ALTUS

Technology Workstation Solutions — Powered

clio

Operating Manual

Table of Contents

⚠️

Software Installation Note:

Make sure your cart workstation USB port is connected to the USB port on the MPM Power unit/controller installed in your cart. Download the Powervar MPM View install package, and save it to the workstation desktop (or other convenient location).

To download the latest software go to: http://connectivity.powervar.com/mpm/download.asp.

Select "Install MPMView (Windows XP/Windows 7)" to download.

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Summary of Warnings

! Please read all parts of this guide. When set-up is complete, do not discard guide. Please file guide in secure place for future reference.

⚡ Appropriate airflow is required for this unit to operate correctly under normal and fault conditions.

⚡ Complies with requirements for US for outside the patient environment.

⚡ Only authorized personnel, experienced in servicing electrical equipment should open the power system.

⚡ DO NOT operate the power system without the covers completely installed and the connectors attached properly. The covers provide safety from potentially dangerous voltages and hot temperatures.

⚡ Do not connect or disconnect the system while power is applied. Do not open or in any other manner change the access to the internal portion of the system while power is applied.

⚡ Do not allow the system to come in contact with fluids. Do not operate the system if wet.

⚡ The supplied spiral cord is rated for medical use. Connecting the cord to an outlet that is not medical grade (indicated with green dot) will not ensure grounding protection

⚡ Spiral cord, power system and cart are for INDOOR use only. DO NOT OPERATE OUTDOORS.

⚡ Inspect spiral cord before each use. DO NOT USE CORD IF DAMAGED.

⚡ DO NOT plug more than the specified number of watts into spiral card cord.

⚡ DO NOT run spiral cord through doorways or across walls or floors.

⚡ Fully insert certified detachable spiral cord plug into outlet. DO NOT unplug by pulling on cord. For 250VA models, a type not lighter than SJT 18AWG should be used.

⚡ DO NOT remove, bend or modify any metal prongs or pins of spiral card cord.

⚡ DO NOT use excessive force to make connections.

⚡ Keep spiral cord away from water. DO NOT PLUG CORD INTO OUTLET IF WET.

⚡ Keep children away from spiral cord.

⚡ DO NOT ALLOW CORD TO OVERHEAT.

⚡ DO NOT drive, drag or place objects over spiral cord. Do not stand or walk on spiral cord.

⚡ Breaking the seal on the battery to add water will damage the battery and could cause injury.

⚡ Battery warranty is automatically void when a fully discharged battery is left in an unused state for more than three (3) consecutive days.

⚡ The power system is designed for power cart mounted equipment only. DO NOT connect equipment that is not mounted on the cart into the power system outlets. DO NOT connect cart mounted equipment directly into a power source that is not mounted to the cart. DO NOT disassemble the MPM

♲ Sealed Lead Acid Battery must be recycled.

Lithium Iron Phosphate (LiFe) Battery Disposal
Battery recycling is encouraged. Dispose of in accordance with local, state and federal laws and regulations.

Transportation/Storage
Store this system within a temperature range of 32˚ F - 90˚ F (0˚ C - 32˚ C); Pressure 500 hPa to 1060 hPA; Humidity 20% RH to 95% RH non-condensing.

Cart Disposal
To dispose of this cart using the local guidelines and regulations for waste. Please contact Altus Customer Service for information: 1.888.527.1311

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Product Introduction
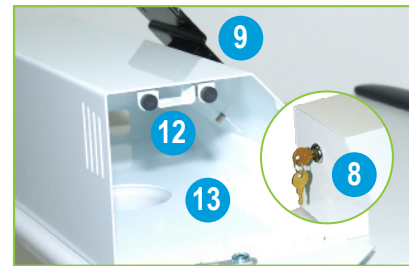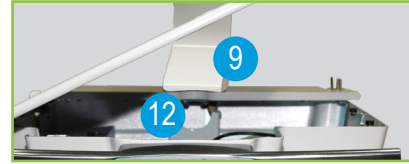
Standard Features:

1. Height Adjustment Column
2. Highly Mobile 4"/100mm Single-Wheel Shrouded Casters
3. Height Adjustment Hand Lever
4. Handle
5. Large Thermofoil Worksurface Area
6. Keyboard Platform
7. Mousing Area
8. Integrated Bar Code Holder
9. LCD Monitor Support
10. RUI
11. Power System & Battery Compartment
12. Internal Technology & Cable Management
13. 3-Outlet Power Cord (not shown)
14. Coiled Power Cord Holder
15. Battery Access Panel (back)
16. Up/Down Button Switch

Keyboard Platform
Adjustment Instructions

1   The keyboard platform is tilted and stored at 90 degrees for shipping purposes only (See Fig. A).

2   To use:

Place both hands on each side of the keyboard platform and simply tilt to desired position and slide-out for use (See Fig. B).

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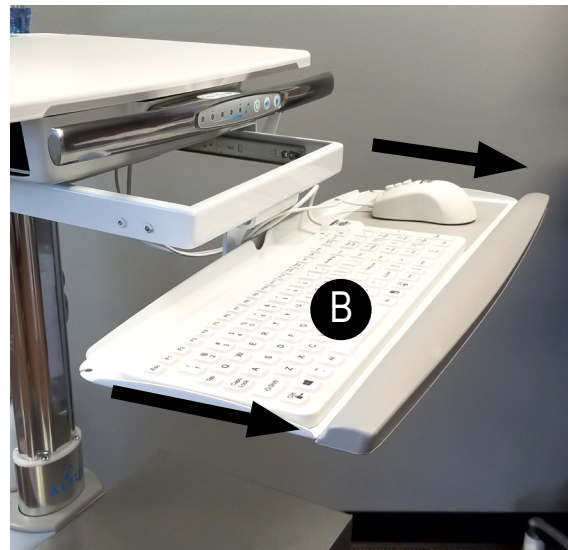
Wired Keyboard and Mousing Routing Installation Instructions

