

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Invitium Battery System

Model **BAT-24CM**

OPERATIONS MANUAL

Planar Systems, Inc.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Planar Systems, Inc. © 2004. All rights reserved.

Information in this document has been carefully checked for accuracy; however, no guarantee is given to the correctness of the contents. This document is subject to change without notice. Planar provides this information as reference only. Reference to other vendors' product does not imply any recommendation or endorsement.

This document contains proprietary information protected by copyright. No part of this manual may be reproduced by any mechanical, electronic, or other means, in any form, without prior written permission of the manufacturer.

Planar is a registered trademark and Invitium a trademark of Planar Systems, Inc. All other trademarks are the property of their respective owners.

DOCUMENT HISTORY

March 2004	020-0332-00 Rev. A
------------	--------------------

America Sales

Planar Systems, Inc.
1195 NW Compton Drive
Beaverton, OR 97006-1992 USA
(503) 748-1100 phone
(503) 748-1493 fax

Medical Sales

Planar Systems, Inc.
400 Fifth Avenue
Waltham, MA 02451-8738 USA
(781) 895-1155 phone
(781) 895-1133 fax

Europe & Asia-Pacific Sales

Planar Systems, Inc.
Olarinluoma 9, P. O. Box 46
FIN-02201 Espoo, Finland
+ 358 9 420 01 phone
+ 358 9 420 0200 fax

medicalsales@planar.com
medicalsupport@planar.com
www.planar.com

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Contents

Product Information	iv
About the Invitium Battery System	1
Locate the Battery Housing	2
Identify the Connector Ports	3
Install the Battery Fuses	4
Charge the Battery	5
Set Up the Power Management System	7
Replace the Battery	11
Troubleshooting	14
Battery Disposal	15
Battery System Specification	16
Index	20
Description of Warranty	21
Regulatory Information	24

QUICK LINKS

[Contents](#)

[Index](#)

[Regulatory Compliance](#)

▶ [Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

Product Information

Safety guidelines

The Invitium battery system is designed to ensure both the highest level of product quality and safety for the user. To maintain both quality and safety, follow the guidelines and instructions in this manual.

- Use the battery system only as intended.
- Do not place the battery system near a window. Exposing the system to rain, water, moisture or constant direct sunlight can severely damage it.
- Refer all servicing to qualified personnel to maintain your warranty. The battery system has no internal user-serviceable parts.
- Do not cover or obstruct any venting holes on the battery system.
- Store the battery system within –20 to +65 degrees Celsius. Storing the system outside that temperature range could result in permanent damage.
- If any cord or cable is frayed or damaged, replace it immediately with another of the same type and rating as supplied by Planar. The safety and regulatory listing and certifications are based on cables supplied by Planar.
- Use and maintain the safety ground plug set (power cord) included with the unit.
- After battery system installation, secure all electrical cords to prevent accidental damage.
- To clean the exterior chassis of the battery system, follow the UL 2601 standard for use in a hospital environment. See [cleaning guidelines](#) for more information.
- Before cleaning the chassis, disconnect the unit from its power source.
- Be careful when moving the battery system to a different location. Use original packaging whenever possible.



Warning

- Equipment is not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide.
- The Invitium battery system may be energized or operational even when disconnected from the AC power source.
- If the Invitium battery system has been exposed to liquid, has been dropped, or if its base has been damaged, it may pose a shock or fire hazard. Immediately unplug it and contact customer service for assistance.
- Use care in handling the battery if any leakage is observed. Avoid skin contact and wash any areas that come in contact with this material immediately.
- Plug the battery system only into a grounded power outlet.

QUICK LINKS

[Contents](#)

[Index](#)

[Regulatory Compliance](#)

▶ [Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install BatteryFuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

Cleaning guidelines

The Invitium battery system continues to operate normally while being cleaned in a fashion normal for a hospital environment. Use a damp, mildly soapy cloth to clean the exterior chassis. Drip protection is provided in accordance with the IPX1 rating, defined in the IEC/EN60529 standard.

Service support

Other than battery installation and replacement, the Invitium battery system requires no routine maintenance. Should your battery system require repair, return the unit to Planar Systems for servicing to maintain product warranty. See the [warranty](#) for more information.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- ▶ [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

About the Invitium Battery System

As a component of the Planar Invitium medical workstation, the Invitium battery system is designed specifically for point-of care use. It is modular, compact, and ergonomically suited for effective utilization in the medical environment.

The battery system supplies a regulated +12 VDC to the Invitium medical workstation. It contains two sealed lead acid batteries, a medically certified universal input power supply, universal charging control module, an AC line filter, a cooling fan, and appropriate cabling. All components are mounted to sheet metal enclosure, which provides mechanical strength as well as EMI/EMC protection and shielding.

