room name, column c is total cooling load, column D is sensible cool load, and column E is heating load. Below is an example of Excel file.

	A	B	C	D	E
1	Floor 1	VP Office	11	9	6
2	Floor 1	Supervisor Office	12	9.5	7.5
3	Floor 1	Manager Office	80	60	55

You can also open the same 'Load Summary' window by clicking 'Room' icon next to IDU models as mentioned:

- These 'Room' icons appear when IDU models are inserted to Stand-by boxes. Double click on them to see 'Load Summary' window.

MultiV1



- When information is inserted, select the room where that IDU will be inserted in and hit OK. Selected room will be then connected.

MultiV1

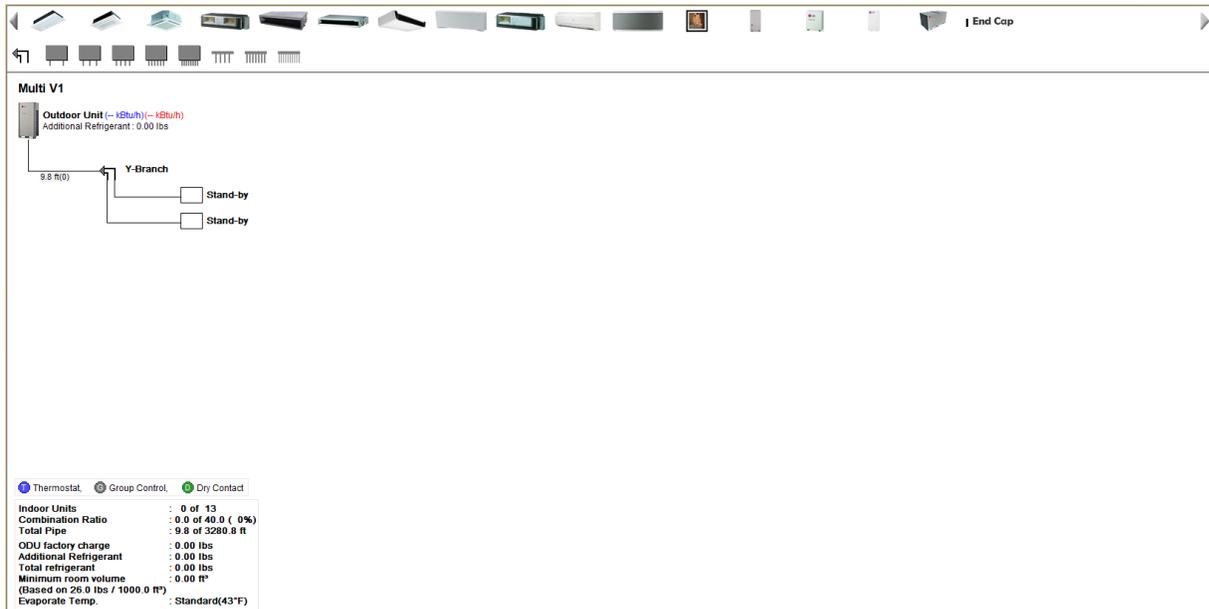


Multi V Project

		Indoor (Return Air)		Outdoor		
Cooling	DBT	80.6	°F	DBT	91.0	°F
	WBT	66.2	°F	WBT	57.9	°F
	RH	50.0	%	RH	13.8	%
Heating	DBT	68.0	°F	DBT	-2.9	°F
	WBT	55.8	°F	WBT	-3.4	°F
	RH	50.0	%	RH	86.0	%

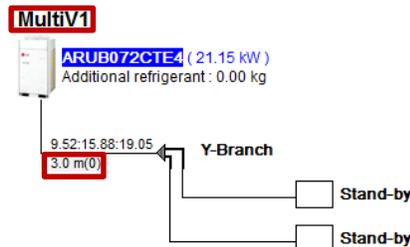
- **Systems:** Name the system.
- **Region:** Select the N.America. Note that each region will have different product database.
- **ODU Series:** Select Multi V series.
- **ODU Types:** Select the type of ODU between Heat Recovery and Heat Pump.
- **Simulation mode:** Select the simulation mode between cooling and heating. Depending on your selection, report view will show capacities values either on heating or cooling mode. You could also choose 'both' to show both heating and cooling capacities.

Note that you can change cooling and heating temperature but RH must be set as 50%.

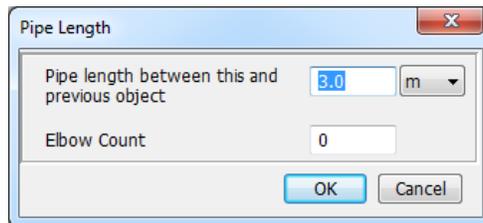


Project window for Multi V system

Multi V System Setting window can be viewed again by double clicking on the title of the project:



You can also modify the pipe length by double clicking on the recorded length. Pipe Length window will pop up and you can simply change the length and elbow count, which is the number of piping turns.



Also, please refer to the table below for fitting losses and equivalent feet of pipe.

inch	1/4	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2	1-5/8	1-3/4	2-1/8
Long Radius Elbow (ft)	0.5	0.6	0.7	0.8	1.2	1.3	1.5	1.6	1.8	2.0	2.1	2.3	2.5	2.8
Y-Branch (ft)	1.6													
Header (ft)	3.3													
HR Unit (ft)	8.2													

Heat Recovery vs. Heat Pump

When setting ODU types, there are two settings you can choose from: Heat recovery and Heat pump. In Heat recovery system, you can place HR boxes as well as Y-branches whereas from Heat pump system, you cannot place HR boxes.

MultiV1
Outdoor Unit (- kBTu/h)
Additional refrigerant: 0.00 lb

9.8 ft(0)

0.0 ft(0)

Stand-by

Stand-by

PRHR022A

Branch/Header Dialog

Model: PRHR022A
Substitute Model: PRHR021A, PRHR022A, PRHR031A, PRHR032

Tag#

HR Unit

HR unit	PRHR021A, PRHR022A
Low pressure gas pipe	Ø22.2(7/8)
High pressure gas pipe	Ø19.05(3/4)
Liquid pipe	Ø9.52(3/8)

Height difference from ODU
Below 9.8 ft

ODU HP Unit

OK Cancel

Indoor Units : 0 of 15
Combination(Ratio) : 0.0 of 40.0 (0%)
Total Pipe : 9.8 of 3280.8 ft

Heat Recovery

MultiV1
Outdoor Unit (- kBTu/h)
Additional refrigerant: 0.00 lb

9.8 ft(0)

Stand-by

Stand-by

Y-Branch

Branch/Header Dialog

Model: ARBLB01620
Substitute Model: ARBLB01620, ARBLN01621, ARBLB01621, AR

Tag#

Low Pressure Gas Pipe [unit:mm]

Liquid pipe

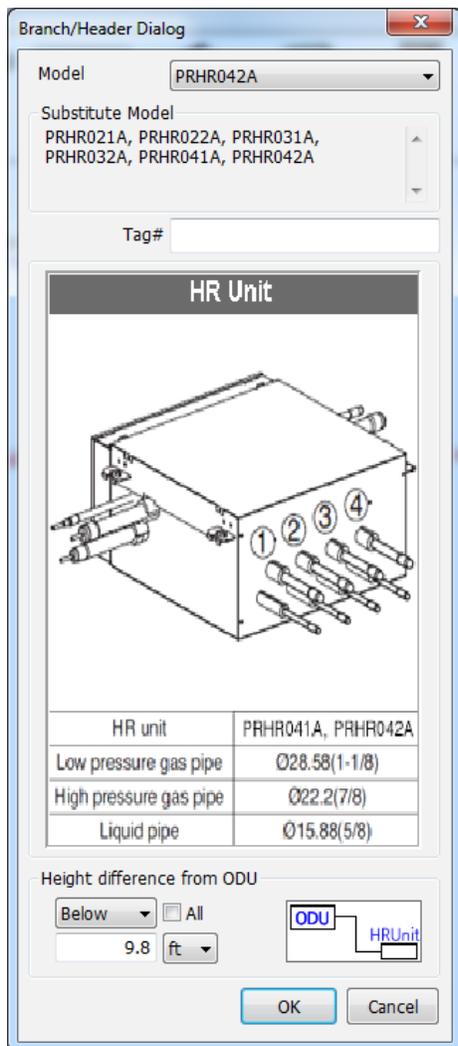
High Pressure Gas Pipe

OK Cancel

Indoor Units : 0 of 15
Combination(Ratio) : 0.0 of 40.0 (0%)
Total Pipe : 9.8 of 3280.8 ft

Heat Pump

When you look at the dialog window for either Y-branch or HR unit, you will notice Tag# space. Here, you can insert ID to distinguish multiple Y-branch/HR units. This will help in actual installation process to easily lay them out without confusion.



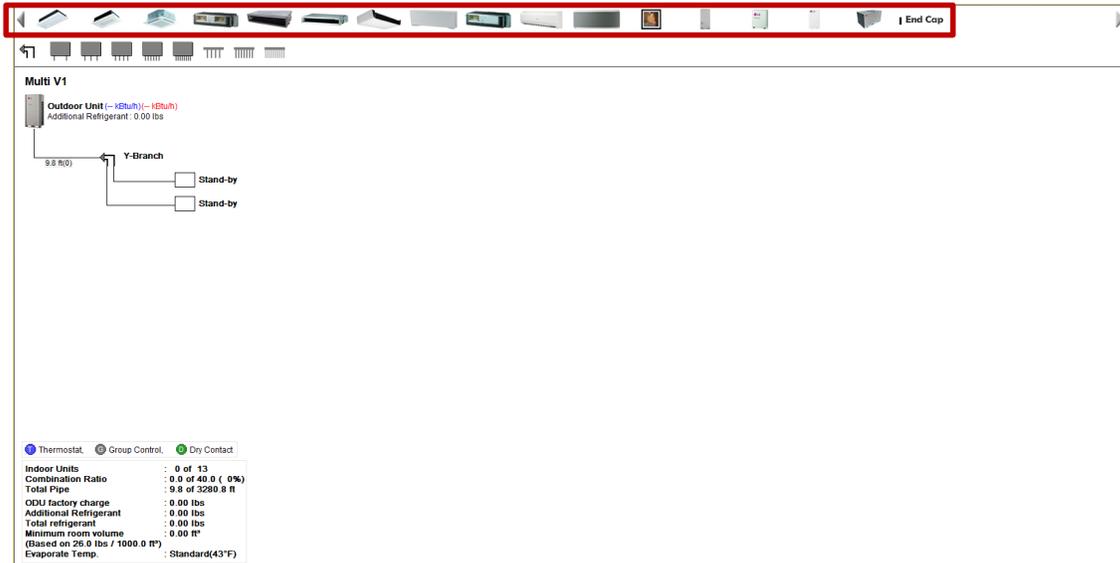
← Especially for HR unit dialog, you can also set elevation of HR unit to ODU. Check the 'All' box to change all HR unit elevation for the system at the same time.

Inserting Indoor Unit

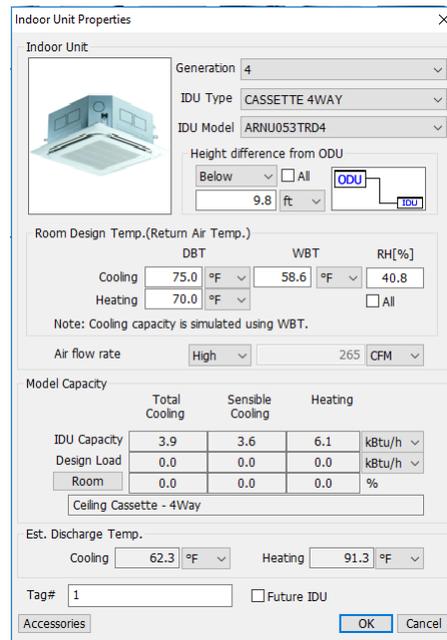
There are two ways to insert IDU: Drag and drop, and double click.

Drag and drop:

1. Select desired IDU from the icon bar located on the top of the window.

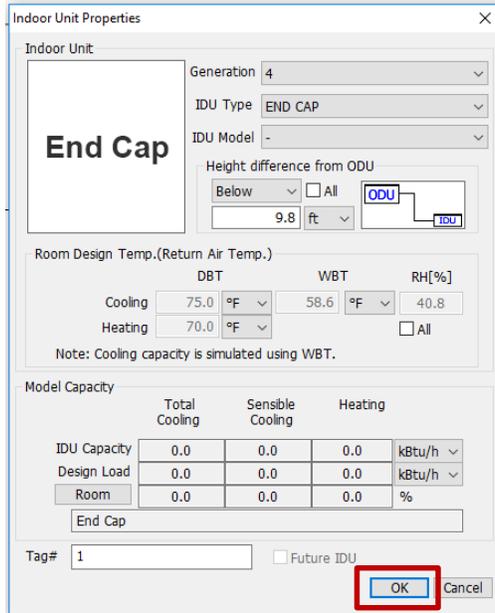


2. Drag and drop the icon to desired Stand-by box.
3. When Indoor Unit Properties window pops up, set IDU options appropriately and click OK.

