

Dynamic Platform User Guide

Model 008PL



SUN NUCLEAR
A MIRION MEDICAL COMPANY

Dynamic Platform User Guide

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10 January 2023



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Health and Safety Instructions

For instructions to report health or safety related concerns, see *Reporting Health or Safety Related Issues or Concerns* on page 18.

General Safety Notices

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered herein.

Safety Precautions

Operating and maintenance personnel must observe all safety regulations. High voltages of 110-250 volts at 50/60 Hertz are used in this equipment. Failure of the operator and maintenance personnel to observe all safety precautions could result in personal injury, damage to the equipment, and loss of product effectiveness. The general safety precautions that must be observed are as follows:



WARNING: High voltages capable of causing death are used in this equipment. Use extreme caution when operating and servicing the Controller. Deenergizing the Controller by using the power switch does not remove the 110-250 VAC power excitation from the Controller. These voltages remain present on the Controller power switch and power connector unless it is disconnected.



WARNING: To reduce the risk of fire, electric shock, or injury when using the Motion Controller, follow the basic precautions below.

- There are no user-serviceable parts inside. Refer servicing to qualified service personnel.
- Use only a grounded 3-prong electrical outlet when connecting this product to a power source. If you do not know whether the outlet is grounded, check with a qualified electrician.
- Do not remove ground prong.
- Do not install or use this product near water, or when you are wet.
- Operate the product securely on a stable surface.
- Set up the product in a protected location where no one can step on or trip over the power cord and the power cord cannot be damaged.
- It is recommended that the customer install an AC surge arrestor in the AC outlet to which the Controller is connected. This is to avoid damaging the equipment by local lightning strikes and other electrical surges.
- To prevent overheating, do not block the fan on the rear panel or the ventilation holes located on the rear panel and bottom of the Controller.



CAUTION: Unsecured phantoms may “walk” during platform operation resulting in damage to the phantom.



CAUTION: Maximum platform load is 70 lb.

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1 Introduction

The CIRS Dynamic Platform provides an economical, user-friendly solution for the complex tasks associated with tumor motion and patient positioning in radiation therapy.

The platform is made from stiff, low-density plastics. The device enables precisely controlled inferior-superior motion up to 50 mm for any phantom up to 70 lb. Multiple types of dosimeters and dosimeter arrays can be positioned on the platform and used for dose verification of moving target treatment plan. A removable pin system in the main platform allows consistent placement and fixation of almost any phantom, and traditional laser alignment marks enable accurate positioning of the entire device. An independently controlled smaller platform provides posterior-anterior surrogate chest wall motion.

Features of Model 008PL

- Move any phantom with sub-millimeter accuracy and reproducibility.
- Surrogate and phantom motion fully and independently programmable.
- Easy transport, setup, and operation.
- Motion software enables different cycles, amplitudes, and waveforms.
- Surrogate breathing platform accommodates numerous gating devices.

Parts

Table 1-1. Model 008PL Parts Included

Part Number	Qty	Description
008PL	1	Dynamic Platform
-	1	Dynamic Motion Controller with firmware installed (110-220 V, 50-60 Hz)
-	1	Actuator attached to platform
-	1	3rd axis gating device (mounted to actuator)
-	1	CIRS Motion Control Software USB
-	1	Cable kit: USB 3.0 Gigabit Ethernet Adapter, Network cable CAT5e 75', DB 25 male-to-male cable, DB 9 male-to-male cable, Power cord
-	2	2-amp fast acting fuses
-	16	Platform pins
-	1	User guide
-	1	Carry case

Table 1-2. Model 008PL Optional Parts

Part Number	Description
008A-125	Chest plate with reflective 11.5 mm tracker balls (Figure 1-1)
008A-253	Cable CAT5e 150' for Dynamic Phantoms (008A, 008M, 008PL)



Figure 1-1. Optional chest plate for collecting chest motion and breathing data using an optical tracking system

2 Setup

Unpacking

- 1 Before you open the case, check the three Drop-N-Tell indicators on the right side of the case. A Drop-N-Tell shipping damage indicator shows when a case has been dropped in transit and contains potential damaged goods. The sensor displays a red arrow when applied before shipping. If the container receives a shock exceeding 25 G force, the sensor display arrows will change to blue. If the sensor has been activated and is blue, a claim may need to be filed with the carrier. If activated, take extra care in inspecting the components as they are unpacked, assembled, and tested.



