



**mitsubishi
ELECTRIC**

PROCON MELCO JACE
Software version: 4.6.1
October 2022

Configured by Forest Rock with the approval
of Mitsubishi Electrical (UK)

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Change History

| User Guide Rev'n | PROCON MELCO Version | Author | Date | Remarks |
|------------------|----------------------|--------|----------|--|
| 1 | 1.4 | JH | Nov 2019 | First draft |
| 2 | 2.0 | GR | Feb 2021 | Added new sections for change history, group discovery preview, global commands. Added more information to FAQ. All previous graphics and text changed to reflect new version of software. Some typographical errors corrected. |
| 3 | 4.6 | GR | Aug 2022 | Includes explanation of new lock screen upon entering the software for the first time. |
| 4 | 4.6.1 | GR | Oct 2022 | No functional changes; procon-rt module was updated from 4.6 to 4.6.1 to fix a dependency issue with the new proconOccupancy module. Warning added to Frequently Asked Questions & Common Issues about not changing the enum ranges of any enum writable points. |

Following a re-alignment of software module and user guide version numbers for purposes of simplification, change history details are now as follows:

| Version | Author | Date | Remarks |
|---------|--------|----------|--|
| 4.5.2 | GR | Dec 2021 | Title page and introduction updated to clarify the software module version numbers to which this user guide relates. References to 'version 2' or 'v2' replaced with 'this version'. Sections 'Group Status Page' and 'Changing Individual Group Settings' updated to explain that an automatic 5-second refresh of group settings has been added. |

Introduction

This documentation is a guide to configuring the MELCO JACE running the v4.6 PROCON Driver & User Interface modules produced by Forest Rock for use in Niagara 4.6 or greater.

The MELCO JACE provides connection to M-NET centralised controllers. It allows for the control of up to 200 indoor units via either a direct connection to a Niagara based system or using the Modbus or BACnet open protocols.

Terminology

PROCON MELCO JACE - The controller supplied by Forest Rock

Centralised Controller - Mitsubishi Centralised Controller that the MELCO JACE communicates with (list of compatible controllers below)

Group - Group of one or more AC units.

AC Unit - Mitsubishi AC unit

Note that **Group** should not be confused with **AC unit**. In many cases the terms could be used interchangeably when there is only one AC unit in each group, but to avoid confusion it is better to differentiate between these terms.

Core Licensing

The MELCO JACE is available with either an FR-PROCON-1 or FR-PROCON-4 license. This corresponds to either 1 or 4 Mitsubishi Controllers respectively. The MELCO JACE can communicate with a maximum of 50 AC units per Mitsubishi Controller, and up to a maximum of 200 AC units per JACE.

Additional Feature Licensing

There are also two additional features that can be licensed as optional extras. These are **Global Command** and **Capacity Save**.

The **global command** feature allows the control of all discovered AC units using one central write feature. This allows for turning all units off to reduce energy consumption, or to change the mode of all discovered units to a new setting such as FAN or AUTO.

The **capacity save** feature has been developed to enable energy savings by allowing the user to set the maximum cooling capacity of all indoor units to between 60-99%. This feature is only compatible with AE200 and EW50 Controllers, where the outdoor units in the system are YLM / YNW or newer.

Please refer to the corresponding sections in the manual for more information about these features, and how they are used.

Connect to the Melco JACE

There are three common ways the MELCO JACE may be networked & configured:

JACE to MITSUBISHI CONTROLLER (wired) / JACE to PC (wired)



The primary ethernet port of the MELCO JACE is used to connect to the Mitsubishi Centralised Controller (usually over the building network). The engineer's PC is then connected directly to the JACE's secondary port to carry out configuration.

JACE to MITSUBISHI CONTROLLER (wired) / JACE to PC (wireless)



The primary ethernet port of the MELCO JACE is used to connect to the Mitsubishi Centralised Controller (usually over the building network). The engineer's PC is then connected to the JACE's wireless network to carry out configuration.

JACE and PC to MITSUBISHI CONTROLLER (Wired)



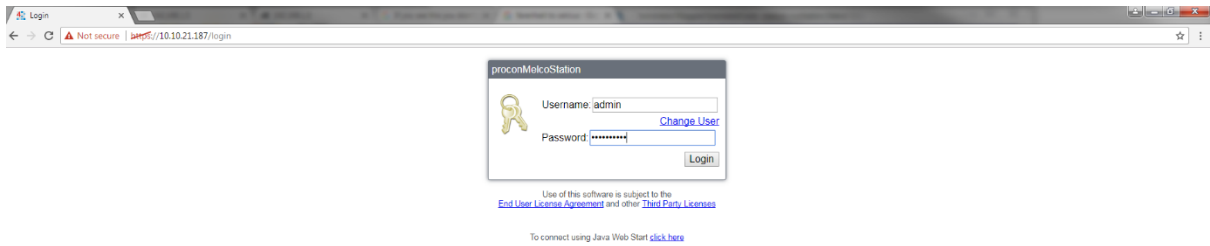
The Mitsubishi Centralised Controller, the primary ethernet port of the MELCO JACE, and the engineer's PC are all connected to the buildings network. Some buildings may have network security that prevents this method being used.

Connect to the MELCO JACE as per the diagrams above. For wireless connections the SSID is 'Melco Jace', and the password will be provided separately.

Note that the wireless access point on the MELCO JACE will automatically disable itself when not used frequently. To reinitialise it you will need to move the wireless switch on the MELCO JACE to 'Off' for 30 seconds, and then back to 'ACC'. Additionally, make sure the included wireless antenna has been attached before attempting to connect wirelessly.

The default IP address for each connector is as follows:

| | |
|-------------------------|---------------|
| Primary Ethernet Port | 192.168.1.140 |
| Secondary Ethernet Port | 10.10.10.10 |
| Wireless | 192.168.11.1 |



On the login page, enter the credentials of the JACE.

Credentials are generated by Forest Rock and dispatched with each purchase of the JACE. If credentials are misplaced, please contact us at support@forestrocks.co.uk.

After connecting using any method, the Primary Ethernet needs to be changed to the same range as the rest of the building network / centralised controller. Often an IP address will be specified by the building owner. The IP of the primary Ethernet interface can be changed via the 'Comm Settings' tab; connections can still be made to the secondary and wireless IP interfaces using the defaults listed above, but their settings can only be changed from within Niagara workbench, not from the user interface of PROCON MELCO.

Please note that the MELCO JACE will restart after the IP address has been updated.

Initial Lock Screen

At first login, the MELCO JACE will open the following page:

Procon MelcoJACE-8000 26-Aug-22 10:05 AM BST

Product Usage Checklist

Welcome to the Procon Melco JACE ! Most features are currently disabled; to use them, you MUST review the warnings & guidelines shown below, then confirm your agreement using the instructions at the bottom of the screen. You accept that:

- 1 - Mitsubishi Procon Melcotel**
Procon Melco JACE cannot be active on the M-Net network at the same time as a Mitsubishi Procon Melcotel interface unit since both items of equipment expect to be 'master'.
- 2 - Supported Centralised Controller types**
Procon Melco JACE is compatible with AE-200, AE-50 and GW-50. It is not compatible with G-50. Full compatibility with EB-50, GB-50 and AG-150 may depend on hardware/firmware revisions; if in doubt, consult a Mitsubishi technical support representative.
- 3 - Expansion Units**
M-Net expansion units must have higher IP addresses than the main controller, and all units must use port 80. For example:
AE-200 -- 192.168.100.11:80
EW-50 -- 192.168.100.12:80
EW-50 -- 192.168.100.13:80 ... and so on ...
The main controller firmware must be at least as recent as that of the expansion units.
- 4 - Supported unit types**
Supported unit types are: 'IC' (VRF/M-Series indoor), 'LC' (Lossnay), 'FU' (Outside air processing), 'CEH' (Hot water heating pump), 'BU' (Air-to-water booster), and 'WH' (Air-to-water hex). Boiler heat pumps (and other unit types) may prevent group discovery.
- 5 - Group numbers and unit addresses**
Successful group discovery requires adherence to group numbering and unit addressing rules (click button below for more details).
[About user addresses and group numbers ...](#)
- 6 - Group names**
Mitsubishi group names should be non-empty and unique.

Enter your name (minimum 8 characters), click 'Save', then 'Accept':

Following acceptance, this 'Home' page will clear and all functions will become enabled (use 'Procon Settings' to configure controllers)

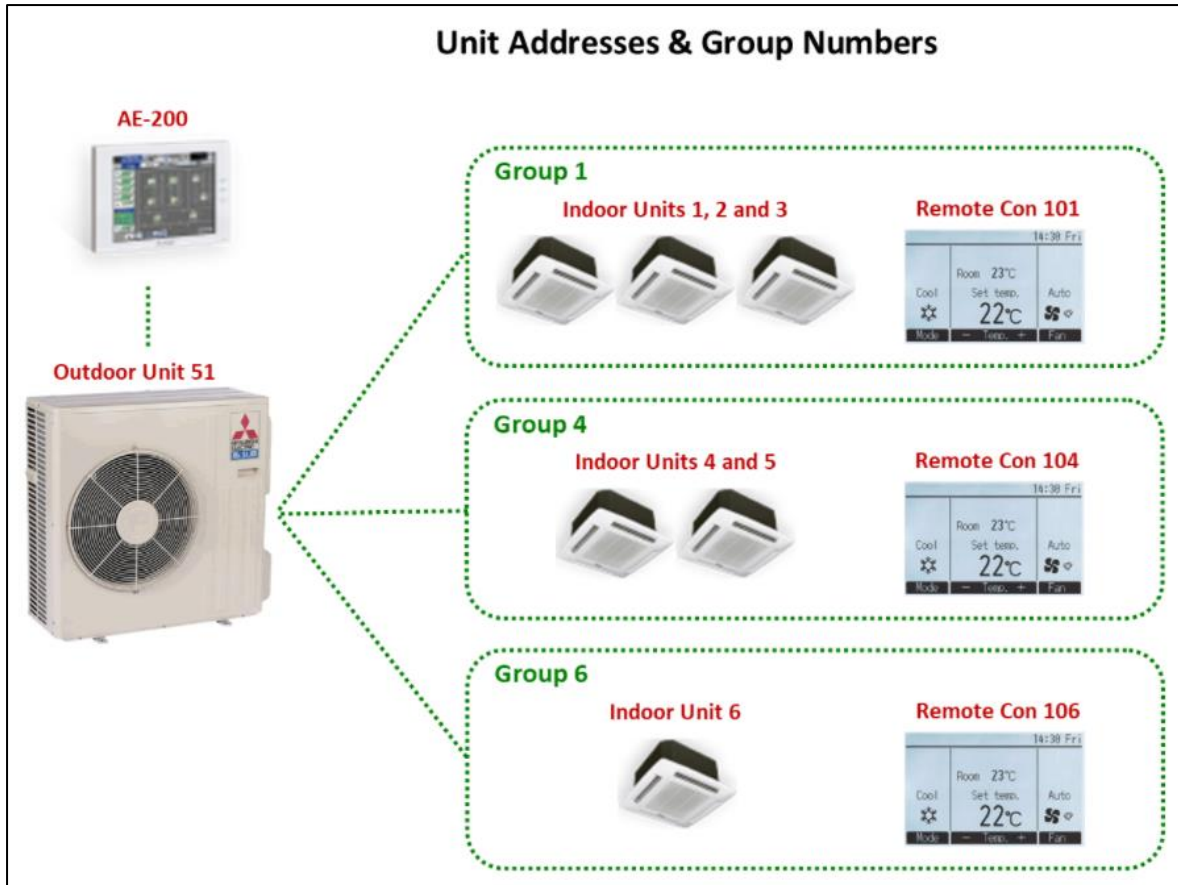
Versions:
Niagara:
User Interface:
Driver:

This page provides compatibility and commissioning information which you are urged to read carefully and understand before proceeding with any configuration of the system.

