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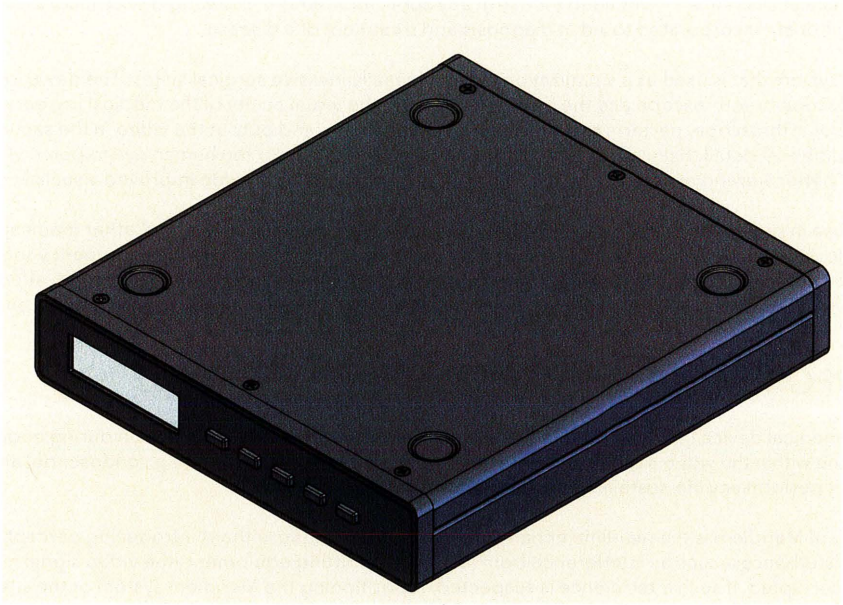
INSTRUCTIONS FOR USE
Meridiem® Image Enhancer



CONTENTS

INTRODUCTION

ABOUT THIS MANUAL

This product manual will help you through the installation and setup processes of your Meridiem® Image Enhancer. It is recommended you read this manual carefully and follow the instructions in the installation section for verification of system functions.

PRODUCT DESCRIPTION & INTENDED USE

The Meridiem™ Image Enhancer (Meridiem) is intended for use in any application where a viewing device (fluoroscope, endoscope, laparoscope, etc.) and monitor are incorporated to aid in diagnosis and treatment of a disease.

Meridiem is a stand-alone system that is used as a visualization aid in minimally invasive surgical suites. The device will reside in the video path between a surgeon's endoscope or arthroscope and the display to improve the visual acuity of the medical imagery. The box will receive native video from the endoscope or arthroscope, perform real-time video enhancement, and output the video in the same raster format/resolution. The output video shows additional detail that was captured by the sensor but difficult for the human eye to perceive. The processed video provides the viewer with a better viewing experience as subtle details are enhanced to provide improved visualization.

Meridiem is designed for use in professional healthcare facilities. This includes hospitals, clinics, and other medical establishments with controlled electromagnetic conditions. Meridiem is not intended for use in environments where high-frequency surgical equipment or magnetic resonance imaging (MRI) devices are in operation, as these may cause electromagnetic interference that could affect device performance. Users should ensure that the device is operated in environments consistent with these specifications to maintain safety and effectiveness.

ESSENTIAL PERFORMANCE OF MERIDIEM

The Meridiem system is a medical device intended to enhance surgical video for improved visualization during endoscopic and arthroscopic procedures. It resides in-line within the video signal chain between the surgical imaging source (e.g., endoscope) and the surgical monitor. The Meredium system does not perform any life-sustaining or patient-contact functions.

The essential performance of Meridiem is the real-time enhancement of surgical video without introducing perceptible latency. In the event of electromagnetic (EM) disturbances—such as interference from nearby RF-emitting equipment—the video signal may become degraded, disrupted, or temporarily corrupted. If such interference is suspected, repositioning the Meridiem system or the suspected RF source may resolve the issue.