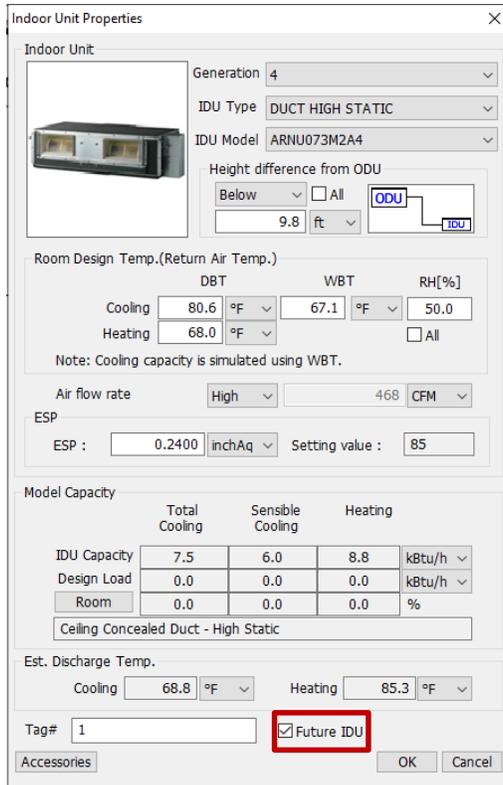


Note that there's also 'All' box under Height difference section and the return air temperatures. By checking this box, you can change all IDU elevation and return air temperatures for the system at once.

4. End caps must be placed on empty ports

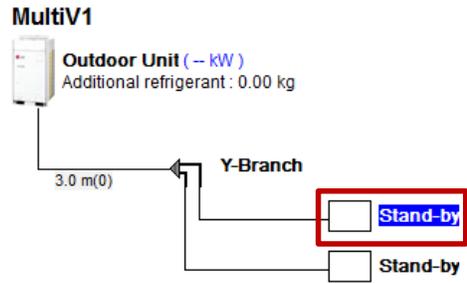


Note: Check the Future IDU box to assign IDU for future use. A system must be at least 50% combination ratio with regular IDUs then future IDUs can be added up to 130%.

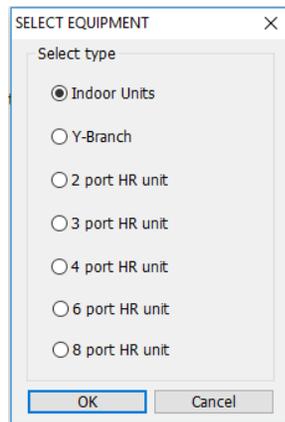


Double click:

1. Double click the Stand-by box. Indoor Unit Properties window will pop up.

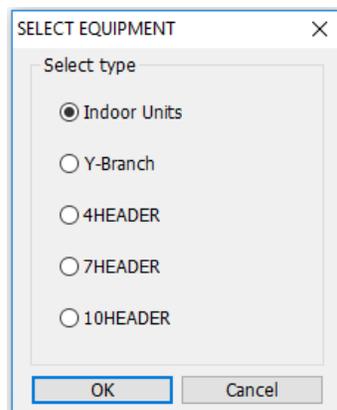


2. From Select Equipment window, choose 'Indoor Units'.

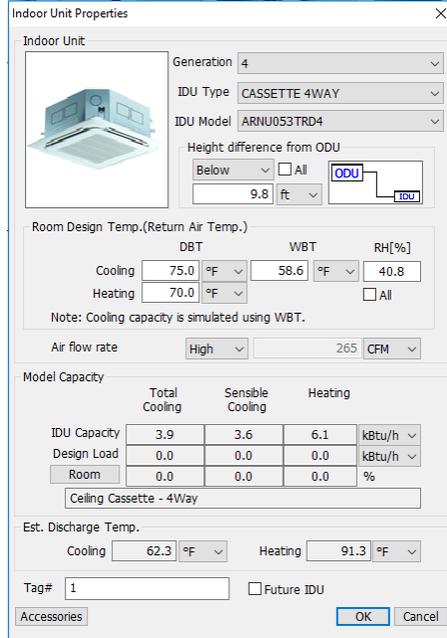


You can also select pipe accessories such as Y-branch or header. This will create further Stand-by boxes that you can insert more on.

Note that there will be different list of options – such as Heat Recovery boxes – if you have Heat Recovery ODU opposed to Heat Pump ODU:

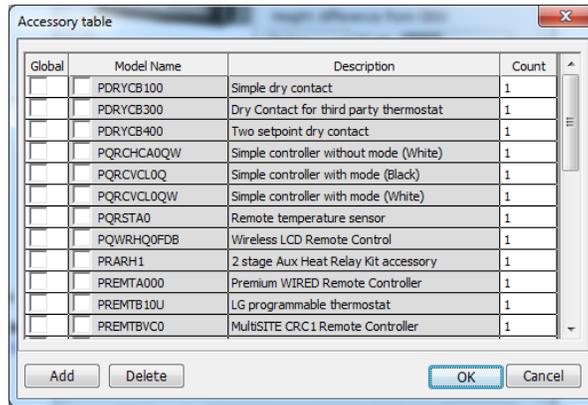


3. When Indoor Unit Properties window pops up, set IDU options appropriately and click OK.

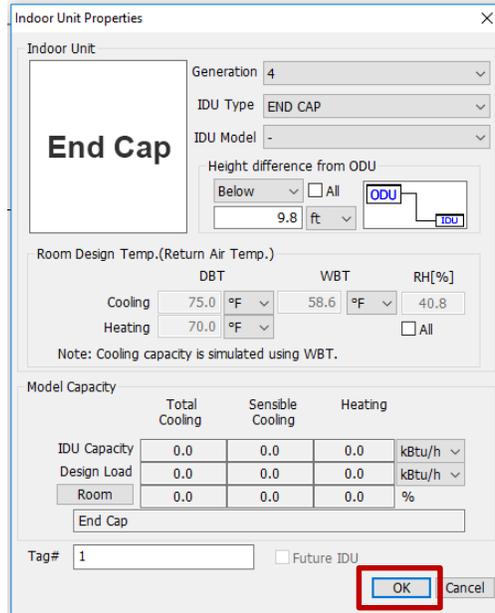


From Indoor Unit Properties window, Room Design Temperature can be modified only if Diversity from Properties Window is set as ON.

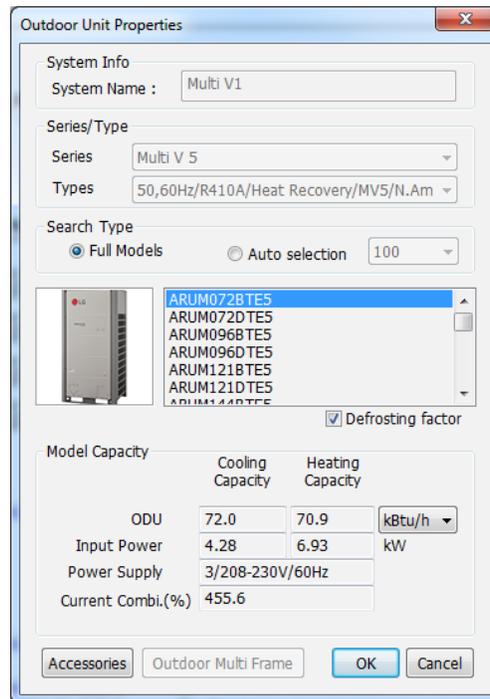
And you can add accessories from Accessories button:



4. End caps must be placed on empty ports



Selecting Outdoor Unit



1. Double click on the ODU icon. Outdoor Unit Properties window will pop up.
2. To manually select, from the listed models, choose one and click OK.
3. To automatically select, change the search type to 'Auto selection' and the program will automatically select based on combination rate.

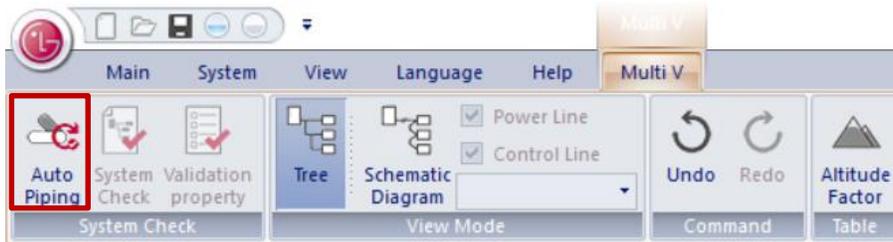
Note that defrosting factor means that for heating to under 0 degree, capacity will be calculated automatically.

And you may also add accessories for ODU from Accessories button.

System Check

After configuration is done, you will need to run System Check to finalize that the system is set correctly.

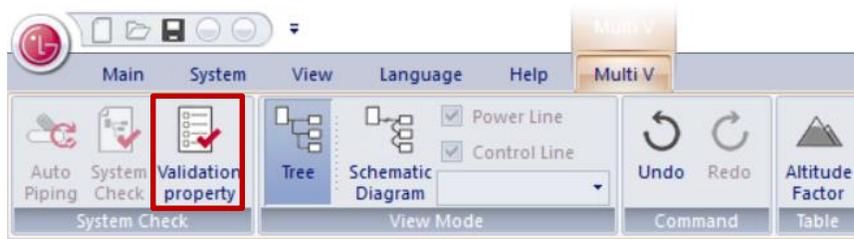
1. Go to Multi V tab and click on 'Auto Piping' button. This function will automatically correct the pipe diameter and Y-branch size.



2. When 'Auto Piping' is completed, 'System Check All' button will be enabled. Click on 'System Check All' button.



3. When 'System Check All' is completed, 'System Properties' button will be enabled. Click on 'System Properties' button.

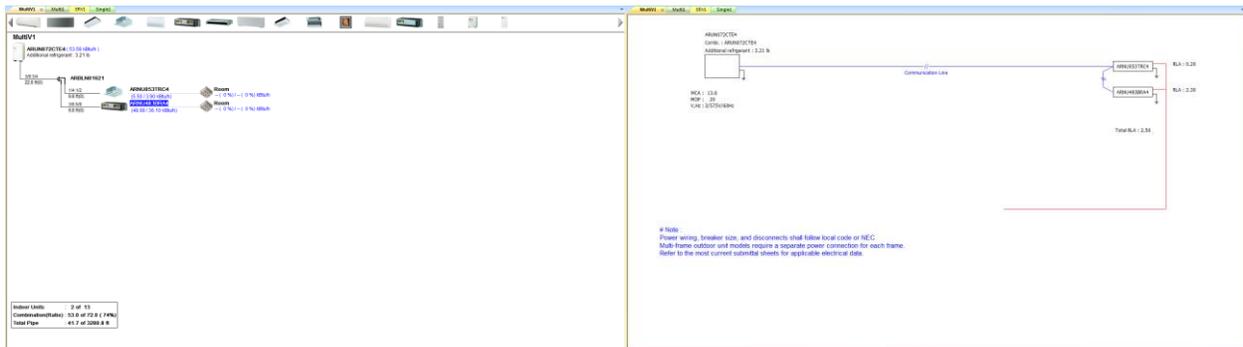
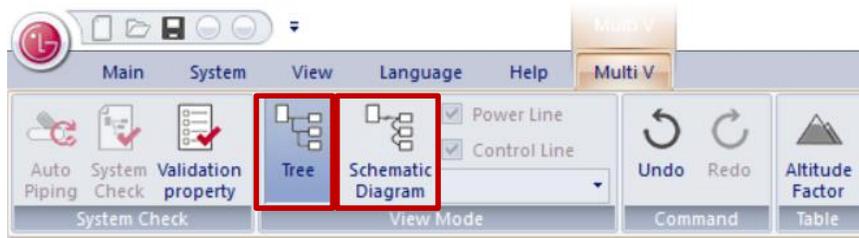


4. System Validation Property window will pop up.

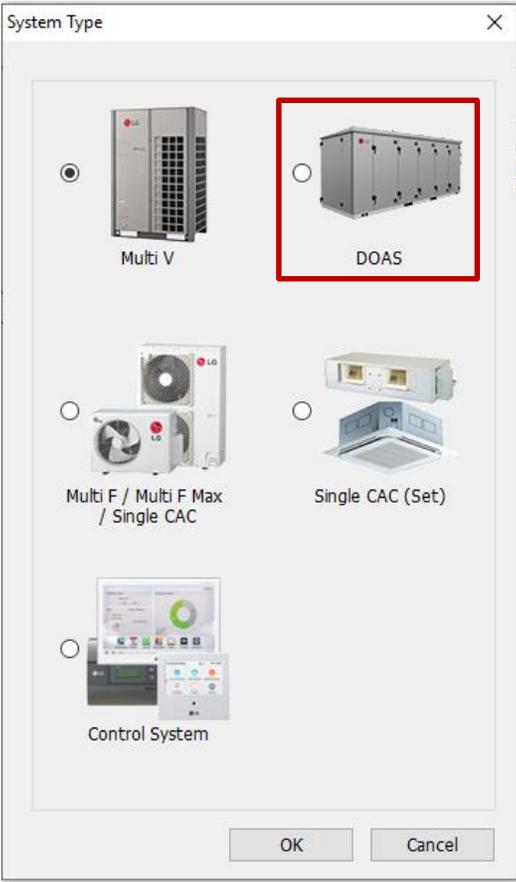
System Validation Check - General Condition		
Outdoor Unit : ARUM072DTE5	Unit : ft	<input checked="" type="radio"/> General Condition <input type="radio"/> Conditional Application
Contents	Limit	Current(Max value : connected unit)
Total pipe length	3280.8 ft	68.9 ft
Longest equivalent pipe length	574.1 ft	39.4 ft : ARNU153M2A-[1]
Longest pipe length after 1st branch	131.2 ft	19.7 ft : ARNU153M2A-[1]
Height difference [Above: IDU, Below: ODU]	360.9 ft	0.0 ft
Height difference [Above: ODU, Below: IDU]	360.9 ft	9.8 ft : ARNU153M2A-[4]
Height difference [IDU to IDU]	131.2 ft	0.0 ft : ARNU153M2A-[1]-ARNU153M2A-[1]
Longest actual pipe length	492.1 ft	29.5 ft : ARNU153M2A-[1]
Height difference [HRU to HRU]	98.4 ft	0.0 ft
Height difference [HRU to HRU connected in series (same branch)]	16.4 ft	0.0 ft
Height difference [HRU to IDU]	49.2 ft	0.0 ft

Note : Except "Longest equivalent pipe length", the other pipe length limitations are actual length.