Note: If there is any damage to the packaging case, containers, foam, and components, or operation, immediately contact the carrier and the phantom supplier, and keep all packaging for carrier inspection.



Figure 2-1. Drop-N-Tell Indicators on Case

- 2 Remove foam insert from case and set aside.



Figure 2-2. Foam Insert

- 3 Remove cables from case and set aside.



Figure 2-3. Cables

- 4 Remove motion controller from case and set aside.



Figure 2-4. Motion Controller

- 5 Remove foam insert from top of platform and set aside.



Figure 2-5. Foam Insert on Top of Platform

- 6 Using handles, pull platform base and actuator assembly from case.



Figure 2-6. Platform Base and Actuator

- 7 Inspect the list of parts before assembly. Refer to *Parts* on page 1. Verify all parts received.



Figure 2-7. Parts Unpacked

Assembly Procedure



WARNING: Follow the cable connection steps as they are presented in this User Guide. Connecting the cables with the Controller “Power On” can seriously damage the Phantom’s electronics.

- 1 Insert platform pins in predrilled holes on perimeter of platform.



Figure 2-8. Platform Pins Installed

- 2 This will secure standard Plastic Water® material (purchased separately).

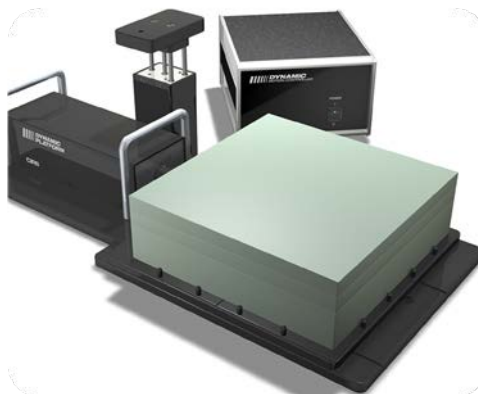


Figure 2-9. Platform With Plastic Water® Material

- 3 Other phantoms may require user to drill additional holes in the platform.

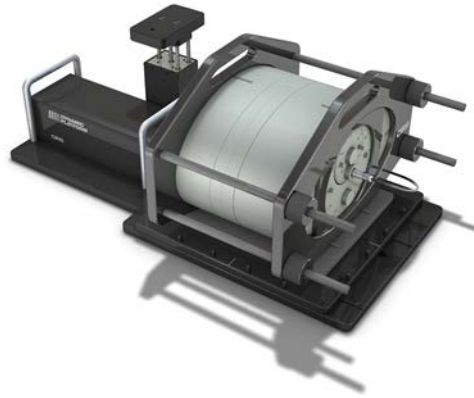


Figure 2-10. Other Phantom on Platform

- 4 Plug the Cable DB25 m/m to back of controller and to back of actuator



Figure 2-11. Connect DB25 Cable

- 5 Plug the Cable DB9 m/m which leads from 3rd axis gating device to back of actuator.



Figure 2-12. Connect DB9 Cable

- 6 Attach Ethernet cable to back of controller.



Figure 2-13. Ethernet Cable Attached

- 7 Plug power cord into the back of controller. Plug other end of power cord into the wall outlet.



Figure 2-14. Power Cord Attached to Controller and Wall Outlet

- 8 The controller and actuator are connected, powered, and ready for use.