If performance degradation persists or a system fault occurs, the video signal may be rerouted directly from the imaging source to the surgical monitor, bypassing the Meridiem device. This allows the surgical procedure to continue using unenhanced video without interruption.

Confirming Essential Performance
The Meridiem system's essential performance is defined as the ability to enhance surgical video in real time without introducing latency.

To confirm essential performance, the user shall:

- Verify that the system is powered on and video is displayed on the connected surgical monitor.
- Confirm that image enhancement is visible and that adjustment controls (front panel or presets) produce noticeable changes in video clarity.
- If video is not displayed or no enhancement effect is visible, follow troubleshooting instructions or bypass the device by routing video directly to the monitor.

DEVICE CLASSIFICATION

The Meridiem system is classified as Class A equipment in accordance with CISPR 11.

NOTE: The characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential ENVIRONMENT (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment

WARNINGS & NOTIFICATIONS

- To prevent fire or shock hazards, do not expose this unit to rain or moisture.
- WARNING: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth
- To avoid shock hazard, do not remove the covers around the unit and do not connect or disconnect the unit during an electrical storm.
- Any equipment to which the unit will be attached must also be connected to properly wired and grounded power outlets.
- The Meridiem device should be installed on a stable, flat surface. It is not designed to be stacked with or placed adjacent to other equipment. If such positioning is necessary, verify that the Meridiem device operates normally in the chosen configuration to ensure its performance and that of surrounding equipment are not compromised.
- Portable radio frequency (RF) communications equipment, including peripherals such as antenna cables and external antennas, should be used no closer than 30 cm (12 inches) to any part of the Meridiem device, including cables specified by the manufacturer. Failure to maintain this minimum separation distance may result in degradation of the device's performance.
- The emisions characteristics of this equipment make it suitable for use in industrial areas and hospitals. If it is used in a residential environment, this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.
- Unauthorized modifications or repairs to the Meridiem system are strictly prohibited and may impair device safety, performance, and regulatory compliance. Only personnel authorized by ZMicro are permitted to perform service or upgrades. Any unauthorized changes void warranty and may result in unsafe operating conditions.

SHIPMENT CONTENTS

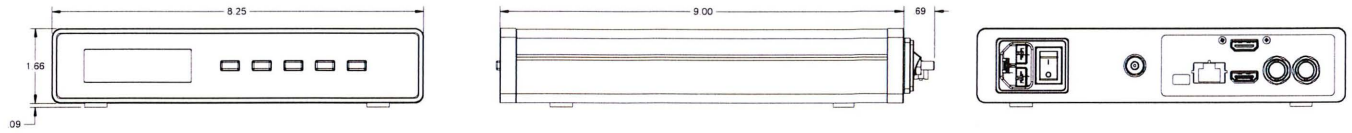
Ensure the following parts are included in the package received from ZMicro. Verify all parts are in good condition and have not been damaged during shipment. If any parts are missing or damaged, please contact our Customer Service department at customer.service@zmicro.com or by calling 858.831.7040.

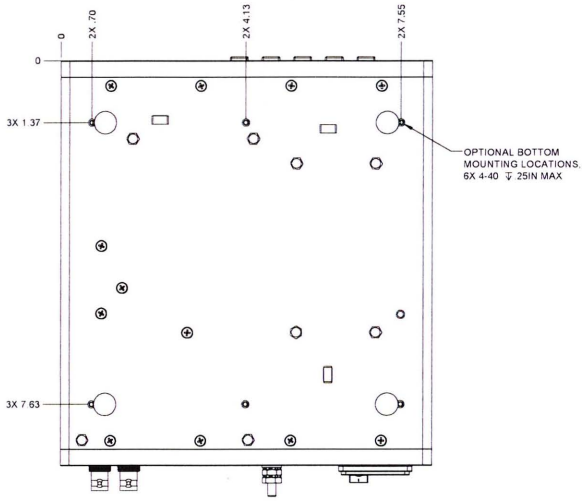
Meridiem requires that the enclosed power cord be used with the system as other power cables may negatively affect EMC performance.