Note that you can also change the view of Project window from Tree to Schematic. Tree diagram lets you see refrigerant diagram in isometric perspective whereas Schematic diagram will let you see electrical and communication sketch.



DOAS Project



From System Type window, select "DOAS"

MULTI V System Setting

Systems:

Region: N.America

ODU Series: MULTI V 5

ODU Types: 50,60Hz/R410A/Heat Recovery/MULTI V 5/N.America

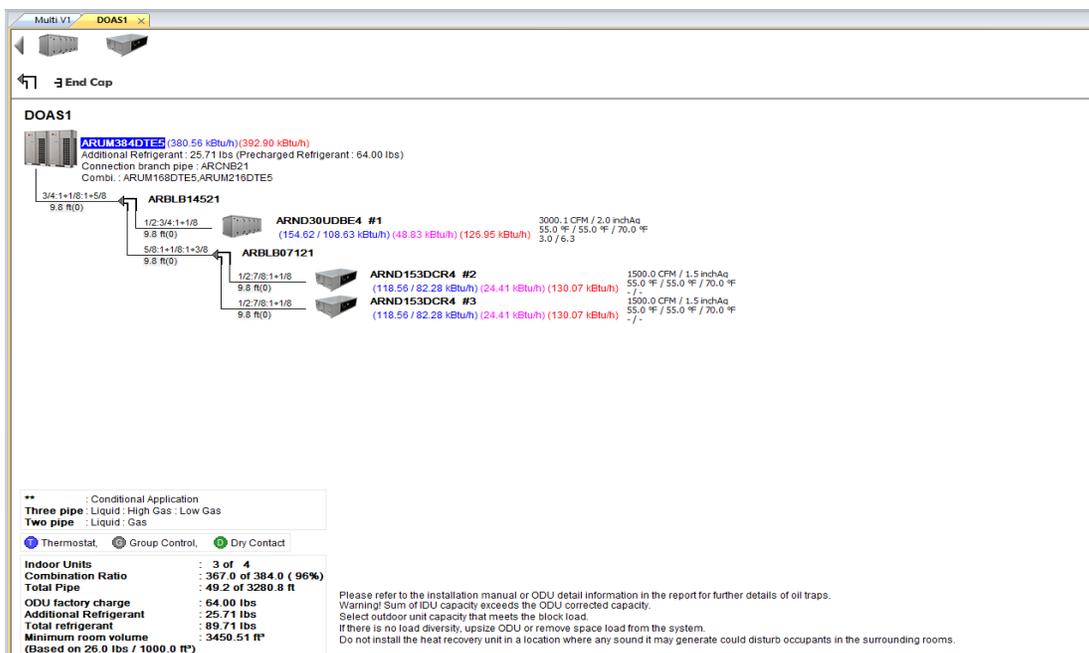
Simulation mode: Both Cooling Heating

Design Conditions	Indoor (Return Air)			Outdoor		
		Value	Unit		Value	Unit
Cooling	DBT	80.6	°F	DBT	91.0	°F
	WBT	67.1	°F	WBT	73.0	°F
	RH	50.0	%	RH	43.0	%
Heating	DBT	68.0	°F	DBT	1.0	°F
	WBT	56.7	°F	WBT	0.5	°F
	RH	50.0	%	RH	86.0	%

OK Cancel

- **Systems:** Name the system.
- **Region:** Default regions will be N.America
- **ODU Series:** Default series will be Multi V 5
- **ODU Types:** Default type will be Heat Recovery

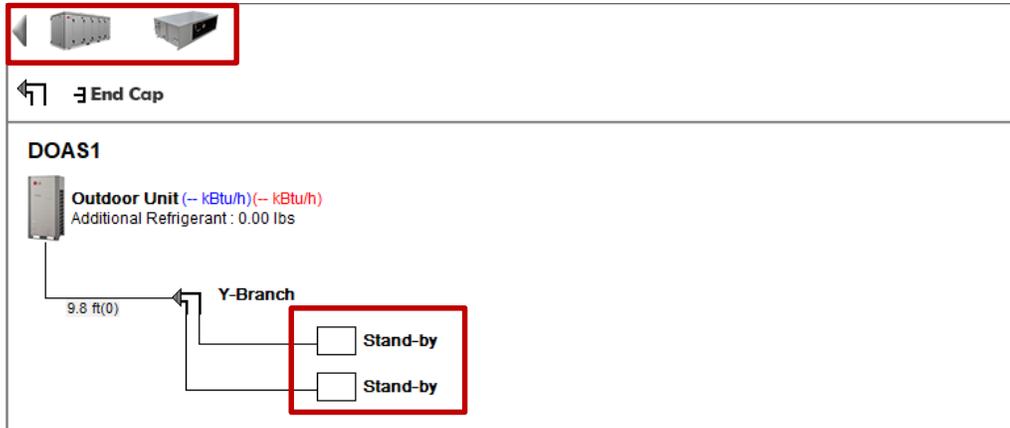
Note that you can change cooling and heating temperature but RH must be set as 50%.



Project window for DOAS system

Selecting DOAS Unit

1. Either drag and drop DOAS units from icon bar or double click on a Stand-by box to open DOAS Indoor Unit Properties window



2. Select models from Split Rooftop DOAS or Split Compact DOAS list. Change air flow rates, external static pressure, discharge position and target temperatures from Design Parameter / Performance tab. Select electrical and controls information from Electrical / Controls tab.

Indoor Unit Properties

Indoor Unit

IDU Type: SPLIT ROOFTOP DOAS
 IDU Model: ARND30UDBE4

Height difference from ODU: 9.8 ft

Room Design Temp.(Return Air Temp.)

	DBT	WBT	RH[%]
Cooling	80.6 °F	67.1 °F	50.0
Heating	68.0 °F	56.7 °F	50.0

Note: Cooling capacity is simulated using WBT.

Design Parameter / Performance Electrical / Controls

Supply Air

Air flow rate: 3000 CFM
 ESP: 2.0000 inchAq
 Discharge Position: Bottom
 Target Cooling DBT / Dew Point: 70.0 °F / 55.0 °F
 Target Heating DBT / Dew Point: 75.0 °F

Return Air

Discharge Position: Bottom
 ESP: 2.0000 inchAq

Entering Air Temp

	DBT	WBT	RH (%)
Cooling	91.0 °F	73.0 °F	43.0
Heating	1.0 °F	0.5 °F	86.0

Exhaust Air

Air flow rate: 3000 CFM
 Discharge Position: Side

Outdoor Air

Discharge Position: End

Leaving Air Temp

	DBT	WBT	RH (%)
Cooling	55.0 °F	55.0 °F	100.0
Reheat	70.0 °F	60.7 °F	59.2
Heating	75.0 °F		

Model Capacity

	Total Cooling	Sensible Cooling	Reheat	Heating	
IDU Capacity	154.6	108.6	48.8	127.0	kBtu/h
ERW Efficiency	66.5	69.4	-	66.5	%
ISMRE / IS COP	3.0	-	-	6.3	

Tag# 1

Fan Curve: Psychometric Chart

OK Cancel

3. Click OK.

Selecting Outdoor Unit

Outdoor Unit Properties

System Info
System Name : DOAS1

Series/Type
Series: MULTI V 5
Types: 50,60Hz/R410A/Heat Recovery/MULTI V 5

Search Type
 Full Models Auto-select 100

 ARUM264BTE5
ARUM288BTE5
ARUM288DTE5
ARUM312DTE5
ARUM312BTE5
ARUM336BTE5
ARUM336DTE5

Defrosting Factor

Model Capacity

	Cooling Capacity	Heating Capacity	
ODU	312.3	319.2	kBtu/h
Input Power	19.68	34.12	kW
Current Combi.	91.7		%
Power Supply	3Phase/460V/60Hz		

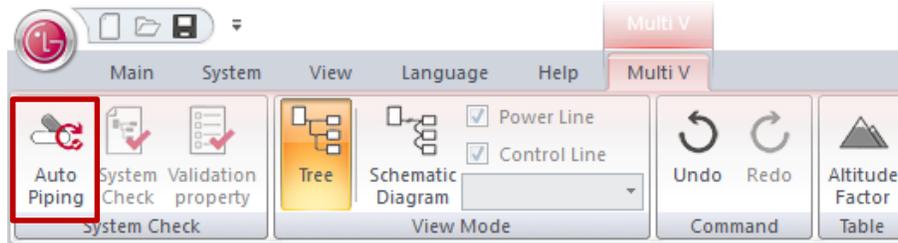
Accessories ODU Frame **OK** Cancel

1. Double click on the ODU icon. Outdoor Unit Properties window will pop up.
2. To manually select, from the listed models, choose one and click OK.
3. To automatically select, change the search type to 'Auto selection' and the program will automatically select based on combination rate.

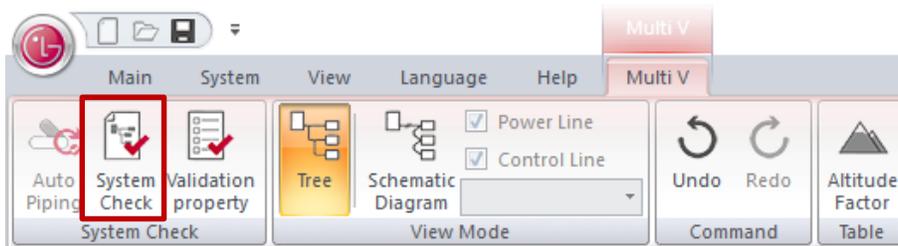
And you may also add accessories for ODU from Accessories button.

System Check

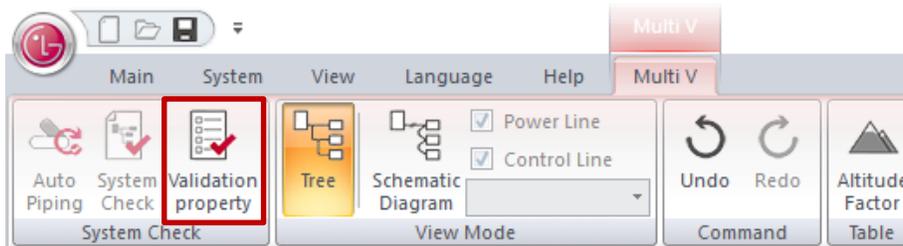
1. Go to Multi V tab and click on 'Auto Piping' button. This function will automatically correct the pipe diameter and Y-branch size.



2. When 'Auto Piping' is completed, 'System Check' button will be enabled. Click on 'System Check' button.



3. When 'System Check All' is completed, 'System Properties' button will be enabled. Click on 'System Properties' button.



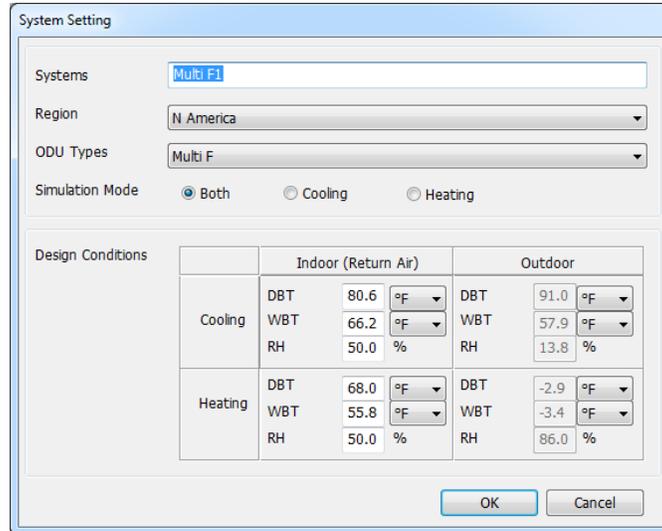
4. System Validation Property window will pop up.

System Validation Check - General Condition		
Outdoor Unit : ARUM241DTES	Unit : ft	<input checked="" type="radio"/> General Condition <input type="radio"/> Conditional Application
Contents	Limit	Current(Max value : connected unit)
Total pipe length	3280.8 ft	29.5 ft
Longest equivalent pipe length	574.1 ft	21.3 ft : ARND203DCR-4[1]
Longest pipe length after 1st branch	131.2 ft	9.8 ft : ARND203DCR-4[1]
Height difference [Above: DOAS, Below: ODU]	360.9 ft	0.0 ft
Height difference [Above: ODU, Below: DOAS]	360.9 ft	9.8 ft : ARND203DCR-4[2]
Height difference [DOAS to DOAS]	131.2 ft	0.0 ft : ARND203DCR-4[1]-ARND203DCR-4[1]
Longest actual pipe length	492.1 ft	19.7 ft : ARND203DCR-4[1]

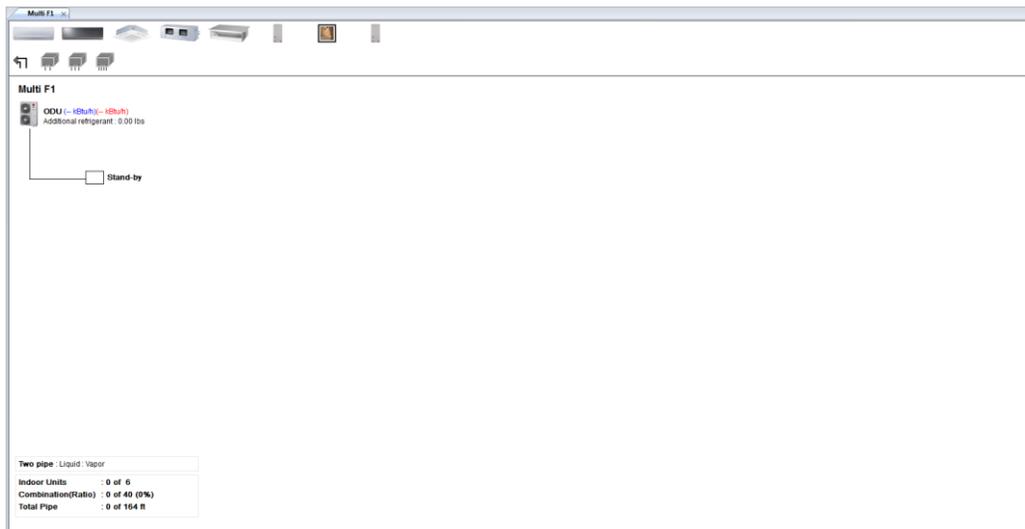
Note : Except "Longest equivalent pipe length", the other pipe length limitations are actual length.