1 Keyboard and Mouse Wire Management
The keyboard platform and mouse tray are equipped with wire managers to keep wires in place (See Fig. A)
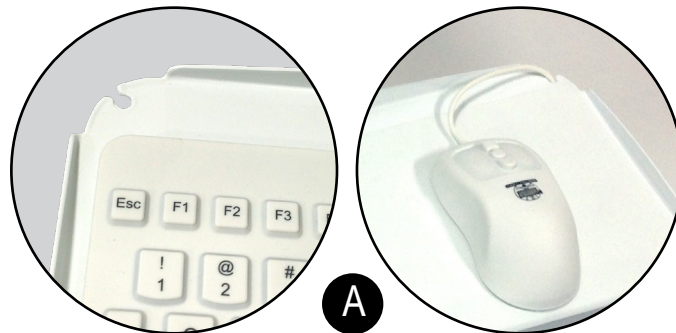
2 Keyboard and Mouse Wire Management to inside of technology storage area
Feed both keyboard and mouse wires through access hole, located under the handle (See Fig. B).

Inside of technology storage area
Once cables are through hole, pull through (See Fig. C). Auxiliary holes (See Fig. C).

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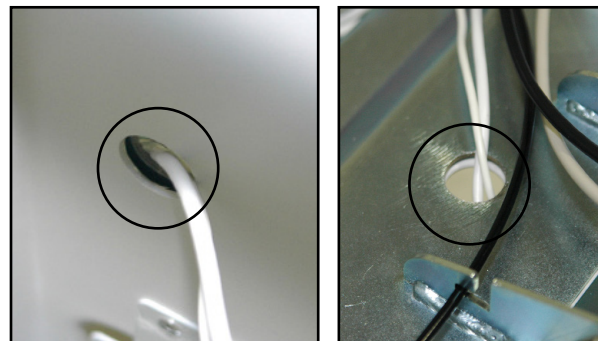
Clio Laptop Stand
(Only on C1 Model)

1   Open surface.

2   Remove "green" shipping tape (located in 4 locations) from Laptop Stand.

3   Remove Laptop Stand.

4   To install all cable into laptop, make sure that all cables are attached to laptop first then connect to appropriate connections within the Clio technology storage area.

When all of cables are managed, place Laptop Stand back into holes in storage area.
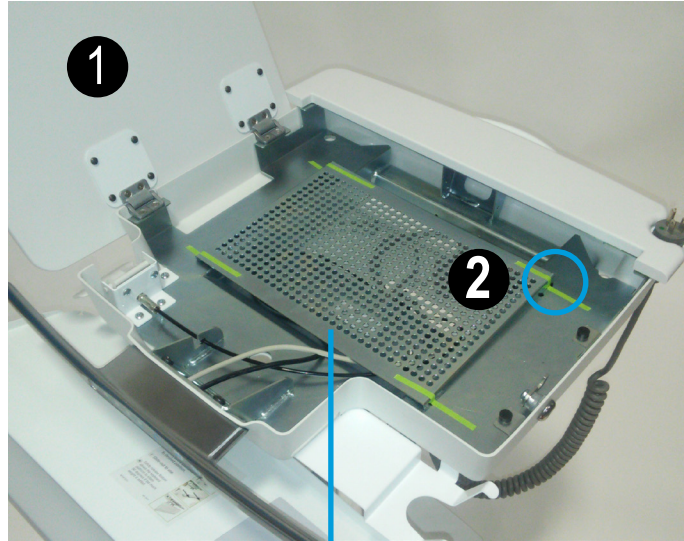
Laptop Stand

Clio Worksurface and LCD Monitor Support
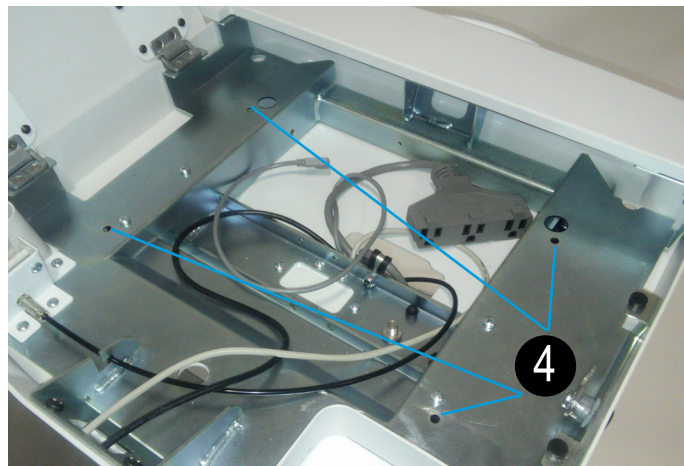
Flat Screen Monitor Support

1 Open front surface.

2 Place Flat Screen Monitor Support through the (2) holes in the rear work surface assembly.

3 Attach (2) 5/16-18" Flange Hex Nuts to bolts underneath the rear work surface assembly. Tighten with 1/2" wrench (preferred)or disposable 1/2" wrench (included).
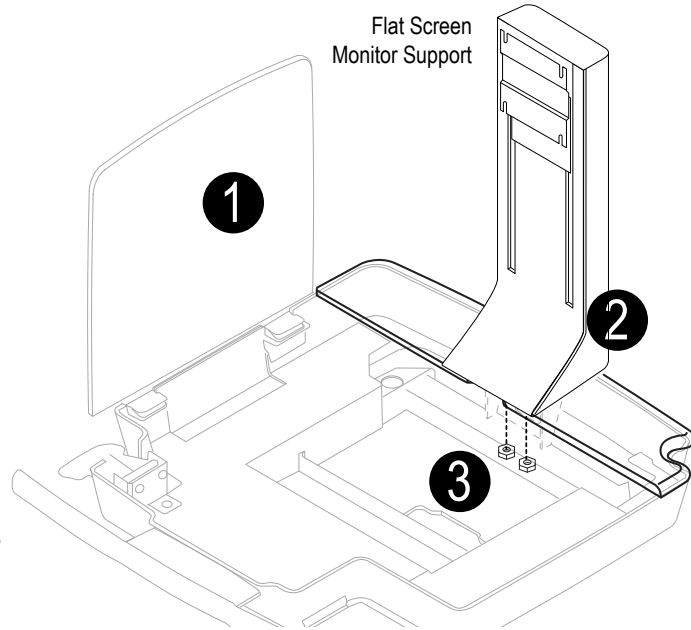
Internal Cable Management

