

manual



helios™

REAL-TIME VIDEO IMAGE
ENHANCEMENT SYSTEM

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IMPORTANT SAFETY INSTRUCTIONS

When using an electrical appliance, basic safety precautions should always be followed, including the following. Read all instructions before using power supplies.

DANGER — To reduce the risk of electric shock: A power supply should never be left unattended when plugged in. Always unplug this power supply from the electric outlet immediately after using.

WARNING — To reduce the risk of burns, fire, electric shock, or injury to persons:

1. Do not allow to be used as a toy. Pay close attention when this power supply is used by or near children.
2. Use this power supply only for its intended use as described in this manual. Use only attachments recommended by the manufacturer as contained in this manual.
3. Never operate this power supply if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or fallen into water. In such cases, return the appliance to the nearest authorized dealer or service center for examination, repair, electrical or mechanical adjustment.
4. Never drop or insert any object into any openings.
5. Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
6. The socket-outlet should be installed near the power supply and should be easily accessible.
7. Do not unplug by pulling on cord. To unplug, pull on the plug, not the cord.

1.1 ABOUT THIS MANUAL

The purpose of this manual is to provide information only. It is subject to change without notice and does not represent a commitment on the part of Inuktun Services Ltd., or its agents.

Prior to shipment, the Helios™ was tested and found to comply with factory standards. If any problems develop with the system, please contact Inuktun Services Ltd.

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1.2 WHAT'S INCLUDED

Please take a moment to ensure that the following items are included with your system.

	Standard Helios™ System – RCA	Standard Helios™ System – DB15	Embedded Helios™ System
Helios™ Device – RCA	●		
Helios™ Device – DB15		●	
2 RCA Cables	●		
5VDC Wall Adaptor	●	●	
Mini USB Cable	●	●	
Helios™ Controller Software Install CD	●	●	
Helios™ PCB	<i>in device</i>	<i>in device</i>	●
Microcontroller PCB	<i>in device</i>	<i>in device</i>	●
Keypad Membrane	<i>in device</i>	<i>in device</i>	●
DB15 to DB15 Cable		●	
This Manual	●	●	●

1.0 INTRODUCTION

1.3 SYSTEM DESCRIPTION

High quality video can be difficult to capture due to adverse conditions such as low light, dust, rain, snow, fog, smoke and turbid water. Helios™, Inuktun's real-time video image enhancement system, automatically corrects these visibility issues and substantially improves image clarity, brightness and edge-emphasis. The Helios™ platform exposes new video image details that escape the naked eye.

Helios™ is a highly affordable hardware / software option that integrates with standard Inuktun controllers and cameras. This innovative solution from Inuktun is essential to the work flow of inspection professionals responsible for mission critical video. **See it for yourself.**

FIGURE 1-1: STANDARD HELIOS™ SYSTEM – RCA DIAGRAM



- **Mini USB** — provides power and/or connection to a computer for software control
- **Keypad Membrane** — control panel for Helios™
- **5VDC In** — provides power via 5VDC wall adaptor
- **Video Out** — video output to monitor or other device
- **Video In** — video input from video source (NTSC or PAL)

The Helios™ is controlled using the keypad membrane or software control. The keypad provides the user with an intuitive control surface and real-time illuminated feedback on three separate LED bar graphs. The software provides the user with additional settings for fine tuning the Helios™.

The Helios™ comes in several different configurations:

- The **Standard Helios™ System** (section 2.2) is the standard connection for most applications. The Helios™ can be plugged in and used right away using the keypad membrane for control. This system comes in two configurations: RCA and DB15.

The **Standard Helios™ System – RCA** has RCA connectors for video input and output. It is for use with standard video sources and monitors.

The **Standard Helios™ System – DB15** has two HD-DB15 connectors for video input and output, power, and audio pass-through. This connection is for integration with Inuktun Services Ltd products.

- The **Embedded Helios™ System** (section 2.3) is used in applications where the Helios™ is to be installed into your own design. The PCBs are provided separately and mounted in your own configuration. The Helios™ is controlled using the keypad membrane for control.