Multi F /Single CAC Project

Note: Single CAC system has Cassette, Ducted, Console and VAHU models



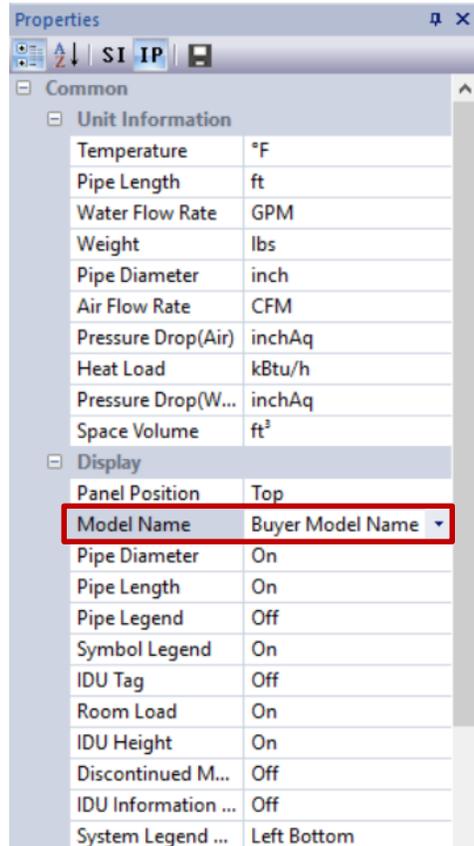
- **Systems:** Name the system.
- **Region:** Select the region where the system will be placed. Note that each region will have different product database.
- **ODU Types:** Select the type of ODU.
- **Simulation mode:** Select the simulation mode between cooling and heating. Depending on your selection, report view will show capacities values either on heating or cooling mode. You could also choose 'both' to show both heating and cooling capacities.
- Note that you can change cooling and heating temperature but RH must be set as 50%.



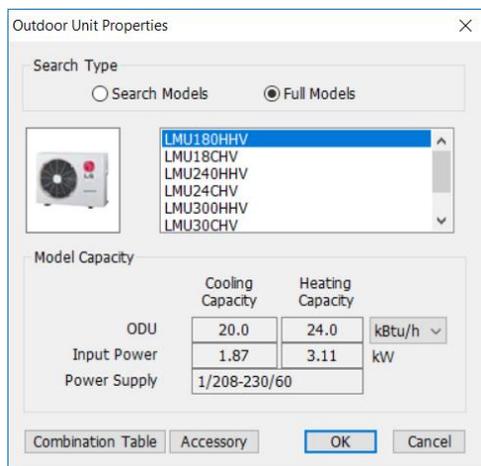
Project window for Multi F / Single CAC system

Selecting Outdoor Unit

For Multi F and Single systems, an outdoor unit has to be selected before inserting indoor unit. Also, before choosing ODU, from the Properties window, you can first choose whether to see the model names as Buyer Model name or Factory Model name. Recommended setting is to set it as 'Buyer Model Name' all times.



Remember to click on Save button for any changes to be updated.
Then to select ODU:

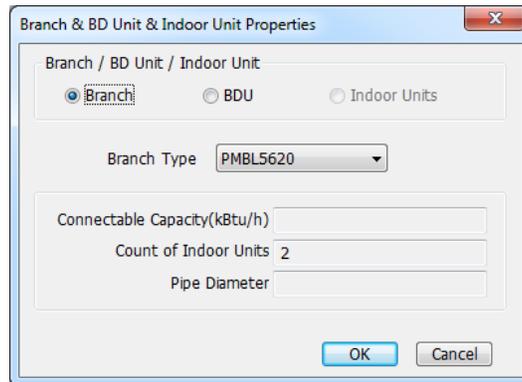


1. Double click on ODU icon. Outdoor Unit Properties window will pop up.
2. Select Search Models to search model by category. To view all lists instead, select Full Models option.
3. From Combination Table button, you can also check the model's automatic calculated combination table.
4. Click OK when done.

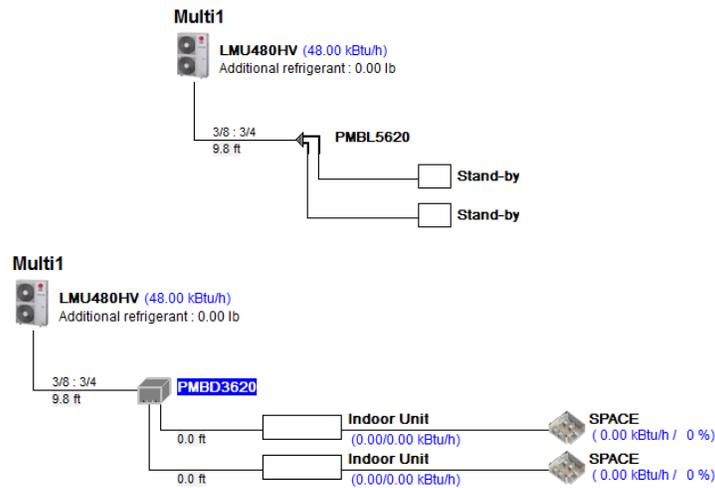
You can also add accessories from Accessories button.

Inserting Branch, BD, Indoor Unit

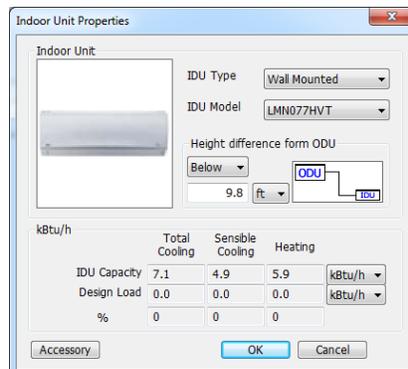
1. Double click the Stand-by box. Branch & BD Unit & Indoor Unit Properties window will pop up.



2. Insert Branch or BDU. Then either of this will show up in Project window.



3. From here, if you have chosen Branch, insert BDU to Stand-by box. If you have inserted BDU first, then either drag and drop IDU from the icon list or double click and choose IDU.



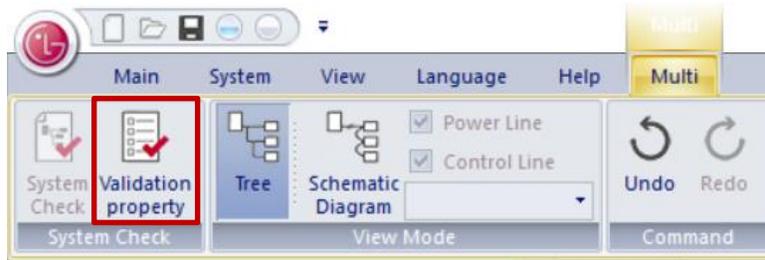
System Check

After configuration is done, you will need to run System Check to finalize that the system is set correctly.

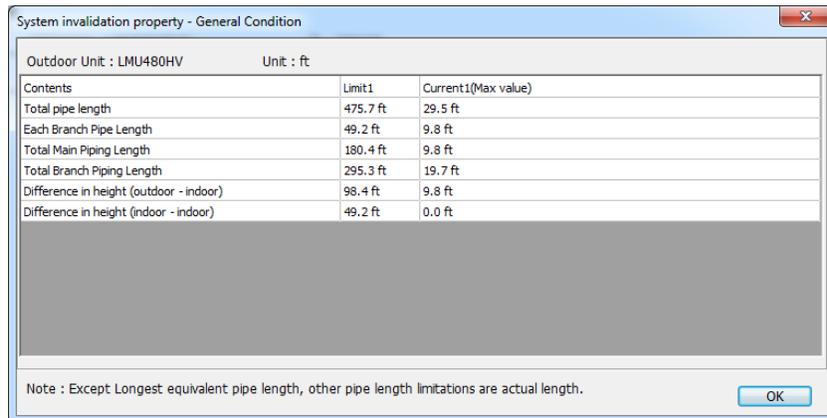
1. Go to Multi tab and click on 'System Check' button.



2. When 'System Check' is completed, 'System Properties' button will be enabled. Click on 'System Properties' button.



3. System Validation Property window will pop up.



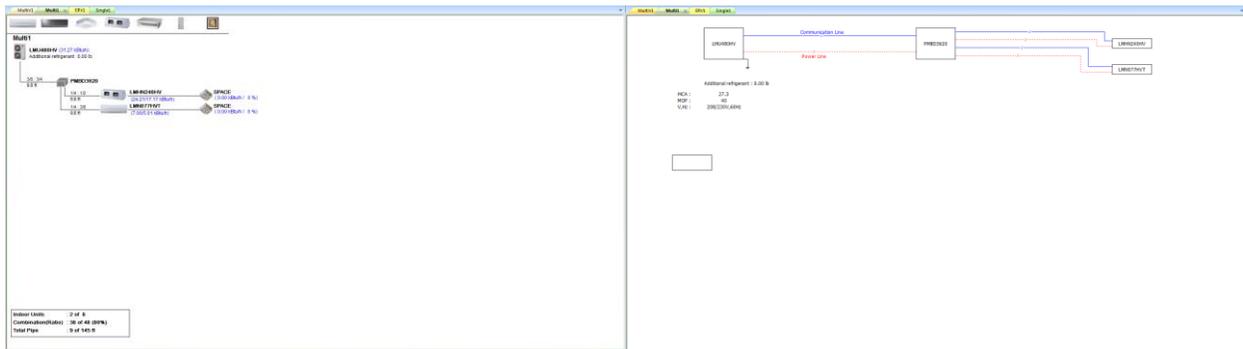
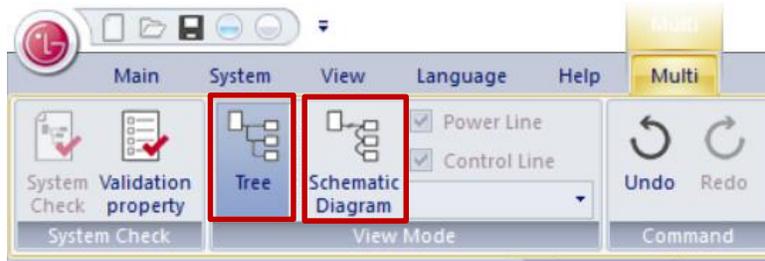
The screenshot shows a window titled 'System invalidation property - General Condition'. The window displays a table with the following data:

Outdoor Unit : LMU480HV Unit : ft		
Contents	Limit1	Current1(Max value)
Total pipe length	475.7 ft	29.5 ft
Each Branch Pipe Length	49.2 ft	9.8 ft
Total Main Piping Length	180.4 ft	9.8 ft
Total Branch Piping Length	295.3 ft	19.7 ft
Difference in height (outdoor - indoor)	98.4 ft	9.8 ft
Difference in height (indoor - indoor)	49.2 ft	0.0 ft

Note : Except Longest equivalent pipe length, other pipe length limitations are actual length.

OK

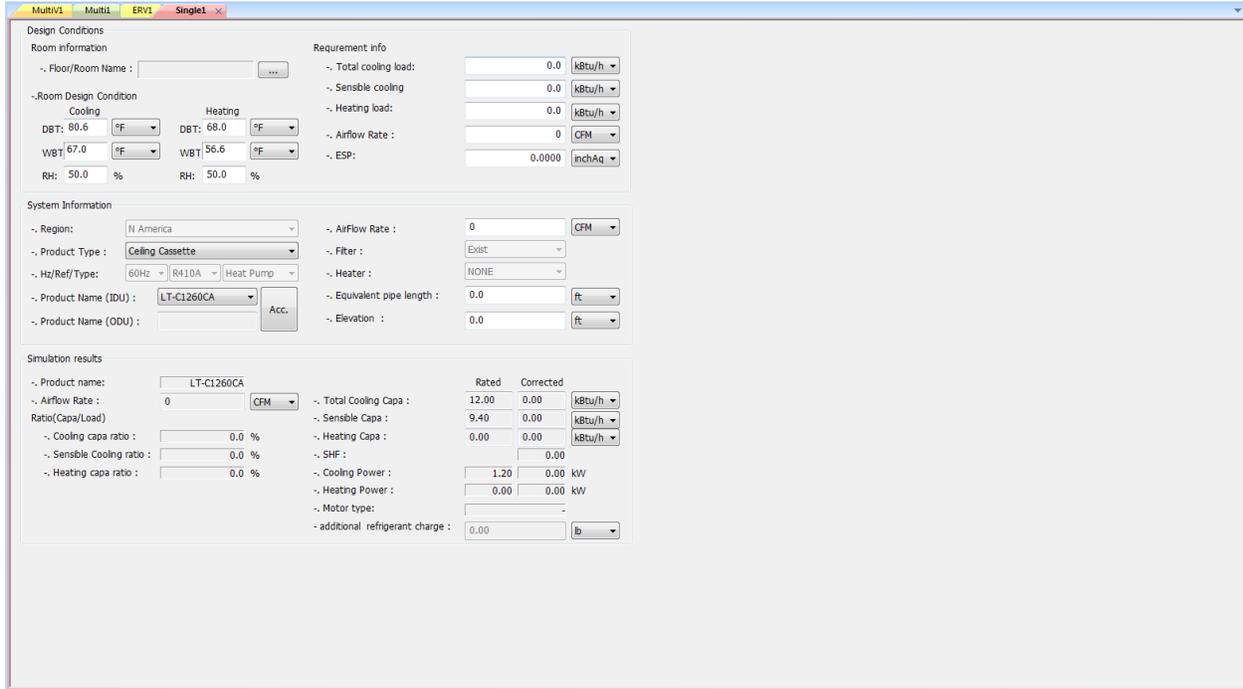
Note that you can also change the view of Project window from Tree to Schematic. Tree diagram lets you see refrigerant diagram in isometric perspective whereas Schematic diagram will let you see electrical and communication sketch.