The Invitium battery system is classified as follows:

- Protection against electric shock: Class I and Internally Powered Equipment
- Degree of protection against electric shock: No Applied Part
- Degree of protection against water ingress: IPX1, Drip-Proof Equipment

At a nominal load of 50 watts, the battery system provides up to 4 hours of system operation. The charging and monitoring electronics control the charge rate of the battery as well as the maximum discharge level. This ensures safe operation of the battery and prevents damage from high charge rates and low discharge levels. This protection gives the battery a minimum cycle life of 250 fully discharged to fully charged cycles. The output voltage regulator provides a regulated 12 volts DC at a power level up to 72 watts. No external regulators are required.

Externally accessible fuses are provided on the charging controller module to electrically isolate the battery from all electronic components during transportation.

See the [technical specification](#) for more information.

About the battery models

The model number scheme for the battery system is BAT-xxyy, where xx is the amp-hour rating of the battery contained in the battery system and yy is the mounting designator.

The mounting SA refers to stand-alone. The battery system can be mounted to any solid surface in a horizontal position, using external straps.

The mounting CM refers to cart-mountable. The battery system can be mounted directly onto the Planar Orion cart.

Caution

The Invitium medical workstation is a Class I system under the Medical Device Directive (MDD), intended for near-patient proximity use. It is not intended for direct connection to the patient.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- ▶ [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Locate the Battery Housing

The Invitium battery system ships already installed on the Invitium cart. The power cord, USB cable, and output power cable are connected, and the output power fuse is installed. You need to install the two battery fuses before operation.



In operation

Check that all cords and cables are securely connected before you turn on the Invitium workstation.

Do not block the vent holes on the battery housing.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

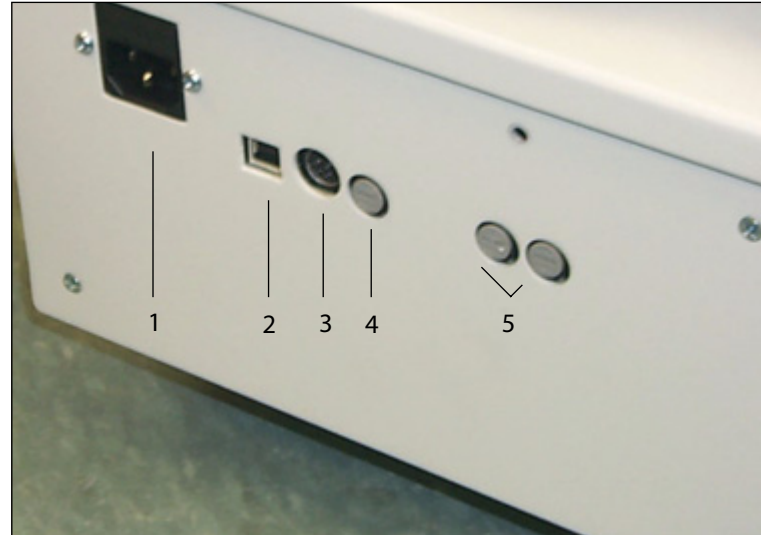
- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Identify the Connector Ports

All external connections to the battery system are located on the rear of the battery enclosure. The design of the enclosure minimizes liquid ingress.



Legend

- 1 Standard IEC 120–250V AC input power
2 A, 250 V replaceable
- 2 USB serial port
Communication channel between the power supply and its host computer
- 3 12V DC 6 A output power
Mini-DIN 4-pin device; requires an external power cable
- 4 Output power fuse
6 A replaceable
- 5 Battery fuse
6 A replaceable

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- ▶ [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Install the Battery Fuses

You need the two battery fuses and a screwdriver for this installation.

To install a battery fuse

- 1 Push the fuse in until you feel the connection.



- 2 Use a screwdriver to secure the connection.



About the battery fuses

The Invitium battery system requires two 6 A fuses. These are available from any hardware store.

Securing the fuse connection

Use the screwdriver to turn the fuse holder approximately a quarter to the right, or until you feel it lock.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [▶ Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Charge the Battery

This section provides basic information on battery operations. See specifications on [battery charging](#), [charging controller board](#), and [power consumption efficiency](#) for more information.

Battery charging

Plug the battery system into an AC power source for charging.

Charge time

The charging controller board is capable of independently charging the batteries while powering the attached system. This ensures that the charge rate of the batteries is the same whether a load is connected or not. Charge time varies depending on the age and usage of the battery. Typically, as a battery ages, it tends to accept less charge; that is, the charge time decreases. Consequently, as the battery accepts less charge, the battery usage time decreases.

Charge Time	Capacity of Charge
3 hours	80%
4 hours	90%
6 hours	100%

Periodically, charge the battery for 10 hours. This assures that the maximum charge capacity of the battery is maintained. The charger enters the trickle charging cycle after the current supplied to the batteries drops below .5 amps. Charge the batteries for 10 hours for every eight charges to 100%.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- ▶ [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Battery discharging

You discharge the battery by (1) disconnecting the battery system from the AC power source and (2) powering the load.