Back Cover

Monitor Support

4 To manage cables within the Monitor Support, remove cover from back of support.

5 Use a #2 Phillips Screwdriver to remove back cover. Do not discard (4) 8 x 5/8 screws.

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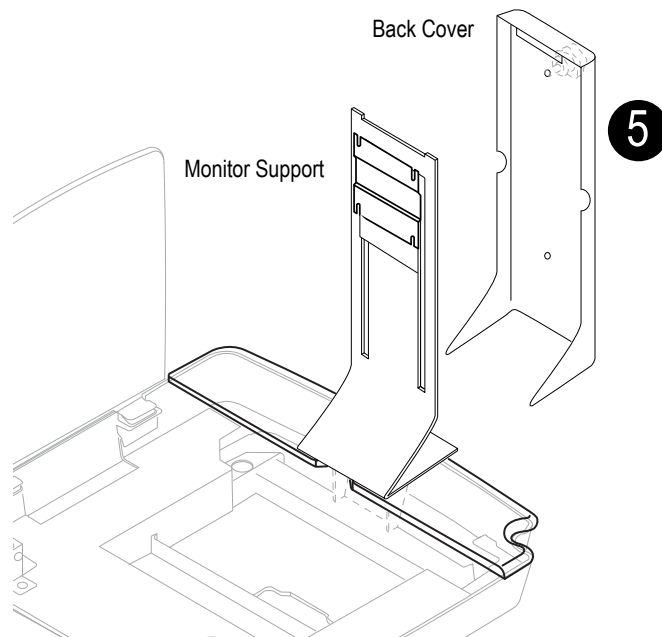
Clio Worksurface and LCD Monitor Support

6 Attach Monitor to VESA Plate using the included (4) Phillips Drive Pan Head Machine Screws.

Choose length of screw by the depth of mounting location on back of monitor. If too long of screw is used, damage to monitor may occur.

6

VESA Plate
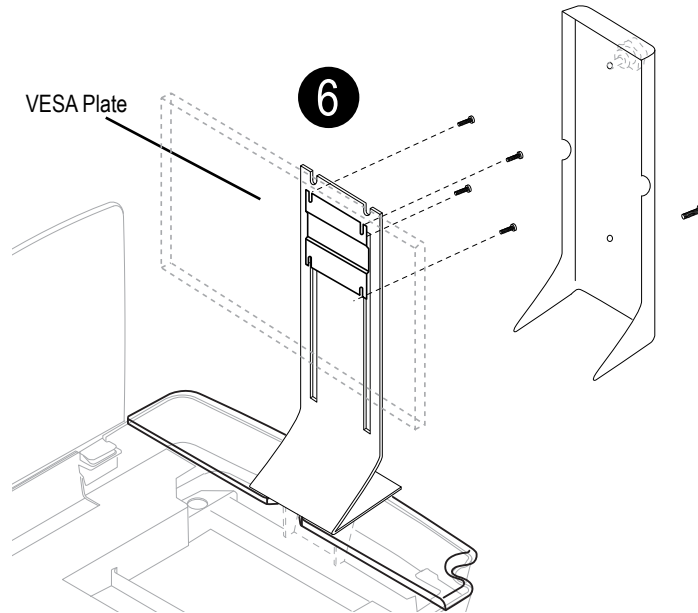
Managing monitor cables:

7 Once monitor is attached. Adjust monitor to its highest position. Manage cables from monitor down and through cable management hole.

8 Reinstall back cover (Make sure to route the cables through the side access holes in cable management cover). Reinstall 4 screws.

Adjustment Knob

8

8-32 x 3/4" Screw

Routed Cables

Cable Access Holes (2)

Cable Management Hole

7
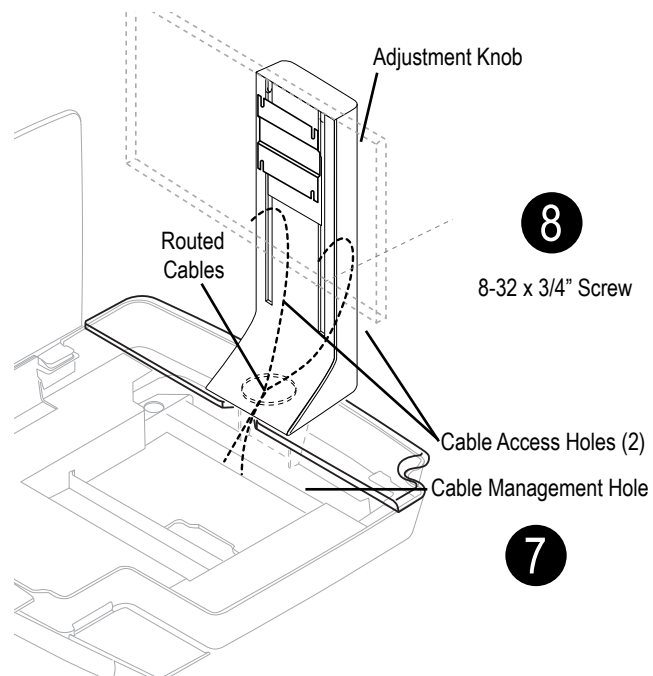
Charging Your Cart

Once cart is fully set up with all electronic devices, it should be plugged into a medical grade outlet. The cart should fully charge before deploying (Note: All carts are shipped with a 30% charge. If storing in warehouse before deploying, charge fully).