Note that the current versions of Niagara and the two MELCO driver modules installed on the MELCO JACE are displayed in the bottom left-hand corner of the page (see yellow box). In the event of any support being required, please quote these version numbers.



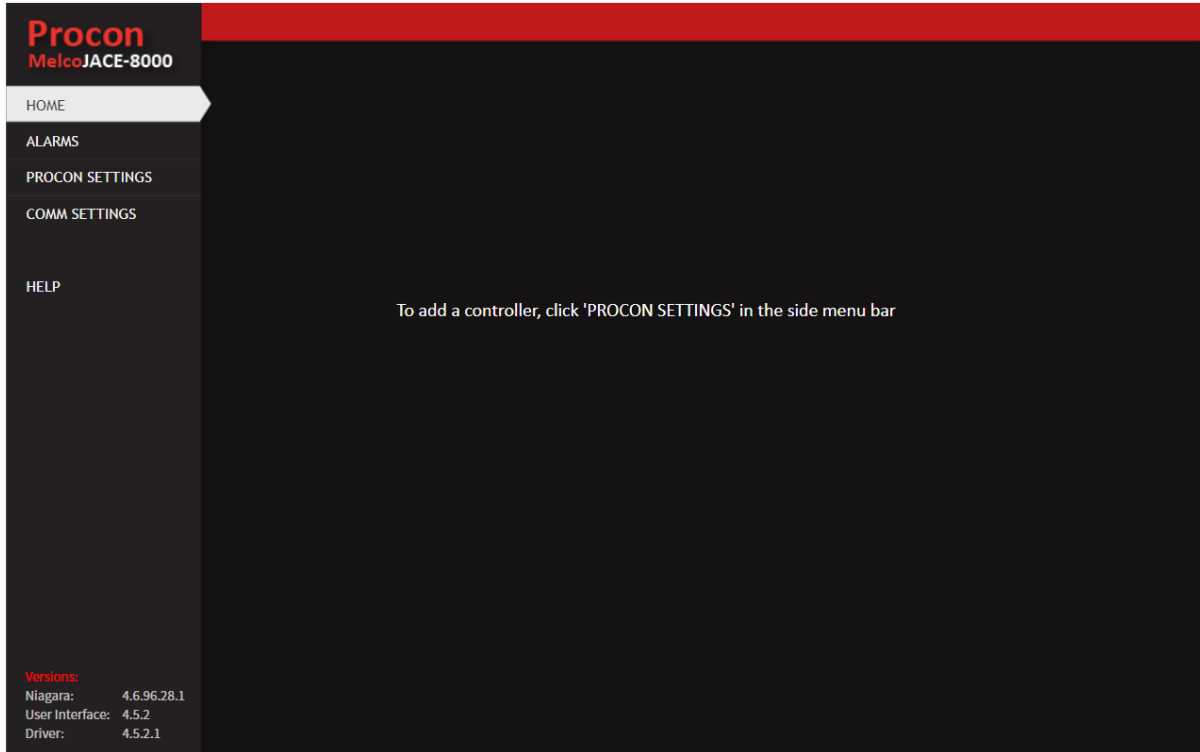
One particularly important item is the “About user addresses and group numbers...” button. This provides a pictorial explanation of the mapping rules, mandated by Mitsubishi, that should have already been followed between group numbers and unit addresses when the air conditioning equipment was originally installed and commissioned - see illustration below.



You cannot proceed to use the main features of the system until you signal your acceptance of the MELCO product usage checklist by entering your name in the text box provided, clicking the 'Save' button, then the 'Accept' button. This will unlock the menu items on the left of the screen, and the lock screen will no longer appear at any future login.

Home Page - Before controller discovery

Once the lock screen has been accepted, a new Home screen will appear with no devices configured, but with an instruction on how to add a controller.

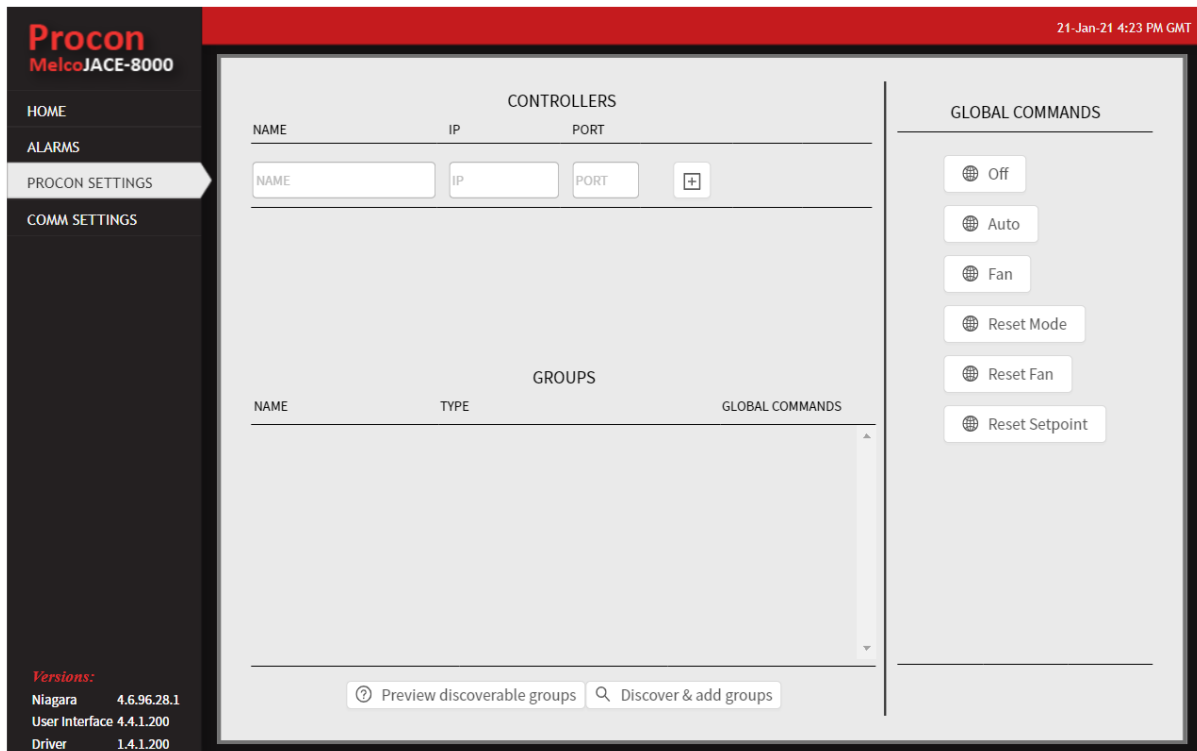


Adding Controllers

The following controllers are compatible with this version of the MELCO driver:

- AE-200E
- EW-50E
- AG-150A
- EB-50
- GB-50

To add a new controller, click on **PROCON SETTINGS** and the following page appears:



Enter the name of the device you wish to add, followed by the IP address of the centralised controller, and the port. Then click the '+' icon to add the device.



PORT number must always be set to 80.

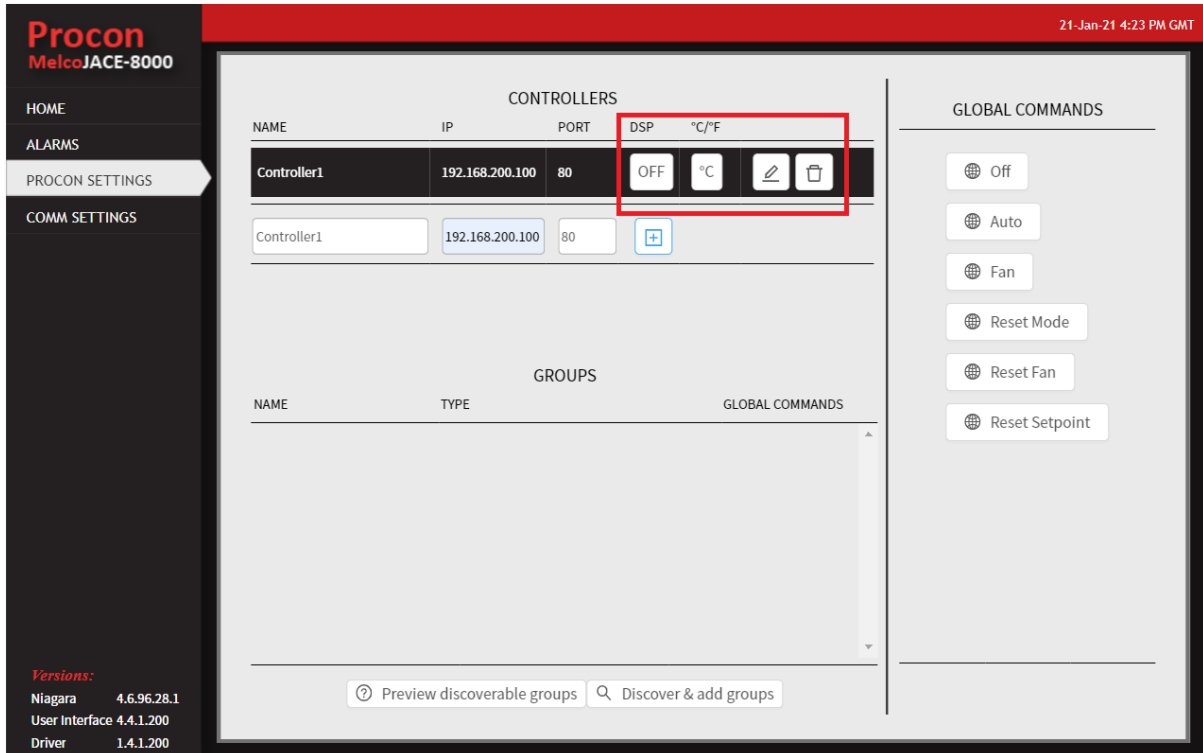


Once the Controller is added please set The Dual Set Point (DSP) to desired position (On/Off), choose the appropriate temperature scale (Celsius or Fahrenheit - default is Celsius), then discover the groups.



DSP is not supported on UK devices, the AG150 or any older device

Controller Options



DSP - Dual Set Point (applicable only to non-UK systems)

Toggles Dual Setpoint mode. By default, the DSP on every Mitsubishi controller is OFF. This means the set temperature is common in heat and cool mode. When changed to ON a setpoint is available for both heat and cool mode, enabling the user to set the temperature for heat and cool mode individually. This feature is not available on UK based systems.



Toggling the DSP button causes the Centralised Controller to restart (This process may take up to 10 mins). Once the Centralised Controller has restarted, the software on the MELCO JACE must also be restarted, and the groups re-discovered, for the change to take effect. The easiest way to accomplish this is to simply restart the MELCO JACE.



The DSP settings can only be changed twice and not between 11pm and 5:30am. Please note that attempting to change this setting on UK based systems will cause unnecessary restarts and may result in data loss.

°C / °F button

Toggling the °C/°F button changes the temperature unit. If this is toggled *after* group discovery, the groups will need to be re-discovered in order for the change to be applied. For this reason, it is advised to set the units before discovering groups.

Pencil / Bin

The pencil icon allows the user to edit the controller settings. The bin icon removes the controller.