When the battery has been discharged for a long period of time, it reaches a point at which it needs to cut off power to its load. The battery system communicates to the host computer and requests a safe shutdown or hibernation.

Thermal protection

The universal power supply is thermally protected and self-resetting. The battery enclosure contains a cooling fan that is activated whenever the system is plugged into an AC power source.

Depth of discharge protection

After the power to the load is cutoff, the internal circuitry goes into sleep mode to prevent further battery discharging. The sleep mode is intended to prevent the batteries from deep discharge.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)

▶ [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

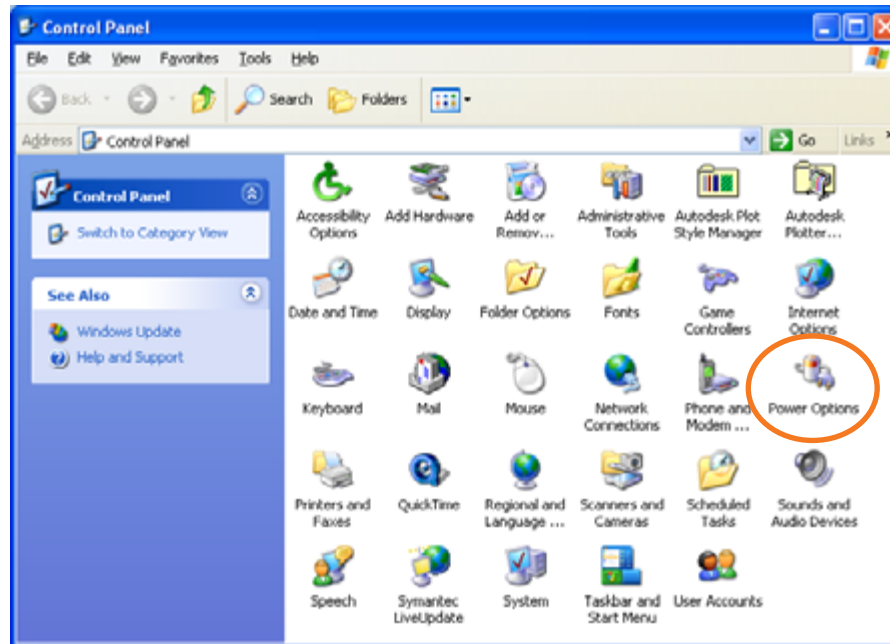


Set Up the Power Management System

All communications occur through the USB serial interface. These are displayed through the Windows Power Options Properties dialog box on the host computer.

To set up power management

- 1 Open the Control Panel and click the Power Options tool.



Easier power management

Unlike earlier Invitium battery systems, this system has no charge indicator panel.

The charge level indicator is software-driven, complying with the Microsoft Windows HID Power Device Specification.

You manage power consumption using the Power Options tool in the Windows Control Panel.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)

▶ [Set Up Power Management](#)

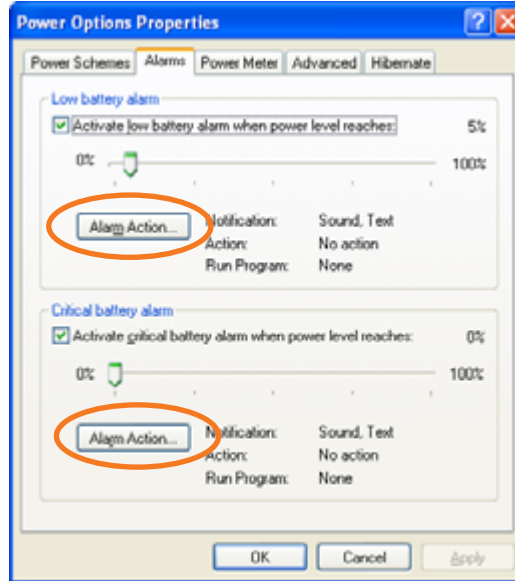
MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

2 Click the Alarms tab on the Power Options Properties dialog box.



3 To set either the low battery alarm or critical battery alarm, or both alarms:

- Click the check box to activate alarm mode.
- Move the slider to the point at which you want the alarm to trigger.
- Click the Alarm Action button to do one or more of the following: select the type of notification, set a computer action, run a specific program.

Low battery alarm

User-selectable alarm that is audible or silent. The alarm is triggered when the battery charge level reaches its low battery limit.

Critical battery alarm

User-selectable alarm that is audible or silent. The alarm is triggered when the battery charge level reaches its depth of discharge limit.

Hibernation/shut down action

If a hibernation or shut down action is enabled, the low or critical battery alarm limit should not be greater than 5% to ensure proper operation.