Single CAC (Set) Project

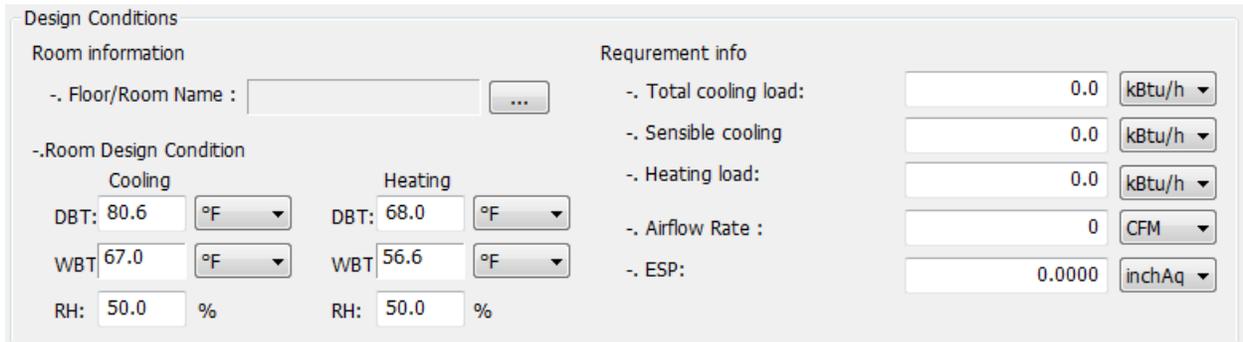
Note: Single CAC (Set) system has Single Wall Mount models

If you select Single CAC (Set) as your system type, below Project window will be shown:



Project window for Single CAC system

1. Insert room information, its design conditions, and any additional information such as cooling/heating load if needed.



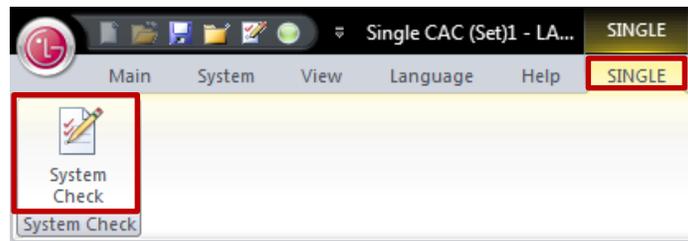
2. Select model type, product name, and insert system information such as pipe length. Note that if product name doesn't show properly, it is most likely because from Properties, it is set to 'Factory Model Name'. Change it to 'On'.

System Information

- Region :	N.America	- Air flow rate :	339	CFM
- Product type :	Wall Mounted	- Filter :	Exist	
- Hz/Ref/Type :	60Hz R410A Heat Pump	- Heater :	None	
- Product name (IDU) :	LSN090HSV5	- Equivalent pipe length :	0.0	ft
- Product name (ODU) :	LSU090HSV5	- Elevation :	0.0	ft

Acc.

3. From Single tab, click 'System Check' button.



4. Then check simulation results from Project window.

Simulation results

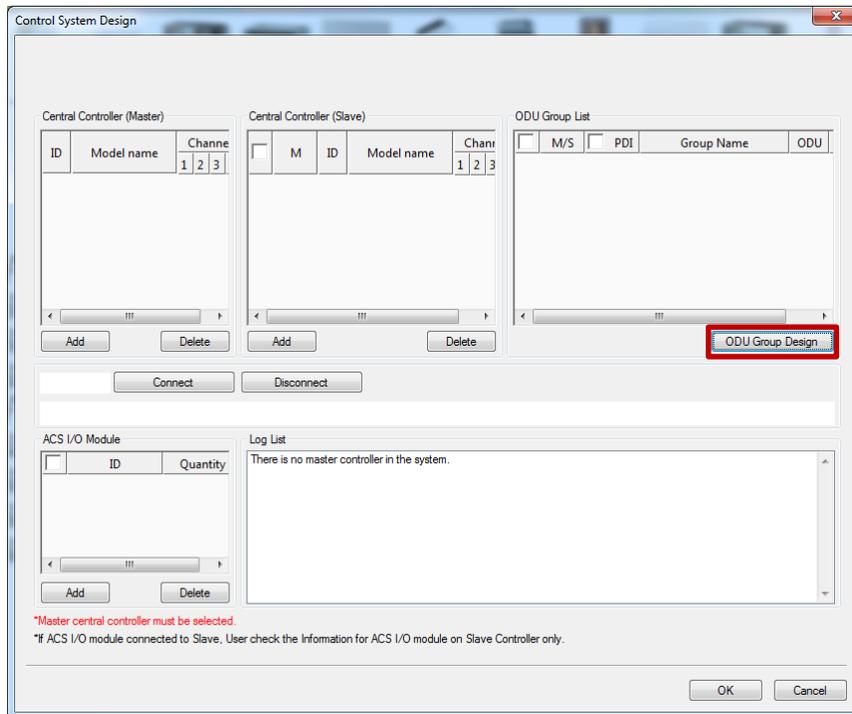
- Airflow Rate :	0	CFM		
- Ratio(Capa/Load)				
- Cooling capa ratio :	0.0	%	- Total Cooling Capa :	Rated 9.00 Corrected 9.02
- Sensible Cooling ratio :	0.0	%	- Sensible Capa :	7.38 7.71
- Heating capa ratio :	0.0	%	- Heating Capa :	11.00 9.35
			- SHF :	0.85
			- Cooling Power :	0.66 0.66 kW
			- Heating Power :	0.83 0.74 kW
			- Motor & Drive type:	Standard & -
			- Additional refrigerant charge :	0.00 lbs

Control system

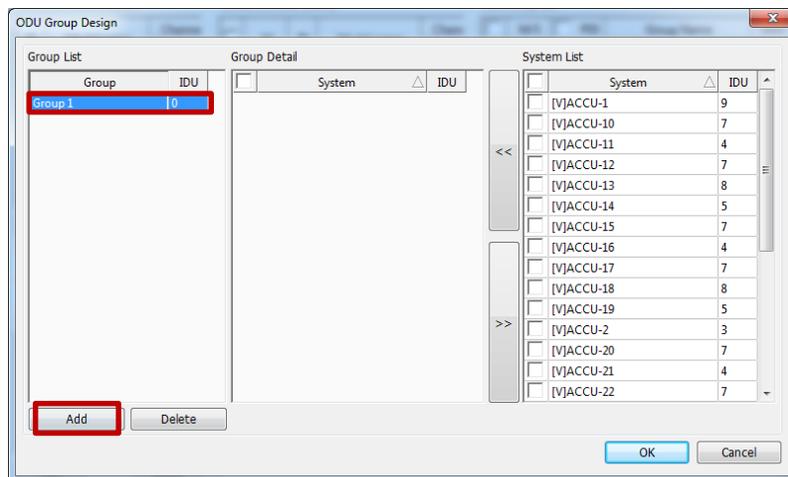
When you have system(s) in your project, you can then design control system for the entire project.

ODU Group Design

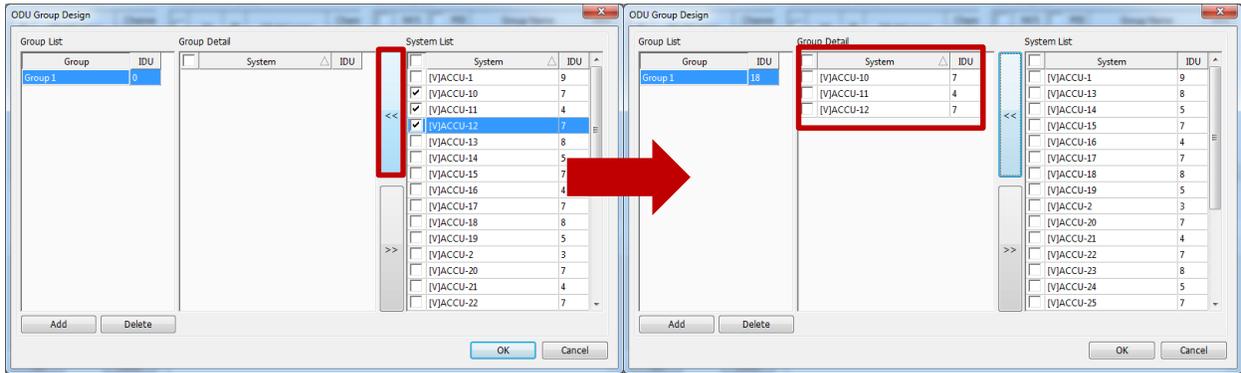
1. Click 'ODU Group Design' button from the Control System Design window.