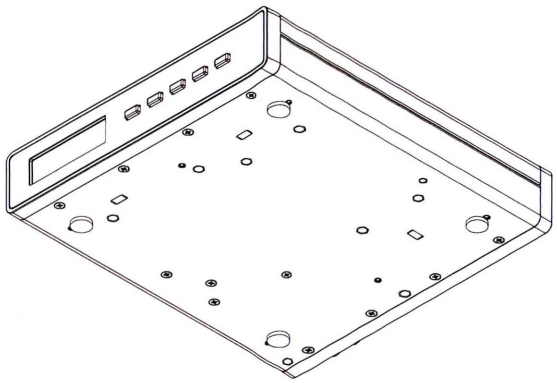
- Meridiem® Image Enhancer
- Medical Grade Power Cable
- Product Folder (Includes: Shipping Information & IFU)

MECHANICAL OUTLINE & TECHNICAL SPECIFICATIONS

MECHANICAL OUTLINE







TECHNICAL SPECIFICATIONS

SIZE & WEIGHT	Dimensions	1.65"H x 8.25"W x 9.00"D
	Weight	3lbs.
POWER	Power Supply	Internal 100/240VAC, 90 to 264V AC auto-ranging, 50 to 60Hz
	Power Consumption	27W
INPUT/OUTPUT	Connectors	Input: 3G-SDI via BNC RF Connector, HDMI Connector Output: 3G-SDI via BNC RF Connector, HDMI Connector
TEMPERATURE	Operating Temp.	+5°C to +35°C
	Storage Temp.	-29°C to +60°C
TEST STANDARDS	IEC 60601-1, Edition 3.2, IEC 60601-1-2, Edition 4.1, and ISTA 2A-2011	

EMC COMPLIANCE

The Meridiem system complies with the electromagnetic compatibility (EMC) requirements as specified in IEC 60601-1-2 Edition 4.1

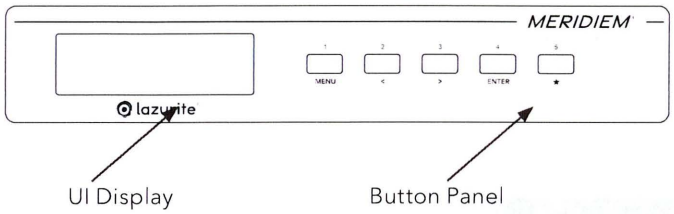
PHENOMENON	PROFESSIONAL HEATHCARE FACILITY ENVIRONMENT	TEST LEVELS AND PARAMETERS
Conducted RF EMISSIONS AC Power Port	CISPR 11, Group 1, Class A	0,15 to 0,50 MHz: 79 dB(µV) QP, 66 dB(µV) AVG 0,50 to 30 MHz: 73 dB(µV) QP, 60 dB(µV) AVG
Radiated RF EMISSIONS Enclosure Port	CISPR 11, Group 1, Class A	30 to 230 MHz: 40 dB(µV/m) QP at 10m distance 230 to 1000 MHz: 47 dB(µV/m) QP at 10m distance 1 to 3 GHz: 76 dB(µV/m) QP at 3m distance 1 to 3 GHz: 56 dB(µV/m) AVG at 3m distance 3 to 6 GHz: 80 dB(µV/m) QP at 3m distance 3 to 6 GHz: 60 dB(µV/m) AVG at 3m distance
Harmonic distortion AC Power Port	IEC 61000-3-2	Refer to IEC 61000-3-2
Voltage fluctuations and flicker AC Power Port	IEC 61000-3-3	Refer to IEC 61000-3-3
ELECTROSTATIC DISCHARGE Enclosure and SIP/SOP Ports	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Radiated RF EM fields Enclosure Port	IEC 61000-4-3	3 V/m 80 MHz - 2,7 GHz 80 % AM at 1 kHz
Proximity fields from RF wireless communications Equipment Enclosure Port	IEC 61000-4-3	Refer to Table (9) of IEC 60601-1-2 Edition 4.1
Electrical fast transients / Bursts AC Power Port	IEC 61000-4-4	± 2 kV 100 kHz repetition frequency
Electrical fast transients / Bursts SIP/SOP Port	IEC 61000-4-4	± 1 kV 100 kHz repetition frequency
Surges Line-to-line AC Power Port	IEC 61000-4-5	± 0,5 kV, ± 1 kV
Surges Line-to-ground AC Power Port	IEC 61000-4-5	± 0,5 kV, ± 1 kV, ± 2 kV
Surges Line-to-ground SIP/SOP Port	IEC 61000-4-5	± 2 kV