Alarm disabled

Deselect the check box to disable the low battery or critical battery alarm.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- ▶ [Set Up Power Management](#)

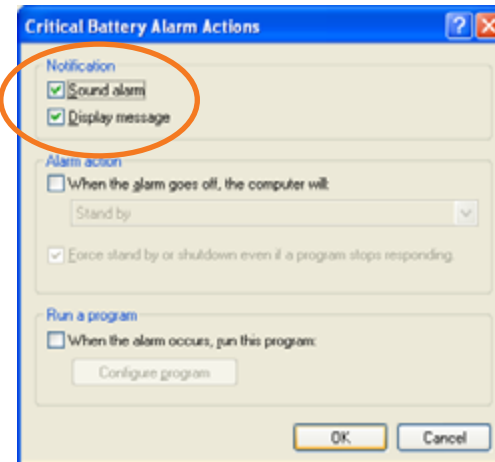
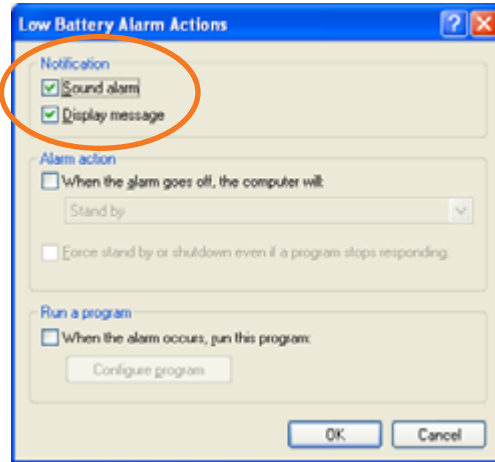
MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

4 Select the notification you want, one of the two types or both. Click OK.



Alarm action

An alarm action to hibernate or shut down can be selected in the Power Options Properties menu.

Alarm notification

You must select a notification for the alarm you choose. Selecting an alarm action or running a program is optional.

To set an alarm action:

- 1 Click the check box to activate the option.
- 2 Select an action from the pull-down list.

To run a program:

- 1 Click the check box to activate the option.
- 2 Click the Configure program button to enter your code.

QUICK LINKS

[Contents](#)

[Index](#)

[Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

▶ [Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

5 Open the Power Meter tab to check the power status of each battery.

- Click the check box to see the details on a battery.
- Click a battery icon for more information.



QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- ▶ [Replace Battery](#)
- [Troubleshooting](#)

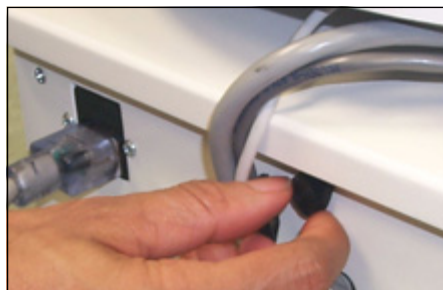
APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Replace the Battery

To remove the battery system from the cart

- 1 Loosen the two screws on the front of the cart.
- 2 Loosen the screw on the back, and tuck the cables to the side.



- 3 Unplug the power cord, USB cable, and output power cable.
- 4 Remove the two battery fuses.
- 5 Pull out the battery enclosure carefully and move it to a flat and stable work surface. The unit is heavily weighted toward the front.



Replacement tips

The Invitium battery system weighs 25 pounds. Handle it carefully.

The unit is heavily weighted toward the front of the cart. As you remove it from the cart, you feel its heaviness.

Once the unit is completely out of the housing, move it to a flat and stable work surface to replace the batteries.

Do not mix old and new batteries. Replace both batteries during the same maintenance session.

The battery system is a self-aligning unit. When you return it to the cart, push it all the way in. The alignment occurs automatically.

QUICK LINKS

[Contents](#)

[Index](#)

[Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

▶ [Replace Battery](#)

[Troubleshooting](#)

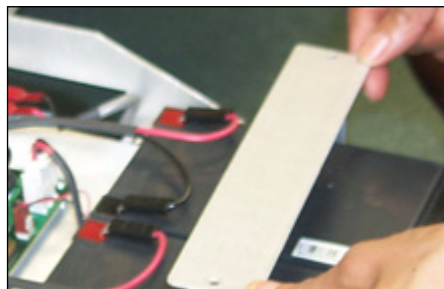
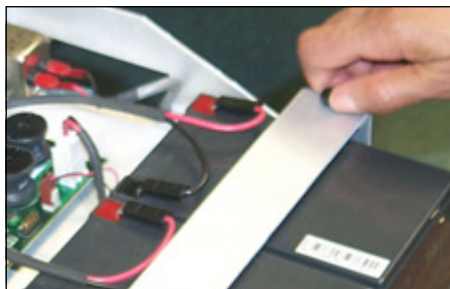
APPENDIXES

[Battery Disposal](#)