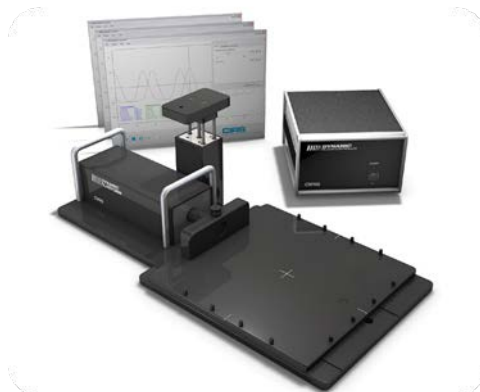


Figure 2-15. Parts Included with Model 008PL

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3 PC/Ethernet Connection Setup

The following are the recommended steps to install the USB-to-Network Adapter that was shipped with this phantom. The new network connection must be set up as a Static IP address in order for the PC to communicate with the motion controller of the phantom.

- 1 To install the necessary driver, unzip the “USB-to-Network Adapter” folder found on the provided USB drive or download the zipped folder from the CIRS website. Unzip to a known location and follow instructions from the Instructions.pdf document.

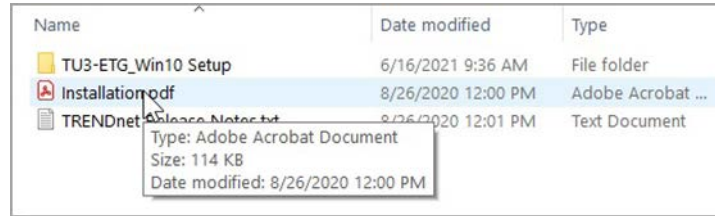


Figure 3-1. Extract USB-to-Network Adapter Folder



Note: The provided USB-to-Network Adapter can act as a Plug-and-Play device on some PCs but CIRS recommends doing the installation of the driver as outlined above.

- 2 Follow the on-screen steps and acknowledge all the messages related to driver installation. Once the driver installation is finished, plug the USB-to-Network Adapter into your PC's USB port and acknowledge the Windows installation message. Exit the USB-to-Network Adapter Software menu by clicking **Exit**.
- 3 From the Control Panel, open the Network and Sharing Center and then select **Change adapter settings**.



Figure 3-2. Access Adapter Settings in Network and Sharing Center

- 4 Provided that the installation of the USB-to-Network Card was successful, the newly installed network adapter should show as “ASIX AX88179 USB 3.0 to Gigabit Ethernet Adapter.” Select **Properties** using the right-click menu as shown below.

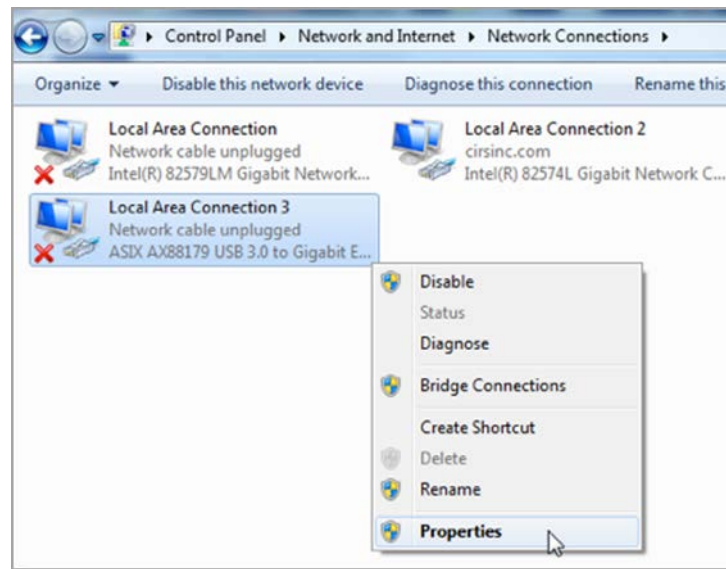


Figure 3-3. Access Network Adapter Properties

- 5 Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.