While the cart is charging, the LED on the power system external user interface will flash until the battery is 100% full.

For LiFe Batteries: Allow up to 2 hours to fully charge.
For SLA Batteries: Allow up to 5 hours to fully charge.
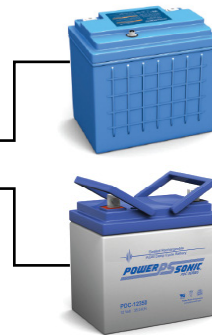
Testing Your Cart

To test your cart for power, the unit needs to be turned on. To do so, press and hold the power button on the power system user interface for approximately 2 seconds.

The power system will beep and the far left LED light will turn on. At this point, all powered devices connected to the outlet strip should receive power. Once on, the LED Keyboard light may be used. Press to turn light on/off. The LED Keyboard light has a 5 minute timeout function just in case the light was not turned off by the operator.

⚠️ Note: Monitors, laptops and other devices will need to be manually turned on.

Software Pre-Installation/Installation Note:

To download the latest software go to: http://connectivity.powervar.com/mpm/download.asp.

Double-click the MPM View installer icon to start the install. MPM View will automatically detect the MPM power unit attached to the PC workstation USB port.

Power System Overview

Clio External User Interface

The easy-to-read battery user interface, which is located on the front surface of the cart handle, gives the user a real-time status of the battery. Each LED will illuminate in several sequences to indicate the approximate charge level of the battery.
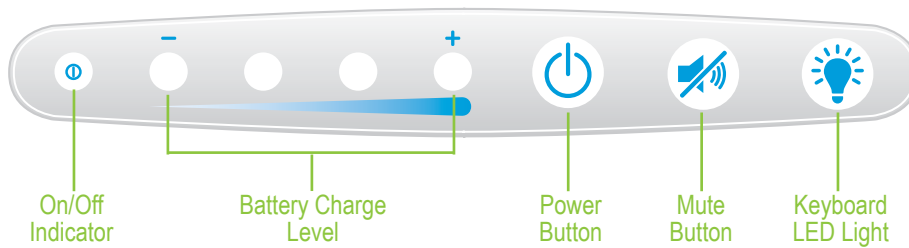

On/Off Indicator   Battery Charge Level   Power Button   Mute Button   Keyboard LED Light

- The first LED displays power on/off indicator
- LEDs two through five indicate charge level and correspond to a percent of charge range.
- Power Button (third to last button on right) - To power up, press and hold for 2 seconds, and the on/off Indicator will beep and power on.
  To power down, press and hold for 2 seconds, and the on/off Indicator will beep and power off.
- Power Alert Mute Button (second to last button on right) - If the battery level falls below 10% for LiFe Battery an alarm will sound. This button will mute the alarm.
- Keyboard LED Light (last button on right) - To turn on, press button. The light will automatically turn off after 5 minutes or if button is pressed again.

Using the Power System

Turning On System	Turning Off System	Mute Button Use
Press and hold power button for approximately 3 seconds	Press and hold power button for approximately 3 seconds	Press and hold until audible alarm discontinues
Fuel Gauge/Power System will beep. The LED on the left side turns green. All components will receive power.	Fuel Gauge/Power System will beep. LED on left side will turn off. If Power System is plugged in, the other LED lights will remain lit to show battery level. All components will NOT receive power.	Fuel Gauge/Power System will beep. Audible alarm will silence as long as battery level is above 10%. When at 10%, the alarm, even if muted, will resound every minute. Action to take is to charge the battery or shut down the unit.
Use this during: • Initial start-up • After replacing battery • If system has been shut down • If system has shut itself down after reaching low battery level	Use this during: • If cart will not be used or plugged in for an extended period of time • Before replacing battery • If Power System will be serviced	Use this during: • When the audible alarm first goes off at the 20% battery level remaining. When alarm sounds, plug in cart to avoid damage to battery.

Power System Overview Continued

LED Position 1 (Power On/Off)

Solid Green - System is on and all components will receive power.

No Light - System is turned off. If cart is plugged in, unit can still be charged.

LED Position 2-5 (Charging Level)

Flashing Red - Less than 5% battery life remaining. Plug in unit immediately.

Flashing Yellow - Less than 10% battery life remaining. Plug in unit as soon as possible.

Solid Green - Battery is at least 90-100% charged. Component should still be plugged in when possible to maximize battery life.

Flashing Green - Each LED flashing green reflects the level of charge achieved during recharging.

No Light - Power System is turned off or battery is not properly connected to the power system.

LED Position 5 (Charging Status when plugged into wall outlet)

Solid Green - Battery is full

Charge Level Indicator Summary (Discharging)						
Approximate Battery Charge Level	Indicates On/Off Only	−			+	Low Battery Alarm
76%-100%	***	Green	Green	Green	Green	OFF
51%-75%	***	Green	Green	Green	OFF	OFF
26%-50%	***	Green	Green	OFF	OFF	OFF
11%-25%	***	Green	OFF	OFF	OFF	OFF
Low Battery Warning	***	Yellow*	OFF	OFF	OFF	ON* 6-10% Default, User Settable
Low Battery Critical	***	Red**	OFF	OFF	OFF	ON** 0-5% State of Charge

* Battery Low:
   LED 2 Flashing Yellow ON for 1 second, OFF for 1 second. Buzzer should beep once per second, until silenced by pressing "Alarm Mute button.

** Battery Low Critical
   When State of Charge level falls below 6%, LED 2 will flash RED 1/2 second ON, 1/2 second OFF. Buzzer will beep 2X each second - until silenced by pressing "Allarm Mute" button.

***Output On LED Behavior
   LED 1 is on when output is on and off when output is off.

Battery Removal and Replacement

⚠️ Only use batteries specified by ALTUS. Failure to do so will void the power system warranty. Call customer service for further details.

⚡ Do not replace battery in oxygen rich environments sparking may occur.