Group Discovery

Procon
MelcoJACE-8000

21-Jan-21 4:23 PM GMT

HOME
ALARMS
PROCON SETTINGS
COMM SETTINGS

CONTROLLERS

| NAME | IP | PORT | DSP | °C/°F |
|-------------|-----------------|------|-----|-------|
| Controller1 | 192.168.200.100 | 80 | OFF | °C |

Controller1 192.168.200.100 80 +

GROUPS

| NAME | TYPE | GLOBAL COMMANDS |
|-----------|-----------------------|-------------------------------|
| Bedroom 1 | Air Conditioning Unit | Obey <input type="checkbox"/> |
| Group_03 | Air Conditioning Unit | Obey <input type="checkbox"/> |

GLOBAL COMMANDS

Off
Auto
Fan
Reset Mode
Reset Fan
Reset Setpoint

Preview discoverable groups [Discover & add groups](#)

Versions:
Niagara 4.6.96.28.1
User Interface 4.4.1.200
Driver 1.4.1.200

To discover groups, select the desired controller (the controller will be highlighted in black when selected, as seen above) and click **Discover & add groups**. Discovered groups will appear in the **GROUPS** table that occupies the lower half of the window; see a later section regarding the use of the Global Commands feature.



An issue that may be encountered is that some or all groups cannot be discovered. This usually relates to the type, naming, firmware or addressing of the AC units themselves. Please see the FAQ for further information; in addition, this version of the MELCO driver provides a feature that may assist you in diagnosing this issue - please follow the next section ('Preview discoverable groups').

Preview discoverable groups

As discussed in the previous section ('Group Discovery') and in the FAQ, the MELCO driver may fail to discover the expected groups for various reasons.

To assist the user in diagnosing this issue, this version of the MELCO driver is equipped with a feature that 'previews' the groups reported by the controller. This is very similar to the normal group discovery process but simply provides a raw report of the group information - it does NOT attempt to create the groups and their associated Niagara properties and points. Thus 'Preview discoverable groups' can be run at any time without affecting output from any previous group discovery.

To use this feature, click **Preview discoverable groups**. The following report appears on the screen:

The following groups were found in this centralised controller:

| Group Number | Group Name | Group Web Name | Group Model | Group Type | Group SubModel | Outdoor Model | Outdoor Address | Valid |
|--------------|-------------|----------------|-------------|------------|----------------|---------------|-----------------|-------|
| 1 | Bedroom 1 | Bedroom 1 | IC | IC | | OC | 51 | ✔ |
| 3 | Group_03 | Bedroom 1 | IC | IC | | NONE | | ✔ |
| 4 | First Floor | First Floor | DC | DC | | OC | 52 | ✘ |

Navigation: < 1 > OK

If the controller has many groups, the report will be split into several pages. If the **Valid** column contains a circular red cross rather than a tick on a green background, this indicates that the MELCO driver will be unable to perform a discovery on this group.

Click **OK** to close the report.



Currently, the MELCO driver can only determine if a group is undiscoverable based on its type provided by M-Net: in the above example, group number 4 is flagged as invalid because the MELCO driver does not support units of type DC (DIDO controller). The FAQ contains a list of supported group types.



In the above example, note that groups 1 and 3 have been registered on their parent AE-200 with identical web names. Whilst the AE-200 touchscreen registration does not see this as an error, the MELCO driver requires unique naming across all groups of a controller; accordingly, it automatically assigns a new Group Name based on the word **Group_** appended with a two-digit group number (**Group_03** in the example).

Global Commands

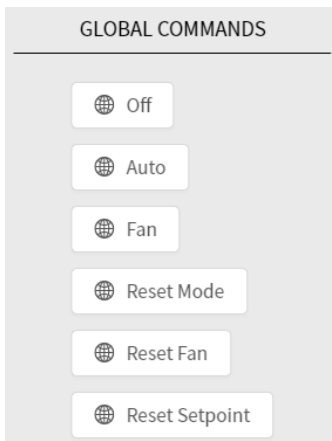
If installed, the **Global Commands** option is a time-saving feature allowing all discovered PROCON units to be adjusted using one central write operation. For example, one operation can turn all discovered units On or Off to reduce energy consumption during peak grid periods; another operation can change the mode of all discovered units; and so on.

Please note that this is an additional feature that requires an additional license.

The user can select which groups are included in/excluded from any global command operations. This is done by setting the slider next to each group in the **GROUPS** table:

| GROUPS | | |
|-----------|-----------------------|--|
| NAME | TYPE | GLOBAL COMMANDS |
| Bedroom 1 | Air Conditioning Unit | Obey <input checked="" type="checkbox"/> |
| Group_03 | Air Conditioning Unit | Obey <input checked="" type="checkbox"/> |

The various buttons in the **GLOBAL COMMANDS** column to the right of the page can then be used to trigger the various operations:

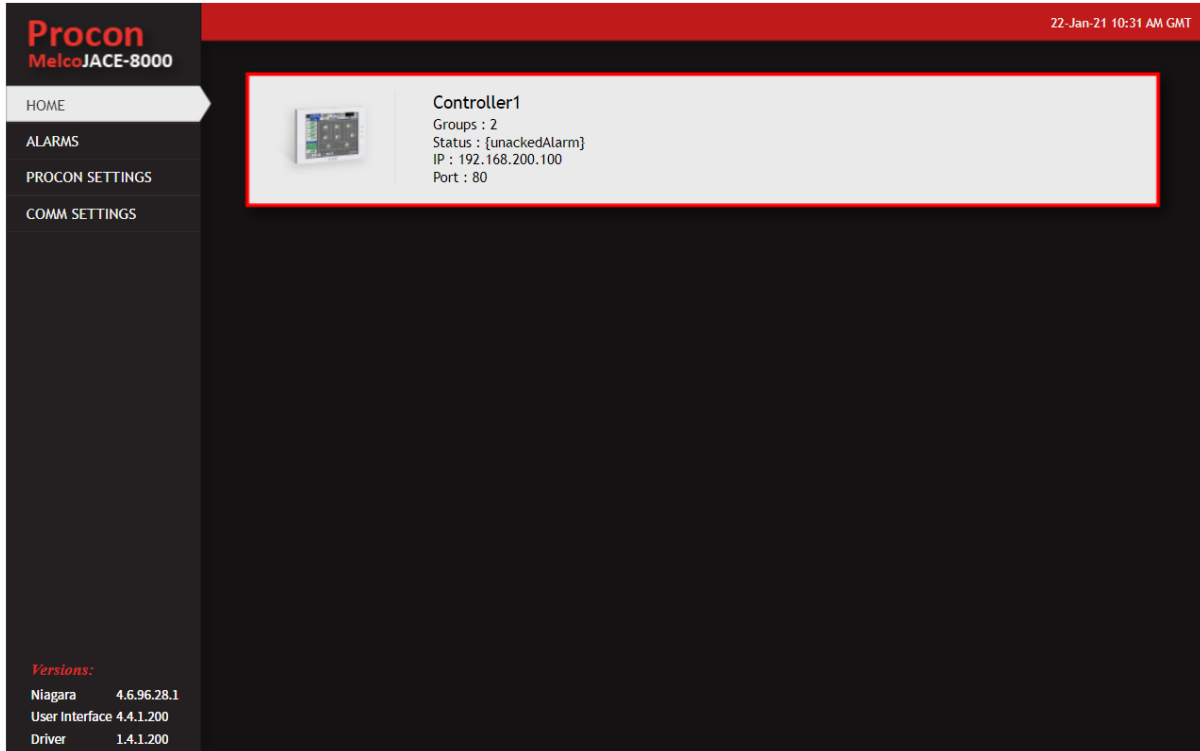


This feature is only available when the optional **Global Commands** feature has been purchased with the MELCO JACE. If this feature is unavailable, the various Global Commands features on the page will be disabled / greyed out.



Reset Mode, **Reset Fan** and **Reset Setpoint** carry out their operations using, respectively, the **Default Mode**, **Default Fan Speed** and **Default Temp** values that are part of the ProconNetwork component - these defaults can only be modified via the Niagara workbench (see the **System Defaults** section later in this document).

Home - After controller discovery



After the controller has been successfully added in **PROCON SETTINGS**, open the **HOME** page. The controller will now appear here. The **HOME** page will offer overview information on each of the controllers.



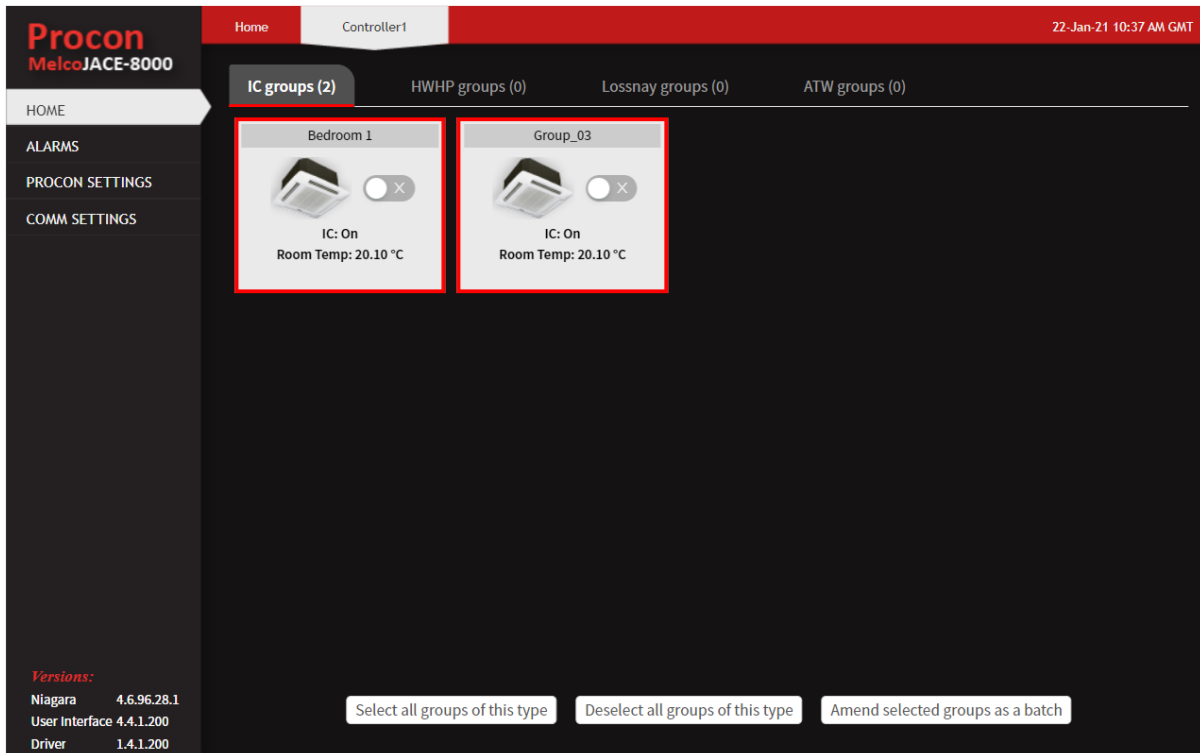
GREEN BORDER: A green box surrounding the controller signals the controller has no alarms.

RED BORDER: A red box surrounding the controller signal the controller has alarms that need actioning.

For more information about alarms please see the 'Alarms in workbench' section of the manual. The alarm console in the graphics view has identical functionality to that of the Niagara workbench alarm console.

Group Status Page

The group status page allows for quick referencing of the status of all groups in a particular Centralised Controller. To access this page, click on the desired Centralised Controller on the home page. A summary page will open as shown below:



Groups are divided into four different tabs based on their type:

- IC: Indoor Unit (VRF or M-Series)
- HWHP: Hot Water Heating Pumps (only type CEh)
- Lossnay: Lossnay or OA processing units
- ATW: Air-To-Water hex or booster units

Each tab title shows how many groups exist of that type.

By default, the **IC groups** tab is displayed first.

If any groups appear to be missing, please refer to the FAQ which covers common addressing reasons that prevent the MELCO JACE from supporting some groups. See also the **Preview discoverable groups** section.

Each group will display a status via a Green or Red border indicating whether that group has any active alarms. The temperature is also displayed when known. Groups of type IC additionally display whether they are ON or OFF.