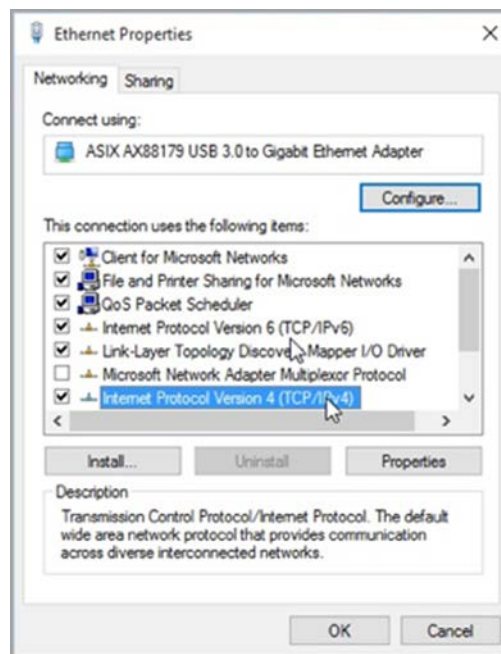


Figure 3-4. Set up Ethernet Properties

- 6 In the Internet Protocol Version 4 (TCP/IPv4) Properties window, change from the default option “Obtain an IP address automatically” to “Use the following IP address.” Enter “192.168.0.101” as the IP address and “255.255.255.000” as the Subnet mask.



Note: If an IP address conflict occurs because IP address 192.168.0.101 is already assigned to another network adapter, the user can try any other IP address between 192.168.0.102 and 192.168.0.249.

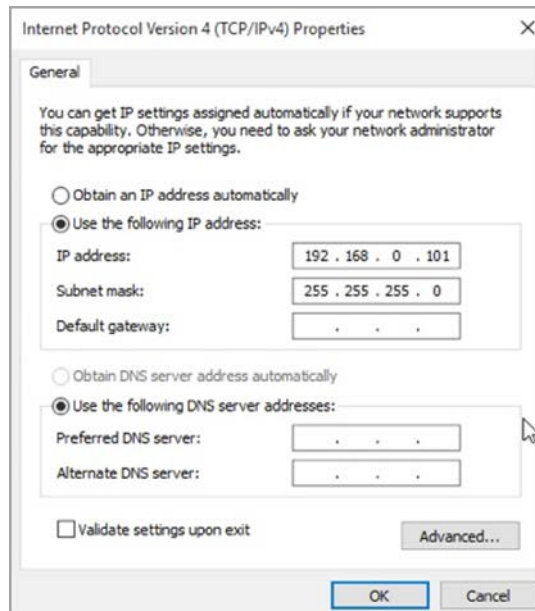


Figure 3-5. Specify IP Address

- 7 Once the IP address is entered, click **OK**. Connect the PC to the Controller using the provided Ethernet cable by inserting one end of the cable into the controller's Ethernet port and the other one into the USB-to-Network Adapter. Power on the controller. To check that the PC-to-controller connection was successful, ensure the icon of the "ASIX AX88179 USB 3.0 to Gigabit Ethernet Adapter" in the Control Panel matches the image below. Network connection can be renamed using the right-click menu.

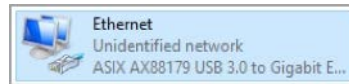


Figure 3-6. ASIX AX88179 USB 3.0 to Gigabit Ethernet Adapter Icon

- 8 A more in-depth check of the PC-to-controller communication connection can be done by running a "ping" command in Command Prompt as seen in the image below. To ping the controller, type "ping 192.168.0.250" and press **Enter**. Ping certifies IP-level connectivity to another TCP/IP device. If you receive Ping statistics for IP address 192.168.0.250 (controller IP address), the communication connection between the PC and controller was successful.