The Standard Helios™ Systems come with Helios™ PC Controller Software (section 2.4). When connected to a computer running Windows® operating systems, the Helios™ can be controlled with more advanced features and additional precision. The settings configured in the software can be saved onto the Helios™ and recalled for use when not connected to a computer.

2.0 SET-UP

2.1 SPECIFICATIONS

Power Requirement	5VDC, 1.5W max
Power Sources	5VDC 1A Wall Adaptor, USB Power
Operating Temperature Range	0° to +50°C
Video Input	Composite (CVSB, RS-170) NTSC or PAL, 75 Ω, 1Vp-p
Video Output	Composite (CVSB, RS-170) NTSC or PAL (same as input), 75 Ω, 1Vp-p
Computer Operating System	Windows XP or later
Computer Framework	.NET 3.5

The Helios™ can be plugged into the wall adaptor and through the USB connection at the same time. It is not recommended that the Helios™ be placed under any physical stress or subject to heavy vibration.

Follow the procedure in section 2.2, 2.3 or 2.4 to set up the Helios™ depending on your configuration.

2.2 STANDARD HELIOS™ SYSTEM SET-UP

FIGURE 2-1: STANDARD HELIOS™ SYSTEM – RCA



The Standard Helios™ System is the standard connection for most applications.

The Helios™ can be plugged in and operated right away using the keypad membrane for control. This system comes in two configurations: RCA and DB15.

- The **Standard Helios™ System – RCA** has RCA connectors for video input and output. It is for use with standard video sources and monitors.
- The **Standard Helios™ System – DB15** has two HD-DB15 connectors for video input and output, power, and audio pass-through. This connection is for integration with Inuktun Services Ltd products.

2.2.1 RCA CONFIGURATION*

To set up the Helios™ for the RCA configuration, plug the Helios™ into a power source (either the 5VDC wall adaptor or USB power). Plug one of the provided RCA cables from the system INPUT of the Helios™ to your raw video source. Plug the other provided RCA cable from the system OUTPUT to a monitor or other device.

Even without power applied, the video signal should be observable.

When the Helios™ is off, the raw video signal will pass through.

The Helios™ is controlled by using the membrane keypad on the top of the device.

Refer to section 3.2 for help.

For advanced control of the Helios™, the Helios™ PC Controller software can be used.

Refer to section 2.4 for help.

2.2.2 DB15 CONFIGURATION*

To set up the Helios™ for DB15 configuration, use the DB15 to DB15 cable included to connect the Helios™ in-line with an Inuktun Services Ltd product. Make sure that the DB15 connectors are secured snugly with the connector screws.

Even without power applied, the video signal should be observable.

When the Helios™ is off, the raw video signal will pass through.

The Helios™ is controlled by using the membrane keypad on the top of the device.

Refer to section 3.2 for help.

For advanced control of the Helios™, the Helios™ PC Controller software can be used.

Refer to section 2.4 for help.

2.3 EMBEDDED HELIOS™ SYSTEM SET-UP*

To set up the Helios™ for the Embedded Helios™ System, mount the PCBs included prior to final connection. The Helios™ PCBs must be in close proximity to the keypad membrane ensuring that the membrane flexible ribbon cable fits uniformly into the microcontroller PCB.

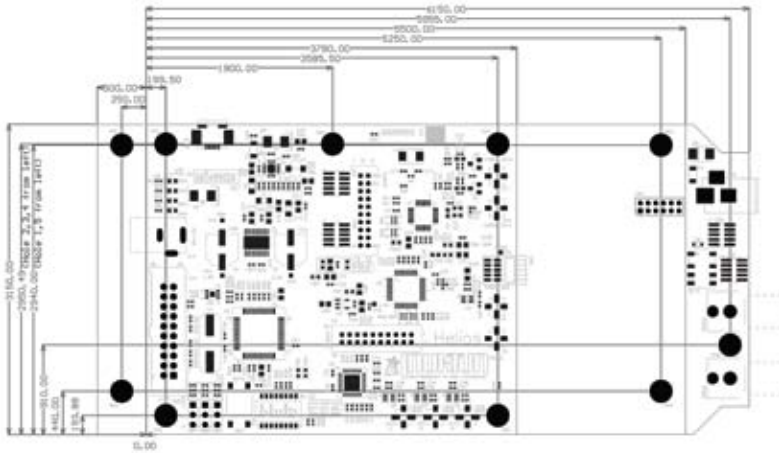
Refer to figure 2-2 (below) for mounting dimensions.

