A3 APEX Pro Device Upgrade Procedure

Replacing an APEX controller is often not an easy swap-out procedure. Even though there is the ability to create a backup (from the MISC tab in a local connection), that is often only ideal when reloading the same APEX after a factory reset. Even then, it often will not work when connecting many modules in a daisy chain wiring setup due to potential race conditions causing Address IDs to be unpredictably assigned. For this reason, you must connect ALL modules one by one to guarantee you have the exact same Address ID for the new APEX as now exists in the current APEX. In the case of going from an A2 Apex to an A3 APEX Pro, the built-in Fluid Monitoring module in the A3 Base Unit will guarantee to create a mismatch with IDs no matter what you do. In this situation, there are many manual steps that should be taken before beginning, and many steps during the swap. Follow these steps carefully, in this order, to reduce risk of equipment failure and livestock death.

Saving and protecting the current configuration for disaster recovery

These steps are something that should be done periodically, and whenever you change the configuration or coding environment. Of course, total failure of an Apex controller cannot be anticipated, so if you are following these instructions to replace a dead unit, then it is too late now to take a backup. In that situation you will have no choice but to rebuild the environment from memory. Not a desirable situation.

1) Take a fresh backup of the current APEX configuration if you don't already have one. Even though this may not be helpful in this situation, it is best to save the current configuration as a contingency plan and future use.
    a. Connect to the current APEX with a local connection via a web browser on the same network. http:// <Apex Device Name>.local
    b. If the dashboard on the current APEX immediately opens, then click on the APEX name in upper left corner. Click on "Misc" from the dropdown menu.
    c. From the MISC page, click on the icon in the toolbar area that looks like a box (Hard drive). You will be prompted for a userid and password. This is the Local connection credentials (e.g. Admin 1234), not your Fusion credentials

    If you do not see the gear or box icons, then you did not do this from an APEX local connection. Reconnect locally and try again.
    d. Click on the box and make a local backup. You will use this in the following steps.

2) Take a copy of the current Apex Configuration Summary report and save the entire configuration. This will probably be the most useful tool for migration from non-identical units and setups

This is done by clicking on the current APEX name in the upper left corner of the Dashboard page and, from the menu dropdown, select "Summary". There is an option to save as a PDF but as of my last attempt, this has a flaw and truncates some lines on page breaks. Instead, simply copy all the contents off the screen and paste it to a Word document.

Preparing current operating environment

1) Ensure critical equipment for life support is disconnected from control by APEX when extended off-time would be dangerous (return-pumps, skimmers, lights, flow pumps, chillers, heaters, etc.). NOTE: Disconnecting means BOTH power and control connections. To accomplish this:
    a. Move power plugs to non-APEX controlled power strips and plugs.
    b. Disconnect any Variable Output (0-10v) control wires from connected devices. For some 3rd party devices disconnecting the 0-10v signal wire may not be enough. There may be configuration changes needed on the device itself.

    For current equipment installed, do the following:

    - **ABYZZ A200**: Toggle through the control menu and scroll to the AuxMode setting. It should show “APEX”. Use the "Start/Stop" and "M" buttons to navigate through those menus. At the end it asks you to Activate. Press M to disable. NOTE: Unplugging the signal wire will not work. You must disable the feature on both A200s.
    - **Reef Octo 300 Skimmer**: Disconnect 0-10 signal wire from skimmers controller box.
    - **Chiller**: Plug chiller power plug into independent socket. Control is maintained by an internal thermostat. Remember you do not have any APEX control to shut it down when flow rate drops below minimums, so monitor return pumps and be ready to manually unplug chiller if pumps stop for any reason.
    - **Lights**: Switch all 5 Radion lights back to mobius and setup a temporary lighting cycle
    - **Wave/Flow pumps**: Switch all 6 MP40s back to Mobius with steady 5% Lagoon flow.

2) Disconnect all APEX specialty modules from the current APEX controller (e.g. FMM, MXM, etc.). These modules will be connected to the new APEX after it is online, and the main functions are programmed.

3) Disconnect all DOS pumps from power/control wires. You don’t want anything getting out of control with the dosing. Set plan to do *manual* dosing for items currently controlled by DOS pumps during conversion.