⚡ Always unplug the power cord from the wall outlet when removing the battery.

Battery Removal

Tools Needed: 1/8" Allen Wrench

Step 1: Power Down System
⚠️ A. Turn off any components plugged into cart
   B. Turn off Power System by Holding On/Off Button for 2 seconds

Step 2: Long-term Storage (more than 2 months)
   Warning: If cart will not be used for more than 2 months, turn off the cart by holding the ON/OFF Button. The battery will need to be recharged every 30 days to prevent damage.

Step 3: Remove back access panel by loosening and removing (2) screws (See Fig A).

Step 4: Remove back panel. Remove strap and slide battery from base (See Fig. B)

Step 5: To access battery cable (to disconnect from controller) loosen and remove (2) screws from the front panel of base (See Fig. C)

Step 6: Disconnect battery harness from controller. (See Fig. D)

(Fig A)

(2) Screws

(Fig. B)
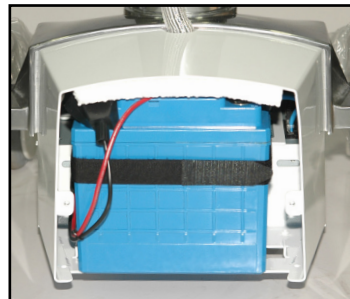
Remove Strap

(Fig. C)

(2) Screws on both sides

(Fig. D)
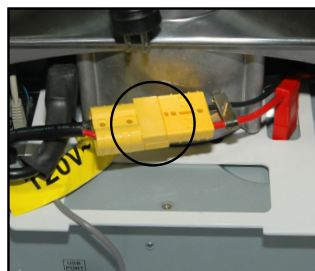
Disconnect Yellow Battery Harness

(Battery terminals) Located in back on Ascend EL

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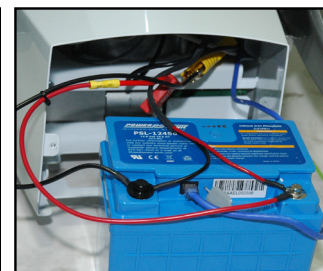
Battery Removal and Replacement

Battery Removal Continued

Step 7: Disconnect "blue" RJ45 cable from controller. (See Fig. E). If replacing with a SLA battery, this step is not needed.

If blue RJ45 cable cannot be accessed, the controller can be removed by loosening and removing (2) screws (See Fig, F). Once screws are removed, simple slide controller out and disconnect Blue RJ45 cable from slot. (Note slot location for new battery cable).

Step 8: Replace with new battery and repeat Steps 1-7 in reverse order. Make sure all connection are secure ("clicking" them in place).

(Fig. E)
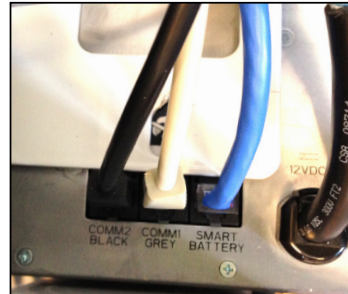
"Blue" RJ45 Cable

(Fig. F)

(2) Screws - Phillips drive

Slide out controller in
Ascend EL Carts

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Battery and Power System Removal and Replacement

WARNING!

DO NOT CONNECT THIS UNIT TO BATTERIES NOT SUPPLIED BY ALTUS
WITHOUT VERIFYING CONTROLLER SETUP AND OTHER OPTIONS WITH ALTUS.

If replacing the LiFe (Lithium Iron Phosphate) battery with a SLA battery or SLA to LiFe, the following steps need to be completed. If the MPM software has been installed, this will help with step #4.

1. All cables to and from controller must be connected, including the battery and its cables and connections.

Both the AC-In and AC-out connector ends include a locking feature to prevent from pulling apart. To disconnect pull back both "red" tabs. **Note: Older models may not have this feature (red tabs) so simply disconnect.**
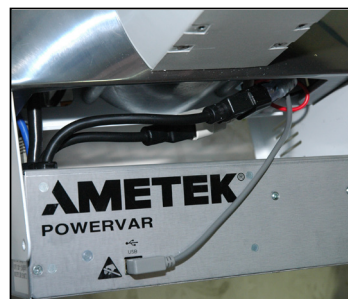Controller must first be <u>OFF</u> (no lights on the Remote User Interface) and connected into AC power.

If using the MPM Software use this step. If not, proceed to step 2.
Connect the USB cable into the technology component within the cart (or into a resident laptop with the MPM software loaded).
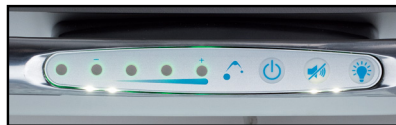
 ← No Lights   ← USB

2. Wait for the double yellow to appear on the interface.

3. When this happens, press and hold the mute button for 5 seconds. One "beep" will be made immediately. Within 3-5 seconds after the initial "beep", a second "beep" will be heard.

Keep holding down the mute button until a scrolling light sequence appears (release mute button at this time). This will look like all of the green LED lights going lighting up in order and then back off in order. When green light sequence is complete, the controller will show a Yellow LED and Green LED and then will shut itself off (all lights will turn off) and then will "Reboot" itself. When controller reboots, the remote user interface will show the battery level of the connected battery.

4. The "battery reading for confirmation" will only be available if MPM View is being utilized. The cart is ready to be used.