There are two ways to route video through to the Helios™ PCB. Refer to section 2.3.1 or 2.3.2.

** NOTE: It is advisable to always record raw video and use the Helios™ processed image (the “Helios-ed” image) for display purposes only. If you record video after it has been Helios-ed it cannot be converted back to its raw form, but raw recorded video can always be played back through the Helios™ for viewing. In addition, this offers the ability to try different settings on the same video recording in order to achieve the best results.*

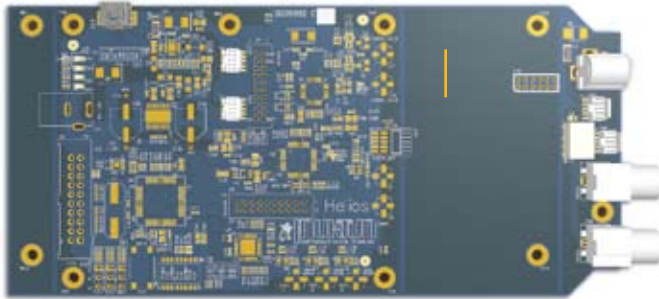
2.0 SET-UP

FIGURE 2-2: HELIOS™ PCB DIMENSIONS (THOUSANDTHS OF AN INCH)



2.3.1 VIDEO THROUGH RCA

FIGURE 2-3: EMBEDDED HELIOS™ SYSTEM USING RCA CONNECTORS



Connect a 5VDC source into either the J14 or CN6, ensuring that the power source has a low voltage ripple and supports 1A of current. Plug an RCA cable from the INPUT RCA connector (JACK1) of the Helios™ PCB to your video source. Plug an RCA cable from the OUTPUT RCA connector (JACK2) to a monitor or other device.

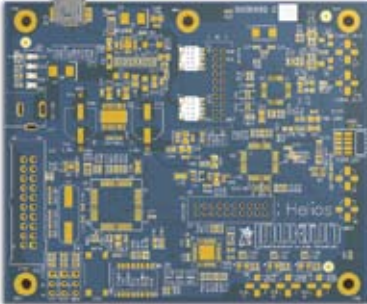
Connect the keypad membrane into the Microcontroller PCB and lock the flexi connector.

Even without power applied, you should see the raw video signal coming through. Likewise, when the Helios™ is off, the raw video signal will also pass through.

Control the Helios™ by using the keypad membrane. Refer to section 3 for help.

2.3.2 VIDEO THROUGH MINI COAX

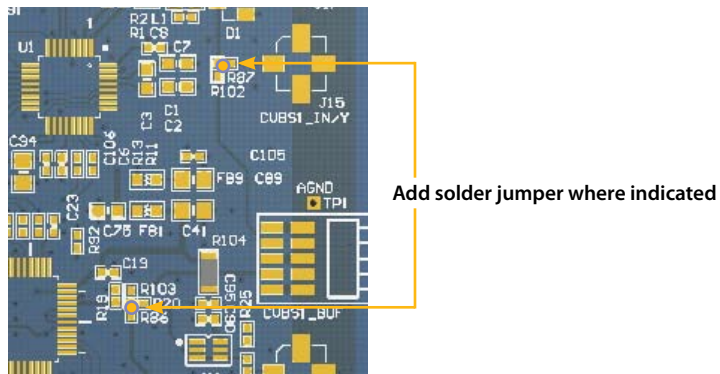
FIGURE 2-4: EMBEDDED HELIOS™ SYSTEM USING MINI COAXIAL CONNECTORS



In applications where the Helios™ PCB must conform to a small enclosure space, the PCB can be miniaturized so that video can be routed through mini coaxial connectors. Before mounting the Helios™ PCB, carefully break off the left and right halves of the Helios™ PCB at the 'v-score' lines. Disconnect and remove cables running to the broken off portion of the Helios™ PCB.