2. Click 'Add' to add ODU groups. Double click on the name to change its name.

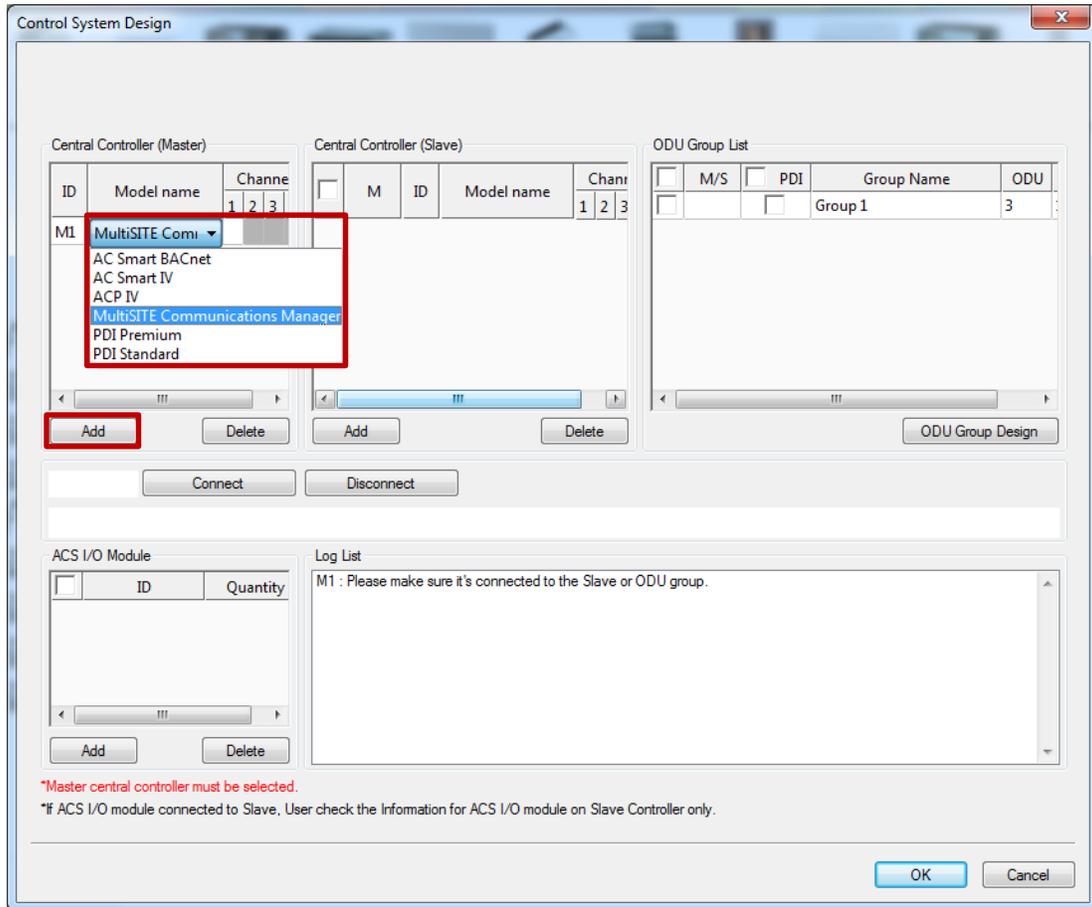


3. Check the systems you want to add to the group, and add it to the group by clicking “<<” button.



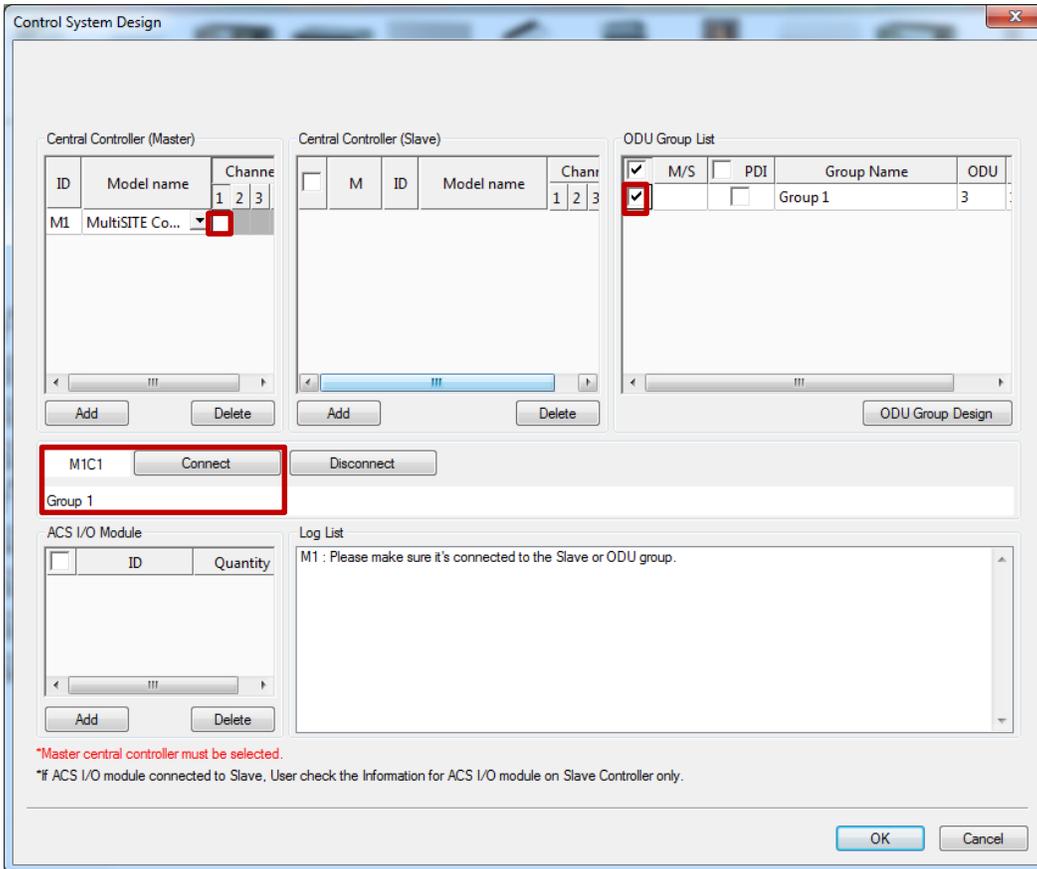
Connecting Main and ODU group

1. Click 'Add' and select Main controller.



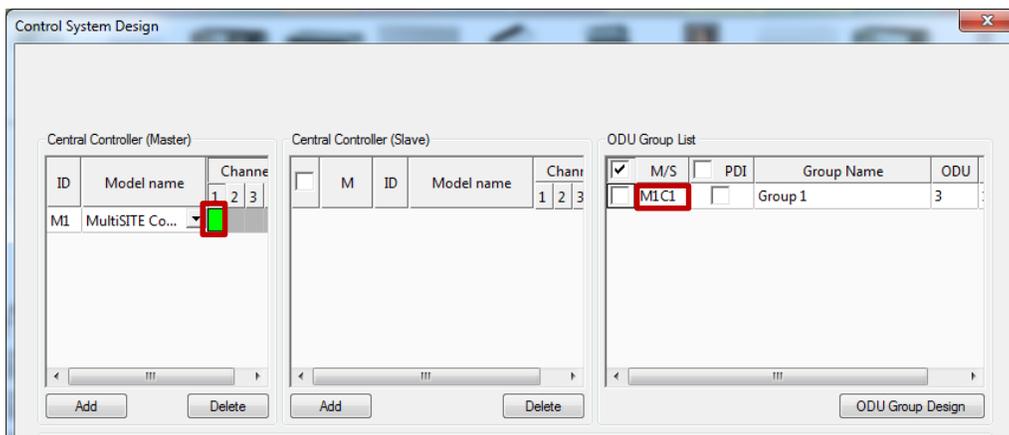
Note that you may select PDI from Main controller menu as well.

2. Check the channel and ODU group, and then click 'Connect'.



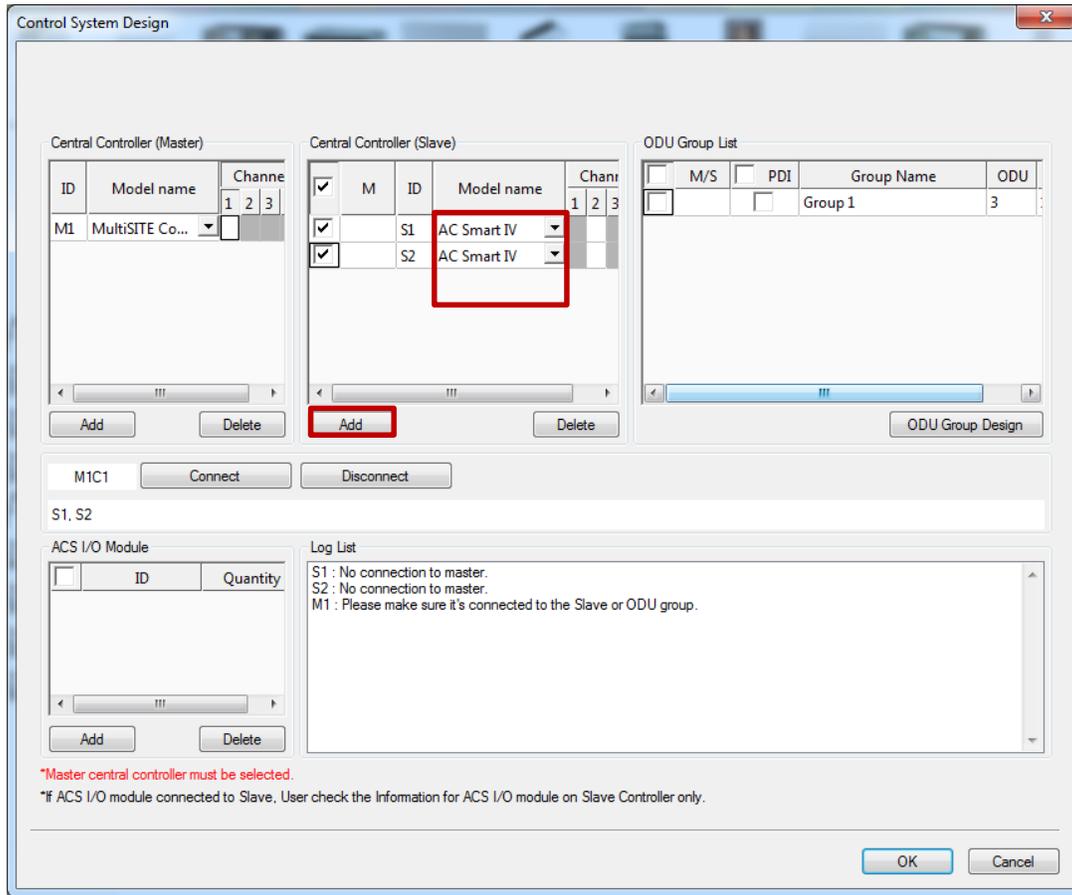
Note that if you select the channel and ODU group correctly, you'll see 'Controller ID Channel no.' next to 'Connect' button, and your selected ODU group name under the 'Connect' button.

3. When it's connected correctly, that channel will be marked with green color.

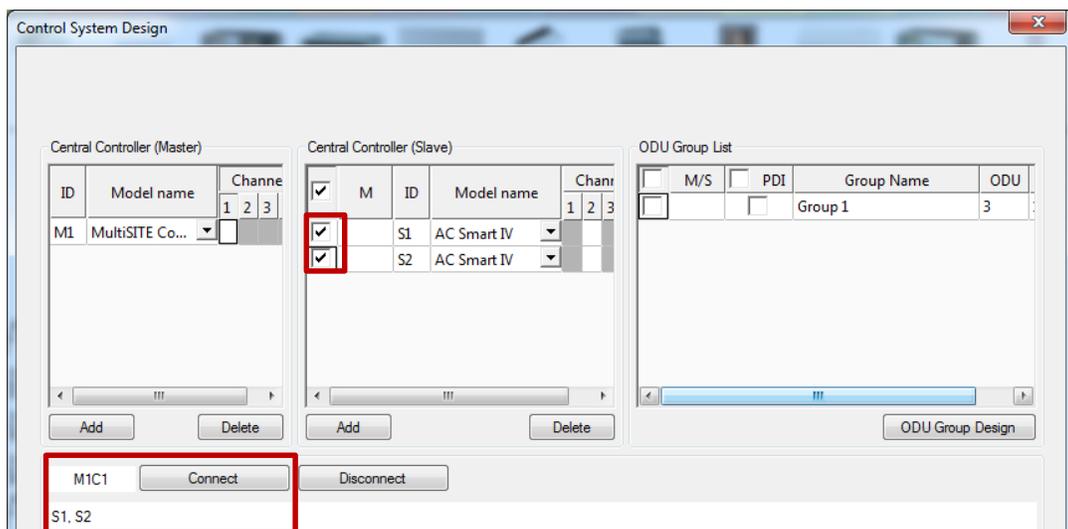


Connecting Main to Sub to ODU group

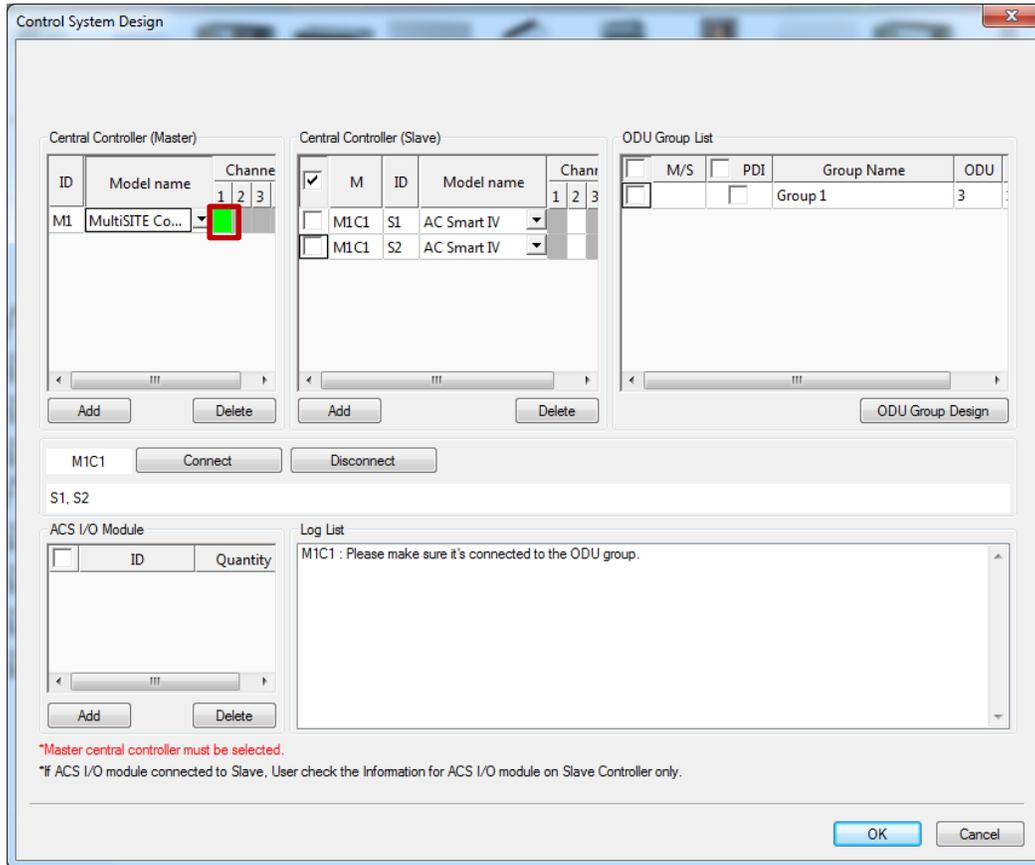
1. Click 'Add' and select Sub controller.