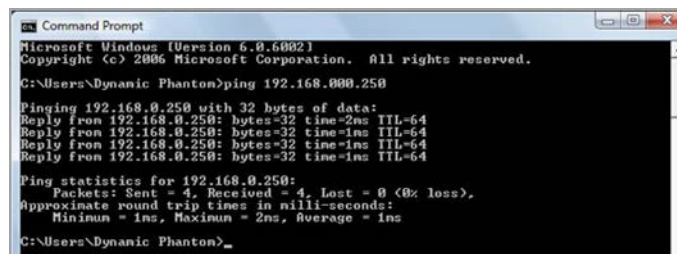


Figure 3-7. Ping Command

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4 Motion Control Software

Introduction

CIRS Motion Control is an application which allows you to control the movement of the CIRS Model 008A Dynamic Thorax Phantom and Model 008PL Dynamic Platform. With CIRS Motion Control, you can quickly set up a movement based on a library of predefined motions, including Sin, Cos4, Cos6, Sawtooth, Sharkfin, Hysteresis (Model 008A only) and Continuous Drift, Transient Excursion, Persistent Excursion, High-Frequency Excursion, or you can import custom motion data from any tab-delimited or comma-separated text file. CIRS Motion Control also allows you to save any motion to easily access the same parameters for repeated calibration and testing.

For software system requirements, see *CIRS Motion Control Software System Requirements* on page 16.

Installation

The CIRS Motion Control application requires the Trio PC Motion library, which allows the computer to recognize the Trio controller board in the Dynamic Phantom or Platform. To install the Trio PC Motion library, double-click **Trio_PC_Motion_ActiveX_2_12_0_Setup** and follow the steps in the InstallShield Wizard.

To install CIRS Motion Control, double-click **MotionControl-Setup** or **Setup** and follow the steps in the Setup Wizard. The Microsoft.NET Framework Version 3.5 is required for the application to run.

General Use

The CIRS Motion Control software is preinstalled on the optional computer. Help can be launched from the Help Menu. A copy of the software is included on a CD or USB drive.

The software automatically creates a log file where data about waveform parameters are saved. The log file is usually located under the current user in the Application Data folder. A Windows OS search function can be used to find the log file. Searching hidden files and folders should be enabled.

The log file provides a record of the motion history of the device and can be used as objective evidence that proper QA was performed.

Software User Manual and Software Upgrades

CIRS Motion Control software has an online user manual. After software installation, a copy may be viewed and downloaded using clicking **Check for Updates** from the Help Menu and selecting **Motion Control User Manual.pdf**, or by pointing a web browser to the CIRS Software Updates webpage: http://www.cirsinc.com/MotionControlUpdates/Motion_Control_User_Manual.pdf

If the user is offline during use of the phantom, it is recommended that a copy of the CIRS Motion Control User Manual is downloaded and saved. Once a copy of the manual is saved in a known location, the PDF document can be opened and viewed in a window separate from the CIRS Motion Control software window to aid in phantom setup and use.

The user manual is regularly updated to incorporate new information based on the addition and/or modification of features as well as user feedback.

CIRS recommends that the user routinely check the CIRS Software Update webpage using the "Check for Updates" option from the Help Menu. This page indicates the current software version (Figure 4-1). The latest free software upgrade is posted as soon as it becomes available. Instructions for updating the software are also posted.



Note: Controllers with serial numbers containing P136 may experience PC communication failures upon updating Windows OS. If this occurs, CIRS strongly recommends a motion controller update. For details on how to upgrade, refer to the Model 008A product brochure.



Figure 4-1. About CIRS Motion Control Software Window

5 Support and Maintenance

Hardware Maintenance

Inspection

Periodically inspect the phantom and accessories for damage. If damage is visible, if any mechanical or electrical degradation is suspected, or if errors are suspected, discontinue use and contact Sun Nuclear Support. See *Contacting Sun Nuclear Support*.