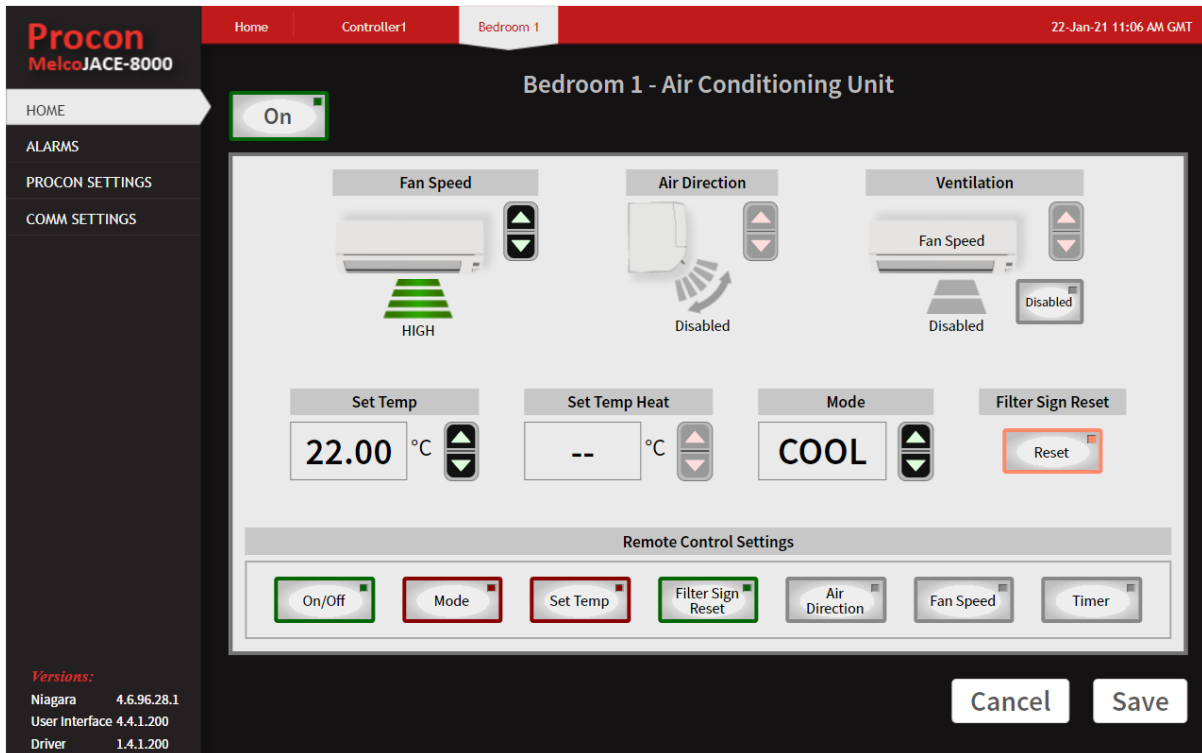
Whilst this page is displayed, the software will query the Mitsubishi controller every 5 seconds for the latest on/off status, alarm condition and room temperature (if relevant to that group type) for all groups in the selected tab.

Changing Individual Group Settings

To change the settings of an individual group, click the appropriate tab on the **Group Status Page**, hover over the group until the cursor changes to a magnifying glass, then click:



This will open the settings for the selected group, as shown below:



The group name is displayed at the top of the page. Settings are changed using the up/down buttons (e.g. for temperatures and enumerated values) and the status buttons with coloured border and inset LED (e.g. for on/off setting, remote control and filter sign management).

Only the settings that are available on the AC units in the selected group will be accessible. Settings that aren't adjustable will be greyed out. This is dictated by the model of AC unit and cannot be altered. For UK based systems Dual Set Point (DSP) will not be available so Set Temp Heat cannot be changed.

Whilst this page is displayed, the software will query the Mitsubishi controller for the latest values of this group's settings every 5 seconds and will update the screen immediately UNLESS the user happens to be making adjustments at the same time (for example, has clicked the 'up arrow' button to increase the setpoint temperature). If such adjustments are in progress, the software will wait for 15 seconds; in that time, if the user does not

submit the adjustment by clicking 'Save' (or abandon the adjustment by clicking 'Cancel' or moving to another screen), the adjustment will be automatically cancelled, a brief warning will be displayed to that effect, and the software will revert to the usual process of updating the screen every 5 seconds with the latest values.



Adjustments are only carried out when the user clicks 'Save'. Clicking 'Cancel' returns the user to the Group Status Page without making any modifications.

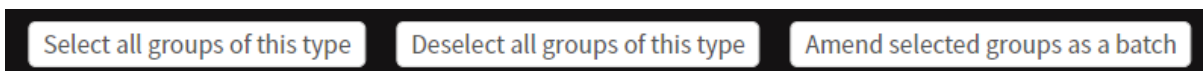
Changing Multiple Group Settings

It is also possible to select multiple groups as a batch and make the same adjustments to each of the groups in that batch as one save action. Selected groups must all come from the same tab on the **Group Status Page**.

To select a group to be included for batch settings adjustment, click the appropriate tab on the **Group Status Page**, hover over the slider for the required group until the cursor changes to a finger pointer, then click the slider; the slider will become ticked and the group background shaded:

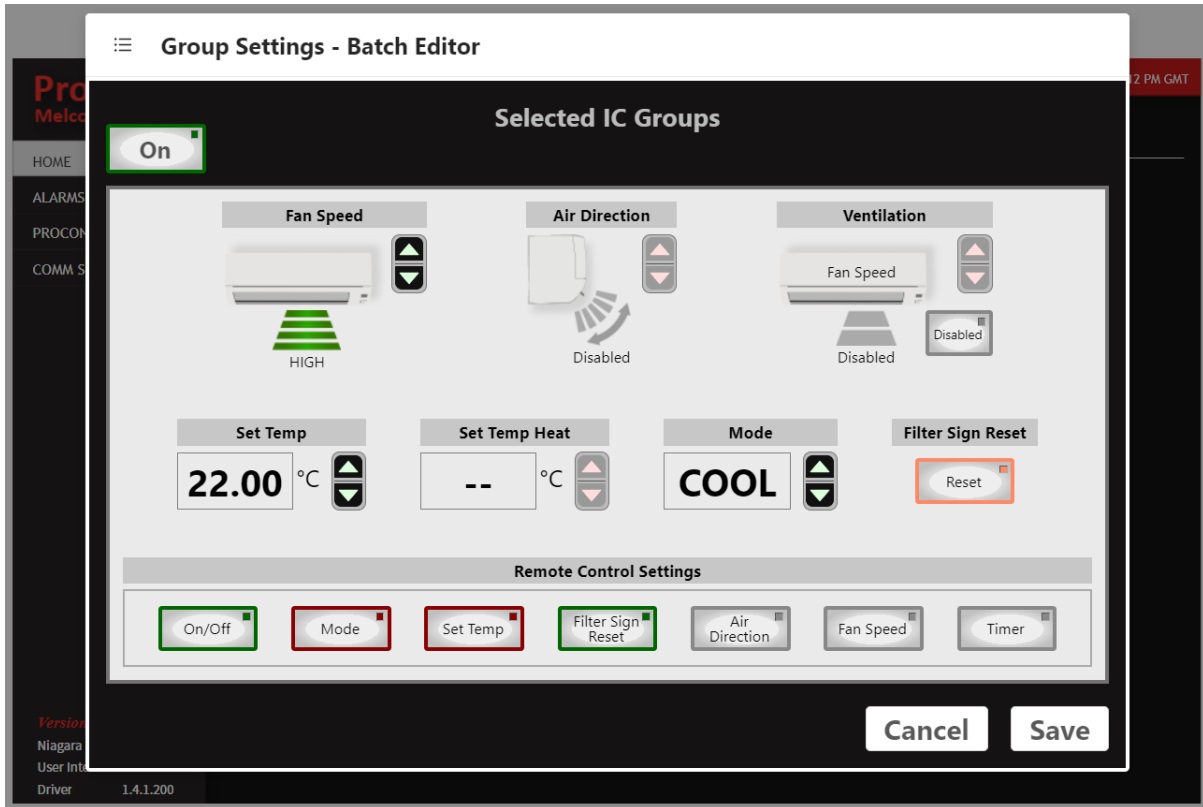


As a convenient shortcut, all groups on the page can be selected at once by clicking the **Select all groups of this type** button, or deselected by clicking the **Deselect all groups of this type** button; both buttons are at the foot of the page:



Once all required groups are selected, click the Amend selected groups as a batch button; note that at least one group must be selected for this to be operative.

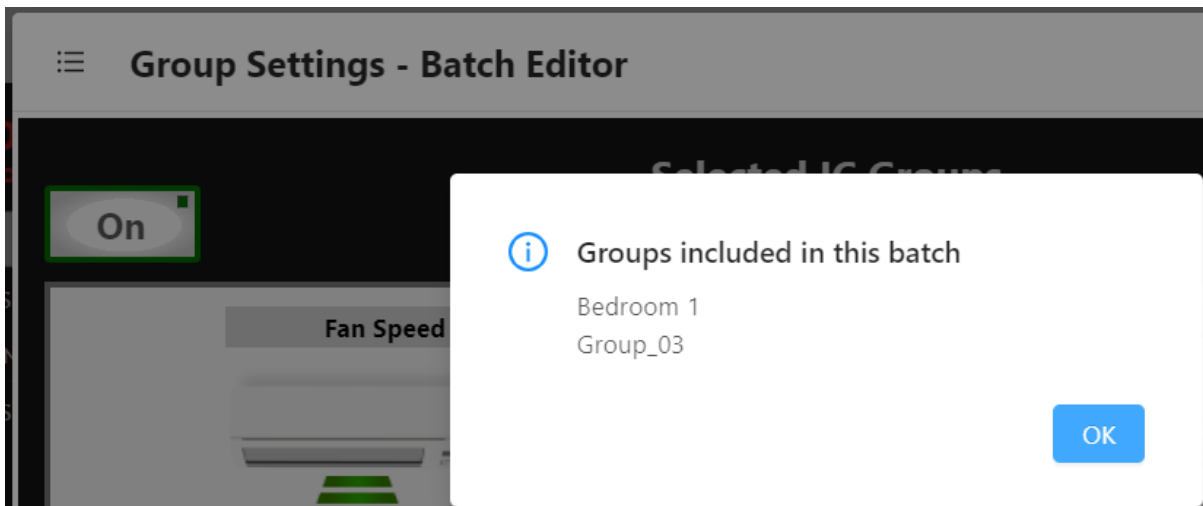
The **Group Settings - Batch Editor** popup will now appear as follows, displaying only those settings which are applicable to the selected group type, and showing values based on the first group in that type:



In case a reminder is needed of the groups that were selected, click the menu icon at the top left-hand corner of the popup:



This will list the group names selected in the current batch:



Click **OK** to close the list of group names and return to the **Group Settings - Batch Editor**.

Settings are changed using the up/down buttons (e.g. for temperatures and enumerated values) and the status buttons with coloured border and inset LED (e.g. for on/off setting, remote control and filter sign management).

Only the settings that are available on the AC units in the selected group will be accessible. Settings that aren't adjustable will be greyed out. This is dictated by the model of AC unit and cannot be altered. For UK based systems Dual Set Point (DSP) will not be available so Set Temp Heat cannot be changed.

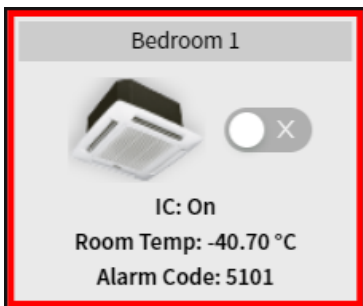


Adjustments are only carried out when the user clicks 'Save'. Clicking 'Cancel' returns the user to the Group Status Page without making any modifications.