Next, ensure that video is routed through the mini coaxial connectors instead of the header connector. Short the pads on R86 and R87 with a solder jumper or 0R ohm resistor. Refer to figure 2-5 below.

FIGURE 2-5: ADD SOLDER JUMPERS TO USE MINI COAXIAL CONNECTORS



By adding the solder jumpers, video can now be routed through J15 and J5. These are mini coaxial connectors. Connector information is below.

Manufacturer: Hirose Electronic

Manufacturer Part Number: H.FL-R-SMT(01)

Description: Rec Coax H.FL Series SMD

2.0 SET-UP

Next mount the Microcontroller PCB and keypad membrane and connect the Microcontroller PCB and Helios™ PCB as before using the cable included. All of the 10 position ribbon cables included are interchangeable, however the start and end connections must always be the same.

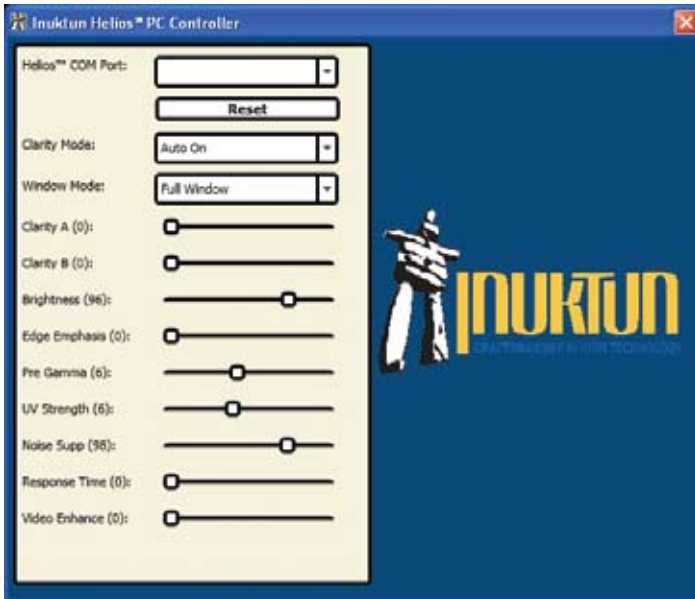
Plug the keypad membrane into the Microcontroller PCB and lock the flexi connector.

*When power is not applied, you will not see video signal coming through.
There is no video pass through in this configuration.*

Control the Helios™ by using the keypad membrane. *Refer to section 3 for help.*

2.4 THE HELIOS™ PC CONTROLLER SOFTWARE SET-UP

FIGURE 2-6: HELIOS™ PC CONTROLLER SOFTWARE



A Standard Helios™ System can be connected to a Windows based computer for software control.

To set up the Helios™ for software control, plug in the Helios™ to the computer using the USB cable provided. Turn on the Helios™ as described in section 3.2.1.

Install the Helios™ PC Controller Software by following the instructions in section 2.4.1. Start the software by double clicking on HeliosController. A window will appear as shown in figure 2-6 above.

Connect to the Helios™ by selecting the appropriate COM port from the drop-down Helios™ COM Port. The Helios™ will show up as a COMxx where xx is a number. There will be several COM ports shown and the Helios™ will most likely be the COM port with the highest number. Click on the appropriate COM port. The Power Indicator shown in section 3.1 will blink continuously when a valid connection is made between the software and the Helios™.

Control of the Helios™ can now be performed by the software and the keypad membrane. Refer to section 3 for help.