EMC COMPLIANCE (CONTINUED)

PHENONMENON	PROFESSIONAL HEATHCARE FACILITY ENVIRONMENT	TEST LEVELS AND PARAMETERS
Conducted disturbances induced by RF fields AC Power Port & SIP/SOP Port	IEC 61000-4-6	3 V 0,15 MHz - 80 MHz 6 V in ISM bands between 0,15 MHz and 80 MHz 80 % AM at 1 kHz
RATED power frequency magnetic fields Enclosure Port	IEC 61000-4-8	30 A/m 50 Hz
Voltage dips AC Power Port	IEC 61000-4-11	0 % UT; 0,5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % UT; 1 cycle and 70 % UT; 25/30 cycles Single phase: at 0° 0 % UT; 250/300 cycle
Proximity magnetic fields Enclosure Port	IEC 61000-4-39	Refer to Table (11) of IEC 60601-1-2 Edition 4.1

DEVICE OVERVIEW, INSTALLATION, & POWER

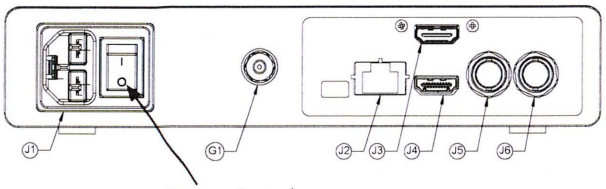
FRONT PANEL



UI Display

Button Panel

REAR PANEL



Power Switch

CONNECTOR DESCRIPTION			
I.D.	**MECHANICAL SPEC**	**ELECTRICAL SPEC**	**USE**
G1	10-32 UNC	N/A	Chassis Ground
J1	IEC 60320 C14 (Male Pins)	IEC 60320 C14	AC Power Input
J2	RJ45	IEEE 802.3	1GbE LAN
J3	HDMI	HDMI 1.4	HDMI Out
J4	HDMI	HDMI 1.4	HDMI In
J5	BNC 75 OHM	3G-SDI	SDI Out
J6	BNC 75 OHM	3G-SDI	SDI In

WARNING: Verify proper signal configuration prior to use. Make sure video sources are connected to inputs and video destination are connected to outputs. Improper configuration will prevent essential performance of the Meridiem system.

POWER SUPPLY & GROUNDING INSTRUCTIONS

The Meridiem system is equipped with an appliance inlet for connection to mains power. To ensure safe operation and proper grounding, use only a medical-grade power cord with an appropriate protective earth (PE) conductor.

A grounding lug is provided on the rear panel of the device. This grounding terminal must be connected to a hospital-grade protective earth ground before operation. This connection reduces the risk of electric shock and is required to maintain compliance with electrical safety standards.

Do not operate the Meridiem system without proper grounding. Ensure the power cord is connected to a grounded hospital-grade power outlet.

Warning: The power switch and appliance inlet must remain accessible at all times to ensure immediate disconnection if required for safety reasons.

POWER CONNECTION & DISCONNECTION

The Meridiem system includes a dedicated power switch located on the rear panel, which serves as the means of disconnection from mains power.

To fully disconnect the device from mains power:

- Ensure the power switch is set to the "OFF" position.
- Disconnect the power cord from the AC mains outlet.