Alarms

| Info | Timestamp | Source | Message Text | Source State | Priority |
|--------------------------|---------------------------|--------------------------|--------------|--------------|----------|
| <input type="checkbox"/> | 22-Jan-21 12:39:30 PM GMT | Controller1 Group_03 | | Offnormal | 255 |
| <input type="checkbox"/> | 22-Jan-21 12:39:30 PM GMT | Controller1 Bedroom 1 | | Offnormal | 255 |
| <input type="checkbox"/> | 21-Jan-21 1:13:57 PM GMT | ProconNetwork OfficeDemo | Ping Success | Normal | 255 |
| <input type="checkbox"/> | 14-Jan-21 1:03:32 PM GMT | Groups Group_03 | Ping Success | Normal | 255 |
| <input type="checkbox"/> | 14-Jan-21 1:03:32 PM GMT | Groups Bedroom 1 | Ping Success | Normal | 255 |
| <input type="checkbox"/> | 07-Jan-21 5:30:20 PM GMT | FreeContactsDeviceExt 1 | Ping Success | Normal | 255 |
| <input type="checkbox"/> | 07-Jan-21 5:30:20 PM GMT | FreeContactsDeviceExt 3 | Ping Success | Normal | 255 |

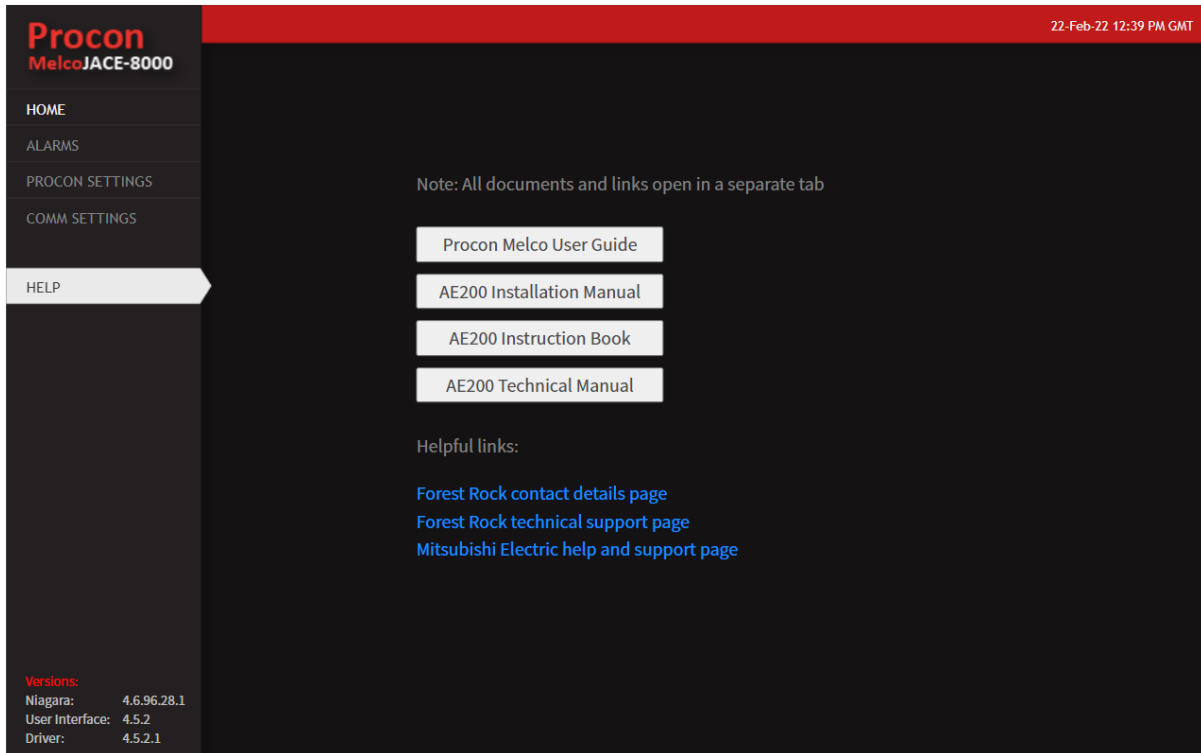
All alarms triggered by the AC units are stored in the alarms page. On the Group Status Page, alarms are also indicated by a red border around the unit and, if available, an alarm code, for example:



Once triggered an alarm will appear in the alarm console and stay there until it is acknowledged. This is true even if the unit that has generated the alarm has returned to a working state. In this case the alarm will appear as 'UnAcked' and requires the user to right-click and acknowledge the alarm in order to clear it from the list. This feature ensures that faults can be picked up even if they only happen for a short period in the middle of the night.

Help

MELCO provides a number of items to assist the user whilst configuring the system, and these are available by clicking the 'Help' menu item on the left-hand side of any screen; this displays the following page:



Each of the four buttons open up a separate tab with the contents of the given manual or guide; the first of these is the user guide you are reading now, and the others are various Mitsubishi technical documents. These documents are all embedded into the MELCO software so do not require a connection to the Internet.

The three links take you to support pages hosted by Forest Rock or Mitsubishi and therefore require an Internet connection.

Workbench Engineering

Introduction

The MELCO JACE can also be accessed via the Niagara 4 workbench software, and more advanced users may wish to access it in this way.

However, although the MELCO JACE has been designed with this capability in mind, please be aware that it is possible to delete and/or break parts of the software if you are unfamiliar with workbench. Only engineers who have completed the Niagara 4 TCP training, and are familiar with how the Mitsubishi Centralised controller works, should configure the system in this way.

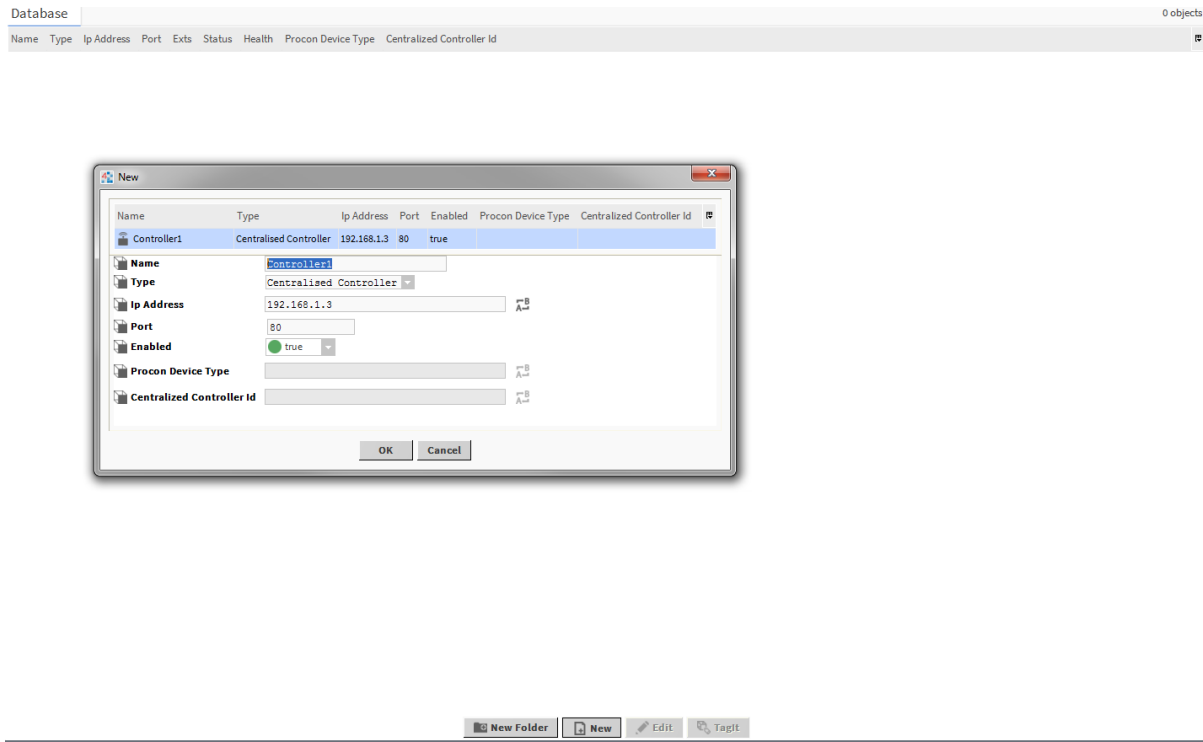
Connecting to the MELCO JACE

You will need to have a licensed copy of Niagara 4 installed your local machine. We recommend Niagara 4.6 as this is what the MELCO JACE is commissioned with. Platform/Station credentials will have been supplied with your purchase.

1. Open Niagara 4 Workbench
2. Connect to the MELCO JACE platform (default IP 192.168.1.140)
3. Go to the application director and check that the ProconMelcoStation is running
4. Connect to ProconMelcoStation
5. Navigate to the ProconNetwork located under: Config -> Drivers

Adding a Centralised controller into the PROCON network

Right click on the ProconNetwork and open Procon Device Manager view. Add Centralised Controllers to the ProconNetwork by using the 'New' button in the device manager. Here you will have the option to add multiple Centralised controllers by changing the 'number to add' after clicking 'New'.



The **New** dialog popup appears. The type of controller is predefined as a **Centralised Controller**. In the fields below provide a valid name and IP Address for the Mitsubishi Centralised Controller you are connecting to. If adding multiple Centralised Controllers you will need to select each individually to set the IP address. The default port 80 should be used throughout.

In this example one new device is now added into the database:

| Database | | | | | | | | |
|-------------|------------------------|-------------|------|------|--------|----------------------------|--------------------|---------------------------|
| Name | Type | Ip Address | Port | Exts | Status | Health | Procon Device Type | Centralized Controller Id |
| Controller1 | Centralised Controller | 192.168.1.3 | 80 | | [ok] | Ok [04-Oct-17 3:09 PM BST] | AE-200E | 1 |

Right click and access the property sheet of the device. We recommend using the AX property sheet view:

Property Sheet

Controller1 (Centralised Controller)

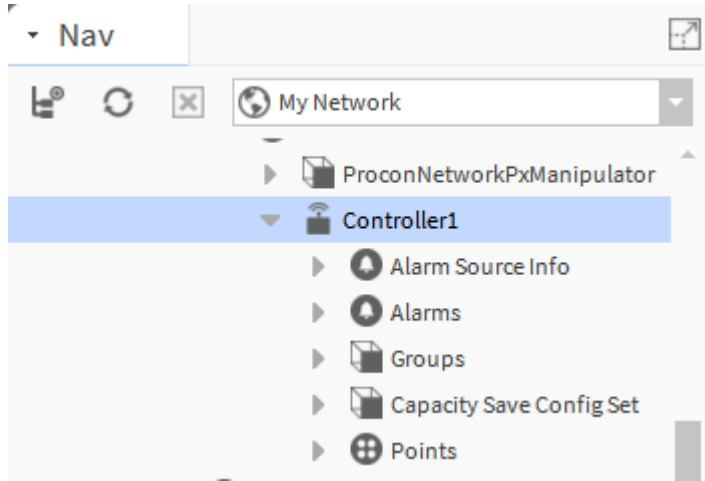
- Status: {unackedAlarm}
- Enabled: true
- Fault Cause: [Empty field]
- Health: Ok [22-Jan-21 1:12 PM GMT]
- Alarm Source Info: Alarm Source Info
- Ip Address: 192.168.200.100
- Port: 80
- Procon Device Type: AE-200E
- Mnet Address: 000
- Centralized Controller Id: 1
- Controller Has Alarms: false
- Alarms: C C Alarm Device Ext
- Groups: Group Ext
- Celsius: true
- Disable Action From UI: false
- Dual Set Point: false
- Set Dual Set Point Once: false
- Set Single Set Point Once: false
- Capacity Save Config Set: Capacity Save Config Set
- Points: Centralised Controller Point Device Ext
- PxView: Px View

This page shows information about the model and status of the centralised controller, and can be used to make some changes to the settings.