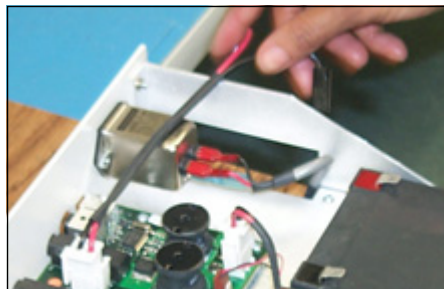
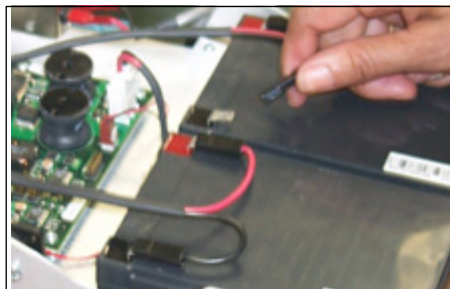
[Specifications](#)

To replace the battery

1 Loosen the two screws and remove the retaining bracket.



2 Detach the four battery terminal cable connectors and move them to the side.



3 Replace both batteries at the same time. Do not mix old and new batteries.

4 Reconnect the four terminal cable connectors. Push in the connector until you feel the connection click.

5 Reattach the retaining bracket with the two screws.



Replacement tips

Use only Yuasa NP 12-12 or B&B EP 12-12 batteries.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [▶ Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

To reinstall the battery system into the cart

- 1 Push the battery system all the way into the housing area.
- 2 Plug in the power cord, USB cable, and power output cable.



- 3 Reinsert the two battery fuses.
- 4 Reinsert the three screws, one in the back and two in the front.



QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)

▶ Troubleshooting

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Troubleshooting

Problem	Possible Cause	Possible Solution
The battery system not functioning, no output power, does not charge when connected to AC power.	AC power is not connected.	Make sure power cord is connected properly
	Input fuse needs to be replaced.	Replace fuse in input connector. Replace with UL recognized fuse 2 A, 250 VAC, fast acting, size 5 mm x 20 mm.
	Over-temperature protection is activated.	Contact Planar.
No power supplied to Invitium system.	Output power cord not connected properly.	Make sure that output power cord is connected correctly. When the power LED on the right side of the Invitium workstation is green, it indicates normal operating mode.
	Power switch is off.	Turn on the power switch, located on the right side of the Invitium workstation.
	Output fuse needs to be replaced.	Replace the output power fuse located next to output power connector. Replace with UL recognized fuse 6 A, 125 VDC, fast acting, size.25 in. x 1.25 in.
	Batteries not connected correctly.	Check battery connections.
System run time is too short.	Battery not completely charged.	Connect AC power and let battery charge completely. Charge status is conveyed through the Power Meter tab on the Power Options Properties dialog box.
	Battery capacity is low.	Replace battery.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [▶ Battery Disposal](#)
- [Specifications](#)

Battery Disposal

Industrial batteries contain lead and sulfuric acid, which are both considered “hazardous substances.” If batteries are improperly disposed of, for example, thrown in the trash or illegally dumped, these substances can eventually leak out and contaminate the surrounding soil and groundwater supply.

It is a federal law to properly dispose of lead-acid batteries once they can no longer be used. Once a battery is purchased, full liability and responsibility lies on the owner to dispose of the battery.

The law says that responsibility is still on the owner if the battery is disposed of improperly by dumping in a landfill, or shipping to a scrap dealer who does not handle it properly and in which environmental damage occurs.

It is illegal to dispose of batteries in any way other than “thermal recovery” or recycling of the hazardous substances in batteries according to the Environmental Protection Agency (EPA).

The Department of Transportation (DOT) has strict guidelines for the shipping of hazardous materials, which result in large fines if they are not followed.

Check with your local ordinances for proper disposal procedures.

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [► Specifications](#)

Battery System Specification

Technical summary

The battery system is a self-contained regulated power supply, battery, and charger unit, packaged in a sheet metal enclosure.

Features

- Universal AC input
- Regulated 12V DC output
- Fast charging
- Intelligent communications (USB host)
- Cooling fan
- Externally accessible fuses

Electrical specifications

Input	Input voltage	85 to 265 VAC
	Input frequency	47 to 63 Hz
	Inrush current limiting	<50A peak
	Input protection	2A, 250V replaceable fuse
Output	Power factor	0.95 (150 W, 230 VAC)
	Output voltage	12 VDC \pm 5%
	Output current	6.0 A maximum
	Output power	36 watts nominal; 72 watts maximum
	Overload recovery	Automatic upon fault removal
	Overload protection	6A replaceable fuse
	Operating time	4 hours at nominal output power
	Output efficiency	>88%

–MORE–

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)

► Specifications

Battery requirements

Battery type	Sealed lead acid; quantity – 2 Yuasa NP12-12 or B and B EP12-12
Capacity	12 Ah each
Output voltage range	12 V nominal 9.5 to 14.4 V
Cycle life	approx. 250 full charge cycles

Connectors/cables

Input power connector	Standard IEC power connector
USB port connector	Standard USB cable (A male to B male)
Output power connector	Mini-DIN 4-pin device

Charging

Charge time (new battery)	3 hours to 80%
	4 hours to 90%
	6 hours to 100%

–MORE–

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)

- [► Specifications](#)