2. Check the sub controller(s) and Main controller channel, then click 'Connect'.

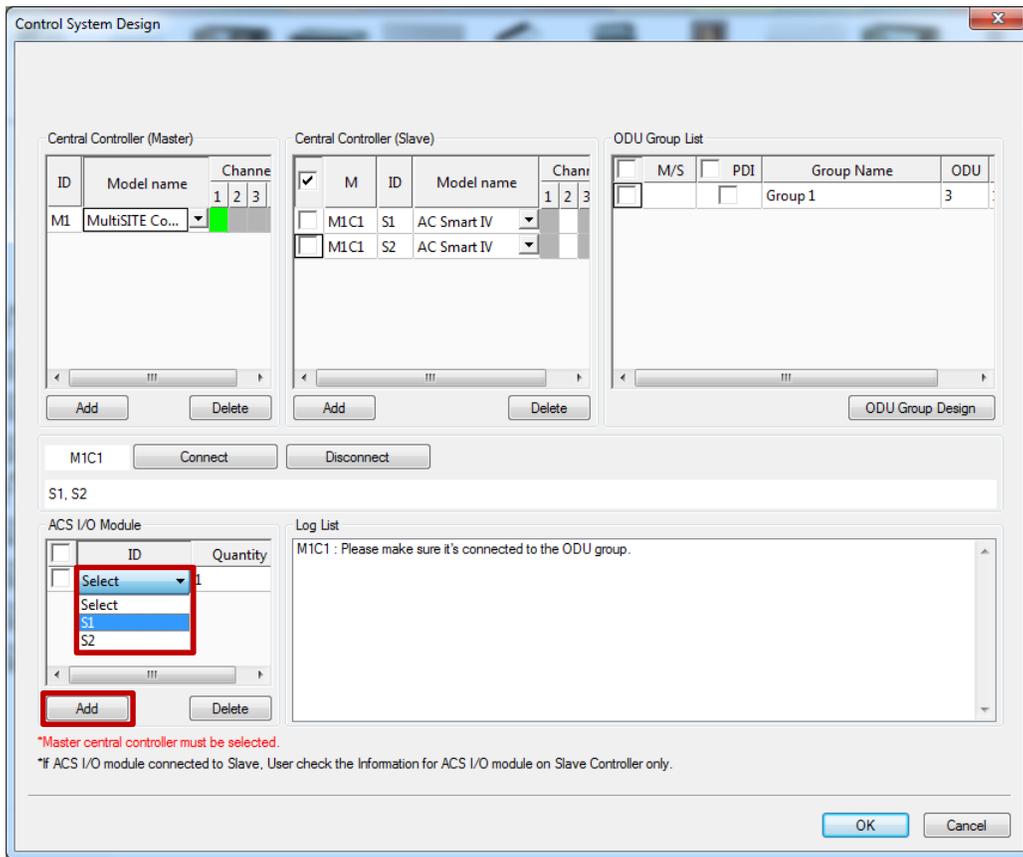


3. When it's connected correctly, that channel will be marked with green color.

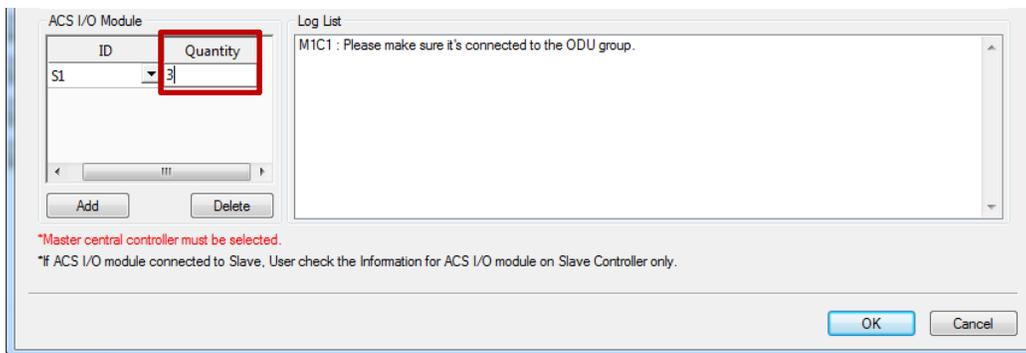


Connecting ACS I/O Module

1. Click 'Add' and select the controller you want to add I/O module to.

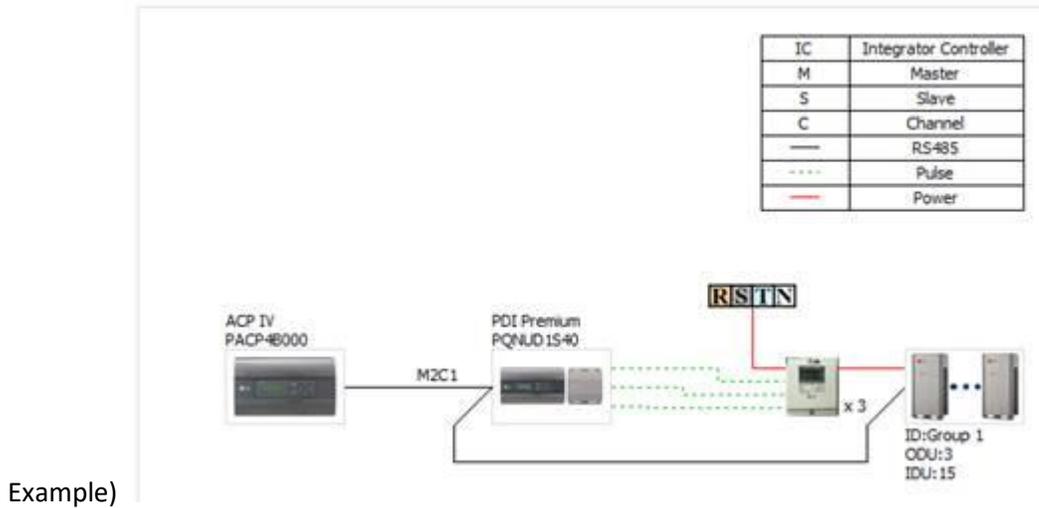


2. Double click on the quantity input to edit the quantity.

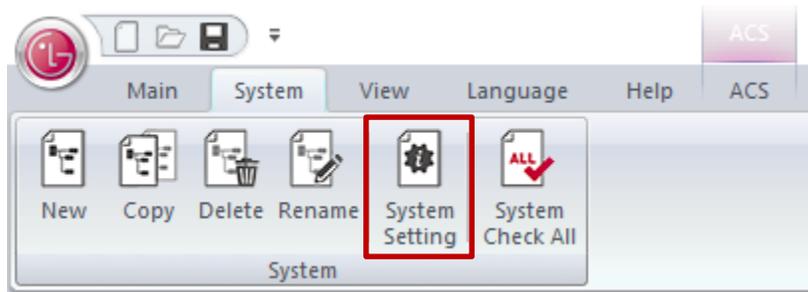


Finishing design and revising

1. When done, click 'OK' to finish the design.

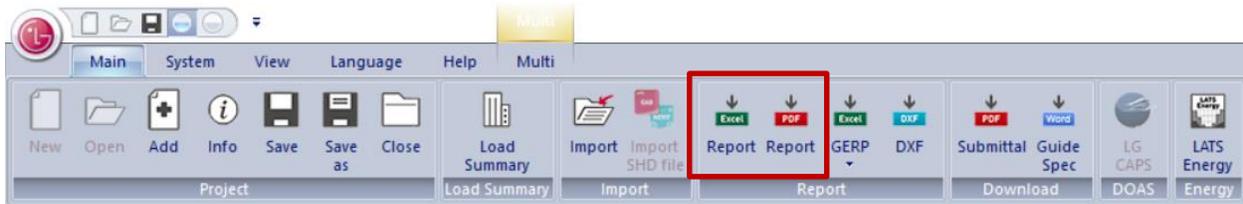


2. To revise, go to 'System setting' from System tab and revise.

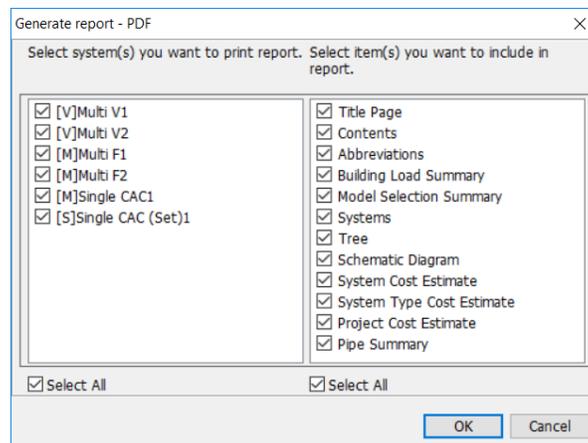


Export Report

After system check has been performed successfully, you can then export report summary of each systems into Excel file. 'Report' button can be found from Main tab. If you want Excel version of the report, choose the first icon. If you want PDF version, choose the second icon.



When you click on 'Report', you can then select which systems you wish to export, and what contents you wish to put into the report file.



After selecting details, it will automatically generate Excel file and open up the file. Here is a preview of an example project:

LG Electronics
Air Conditioning Proposal
vr1051

AIR CONDITIONING PROPOSAL SHEET
09/12/2016

LG Electronic U.S.A.
11405 Old Roswell Road, Alpharetta, Georgia

Prepared by :

Model Selection - Summary

Project Name: Project_20160912 09/12/2016

1. Outdoor Units

Model Name	Quantity	Description
ARLN072CE4	1	60Hz/R410A/Heat Pump/Multi VV/Canada
Total		1

2. Indoor Units

Model Name	Quantity	Description
ARNU05379C4	1	Ceiling Cassette - 4Way(3MRB_2X2)
ARNU48389A4	1	Ceiling Concealed Duct - High Static(48MRB)
Total		2

Index	Die(Liq Gas,inch)	Length(Ft)
P0	1/4 - 1/2	9.8
P1	3/8 - 5/8	9.8
P2	3/8 - 3/4	22

Model Name	Quantity
ARLN01621	1

5. Accessories

Index	Model Name	Quantity	Description

Export GERP

After system check has been performed successfully, you can not only export reports but also can automatically compile and create equipment lists in Excel file. This can be done through 'GERP' button in Main tab. There are different GERP files you can choose from:



Here is a preview example of GERP file:

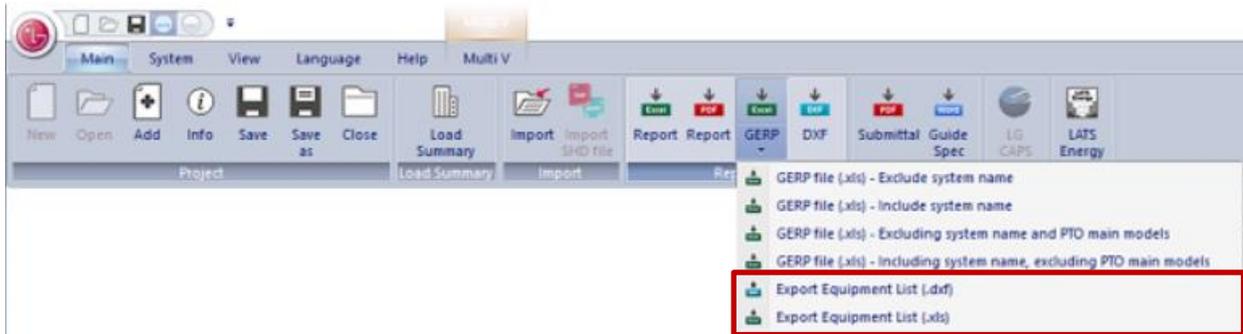
ModelCode.SUFFIX	DeliveryDate	Quantity	ModifiedListPrice	FinalDCPrice	DeliveryFr
ARUN072CTE4		1			L
ARNJ053TRC4		1			L
ARNJ483BRA4		1			L
ARBLN01621		1			L
LMU480HV		1			L
LMHN240HV		1			L
LMN077HVT		1			L
PMBD3620		1			L
AMNW09GL1A0		1			L
AULW09GAE		1			L
PACP4B000		1			L
PACS4B000		1			L

Hit OK and it will export into Excel file:

	A	B	C	D	E	F	G	H
	ModelCode.SUFFIX	DeliveryDate	Quantity	ModifiedListPrice	FinalDCPrice	DeliveryFr	Description	
1	ARUN072DTE4		1			L		
2	ARUN168DTE4		1			L		
3	ARUN240DTE4		1			L		
4	PRLK048A0		2			L	EEV Kit	
5	PRLK096A0		2			L	EEV Kit	
6	ARBLN07121		1			L		
7	ARCNN21		1			L		
8	PRDCAM		3			L	AHU Comm Kit with I/O board(Heat pump only)	
9	PREMTB10U		3			L	LG programmable thermostat	
10								
11								
12								
13								
14								

Export Equipment Schedule

Equipment schedules can be compiled and exported into Excel or AutoCAD (DXF) files automatically from the same menu as well.



And here is an example of Excel file:

Multi V Indoor Unit Equipment Schedule																					
Location	Mark	Room Name	Model Number	Type	Quantity	Nominal Capacity (BTU/h)			Corrected Capacity (BTU/h)			Entering (Return) Air Temperature (°F)			Fan Airflow (CFM)	Piping Connections (in.)		Power			
						Total Cooling	Sensible Cooling	Heating	Total Cooling	Sensible Cooling	Heating	Cooling DB	Cooling WB	Heating DB		Liquid	Gas	Volts	Phase	Hz	PLA
MultiV1		Room	ARNUDS3TRC4	CASSETTE_4WAY	1	5500	3900	6100	5436	3899	6094	81	67	68	265/247/212	1/4	1/2	220-240V	3Ph	50Hz/60Hz	0.2
MultiV1		Room	ARNUH43BR4A	DUCT_HIGH_STATIC	1	48100	35617	51200	48084	36096	51152	81	67	68	1,582/1,434/1,176	3/8	5/8	220-240V	3Ph	50Hz/60Hz	2.3

Multi V Outdoor Unit Equipment Schedule - Air																					
Location	Mark	Model Number	Type	Quantity	Cooling Capacity (BTU/h)		Corrected Capacity (BTU/h)		Fan Airflow (CFM)	Quantity	Outdoor Temperature (°F)	Efficiency		Refrigerant	Piping Connections (in.)			Power			
					Total Cooling	Heating Cooling	Total Cooling	Heating Cooling				Cooling EER (SEER)	Heating COP (HSPFP)		Liquid	LP Gas	HP Gas	Volts	Phase	Hz	MCA
MultiV1		ARLN072CTE4		1	72000	81000	53582	57247	7400	1	94	74	17	R410A	3/8	3/4	HP Gas	575V	3Ph	60Hz	13.6

Multi V Outdoor Unit Equipment Schedule - Water																					
Location	Mark	Model Number	Type	Quantity	Cooling Capacity (BTU/h)		Corrected Capacity (BTU/h)		Flowrate (GPM)	Entering Water Temp (°F)	Cooling EER (SEER)	Heating COP (HSPFP)	Refrigerant	Piping Connections (in.)			Power				
					Total Cooling	Heating Cooling	Total Cooling	Heating Cooling						Liquid	LP Gas	HP Gas	Volts	Phase	Hz	MCA	
MultiV1		ARLN072CTE4		1	72000	81000	53582	57247	7400	1	94	74	17	R410A	3/8	3/4	HP Gas	575V	3Ph	60Hz	13.6

Multi V HR Boxes							
Location	Mark	Model Number	Quantity	Power			
				Volts	Phase	Hz	PLA

Here is an example of DXF schedule file:

The screenshot shows a DXF schedule file with the same table structure as the Excel file. It includes sections for 'Multi V Indoor Unit Equipment Schedule', 'Multi V Outdoor Unit Equipment Schedule - Air', 'Multi V Outdoor Unit Equipment Schedule - Water', and 'Multi V HR Boxes'. The data is rendered in a dark-themed interface.

The function will compile model name, quantity, price, description and so on automatically.