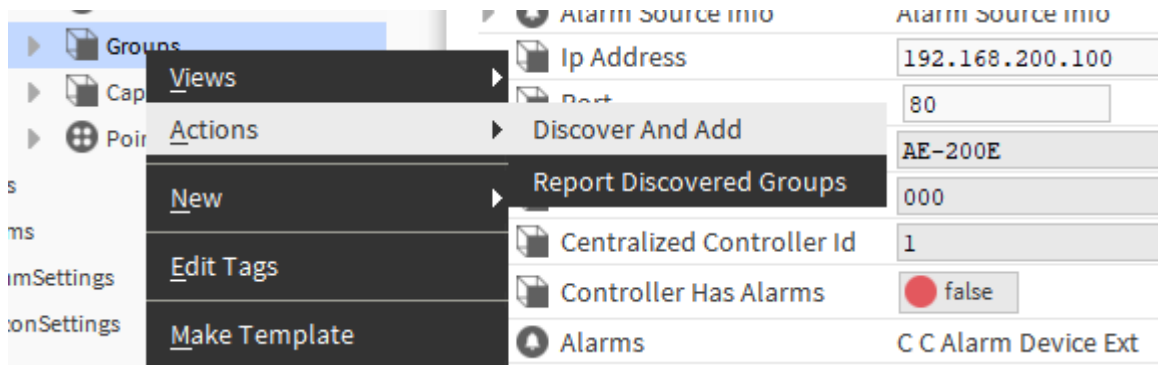
The default temperature unit is Celsius. This can be changed to Fahrenheit by changing the 'Celsius' field to False.

Group Discovery

After adding a Centralised Controller to the database, navigate to it in the Nav bar (on the left-hand side of the workbench) and click on the triangular nav icon to open up its contents:



Right-click the **Groups** container and navigate down to the **Actions** menu as follows:



Click **Discover And Add** to search for and automatically add all available AC unit groups into the controller's **Groups** container. Refer to the FAQ for all conventions that AC units/groups must follow in order to be discoverable.

On discovery of each group, the driver also automatically generates and adds the control points relevant to that group. The progress of discovery is logged in the Application Director console as long as a minimum of INFO logging has been configured:

```
INFO [13:55:36 22-Jan-21 GMT][procon.Controller1] Group discovery: number=1,
webname=Bedroom 1, name=Bedroom 1, model=IC, OC=51, valid=true

INFO [13:55:36 22-Jan-21 GMT][procon.Controller1] Group discovery: number=3,
webname=Bedroom 1, name=Group_03, model=IC, OC=, valid=true
```

Px Manipulator

Once the group discovery process is completed open the PROCON Controller palette, and add a **ProconNetworkPxManipulator** object to the the drivers section of the station if it is not already present. Right click **Actions** and trigger the **Run Procon Network Px Manipulator** action. This will generate all the graphics and px views needed for the graphical browser representation of the controllers.



The ProconNetworkPxManipulator action **must** be triggered every time:

- Groups have been re-discovered
- Group Descriptions have been modified
- Controller Name has been changed

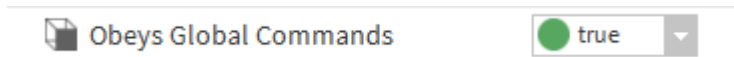


The Celsius setting can be changed at any time, however a group re-discovery must be performed after the change is made.

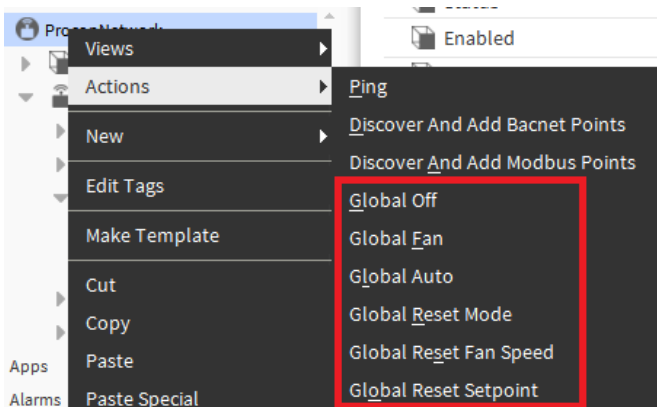
Global Commands

If installed, the **Global Commands** option is a time-saving feature allowing all discovered PROCON units to be adjusted using one central write operation. For example, one operation can turn all discovered units On or Off to reduce energy consumption during peak grid periods; another operation can change the mode of all discovered units; and so on.

The user can select which groups are included in/excluded from any global command operations. This is done by setting the **Obeys Global Commands** value available in the Niagara workbench property sheet for each group:



Actions in the right-click menu of the ProconNetwork component can then be used to trigger the various operations:



This feature is only available when the optional **Global Commands** feature has been purchased with the MELCO JACE. If this feature is unavailable, the various Global Commands features on the page will be disabled / greyed out.



Reset Mode, **Reset Fan** and **Reset Setpoint** carry out their operations using, respectively, the **Default Mode**, **Default Fan Speed** and **Default Temp** values that are part of the ProconNetwork component - these defaults can only be modified via the Niagara workbench (see **System Defaults** below).

Max Capacity Save

The max capacity save feature allows Energy saving / Load shedding by setting a maximum specific energy consumption for Procon units on a specific centralised controller. Please note that this is an additional feature that requires an additional license.

To set this, navigate to the property sheet of the Centralised Controller, and open the property sheet for 'Capacity Save Config'. From here select the required AC units using their OCU address, and then set the corresponding maximum Capacity. The capacity is set as a percentage of the units total unrestricted power, and can be set between 60% and 99% as seen below:

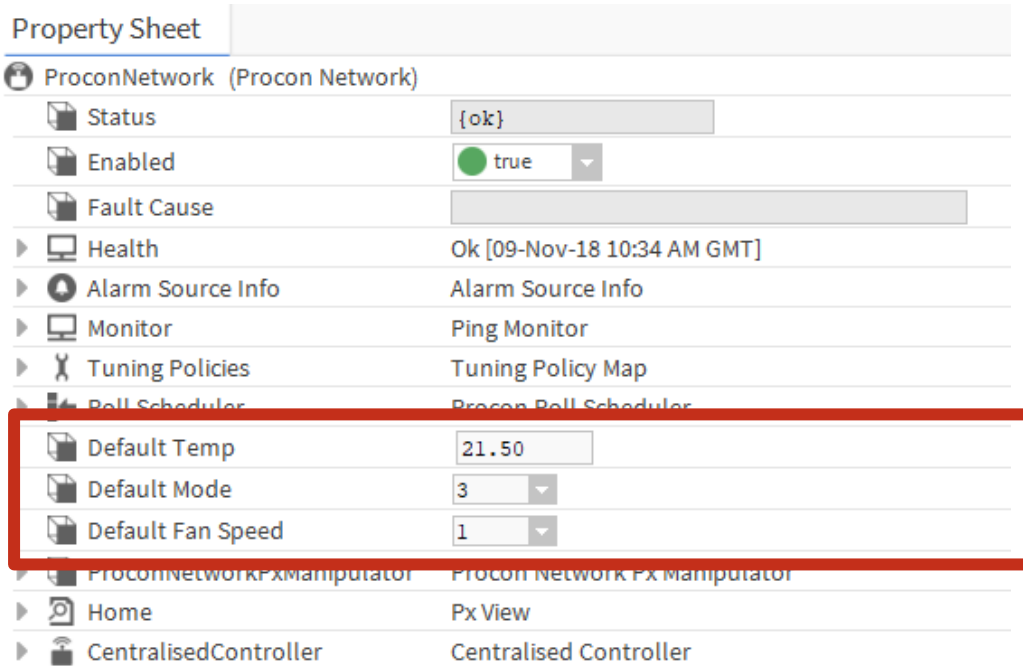
| Property Sheet | | |
|--|-------------------------------|---------------------------------|
| Capacity Save Config1 (Capacity Save Config) | | |
| Capacity Save Item1 | OCU Address (51-100 or None): | 51 % Max Capacity (60-99): 65 |
| Capacity Save Item2 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |
| Capacity Save Item3 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |
| Capacity Save Item4 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |
| Capacity Save Item5 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |
| Capacity Save Item6 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |
| Capacity Save Item7 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |
| Capacity Save Item8 | OCU Address (51-100 or None): | None % Max Capacity (60-99): 60 |

OCU Address (51-100 or None) dropdown menu options: None, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64

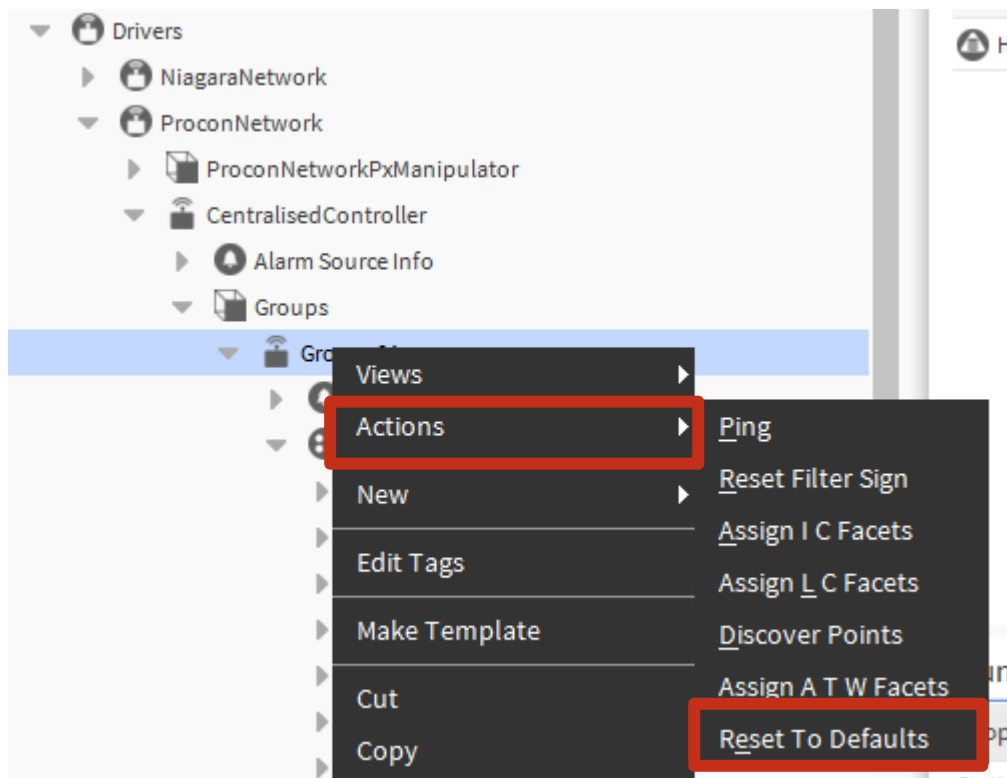
A minimum capacity of 60% must be maintained for each AC unit.

System Defaults

Default temperature and mode parameters can be set in the Property Sheet of the ProconNetwork.



The settings for an individual unit can be overridden by a room occupant from the touch panel. When the occupant leaves, the unit can be reset back to the default by right clicking on the relevant **group** and selecting the 'Reset to Defaults' action.