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Diagnostics & Troubleshooting

This section includes a brief troubleshooting table and the complete list of Events and condition codes that are logged and displayed in *MPMView*

Troubleshooting

The troubleshooting information provided in this section should help you discover the cause of most commonly encountered difficulties. Before following the troubleshooting steps provided, be certain that

- o the MPM is connected to a properly working outlet,

- o the line voltage to the MPM is within specified boundaries

Problem	Possible Cause	Action you should take
MPM does not power up and has no audible alarm	On/Off button is not pressed long enough	Press and hold the On/Off switch for at least 3 seconds.
	Invalid Battery and Invalid Input AC.	Check wall socket and test for proper line voltage.
	MPM input power cord is not plugged in	Plug in input power cord
	Output fuse is open	Reduce load replace fuse and test
Backup time is less than expected	Battery is not fully charged or battery is dead.	Recharge battery for at least 24 hours and retest backup time.
MPM is normal, but the load will not turn on.	Load input power cord is loose or not connected. Output Fuse is blown.	Verify computer input power cord Verify output wiring harness within cart assembly Check Output Fuse located on end of MPM unit . (see p.31)

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Troubleshooting

Events & Conditions

The MPM will indicate the presence of Warning (yellow) and Severe (red) Alarms and Conditions via the RUI and via the ClinicView taskbar application as shown below.
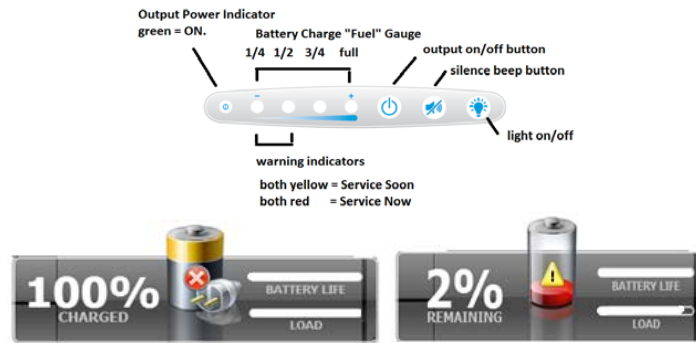
The specific alarm that is raising the Yellow or Red indicator will be logged and displayed locally in the *TechView* application (taskbar app, right click, Advanced) or over the network (LAN) via CIO/FleetView application.

The table below lists the specific alarms and what they mean.

INDICATIONS DURING NORMAL POWER SYSTEM OPERATION			
Code	As displayed in MPMView	As displayed in RUI LEDs	What it means
	No Display	1st fuel gauge LED green, top fuel gauge led Red	**USER ACTION: None – normal start up indication.** Technician Note: the charger inverter is powering up
NONE	Normal Operation	Output AC LED green or off. One or more fuel gauge LED(s) Green.	**USER ACTION: note "fuel gauge" LEDs on RUI or battery charge level and estimated minutes available on MPMView taskbar icon. Blinking green fuel gauge LED indicates battery recharge in process**
14-054	Battery Recharge in process		
24-034	Battery Charge Threshold: Low	Bottom fuel gauge LED Yellow	**USER ACTION: "<3-minute warning" connect cart power to AC soon to recharge the battery.** Technician Note: 1st level warning for low battery charge level, triggered when either threshold for % charge or estimated minutes is reached. Default thresholds are 10% or 3 minutes. These settings can be modified using MPM TechView software.
34-053	Battery Charge Threshold: Low-Critical	Bottom fuel gauge LED Red	**USER ACTION: battery nearly depleted, connect cart power to AC now to recharge the battery.** Technician Note: Final warning to recharge battery – shutdown imminent. Hard coded within MPM to signal when charge level is less than 5% of full capacity.

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Code	As displayed in MPMView	As displayed in RUI LEDs	What it means
14-070	Charger is in PreCharge Mode	RUI will blink the 4 "fuel gauge" LEDs low to high in a "rolling green" pattern	**USER ACTION: Use the cart only when connected to AC power. When the alarm clears – note battery charge state before disconnecting from AC power.** Technician Note: PreCharge is a special charger operating mode designed to reactivate a Smart Lithium battery in self-protect mode. This alarm presents on startup if all three conditions are true: 1.) MPM is configured for Lithium battery and 2.) invalid battery terminal DC voltage detected by the MPM and 3.) the battery communicates its state as self-protect mode, or there are no communications with the battery. The charger will remain in this mode for up to 30 minutes waiting an indication that the battery has returned to normal function. After 30 minutes, this condition will escalate to a yellow warning indicating that the battery needs service attention. (See 24-032 Service Check: Battery Connection).
14-056	Smart Battery: Reports Full Discharge	none	**USER ACTION: None** Technician Note: This alarm originates with a smart lithium battery and detected by MPM via battery communication. The Yellow and Red low battery alarms would normally appear before this alarm. The alarm is informational and is logged in MPMView event log for subsequent analysis if needed. The alarm will trigger or low battery alarms if not already activated.
14-057	Smart Battery: Reports Terminate Charge	none	**USER ACTION: None** Technician Note: This alarm originates with a smart lithium battery and detected by MPM via battery communication. The alarm is informational and is used by the MPM to manage charger operation.
14-058	Smart Battery: Charge Threshold Low	none	**USER ACTION: See Low battery alarms 24-034 or 34-053** Technician Note: This alarm originates with a smart lithium battery and detected by MPM via battery communication. This condition raises the yellow or red Low Battery alarms (24-034 or 34-053) if not already active based on MPM battery charge detect thresholds.

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14-059	Smart Battery: Reports Terminate Discharge	none	**USER ACTION: None** Technician Note: This alarm originates with a smart lithium battery and detected by MPM via battery communication. The alarm is informational in that it will cause the MPM to immediately turn off output power before any other indications can be presented. Normally this alarm may only appear if the cart is left running from battery and no action was taken when yellow or red low battery alarms were presented on the RUI.
14-060	Smart Battery: Needs Calibration	none	**USER ACTION: None** Technician Note: This alarm originates with a smart lithium battery and detected by MPM via battery communication. Usually is related to long periods of storage without regular use or recharge. This alarm may clear after a few full recharge and discharge cycles. If the condition persists, use the Diagnostics Report option in MPM TechView software to retrieve all internal battery information as an html file than can be sent to cart OEM for interpretation.
14-065	Smart Battery: High Error Rate on Communications Line	none	**USER ACTION: None** Technician Note: This alarm is raised by the MPM when there is a problem with consistent communications with the battery. Remedy: Verify battery communications cable is good and properly connected.
10-194	Charger current reduced	None	**USER ACTION: None** Technician Note: Indicates that the MPM charger is operating at reduced power due to low input AC line voltage or an over temperature condition (see yellow alarm 20-134) Use MPM TechView software to review input line voltage as measured by the MPM. Move the cart to a different circuit with higher AC line voltage or accept slower recharge time..