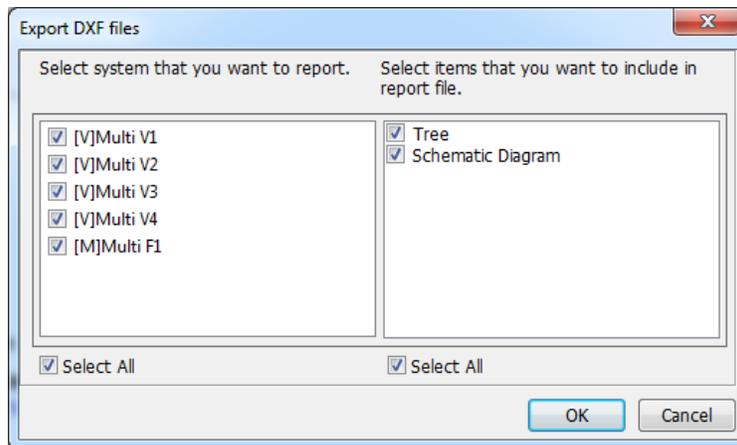
Note that this can be only created for Multi V projects.

Export DXF

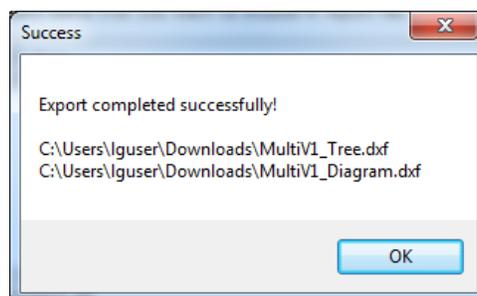
You can also export Tree diagram and Schematic diagram in AutoCAD file from LATS HVAC. This function is located under Main tab as 'DXF' button.



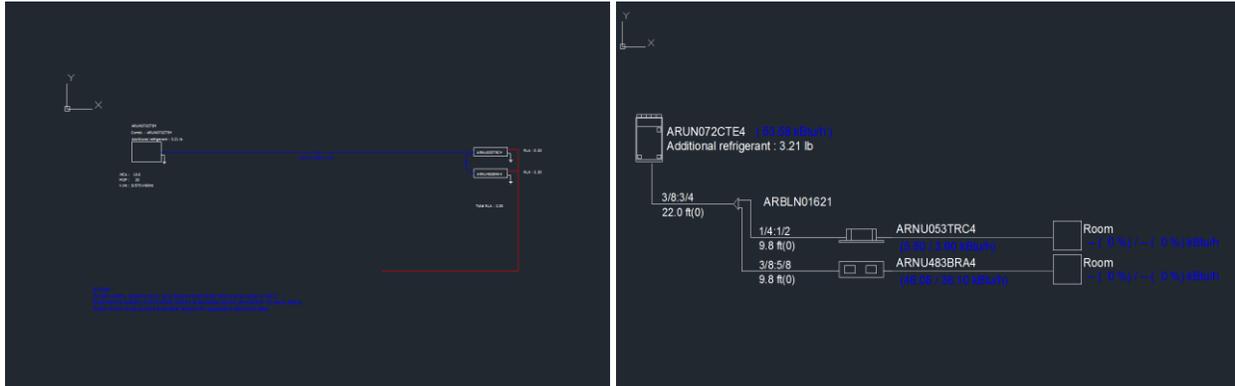
When you click on the button, you can choose which to include in the file and which systems you want DXF exports for:



After chosen, select the folder path where you want the file to be saved on. If it is successfully exported, this message will pop up:

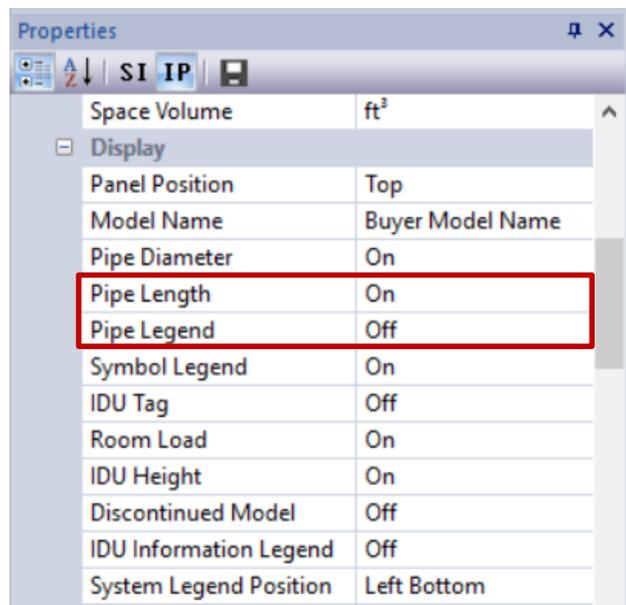


Here is an example of exported DXF file:



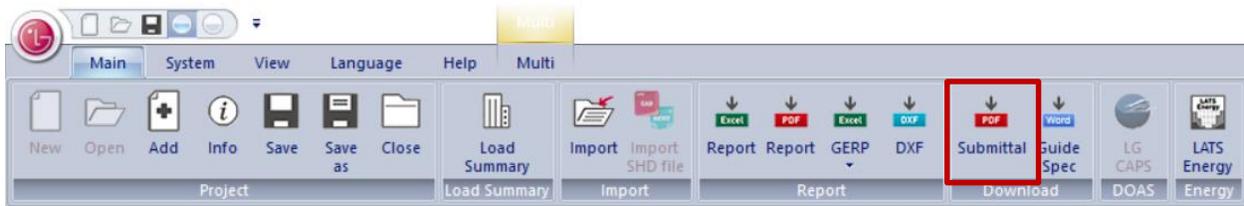
Note that this can be only created for Multi V and Multi F projects.

Also, if you wish to hide pipe diameter or pipe length, you can change options from Properties window.

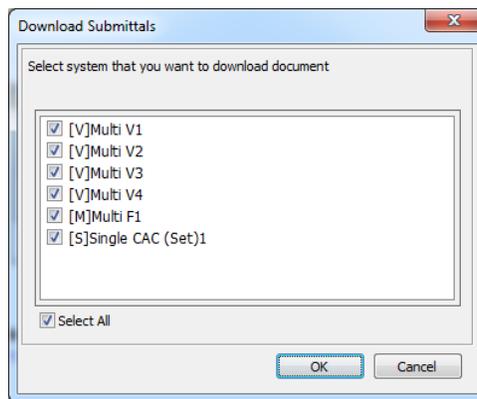


Download Submittals

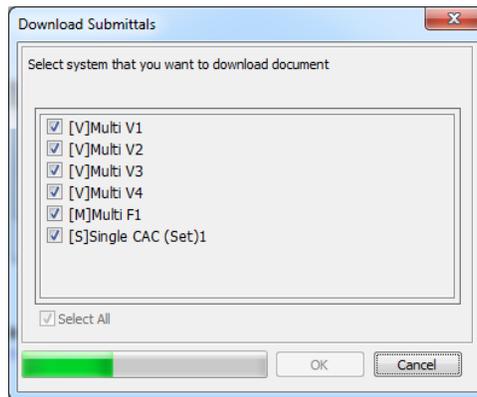
You can download submittals of all ODU, IDU, HRU, and available accessories in your project by clicking 'Submittal' button. It is located under Main tab.



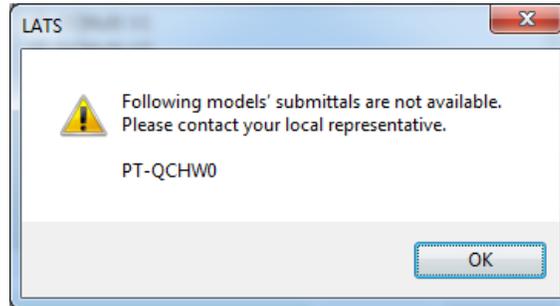
When you click on the button, you can choose which systems' submittals you wish to download:



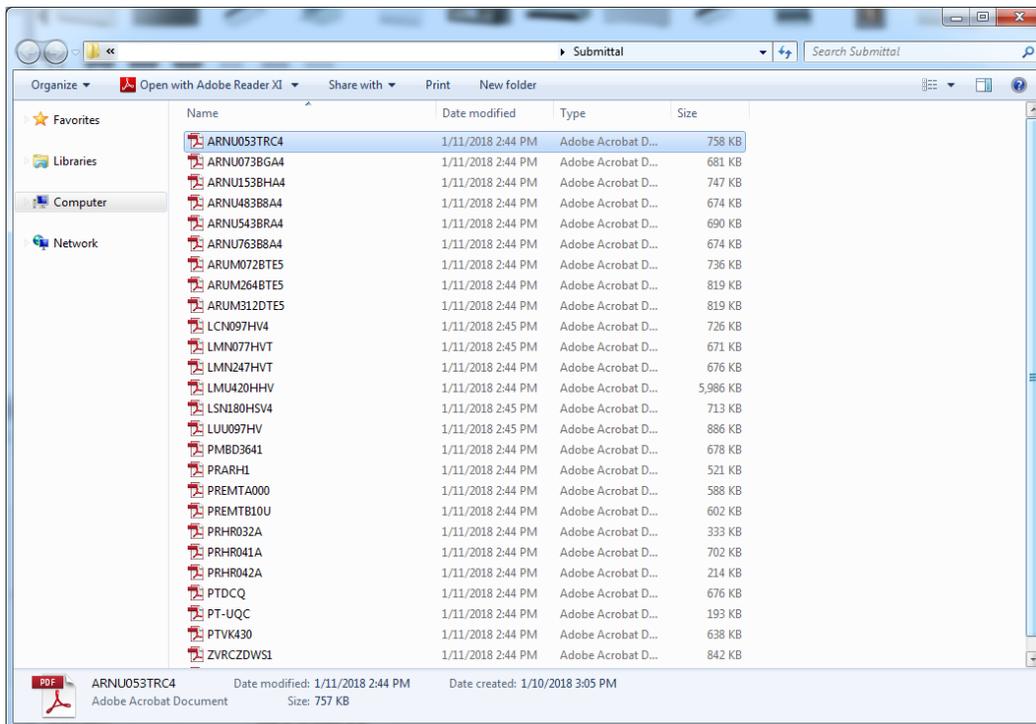
After chosen, click OK and you'll see the progress of the download from the same window.



If any of the submittal(s) cannot be downloaded, it will show this error message. Please check with your local representative to see if the submittal is available or not.



And after the download is completed, it will automatically open the folder containing all the downloaded submittals. The folder is located where your project file is saved.



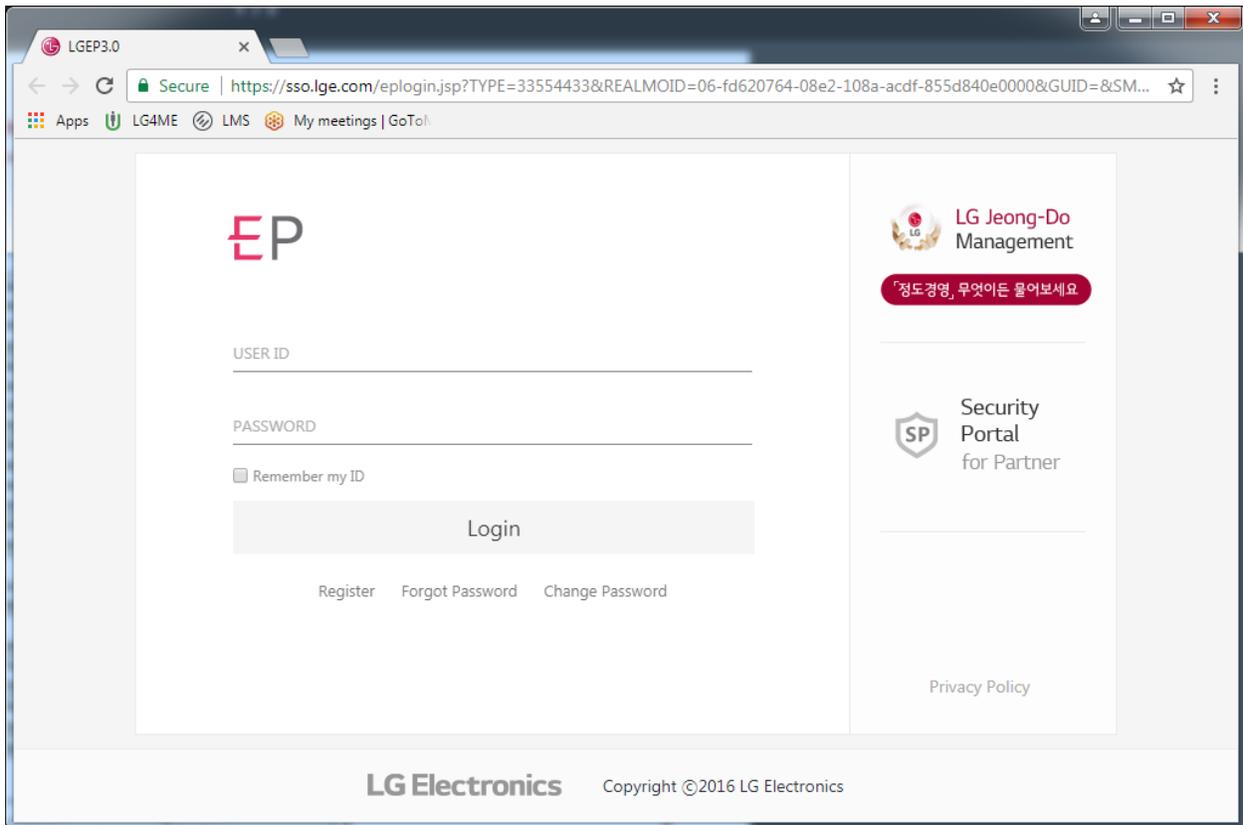
Other Links

You can open LG CAPS software or LATS Energy website by clicking the shortcut buttons located on Main tab.



Note that you must have LG CAPS installed on your computer to use LG CAPS shortcut or it will be disabled like above image.

Also, you must log in to EP website to use LATS Energy website.



For additional information on functions such as Diversity or Operation Mode Lock, please contact your Local LG Electronics representative [here](#).