Points

The image below shows the point database of an AC unit within workbench. This is found under the points folder of the device.



| Name | out |
|--------------------|----------------------------------|
| OnOff | OFF [ok] @ def |
| CommonAlarms | OFF [ok] |
| SetTempCool | 22.00 °C [ok] @ def |
| SetTempHeat | 5.00 °C [ok] @ def |
| SetTempSetbackCool | 19.00 °C [ok] @ def |
| SetTempSetbackHeat | 4.50 °C [ok] @ def |
| Mode | AUTO [ok] @ def |
| FanSpeed | HIGH [ok] @ def |
| AirDirection | VERTICAL [disabled, stale] @ def |
| FanSpeedLossnay | HIGH [disabled, stale] @ def |
| OnOffLossnay | OFF [disabled, stale] @ def |
| RoomTemp | 20.10 °C [ok] |

Description of points

OnOff - Boolean Writable - Turns AC group ON/OFF

CommonAlarms - Boolean Point - reflects the alarm state of an AC group. The driver considers Filter Sign as an alarm.

SetTempCool - Numeric Writable - reflects the AC unit Set temperature. If single set point mode is used then SetTempCool is common for cool mode and heat mode. If dual set point is enabled then SetTempCool is used for setting the temperature for cool mode only.

SetTempHeat - Numeric Writable - reflects the AC unit Set temperature for heat mode. Enabled only when the dual set point is enabled.

SetTempSetbackCool - Numeric Writable - reflects the AC unit Set temperature for setback-cool mode. Enabled only when the dual set point and setback mode is enabled.

SetTempSetbackHeat - Numeric Writable - reflects the AC unit Set temperature for setback-heat mode. Enabled only when the dual set point and setback mode is enabled.

Mode - Enum Writable - reflects the AC unit operation mode.

FanSpeed - Enum Writable - reflects the AC unit fan speed mode.

AirDirection - Enum Writable - reflects the AC unit air direction mode. Enabled only when the AC unit supports this feature.


































FanSpeedLossnay - Enum Writable - reflects the AC unit Lossnay fan speed mode. Enabled only when the AC unit supports this feature.

OnOffLossnay - Boolean Writable - reflects the Lossnay ventilation On/Off. Enabled only when the AC unit supports this feature.

RoomTemp - Numeric Point - reflects the inlet temperature.

Group properties

The property sheet of each group, including its **Remote Control Settings** property collection, allows various aspects of the group to be adjusted, for example:

| Property Sheet | |
|---|--|
|  Bedroom 1 (Group) | |
|  Status | <input data-bbox="742 465 1029 504" type="text" value="{unackedAlarm}"/> |
|  Enabled | <input checked="" type="radio"/> true <input type="radio"/> |
|  Fault Cause | <input data-bbox="742 564 1313 602" type="text"/> |
|   Health | Ok [22-Jan-21 4:44 PM GMT] |
|   Alarm Source Info | Alarm Source Info |
|   Points | Group Point Device Ext |
|  Group Description | <input data-bbox="742 757 1313 795" type="text"/> |
|  Group Number | <input data-bbox="742 801 949 840" type="text" value="1"/> |
|  Group Name | <input data-bbox="742 846 1313 884" type="text" value="Bedroom\$201"/> |
|  Group Model | <input data-bbox="742 891 1313 929" type="text" value="IC"/> |
|  Group Type Enum | <input data-bbox="742 936 821 974" type="text" value="IC"/> |
|  Group Sub Model | <input data-bbox="742 981 1313 1019" type="text"/> |
|  O C Model | <input data-bbox="742 1025 1313 1064" type="text" value="OC"/> |
|  O C Address | <input data-bbox="742 1070 1313 1108" type="text" value="51"/> |
|   Alarms | Group Alarm Device Ext |
|  Alarm Code | <input data-bbox="742 1164 1313 1202" type="text" value="5101"/> |
|   Devices | Group Device Ext |
|  Temperature Increment | <input data-bbox="742 1254 1313 1292" type="text" value="0.5"/> |
|  Filter Sign | <input checked="" type="radio"/> On <input type="radio"/> |
|  Legacy Uses Lower Cool Dry Limit | <input type="radio"/> false <input checked="" type="radio"/> |
|  Obeys Global Commands | <input checked="" type="radio"/> true <input type="radio"/> |
|   Remote Control Settings | Remote Control |
|  Drive On Off Control | <input checked="" type="radio"/> Allowed <input type="radio"/> |
|  Operation Mode Control | <input type="radio"/> Prohibited <input checked="" type="radio"/> |
|  Set Temperature Control | <input type="radio"/> Prohibited <input checked="" type="radio"/> |
|  Filter Sign Reset Control | <input checked="" type="radio"/> Allowed <input type="radio"/> |

Description of group properties

N.B. The list below are properties, not control points

Group Description - Writable String - can be used to give the group some meaningful context (e.g. geographical location) above and beyond the group name itself.

Group Number - Read-Only Integer - the number of this group as registered with the centralised controller.

Group Name - Read-Only String - the name PROCON MELCO creates for this group, either based on the web name registered with the centralised controller, or compiled from the string **Group_** plus the two-digit group number.

Group Model - Read-Only String - the code M-Net assigns as the type of this group.

Group Type Enum - Read-Only Enum - the **Group Model** as a Niagara enumerated value.

Group Sub Model - Read-Only String - the code which M-Net sometimes uses to sub-divide particular group model types.

OC Model - Read-Only String - the outdoor unit type associated with this group.

OC Address - Read-Only String - the outdoor unit address associated with this group.

Alarm Code - Read-Only String - the alarm code of this group if it is currently in alarm.

Temperature Increment - Read-Only String - the resolution for the temperatures relating to this group (can be 0.5 or 1.0 degrees).

FilterSign - Read-Only Boolean - if **On**, this unit has a filter which needs cleaning.

Legacy Uses Lower Cool Dry Limit - Boolean - If **True**, this is a legacy unit which uses 14 degrees C rather than 19 degrees C as its lower setpoint limit in cooling or drying modes.

Obeys Global Commands - Boolean - If **True**, this unit will obey a global command.

Description of group remote control properties

Under each group is the **Remote Control Settings** component, containing a set of writable boolean properties which determine whether a user is allowed to control different aspects of the AC unit from a remote controller. Note that some properties will not be available depending on the group type.

Drive On/Off Control - if **Allowed**, the user can use the remote controller to turn the unit on or off.

Operation Mode Control - if **Allowed**, the user can use the remote controller to adjust the unit's mode (e.g. heating, cooling, drying, etc.).

Set Temperature Control - if **Allowed**, the user can use the remote controller to adjust the unit's set temperature.

Filter Sign Reset Control - if **Allowed**, the user can use the remote controller to reset the unit's filter sign alarm.

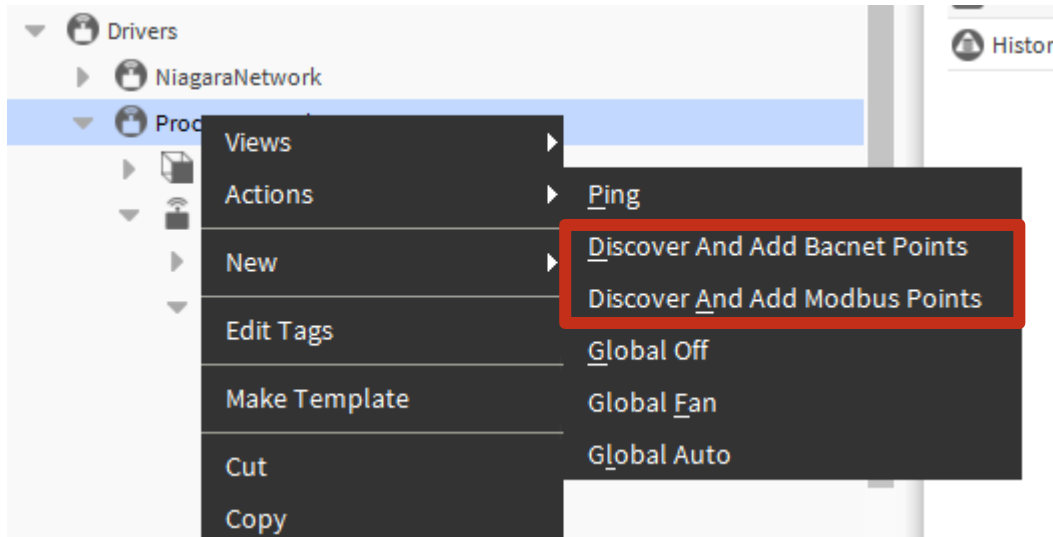
Air Direction Control - if **Allowed**, the user can use the remote controller to adjust the unit's air direction louvre if available.

Fan Speed Control - if **Allowed**, the user can use the remote controller to adjust the speed of the unit's fan if available.

Timer Control - if **Allowed**, the user can use the remote controller to adjust the unit's timer settings if available.

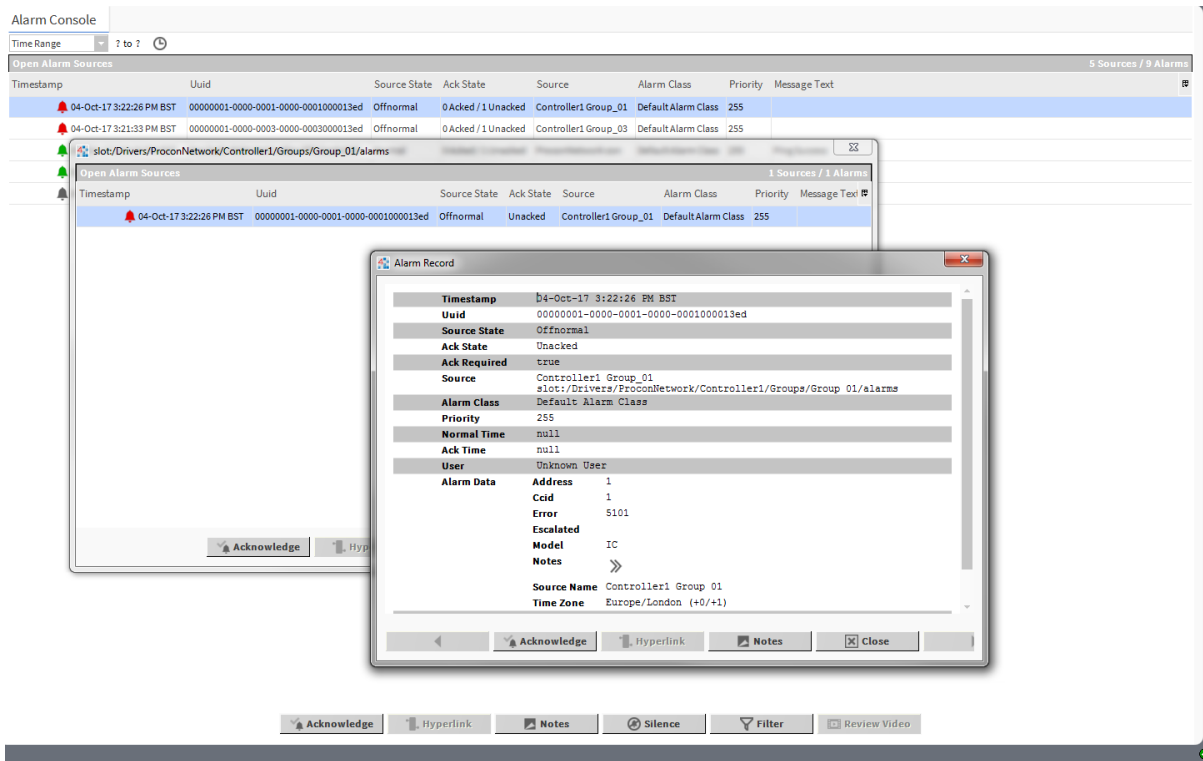
BACNET and Modbus point discovery

After groups are successfully discovered and all points have been added to each group, the PROCON points can be exposed either as BACNET or Modbus points. Right-clicking the Procon network gives the option to export points using either of these protocols.



Each time a group is re-discovered the BACNET / Modbus points must be re-discovered too.