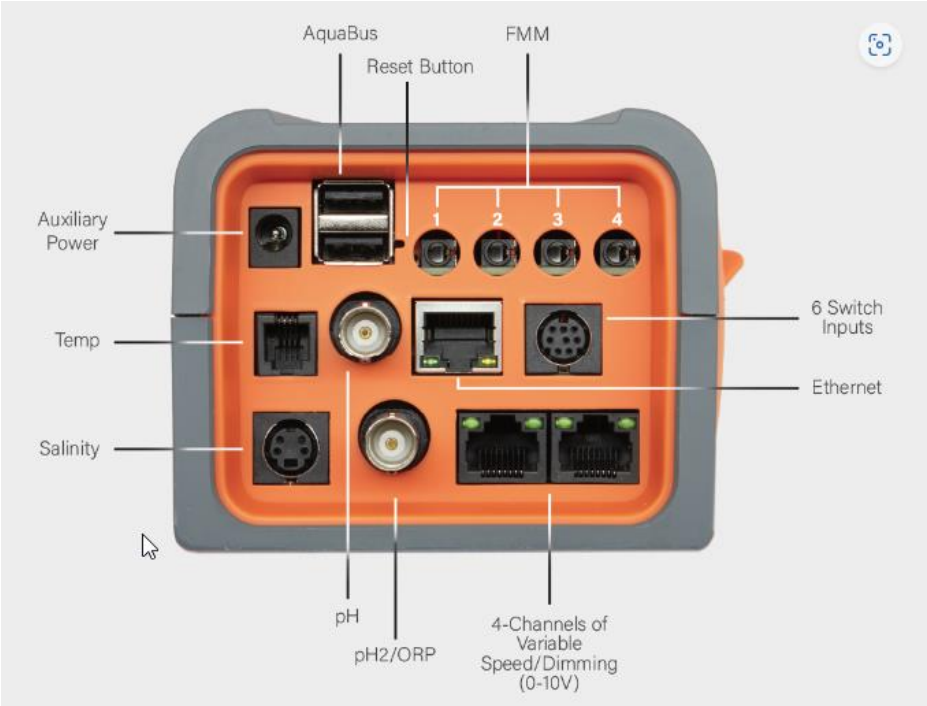
    NOTE: Do *NOT* delete any code or objects from the current Apex configurations when you physically disconnect them. You want to keep as much as possible of the dashboard configuration of the current Apex accessible, so you can reference it as necessary during the migration. You already took a copy of the APEX summary, but being able to view and access the current APEX configuration in Fusion will be extremely helpful. It will also help you rebuild the dashboard as it was before.

Preparing the new APEX

1) Enable and register new APEX controller with the Fusion internet service. Do this from a device that is connected to the internet AND can connect to other devices via Bluetooth. Initial connection is done with Bluetooth not TCP/IP
    a. Open APEX Fusion app and go to the App List page. Press the "Add new Apex" icon and define a new aquarium. This is best done on the same account where the current APEX is running. Do not create a new account for this new APEX unless it is necessary.
2) Load backup from current APEX to the new APEX. NOTE: This will load more than what will be useful, but it will load all existing Profiles, Display Configurations, Variable Outputs, Virtual Outlets, etc. For the module definitions, this may not work because a different Address ID could be created if the modules are added back in a different order. Unfortunately, there is no way to manually assign Address IDs. So, try this first and see what happens. If it makes a mess in the following steps, then reset to factory and start over without loading the backup.

Installing new APEX base unit

1) Remove all connections from the current APEX. Take note of the 0-10 signal wires. There are two and they look identical. You want to install them into the same sockets (Left, Right) in the new unit.



2) Take note if anything undesirable happens. If so, reconnect the current APEX and make additional necessary preparation steps before trying again.

3) Connect an independent power source (12vdc) with the “Auxiliary Power” plug to run the new APEX. We don’t want to connect any Energybars to the new APEX yet. We will leave this connection and get auxiliary power from the Grid even after we install the Energybars. This way APEX can monitor, and report, on any power outages to the Grid. Main power will come from the Energybars which are connected to the Power backup system.

4) With the new APEX powered on, first recreate base settings:
    - LCD Display settings
    - Feeding intervals
    - sound settings
    - time settings
    - Heartbeat, etc.

5) Next, add any defined Profiles in the current APEX. NOTE: APEX comes with default Profiles named PF1-32. They are fixed and cannot be deleted so rename an existing Profile and use it as you need.

6) Next, add the following device connections back to the new APEX. This includes:
    a. Probes
    b. 0-10v signal wires
    c. RJ45 internet plug (if used)
    d. Leave any Aquabus (USB) cables disconnected initially.

7) At this point you should see the probes and 0-10 switches on the dashboard. Rename and program them from the configuration on the current APEX. Do not move the 0-10 signal-controlled devices back to APEX control. You have already determined these devices are critical. Run them outside APEX until the end.

8) With the Base unit objects recreated, next reconnect the USB AquaBus cables to the base unit to bring the Energybars and expansion modules back online.

9) With everything online, go to the Modules page, and rename all Modules to designated names from the Current APEX. There is no code to copy with inputs, just set the name and any configurable parameters.

10) With all modules renamed, now configure all the INPUTS, OUTPUTs, and VIRTUAL OUTPUTS. This is where most of the work will now be. This is also where you want to use the Summary report you created in a Word document. There are many Input, output, and Virtual Outputs, and there will be references in their code pointing to others. This creates a dependency hierarchy to deal with. Instead of trying to figure out which are at the bottom of the hierarchy, just go through the Summary list from top to bottom, one by one, and add the items shown. If one is dependent on another (lower in the list) and preventing you from saving the changes, recreate the lower-level first. Do not cancel what you have done so far, just leave this window as is and open another Fusion window to create the new dependent VIR. After it’s created, switch

back to the other Fusion window, and hit save. This will allow you to stay sequential and ultimately make the recoding faster.

11) After everything is added, build your dashboard as it was before. Then click on each item on the dashboard and reconfirm the setting and code for each is correct with the Summary report.

Final comments:

- This is tedious if it is not a one-for-one swap, and you cannot ensure the modules are given the same exact Address ID.. For an upgrade of the Base controller and/or environment, plan on about 15 work hours. If this is being done as an optional upgrade (and not a hardware crash) then plan accordingly and do this when the time is right.

- Do not remove your old A2 Apex/EL from your APEX Fusion account until after your new A3 Apex has been fully in service for several days. Optionally, you can use the Adopt Data feature available when connecting to LOCAL.

- After a few days remove the current APEX from your APEX Fusion account and initialize it back to factory defaults. Save it as a backup device or sell/give it to someone else.