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INDICATIONS OF PROBLEM IN POWER SYSTEM - Yellow Warnings

Code	As displayed in MPMView	As displayed in RUI LEDs	What it means
20-134	Service Check: Temperature Warning	Two yellow LEDs	**USER ACTION: OK to use the cart. Contact Cart Manufacturer** Technician Note: This is the 1st level warning that the MPM internal temperatures are nearing a level where immediate thermal shutdown could occur if temperatures continue to increase. Remedy: Check that MPM ventilation is unobstructed. If no visible obstruction, MPM unit may need cleaning or other Service.
24-032	Service Check: Battery Connection	Two yellow LEDs	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: The MPM unit detects no voltage across the battery terminals. Battery may be disconnected, or there may be a blown fuse in the battery cable. The MPM can still power up when connected to AC input line. Remedy: Verify battery DC power connections. Verify battery condition.
24-050	Service Check: Battery Parameters not Initialized	Two yellow LEDs	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: This Alarm raised when the MPM is configured to detect a smart battery but is unable to establish communications to the battery. The MPM would then be operating in Smart Discovery Mode at reduced charger current. Remedy: Use MPM TechView software to verify battery configuration. Configure the unit for the actual battery attached. If battery configuration is correct, verify that battery communications cable is in good condition and fully connected to battery and MPM communications ports..
24-066	Service Check: Smart Batteries - Communication	Two yellow LEDs	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: This alarm is raised when MPM unit has lost communication with a SmartBattery. This is different than not detecting a smart battery during startup (see 24-050). The alarm may clear if the MPM unit isable to recover the battery. Communications. Remedy: Could indicate Smart Battery has entered a Safe/Protect Mode from being left depleted and without charge for too long. If the alarm persists, check SmartBattery cable connections.

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24-051	Service Check: Replace Battery – Health Threshold	Not presented on RUI	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: This alarm is raised when the measured battery capacity is less than 50% of original design capacity (measure of State Of Health). The default SOH threshold is 50%, this value can be modified using MPMView. Remedy: Replace the battery or accept significantly reduced time from battery.
24-063	Service Check: Replace Battery – Date Threshold	Not presented on RUI	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: This alarm is raised when the comparison of MPMView host PC system date to Battery Replace Date indicates that the battery Age is older than the Battery Age Threshold. Default is 18 Months, configure via MPMView. Remedy: Option to ignore this threshold and wait for Health thresholds to confirm battery capacity is degraded
20-147	Lost Device Communications	Not presented on RUI	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: This an MPMView software warning code. MPMView is unable to communicate with MPM unit. This could be caused by the USB cable being disconnected, the USB port on the computer has failed or the MPM is off and disconnected from AC. Remedy: Verify USB cable is good and properly connected. Verify PC USB ports are active and operational.

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INDICATIONS OF PROBLEM IN POWER SYSTEM - Red Warnings			
Code	As displayed in MPMView	As displayed in RUI LEDs	What it means
30-189	Input Frequency Out Of Range	Two Red LEDs	**USER ACTION: OK to use the cart on AC power. Contact Cart Manufacturer** Technician Note: This alarm is raised if the frequency of the input AC power to the MPM unit is out of range and the output can only be supplied from battery power. Remedy: verify if AC circuit is on generator source, switch cart to a different branch circuit , or check with facilities management.
36-080	Output Overload	Two Red LEDs	**USER ACTION: Turn off cart power, unplug from AC Power. Contact Cart Manufacturer** Technician Note This alarm is raised if MPM detects its VA output is over 110%.
36-081	Output Overload	Two Red LEDs	**USER ACTION: Turn off cart power, unplug from AC Power. Contact Cart Manufacturer** Technician Note This alarm is raised if MPM detects its Watt output is over 110%.
33-038	Service Required: Charger	Two Red LEDs	**USER ACTION: Turn off cart power, unplug from AC Power. Contact Cart Manufacturer** Technician Note This alarm is raised when MPM is attached to a Smart battery and battery indicates an "OverCharged" alarm Remedy: Replace the MPM charger inverter unit.
30-190	Service Required: Output Bad		**USER ACTION: Turn off cart power, unplug from AC Power. Contact Cart Manufacturer,.** Technician Note MPM detects a problem in inverter or output circuits; output relay is shorted, inverter voltage too high or too low, inverter failure or output fuse open. Remedy: Replace the MPM charger inverter unit.

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30-192	Service Required: EEPROM failure		**USER ACTION: Turn off cart power, unplug from AC Power. Contact Cart Manufacturer** Technician Note MPM detects a serious internal error. Return for Service. Remedy: Replace the MPM charger inverter unit.
34-055	Service Warning: Smart Battery Over Temp	Two Red LEDs	**USER ACTION: Turn off cart power, unplug from AC Power. Contact Cart Manufacturer** Technician Note This alarm is raised when MPM is attached to a Smart battery and battery indicates its internal temperature has exceeded internal threshold. Remedy: If the condition persists, use the Diagnostics Report option in MPM TechView software to retrieve all internal battery information as an html file than can be sent to cart OEM for interpretation.

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Power System Removal and Replacement

⚠️ Power System should only be accessed if approved by Altus

⚠️ Always unplug the power cord from the wall outlet when removing the Power System.