Alarms in the Workbench



Alarms are collected in an Alarm Console where each record corresponds to an AC group that generates an error. The error code and unit address can be viewed in the **Alarm Data Facets**.

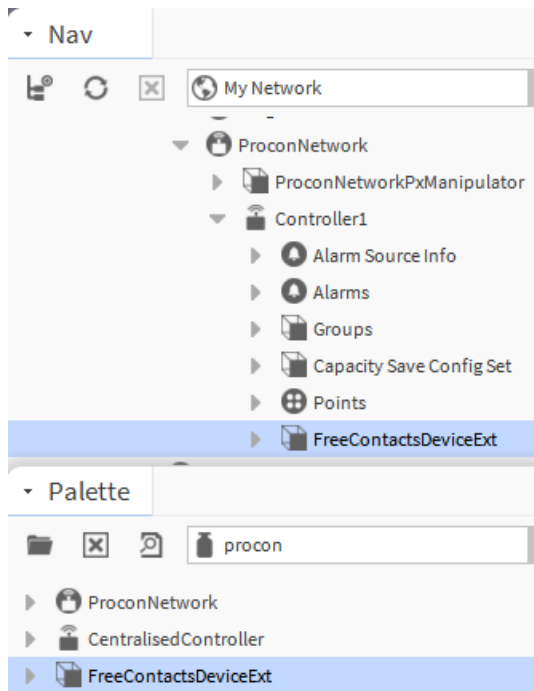
As is standard with all Niagara alarms, once triggered an alarm will appear in the alarm console and stay there until it is acknowledged. This is true even if the unit that has generated the alarm has returned to a working state. In this case the alarm will appear as 'UnAcked' and requires the user the right click and Acknowledge the alarm to clear it from the list. This feature ensures that faults can be picked up even if the only happen for a short period in the middle of the night.

Volt-free Contacts

Adding volt-free contacts

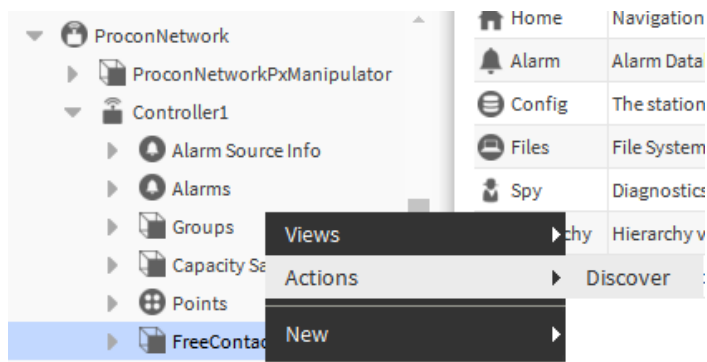
The PROCON MELCO Driver supports reading and writing of volt-free contacts (digital inputs and outputs) when connected to a device that has them.

To add these in workbench start by opening the **procon** palette from the palette side bar, and then drag a copy of FreeContactsDeviceExt from the palette onto the centralised controller that has the volt-free contacts.



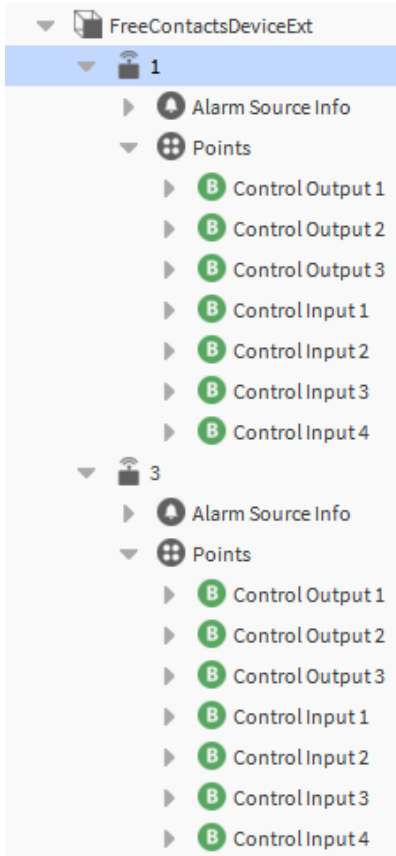
This will add a FreeContactsDeviceExt component to the centralised controller (as shown); this new component is responsible for managing the sets of volt-free contact points.

Next, right-click on the FreeContactsDeviceExt that was added to the centralised controller in the previous step, then click the **Actions** and **Discover** menu items as show below:



This will create an additional ‘free contacts device’ corresponding to each of the centralised controller groups; the name of each free contacts device will be based on the number of the centralised controller group. Additionally, the PROCON MELCO driver will add a set of boolean inputs and outputs to each free contacts device. These points will be enabled only if the associated group supports them; enabled points can now be read and/or written as required.

The following example shows volt-free contact points added for group numbers 1 and 3:



Deleting volt-free contacts

If desired, the user is free to use the Niagara workbench to delete any individual free contacts devices that are not of interest in the station.

Frequently Asked Questions & Common Issues

Discovery Failure - Group Addressing

The most common problem encountered is not being able to discover groups, or only being able to discover some of the groups. It's important to note that the terms 'AC unit' and 'Group' cannot always be used interchangeably. Often they may be as each group only contains one AC unit, in which case each 'Group' is just one 'AC unit', but other times a group will have multiple AC units in it.

The AC units themselves are internally physically addressed, and they need to be addressed in a certain way in order for the software to pick them up. The group numbers in the controller **must** line up with these address's in order to work. As soon as an Address/Group do not line up the software will not pick any further groups up

The table below shows an example where units are split into groups:

| Group | FC Unit (Incorrect Setup) | FC Unit (Correct Setup) |
|-------|------------------------------|----------------------------|
| 1 | 1 | 1 |
| 2 | 2,3 | 2,3 |
| 3 | 4 | -- |
| 4 | 5 | 4 |
| 5 | 6 | 5 |
| 6 | 7 | 6 |
| 7 | 8,9 | 7 |
| 8 | 10 | 8,9 |
| 9 | | -- |
| 10 | | 10 |

- In the incorrect setup column, the software will only pick up the first three units, because they become mismatched from the group number after that.
- In the correct setup the units are addressed to keep the address's in line with the groups. Note that to do this after any group containing multiple units an omission is made to keep everything in line. If you were to group more than two units then further omissions would have to be made to keep group/unit address's matched.

Discovery Failure - Unsupported Group Types

The list of group types supported by the PROCON MELCO driver is as follows:

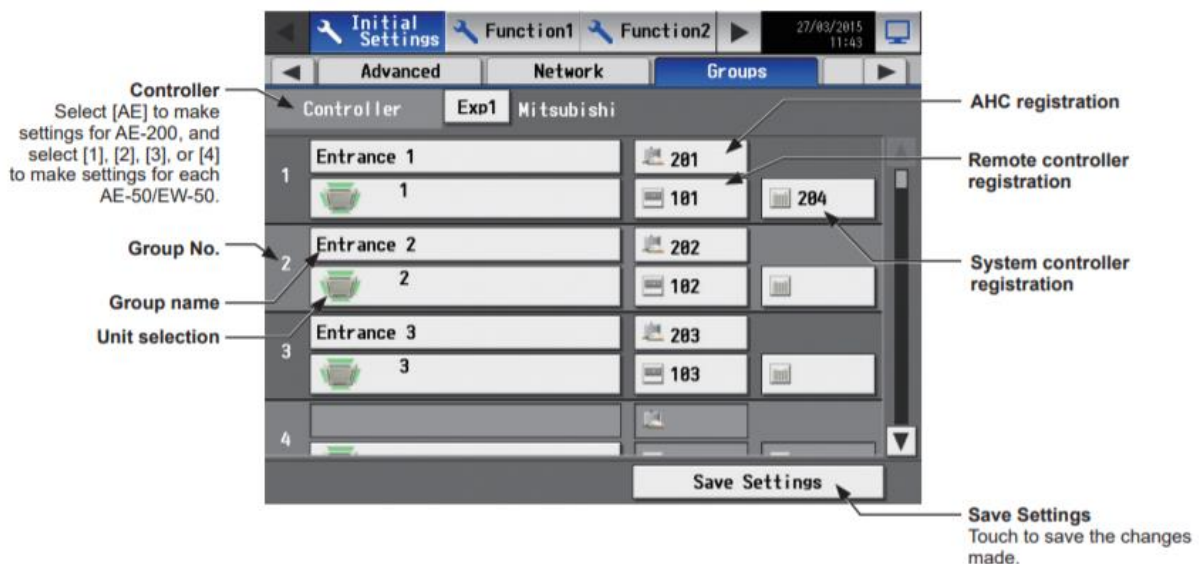
| Group type | Description |
|------------|--|
| IC | Indoor unit (VRF or M-Series) |
| LC | Lossnay ventilation unit with energy recovery |
| BU | Air-To-Water booster unit with compressor for VRF |
| FU | OA processing unit with energy recovery heat exchanger for VRF |
| CEh | Hot water heating pump unit |
| WH | Air-To-Water hex unit without compressor for VRF |

Discovery Failure - Incompatible/Unsupported Firmware

Groups that the user might expect to be supported may not be discovered because of the version of Mitsubishi firmware stored inside the controller or attached unit. This is purely a function of the M-Net protocol and associated layers of Mitsubishi software and is therefore entirely outside the remit of the PROCON MELCO driver; you may need to contact your Mitsubishi Electric support representative for further assistance in this area.

Group naming

When initially setting up a Mitsubishi HVAC system, the engineer has the opportunity of setting a name for each group. For instance, the following diagram shows how this would be done through an AE-200 centralised controller touch screen:



The Mitsubishi equipment itself typically does not impose such a restriction but PROCON MELCO will only recognise and display the above names if they are unique across all groups of a controller. To cater for this, PROCON MELCO uses the following naming mechanism:

1. It refers to the Mitsubishi group name (above) as **group web name**.

2. As well as the **group web name**, PROCON MELCO defines its own **group name** which is used in a Niagara context
3. During discovery, PROCON MELCO will set **group name** to be the same as **group web name** as long as the latter is present and unique. If it is not, **group name** will be set to the text **Group_** plus a two-digit representation of the group number.

In other words, if groups 1, 2 and 3 all have a group web name of 'Ground Floor', the PROCON MELCO discovery will assign group names of 'Ground Floor', 'Group_02' and 'Group_03' to the three groups respectively.

Finally, please recall that Niagara has a mechanism for escaping special characters when they are used in component names to avoid causing issues in other software such as web browsers. For example, 'Bedroom 1' is represented as 'Bedroom\$201'. PROCON MELCO will support the use of special characters in group names for all **typical** usage situations, but please bear in mind that there is a possibility that the Niagara escaped version of a group name may appear.

Using EW-50E as an expansion

It is possible to use an EW50 as expansion units to the AE200 and connect to them using the MELCO JACE. However, there are a few prerequisites for this to work successfully:

- The AE200 has to be the same firmware or higher than the EW50
- The IP addresses have to be different
- The AE200 has to be the lowest of the IP addresses. For example, use the AE200 as .1 and expansions as .2 .3 and so on.
- All devices should use port 80.

Boiler Heat Pump / Any non-supported device in groups

If there is a boiler heat pump in one of the groups it will prevent any groups from being discovered. If working on a site with one of these it will need to be removed from the group in order to enable discovery. This may also be the case for any other devices not listed as officially supported, so if group discovery fails the groups should first be checked for any other devices. These devices should then be removed, and groups rediscovered. Additional devices may be added in future software releases.

Group EnumWritable points



Each air conditioning group typically has at least one enum writable point (e.g. for mode, air direction, etc.). The range facets of these points are specially configured by the Procon Melco runtime module when groups are first discovered; they **MUST NOT** be altered in any way by the user, otherwise correct functioning of the software cannot be guaranteed.