Ensure that the device is easily accessible and not permanently fixed so that it can be quickly unplugged if necessary. Do not cover or block access to the power switch or appliance inlet during installation or use.

CABLE INSTALLATION & POWERING SYSTEM ON

1. Using the diagram on the 'Device Overview' page, connect all appropriate cables required for your configuration.
2. Connect the power cable to the Meridiem system. Note the notch configuration and pin-mating when connecting to power to avoid damaging the unit.
3. When the connection process has been completed, turn the power switch located on the rear panel to the ON position.

NOTE: Once power is applied to the Meridiem system, it may take up to 30 seconds to initialize. (Fig. A)

Fig. A Fig. B

NOTE: Upon initializing, the LCD screen will automatically default to the PRESETS screen (unless the default screen is changed by the user). (Fig. B)

BYPASS PROCEDURE FOR MERIDIEM SYSTEM

The Meridiem system is designed to enhance the visibility of surgical video in real-time; however, it is not essential to the safe operation of any medical procedure. In the event of a system fault, service interruption, or other circumstance where video enhancement is not available, the system can be bypassed to allow direct video pass-through from the video source to the destination display.

Conditions for Bypass

The Meridiem system should be bypassed under the following conditions:

- The system fails to boot or becomes unresponsive during use.
- Video enhancement features are degraded or non-functional.
- As instructed by clinical or technical personnel during troubleshooting or service.

Bypass Instructions

To bypass the Meridiem system:

1. Power down the Meridiem unit using the main power switch.
2. Disconnect the video input and output cables from the rear panel of the Meridiem unit.
3. Connect the video source (e.g., surgical camera) directly to the destination display or video recorder using a compatible video cable.
4. Confirm video signal integrity and image display on the monitor.

This configuration restores direct video transmission without routing through the Meridiem system. No special tools are required. Clinical functionality is preserved, though image enhancement features will be unavailable during bypass operation.

SAFETY SYMBOLS

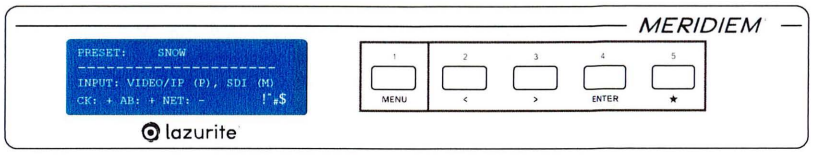
Your product may pose an electrical shock risk. Ensure to disconnect all plugs from power sources before working on the product and that the chassis is properly grounded.

Icon	Meaning
	Disconnect all plugs from power source
	Chassis ground
	CAUTION: Risk of electrical shock

MENU NAVIGATION

QUICK PRESET MENU MODE

Upon powering on the unit, it will automatically take the user to the Quick Preset Menu Mode, see above image. In the preset menu mode, the navigation buttons behave in the following manner:



BUTTON	BEHAVIOR
1/MENU	A long hold, for greater than 4 seconds, will take you to the Quick RTEV Menu Mode. A short press will activate the assigned preset for # 1.
1(MENU) **2(<)** **3(>)** **4(ENTER)** **5(*)**	All 5 buttons act as preset buttons, and will swap to assigned preset when pressed.

QUICK RTEV MENU MODE

After a long hold to the 1/MENU button, the user will be taken to the Quick RTEV Menu Mode. In the Quick RTEV Menu Mode, the navigation buttons behave in the following manner:

BUTTON	BEHAVIOR
1/MENU	A long hold, for greater than 4 seconds, takes you back to the Preset Menu Mode A short press takes user to the Main Menu Mode
2(<) **3(>)**	Adjust RTEV level up and down
4(ENTER)	Change the RTEV Impact Zone: OFF, FULL, WINDOW, LEFT, RIGHT Press again to save the selected setting
5/*	Not Applicable

MAIN MENU MODE

To access the main menu mode, do a short MENU/1 press from the Quick RTEV menu mode. In the Main Menu Mode, the navigation buttons behave in the following manner:

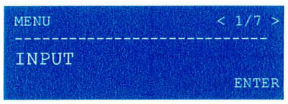
BUTTON	BEHAVIOR
1/MENU	Short press, less than 4 seconds, access Quick RTEV Menu Mode Long press, greater than 4 seconds, access Preset Menu Mode When in a lower menu, acts as a back button to access higher menus
2(<) **3(>)**	Left and right navigation between menus
4(ENTER)	Enter selected submenu Confirm and save selected option
5/*	Not Applicable

MENU MODES

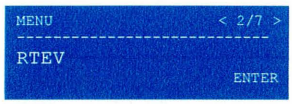
There are three menu mode screens which the system will cycle through upon pressing the Menu button located on the front panel. Features will vary with each mode.

1. **PRESETS** - This is the default mode. Items to communicate on LCD: active Preset, active Primary Input, active Mask Input, window mode, Chroma-key, Alpha-Blending and network status.
2. **RTEV** - mode provides quick algorithm adjustments. Display shall automatically revert to Main mode after "Menu Timeout" with no button presses from any PRESETS. Items to communicate on LCD: Algorithms that are active, window mode, overall level setting.
3. **MENU** - This allows user to modify any available setting. Display shall automatically revert to Main mode after "Menu Timeout" with no button presses from any PRESETS.

MENU OPTION OVERVIEW



INPUT
- Set input sources
- Set input signal



RTEV
- Enhancement Area
- Tru-Color
- Expanded Sharpener
- Clarifier

BLENDING
- Chroma-Key
- Chroma Color RGB
- Alpha Blending
- Blending In
- Blending Time

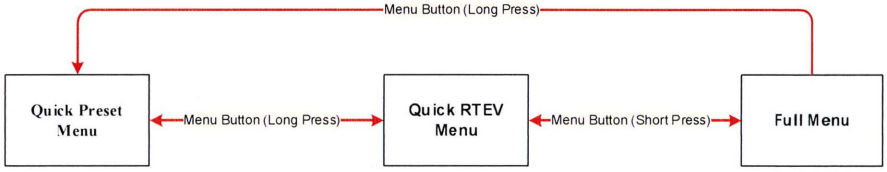
PREFERENCES
- Display Brightness
- Menu Timeout
- Fan Enable
- Factory Reset

PRESETS
- Preset Select
- Preset Save
- Preset Clear

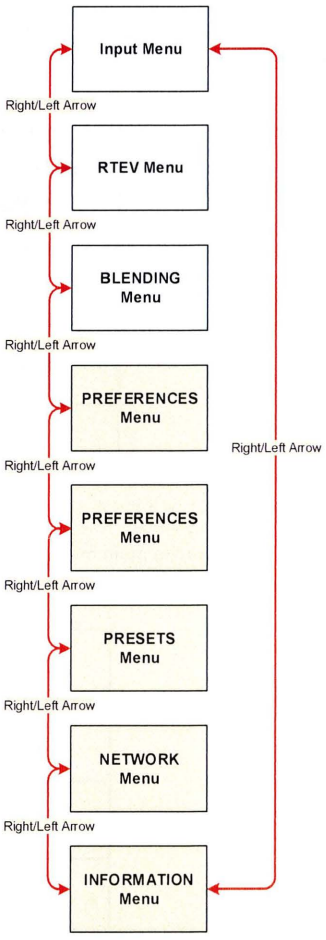
NETWORK
- DHCP
- IP Address
- Subnet Mask
- Default Gateway
- MAC Address

INFORMATION
- Model Number
- Serial Number
- Manufacture Date
- MCU Firmware
- UI Firmware
- MPU Kernel
- PMU Application
- FPGA Firmware
- Help