Four modes of the battery system

Charging mode	The battery system is plugged into an AC power source. During charging mode, the attached load to the battery system is operational. The batteries charge. The cooling fan runs only when the unit is plugged into an AC power source.
Running mode	The batteries have some level of charge and the battery system is not plugged into an AC power source. During running mode, the attached load to the battery system is operational. The batteries discharge. The cooling fan is off. The load to the battery system is active.
Stand-by mode	The batteries have some level of charge, the battery system is not plugged into an AC power source, and the load is either disconnected or off. The cooling fan is off. The load is powered when the system is either turned on or reconnected.
Off mode	The batteries have no charge and the battery system is not plugged into an AC power source. During off mode, the attached load to the battery system is not operational, whether connected or turned on. The controller board is in sleep mode. The cooling fan is off. Plug the battery system into an AC power source to leave off mode.

–MORE–

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)

- [► Specifications](#)

Power consumption efficiency

The charging controller board has four levels of power consumption: charging, running, stand-by, and off.

Charging mode	The batteries are charged using a constant current/constant voltage algorithm. A constant current of 3.0 amps max is applied to each battery until the voltage on the battery reaches 14.4 V. The current exponentially decreases to maintain 14.4 V on the battery. The cooling fan is on during this cycle. The +12VDC regulator circuitry is powered by the power supply, and the communication system reports the charge status of the batteries to the host.
Running mode	The board consumes power at a rate proportional to the power consumed by the load during its running mode. The board proves to be 88% efficient when connected to a 4.5 amp load.
Stand-by mode	The board consumes about 8.5 mA of current when in stand-by mode. A fully charged and new battery lasts about 3 months in the battery system before it needs to be replaced.
Off mode	The board consumes about 350 μ A of current when in the stand-by mode. A fully charged and new battery lasts about 3 months in the battery system before it needs to be replaced. The battery continues to drain at a rate of 350 μ A. Batteries that are not connected to the controller board have a shelf life of 1 month 97%, 3 months 91%, 6 months 85%, at 68° F.

QUICK LINKS

[Contents](#)

► [Index](#)

[Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

Index

A

alarm

- critical battery 8
- disabled 8
- low battery 8
- setting 8, 9

B

battery

- about system 1
- charging 5
- connector ports 3
- discharge protection 6
- discharging 6
- disposal 15
- fuses 3, 4
- housing 2
- input power 3
- maintaining system 11
- models 1
- output power 3
- power consumption 19
- reinstalling 13
- removing 11
- replacing 11, 12
- specifications 16
- thermal protection 6
- USB serial port 3

C

- cables/connectors 2, 17
- charge time 5
- charging battery 5
- charging controller board 17, 18
- cleaning guidelines v

- compliance 24
- components, identifying 3
- controller board, charging 17, 18
- customer support 22

D

- discharge protection 6
- discharging battery 6
- disposing of battery 15

F

- fuses 3, 4

G

- guidelines
 - cleaning v
 - safety iv

I

- identifying components 3
- IEC connector 3
- information
 - product iv
 - regulatory 24
- installing fuses 4

M

- maintaining battery system 11

N

- notification, alarm 9

O

- output power 3
 - fuse 3
 - port 3
- overview of battery system 1

P

- ports, connector 3
- power
 - checking status 10
 - connector 3
 - consumption 19
 - management 7
- Power Meter tab 10
- Power Options tool 7
- product information iv
- protection
 - depth of discharge 6
 - thermal 6

R

- regulatory information 24
- reinstalling battery 13
- removing battery 11
- replacing battery 11, 12

S

- safety guidelines iv
- service v
- setting alarm 8
- specification, battery 16
- symbol explanations 27

T

- thermal protection 6
- troubleshooting 14

U

- USB serial port 3

W

- warranty 21
- Windows HID power device 7
- workstation, cleaning v

QUICK LINKS

[Contents](#)

[Index](#)

[Regulatory Compliance](#)

[Product Information](#)

► [Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

Overview of Standard Warranty

Summary

- Standard 1-year “repair and return” warranty on all Invitium Medical Workstations
- Typical repair turnaround time of 10 business days
- Repair facilities and technical support in the United States and in Europe

Standard Warranty Return Procedure

As a Planar Standard Warranty customer, you must follow the procedure below if you have a non-functioning Invitium Medical Workstation. Planar customer service staff will attempt to correct any minor issues that may be causing the problem. Once Planar has determined that you have a non-functioning product, Planar will arrange for return and repair of the non-functioning product.

- 1** Contact Planar via the web at <http://www.planar.com/support>. In North America, call (866) PLANAR1 (866.752.6271). In Europe, call +358 9 420 01 or send your info by fax to +358 9 420 0200. You must have the model number, serial number, and proof-of-purchase available.
- 2** Planar customer service staff will attempt to correct any minor issues that may be causing the problem. If we are unable to correct the problem to your satisfaction, we will issue a Return Material Authorization (RMA).
- 3** You must return the product, as specified, to Planar Systems. Do not return the battery cell or cart to planar Systems unless directed by Planar customer service.
- 4** Planar will validate the defect, repair the unit, and return the unit to you. The typical turnaround time is 10 business days.