2.4.1 HELIOS™ CONTROLLER SOFTWARE INSTALLATION

Insert the Helios™ Controller Software CD into your Windows based computer. Open the directory on your CD ROM drive. Two files are included:

- **dotnetfx35.exe – OS Framework .NET 3.5 Setup**
- **HeliosControllerSetup.exe – Helios™ Controller Software Setup**

Be sure that your computer is running Windows® XP or later. Install the Helios™ Controller Software by double clicking on HeliosControllerSetup.exe. Follow the installation instructions. Double click on HeliosController.exe to begin. To uninstall, navigate to and double click on Inuktun\HeliosController\Uninstall HeliosController in your start menu.

OR

If the Helios™ Controller Software does not work properly, then you may need to install the .NET 3.5 framework. Uninstall the Helios™ Controller Software by double clicking on Inuktun\HeliosController\Uninstall HeliosController in your start menu.

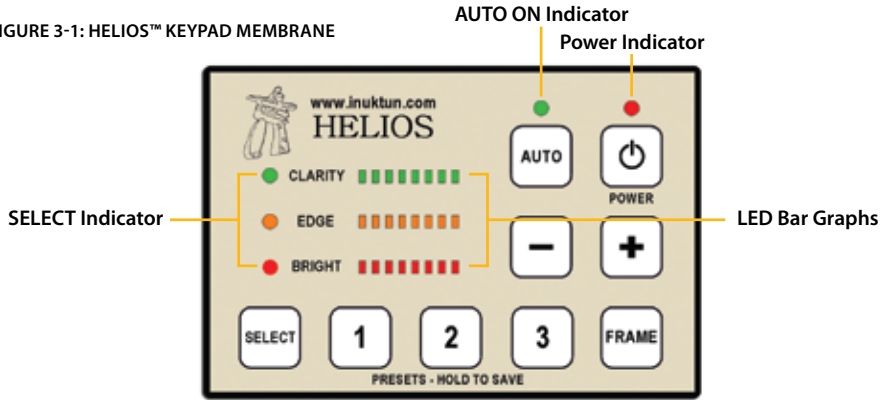
Install the .NET 3.5 framework by double clicking on dotnetfx35.exe file on the CD.

Install the Helios™ Controller Software by double clicking on HeliosControllerSetup.exe on the CD. Follow the installation instructions. Double click on Helios™Controller.exe to begin. To uninstall, navigate to and double click on Inuktun\HeliosController\Uninstall HeliosController in your start menu.








3.0 OPERATION

3.1 KEYPAD OVERVIEW

FIGURE 3-1: HELIOS™ KEYPAD MEMBRANE





Button functions are defined below:

-  **Power On/Off** — the Power Indicator will light when on.
-  **Clarity Auto** — the AUTO ON Indicator will light when on.
-  **Setting Increase** — the selected setting will increase once.
-  **Setting Decrease** — the selected setting will decrease once.
-  **Helios™ Enhanced Frame Size/Location**
-  **Recall/Save Settings**
-  **Setting Select** — use to select which setting to adjust.

3.2 BASIC FUNCTIONS (NORMAL MODE)

Follow the steps in section 2.2 to setup the Helios™.


3.2.1 POWER ON/OFF

Press  to turn the Helios™ on or off. When the Helios™ first turns on, you will hear a small click and all LEDs will illuminate for a short time. The Power Indicator will remain on while the Helios™ is on. The settings stored in  will be recalled. When the Helios™ is connected to the computer

and the Helios™ Controller Software is running, the Power Indicator will blink continuously signifying a valid link has been made.


If at any time the Helios™ appears to have frozen, turning the Helios™ off, then on again will reset it.



3.2.2 FRAME ADJUSTMENT

Press  to change the Helios™ enhanced frame size. Each press will cycle the FRAME from Center Enhanced, Half Enhanced, and Full Enhanced. This is the portion of the image that is enhanced using your current settings. The rest of the image is in its original state.


3.2.3 SETTING ADJUSTMENT

The adjustable settings available in Normal Mode are CLARITY, EDGE, and BRIGHTNESS.




Press  until the desired setting is selected (the LED beside the desired setting is illuminated).




Press  or  to increase or decrease the selected setting.