Menu Mode Navigation



Full Menu Navigation



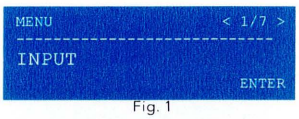


Fig. 1

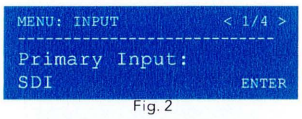


Fig. 2

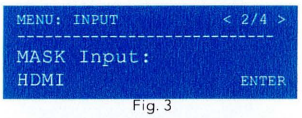


Fig. 3

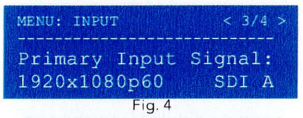


Fig. 4

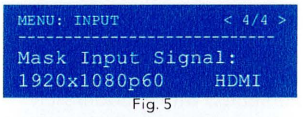


Fig. 5

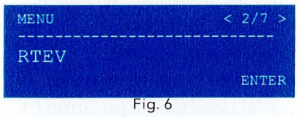


Fig. 6

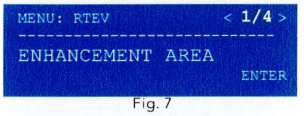


Fig. 7

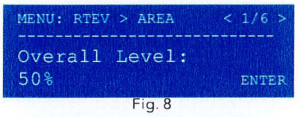


Fig. 8

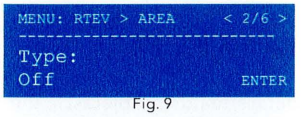


Fig. 9

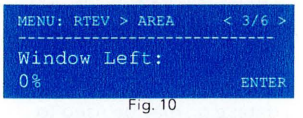


Fig. 10

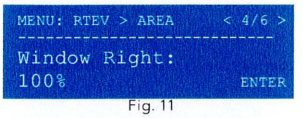


Fig. 11

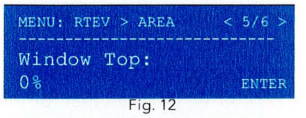


Fig. 12

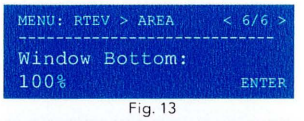


Fig. 13

ON SCREEN MENU OVERVIEW

INPUT

Allows user to select video input source and verify the resolution coming from the input signal. (Fig. 1)

PRIMARY INPUT
Select the desired primary input source which consists of SDI, HDMI or Video/IP. (Fig. 2)

Note: If Video/IP is selected, as either the Primary Input or Mask Input, there will be another option to choose a video source stream. If no video sources have been previously created and saved by the user, the video source field will be empty. Video/IP and video source stream options are setup via API commands.

MASK INPUT
Select the desired mask input source. (Fig. 3)

PRIMARY INPUT SIGNAL
Displays the resolution coming from the primary input source. (Fig. 4)

MASK INPUT SIGNAL
Displays the resolution coming from the mask input source. (Fig. 5)

RTEV

Allows user to adjust the Enhancement Area, True Color, Expanded Sharpener, and Clarifier settings. (Fig. 6)

ENHANCEMENT AREA
Allows user to adjust the overall level enhancement, window type and window position. (Fig. 7)

OVERALL LEVEL
Adjusts the overall intensity of the selected algorithm effect. (Fig. 8)

TYPE - Toggles the enhancement effects through different viewing mode options. Window Mode consists of Window, Full, Left, Right and Off options. Window modes are further defined as: (Fig. 9)

- Full (Enhance): Applies enhancement to full window size
- Window (Custom): Applies enhancement to custom window size
- Right/Left Screen: Applies enhancement to right or left half of the screen
- Off: Enhancement disabled

WINDOW LEFT - Adjusts the left position of the custom window. (Fig. 10)

WINDOW RIGHT - Adjusts the right position of the custom window. (Fig. 11)

WINDOW TOP - Adjusts the top position of the custom window. (Fig.12)

WINDOW BOTTOM - Adjusts the bottom position of the custom window. (Fig. 13)