At its sole discretion, Planar may charge you the customer for returned units deemed functional or for returned units with only customer-caused damage. It is the responsibility of the customer to properly package the hardware, include all appropriate materials, and return it to the location specified by Planar customer service.

–MORE–

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)

► Warranty

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Summary Limitations and Exclusions of Invitium Medical Workstations

- 1 Invitium warranty is valid only for the first consumer purchaser (non-transferable).
- 2 Invitium warranty does not cover the battery cell(s), mouse, or keyboard.
- 3 The customer must provide original proofs of purchase for the Invitium hardware.
- 4 Warranty is void on any product with a defaced, modified, or removed serial number.
- 5 Warranty is void on any product with damage, deterioration, or malfunction resulting from the following:
 - a) Accident, misuse, neglect, fire, water, lightning, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
 - b) Repair or attempted repair by anyone not authorized by Planar.
 - c) Any damage of the product due to shipment.
 - d) Removal or installation of the product.
 - e) Causes external to the product, such as electric power fluctuations or failure.
 - f) Use of supplies or parts not meeting Planar specifications.
 - g) Normal wear and tear, including backlights dimming over time.
 - h) Any other cause which does not relate to a product defect.
- 6 Warranty excludes removal, installation, and setup service charges.

Limitation of Implied Warranties

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION CONTAINED HEREIN INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Customer support

In North America, call 1 (866) PLANAR1 between 8 A.M. and 5 P.M. Pacific time, Monday through Friday, or send a description of your technical issues and e-mail address to medicalsupport@planar.com.

In Europe, call +358 9 420 01 between 8 A.M. and 4 P.M. Finnish time (Eastern European time), Monday through Friday, or send a description of your technical issues and e-mail address to medicalsupport@planar.com.

–MORE–

QUICK LINKS

- [Contents](#)
- [Index](#)
- [Regulatory Compliance](#)
- [Product Information](#)
- ▶ [Warranty](#)

GETTING STARTED

- [About the Battery System](#)
- [Locate Battery Housing](#)
- [Identify Connector Ports](#)
- [Install Battery Fuses](#)

USING THE BATTERY

- [Charge Battery](#)
- [Set Up Power Management](#)

MAINTAINING THE BATTERY

- [Replace Battery](#)
- [Troubleshooting](#)

APPENDIXES

- [Battery Disposal](#)
- [Specifications](#)

Exclusion of Damages

THE LIABILITY OF PLANAR IS LIMITED TO THE COST OF REPAIR OR REPLACEMENT OF THE PRODUCT. PLANAR SHALL NOT BE LIABLE FOR THE FOLLOWING:

- 1** DAMAGE TO OTHER PROPERTY CAUSED BY ANY DEFECTS IN THE PRODUCT, DAMAGES BASED UPON INCONVENIENCE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME, LOSS OF PROFITS, LOSS OF BUSINESS OPPORTUNITY, LOSS OF GOODWILL, INTERFERENCE WITH BUSINESS RELATIONSHIPS, OR OTHER COMMERCIAL LOSS, EVEN IF ADVISED OF THEIR POSSIBILITY OF SUCH DAMAGES.
- 2** ANY OTHER DAMAGES, WHETHER INCIDENTAL, INDIRECT, CONSEQUENTIAL, OR OTHERWISE.
- 3** ANY CLAIM AGAINST THE CUSTOMER BY ANY OTHER PARTY.

Effect of Local Law

This warranty gives you specific legal rights, and you may have other rights, which vary from locality to locality. Some localities do not allow limitations on implied warranties and/or do not allow the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

QUICK LINKS

[Contents](#)

[Index](#)

▶ [Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

Regulatory Information

U.S. Federal Communications Compliance Statement

The Planar Invitium Battery (model BAT-24CM) have has been tested and found to comply within the limits of a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment on and off), the user is encouraged to try to correct the interference by using one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technical for help.

Canadian DOC Notice

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulation of the Canadian Department of Communications.

“Le present appareil numerique n’emet pas de bruits radioelectriques depassant les limires applicables aux appareils numeriques de la class B prescrites dans le Reglement sure le brouillage radioelectrique edicte par le minstere des Communications du Canada.”



Caution

To comply with the limits for an FCC Class B computing device, always use the cords supplied with the unit. The FCC warns that changes or modification of the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

–MORE–

QUICK LINKS

[Contents](#)

[Index](#)

▶ [Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

Regulatory Compliance

This system has been tested and found to comply with IEC/CSA 601-1, UL 60601-1 and CAN/CSA C22.2 No. 601.1 medical standards by CSA.