3.2.4 AUTO ON/OFF

Press  to turn CLARITY AUTO adjust on or off. When AUTO is on, the AUTO ON indicator will illuminate and the CLARITY LED Bar Graph will turn off. When this feature is turned on, CLARITY will automatically adjust with the image to give the optimal setting. When this feature is off, the CLARITY LED Bar Graph will turn on, and your current setting will be displayed.

3.2.5 SAVE/RECALL SETTINGS

To save your current settings there are three save slots available. Press and hold ,  or  for about four seconds to save your settings. The LED Bar Graphs will blink in sequence to indicate the settings were saved.

To recall your settings, press ,  or  once. The settings will load and appear in the LED Bar Graphs. Note that even if settings have been stored while in Software Mode (*refer to section 2.4 and section 3.3*), these settings can also be recalled while in Normal Mode.

3.0 OPERATION

3.2.6 RESTORE FACTORY DEFAULTS

To restore factory defaults, press and hold **2**, **3** and **+** for about six seconds. The LED Bar Graphs will blink in sequence to indicate the settings were restored to default values.

Note that when restoring factory defaults, this will permanently clear any previously saved settings.

3.3 ADVANCED FUNCTIONS (SOFTWARE MODE)

The advanced functions are only available in the Standard Helios™ System.

Follow the steps in section 2.4 to setup the Helios™.

The Helios™ is now connected to the Helios™ Controller Software. The Power Indicator on the Helios™ will blink as long as there is a valid link between the two.

The settings can be adjusted by either the software or the keypad membrane. When one is adjusted, the other will update immediately. Many of the settings in the software do not appear on the Helios™ but will be stored in memory.

3.3.1 SAVE/RECALL SETTINGS

After the settings have been adjusted they can be saved into one of the three memory slots on the Helios™. All of the settings in the Helios™ Controller Software will be saved in the Helios™ memory. Likewise, when the settings are recalled, all of the settings will be loaded from memory even when not connected to a computer.

Follow the directions in section 3.2.5 to save/recall settings.

If at any time you are not sure what settings are on the Helios™, connect the Helios™ to the Helios™ Controller Software on a computer and recall the settings. The software will update and display the current settings.

Use the instructions in section 3.2.6 to clear the 3 memory slots on the Helios™ back to factory default values.

HAVING PROBLEMS?

For technical support, please contact your local Inuktun office:

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EC Declaration of Conformity

Inuktun Europe Limited, 154 Forest Avenue, Aberdeen, UK AB15 4UN hereby declares that the following equipment:

Helios™ Video Enhancement System

The equipment can be described as; a hardware/software option that integrates with standard Inuktun controllers and cameras.

Specification

Power Requirement	5VDC, 1.5W max
Power Sources	5VDC 1A Wall Adaptor or USB Connection
Dimensions	121 mm / 4.75" diameter 406mm / 16"
Operating Temperature Range	0° to +50°C
Video Input	Composite (CVSB, RS-170) NTSC or PAL, 75 Ω, 1Vp-p
Video Output	Composite (CVSB, RS-170) NTSC or PAL (same as input),75 Ω, 1Vp-p
Computer Operating System	Windows XP or later
Computer Framework	.NET 3.5

Has been designed and manufactured in accordance with;

The European Machinery Directive 2006/42/EC being implemented in the United Kingdom by the Supply of Machinery (Safety) Regulations 2008.

and

The European Low Voltage Directive 73/23/EEC – 93/68/EEC implemented in the United Kingdom by The Electrical Equipment (Safety) Regulations 1994 (SI 1994 / 3260)

This equipment was designed to meet with the following European Harmonised Standards;

BS EN 55022:2006 Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement

BS EN 55024:2010 Information technology equipment. Immunity characteristics. Limits and methods of measurement

BS EN 60950-1: 2006 +A1: 2010 +A11: 2010 Information technology equipment. Safety. General requirements

I hereby declare that the equipment described in this document has been designed and manufactured in compliance with the relevant sections and essential health and safety requirements of the aforementioned Standards, Codes and Directives / Regulations.

Name Brian Storie Position Authorised Representative

Signed:



26th September 2012



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