Repair

The phantoms and the parts provided with the phantoms cannot be repaired by the user. If there are problems with any of the devices, contact Sun Nuclear Support.

Cleaning

You can clean the phantom with a soft cloth dampened with water and mild detergent. Do not use disinfectants or solvent-based cleaners or sprays.

Disposal and Recycling



Do not discard unit as waste. Recycle the components in accordance with local regulations.

Contacting Sun Nuclear Support

You may request support in two ways:

- Submit a support request using our online form. See *Support Website* below.
- Contact the Sun Nuclear Support team by telephone:
 - U.S.A.: +1 321-259-6862, Option 3
 - Netherlands: +31 20 399 90 41, Option 1
 - Germany: +49 61 02 50 49 500, Option 2

Support Website

- 1 Open an internet browser and navigate to www.sunnuclear.com/support.
- 2 Enter your email address and password and then click **Login**.
 - To download product information, click **Products and Devices**, select the product, and then select the download type.
 - To open a Support request, click **Open New Case**, complete the form, and then click **Create Case**.

6 Specifications

Product Specifications

Table 6-1. Model 008PL Specifications

Characteristic	Specification
Overall Dimensions	71 x 35 x 28 cm
Overall Weight	17.2 kg
Power	110-250 VAC, 50/60 Hz
Platform Dimensions	35 x 35 cm
Max. Platform Load	32 kg (70 lb)
Amplitude, IS	± 25 mm
Amplitude, AP Surrogate	± 25 mm
Max. Surrogate Platform Load	5.4 kg (12 lb)
Motion Accuracy	± 0.1 mm
Cycle Time	1 - ∞ (adjusted based on amplitude)
Editable built-in waveforms	$\sin(t)$, $1-2\cos^4(t)$, $1-2\cos^6(t)$, sawtooth, sharkfin

CIRS Motion Control Software System Requirements

- Windows XP® or later
- Pentium 3® or equivalent
- 512 MB RAM
- 2 MB of available disk space

Appendix A: Regulatory Supplement

Sun Nuclear Corporation Symbols

The following symbols are used in this guide and in Sun Nuclear Corporation's product labels.



WARNING: This symbol indicates a risk of electric shock. (EN ISO 7010, W012)



WARNING: This symbol indicates a hazard that could result in major injury or equipment damage. (EN ISO 7010, W001)



CAUTION: This symbol indicates a potential hazard that could result in minor injury or equipment damage. (EN ISO 15223-1, 5.4.4)



CAUTION: This symbol indicates a pinch hazard. (EN ISO 7010, W024)



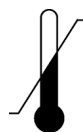
Note: Important or supporting information.



Manufacturer's Identification (name and address). (EN ISO 15223-1, 5.1.1)



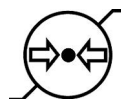
Date of Manufacture. (EN ISO 15223-1, 5.1.3)



Temperature limitation. (EN ISO 15223-1, 5.3.7)



Humidity limitation. (EN ISO 15223-1, 5.3.8)



Atmospheric pressure limitation. (EN ISO 15223-1, 5.3.9)



Catalog Number. (EN ISO 15223-1, 5.1.6)



Consult instructions for use. This equipment must be used in accordance with the instructions in this manual. Read all instructions and safety labels before use. (EN ISO 15223-1, 5.4.3)



Do not throw in trash; dispose of in an environmentally friendly way. (EN 50419)



This symbol indicates a general mandatory action. (EN ISO 7010, M001)

Operator Responsibility

The instructions in this manual are intended for trained clinical personnel. The operator is solely responsible for the accurate setup and use of the phantom.

Reporting Health or Safety Related Issues or Concerns

A notice to the user and/or patient that any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

To report any safety or health related issues or concerns regarding the use of Sun Nuclear products, contact Sun Nuclear directly.

Modifications to Equipment

Any changes or modifications to the device that are not expressly approved by Sun Nuclear Corporation could void your warranty.

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