Because many medical offices are located in residential areas, the Invitium battery system, in addition to meeting medical requirements, has also been tested and found to comply with the limits for Federal Communications Commission (FCC) Class B computing devices in a typically configured system. It is the responsibility of the system integrator or configurer to test and ensure that the entire system complies with applicable electromagnetic compatibility (EMC) laws. Planar Systems, Inc. has made great efforts to support the medical device industry, in particular medical device manufacturers and medical device system integrators. We offer state-of-the-art systems that are compliant with worldwide accepted medical device safety standards, and for the European market, EC-marked displays based on compliance with counsel directive 93/42/EEC — commonly referred to as the Medical Device Directive (MDD). The following summarizes our qualification of these displays as it relates to compliance with the MDD.

The European MDD requires that the intended use of the device be defined. The intended use of the Invitium workstation is “to display alphanumeric, graphic, and image data as inputted from any type of medical device.” This system does not provide a measurement function in any way, and it is the device and systems manufacturers responsibility to verify its function in the integrated device or system. The workstation was classified as required by the MDD according to Annex IX of the directive and the medical device (MEDDEV) guidance available at the time of classification.

Because the workstation uses electrical energy and has no direct patient connections and — by itself — no medical utility, the workstation is classified according to Rule 12 as an MDD Class I device-component or accessory.

The MDD states that manufacturers of Class I medical devices or accessories shall satisfy the requirements in regard to design and manufacturing controls; in other words, the applicable assessment route to be used for CD-marking under the MDD, and it shall carry the CD-mark according to Annex XII for the directive, with no notified body annotation.

–MORE–

QUICK LINKS

[Contents](#)

[Index](#)

▶ [Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)

APPENDIXES

[Battery Disposal](#)

[Specifications](#)

The applicable safety standards for an MDD Class I device are IEC/EN60601-1: 1990 along with Amendments 1 and 2. To help the medical device designer evaluate the suitability of these workstations, Planar has also conducted EMC testing to IEC 60601-1-2 as it can be applied. The display with its power supply alone does not represent a functional medical device. Hence, Planar configured a minimal operating system to exercise the display. The resulting data is made available to interested parties.

The data is informative data, not certification data. Certification data must be obtained by the device or system integrator according to Article 12 of the MDD titled "Particular procedure for systems and procedure packs." Paragraph 2 clearly outlines the device or system integrator's responsibility in this matter.

In summary, Planar Systems, Inc. is CE-marking these workstations under the Medical Device Directive, which establishes compliance to the basic medical safety standards. However, EMC compliance can only be accomplished in the configured medical device or system and is the responsibility of the device or system manufacturer. Planar has the necessary documentation such as IEC 60601-1 notified body and other third-party test reports and certifications, a risk/hazard analysis, and essential requirements checklist, and Planar's International Electrotechnical Commission (IEC) declaration of conformity.

Planar Systems, Inc., located in Beaverton, Oregon, USA, is the manufacturer of these workstations in the meaning of the directive. As required by the MDD in Article 14, Planar Systems, Inc. not residing in the European Economic Area (EEA) has a European Representative, Planar Systems, Inc. – Espoo, Finland.

In the opinion of Planar Systems, Inc. registration required to put its device into commerce is the responsibility of the medical device/system manufacturer, and Planar supports this requirement by providing a European Commission (EC) declaration of conformity. If Planar supplies a workstation to an end user, rather than a device manufacturer, it is the end user's responsibility to ensure continued compliance with the MDD of the system in which the workstation is integrated. For vigilance reporting as required under Article 10 of the MDD, Planar Systems, Inc. will provide any information requested by competent authority to support any reported incident investigation by such an authority.

–MORE–

QUICK LINKS

[Contents](#)

[Index](#)

▶ [Regulatory Compliance](#)

[Product Information](#)

[Warranty](#)

GETTING STARTED

[About the Battery System](#)

[Locate Battery Housing](#)

[Identify Connector Ports](#)

[Install Battery Fuses](#)

USING THE BATTERY

[Charge Battery](#)

[Set Up Power Management](#)

MAINTAINING THE BATTERY

[Replace Battery](#)

[Troubleshooting](#)


APPENDIXES

[Battery Disposal](#)


[Specifications](#)


Symbol explanations


Following are explanations of the symbols found on the Invitium battery, model BAT-24CM).

 E226863 Product has been tested and certified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with US 2601-1 and CAN/CSA C22.2 No. 601.1 and IEC 60601-1 for medical equipment. If this mark appears with the indicators "C" and "US", the product is certified for Canadian and U.S. markets, meeting the applicable Canadian and U.S. standards.

UL 60601-1
CAN/CSA C22.2 NO.601.1
CLASS 8750


 Proof of conformity to applicable European Economic Community Council directives and two harmonized standards published in the official journal of the European Communities.

 Product has been tested to comply with FCC Class B standards.

 Consult accompanying documents.

 Indoor use only.

IPX1 Drip-Proof rating per IEC/EN60529

 DC (direct current) voltage

 AC (alternating current) voltage

 Fuse

Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>