Power System Removal

Phillips Head Screwdriver and 1/8" Allen Wrench

Step 1: Power Down System
    A. Turn off any components plugged into cart
    B. Turn off Power System by Holding On/Off
       Button for 2 seconds

Step 2: Unplug Power Cord from Wall Outlet

Step 3: Remove front panel (1/8" Allen Wrench needed)
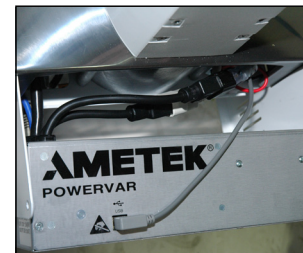   A. Loosen and remove (2) screws from sides (See Fig A)

Step 4: Remove controller from base (Phillips Head Screwdriver needed)
    A. Loosen and remove (2) screws (See Fig B)
    B. For Ascend EL Carts, slide out controller (See Fig. B).

Step 5: Gently slide controller out of base.
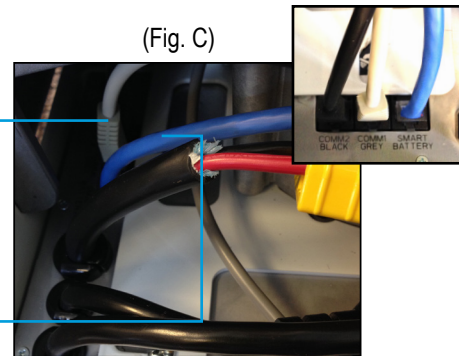
Step 6: Disconnect Cables (6) from Power System
    A. Unplug Black and Grey CAT 5 cables from unit (See Fig C)
    B. Unplug Blue CAT 5 Smart Battery Cable from unit (See Fig C)
    B. Unplug USB cable from unit (See Fig D)
    C. Unplug Yellow cable from unit (See Fig D)
    D. Unplug AC Input In/Out Power cords. (See Fig D)

Step 6: Remove Power System

Step 7: Replace with New Power System

Repeat steps 1-6 in reverse.

(Fig. A)
(2) Screws on both sides

(Fig. B)
(2) Screws - Phillips drive   Slide out controller in Ascend EL Carts

(Fig. C)
Controller Slots
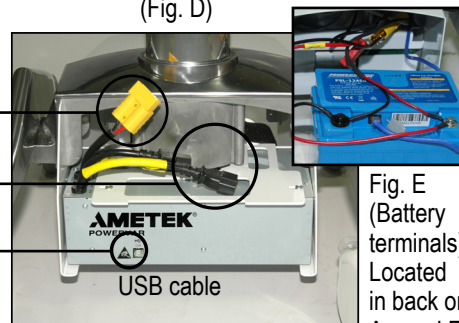
(Fig. D)
USB cable

Fig. E (Battery terminals) Located in back on Ascend EL

Troubleshooting

Cart will not power up:

- Plug power cord into a working hospital grade outlet. Note: Do not plug into a multi-outlet surge distribution strip.

- Check to make sure power cord is plugged securely (See Fig. A).

- Check to make sure the Power System is charging when plugged in (See Fig. B) (Right four (4) Green LED lights will be flashing if charging).

- Check to make sure all cables to the power system are secure (See Fig. C). the Blue (LiFe) RJ45 cable ends are secured/snapped into place. First end location is in the LiFe Battery (see Fig. 1). Second end location is in the power controller

- Make sure Power connection from the power controller is secure (Fig. D) Both the AC-In and AC-out connector ends include a locking feature (red tabs) to prevent from pulling apart. To check the connections are secure, look at red tabs and pull back and make sure they are locked into place. **Note: Older models may not have this feature (red tabs) so simply disconnect.**
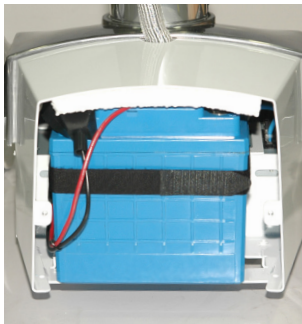

(Fig. A)
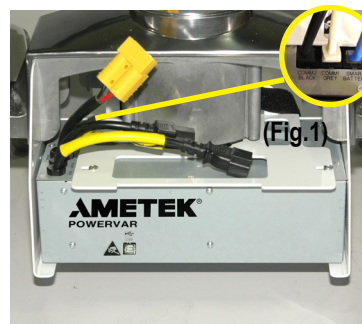

(Fig. B)

Fig. C
(LiFe Battery - Back side)

Fig. C
(Power Controller- Front side)

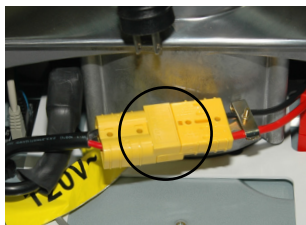Fig. D
(Power Connection is Secure)

Fig. E
(Battery terminals)

Fig. E
(Battery terminals)
Located in back on
Ascend EL

Cart will not power on or charge: Perform a voltage meter reading by taking a reading at the batteries +/- terminals and then again at the +/- terminals on the controller.

Normal reading: 10.5V-13.4V on a 12V battery
Abnormal reading: 13.4V and below 10.5V

Actuator is connected directly to the battery. If battery is dead, the actuator will not work. When plugged in, the cart will charge first then be able to service the actuator.

Cart will not charge:

- Check to make sure external spiral cord secure within the cart.
- Ensure outlet is functionally operational.
- Plug power cord into a working hospital grade outlet. Note: Do not plug into a multi-outlet surge distribution strip.
- Check and make sure the External User Interface (EUI) indicates the unit is charging when plugged in.
- If charge level is low (last one or two LED lights lit) let charge until full.
- If cart still does not charge, check to make sure all cables to the power system are secure.

- If cart still does not charge, resetting the controller is recommended (this is called a Hard Reset). To perform a hard reset, disconnect the yellow battery terminals, wait for 10 seconds, then reconnect battery terminals. Make sure both end "click" together. Note: The Hard Reset will remove all current from being fed into the controller and will assist with a battery that remains in battery recovery mode.