ON SCREEN MENU OVERVIEW

Fig. 14

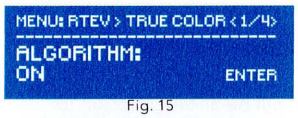


Fig. 15

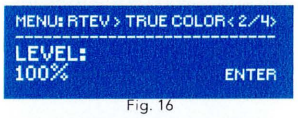


Fig. 16

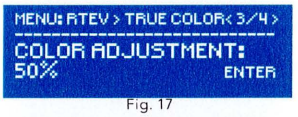


Fig. 17

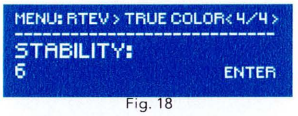


Fig. 18

Fig. 19

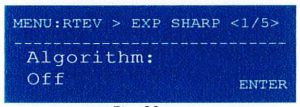


Fig. 20

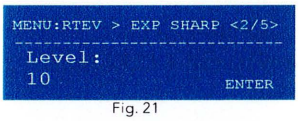


Fig. 21

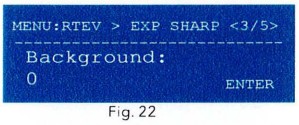


Fig. 22

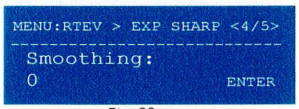


Fig. 23

Fig. 24

RTEV CONT.

TRUE COLOR

The True-Color Algorithm can remove the detrimental effects of haze, fog, smoke, mist, dust or other contaminants which may be interposed between, e.g., a camera and the object(s) it is observing. (Fig. 14)

ALGORITHM - Toggle to Enable or Disable the current algorithm. (Fig. 15)

LEVEL - Adjusts the overall intensity of the algorithm effect. (Fig. 16)

COLOR ADJUSTMENT - Lowering this control from its default value of 100 adjusts the calculated correction values for red, green and blue, and forces them toward all being equal, removing assumed wavelength dependence of color corrections. (Fig. 17)

STABILITY - Adjusting this parameter allows the enhancements to exhibit less change when new objects are injected into the enhancement area. (Fig. 18)

EXPANDED SHARPENER

Meridiem's Expanded Sharpener algorithm is locally adaptive, implemented with a moderately sized convolution kernel. In additional to the traditional "edge sharpening" operation as found elsewhere, this implementation also comprises a low spatial frequency ("background") suppression, as well as the capability to simultaneously smooth the very highest spatial frequencies in the image to reduce undesirable noise which may be present in some imaging situations. This latter characteristic effectively allows a selectable spatial bandpass operation to be performed, giving additional emphasis to a specifiable range of relatively high spatial frequencies in the image, highlighting objects and features of a corresponding characteristic size. (Fig. 19)

BACKGROUND

Suppresses unwanted image variations at 2D "low" spatial frequencies (where "low spatial frequencies" correspond to smooth image areas larger than several pixels, as set by the Kernel Size value). This is similar to the low spatial frequency treatment in the Clarifier algorithm, but is for much smaller characteristic sizes in the image; the two treatments may effectively be balanced/used together in obtaining best overall results. (Fig. 22)

ALGORITHM - Toggle to Enable or Disable the current algorithm. (Fig. 20)

LEVEL - Boosts 2D "high" spatial frequencies (very small details/features/objects) in the image, effectively after optionally Pre-Smoothing incoming data. This essentially boosts spatial frequencies between characteristics as set by the Smoothing and Kernel Size values. (Fig. 21)

SMOOTHING - Applies smoothing operation to incoming data; e.g., may be used to reduce unwanted very high spatial frequency noise, highlight other frequency ranges, etc. Note also that this Pre-Smoothing control and the Kernel Size control are linked/constrained, such that the Pre-Smoothing value is always below the Kernel Size value. (Fig. 23)

KERNEL SIZE - Sets the characteristic size/frequency boundary between "high" and low" spatial frequency (as defined for this function). Note that, while significantly larger than many other traditional edge sharpener implementations, the range of kernel size utilized by this algorithm is still much smaller (only several pixels FWHM) than that for the Clarifier function. (Fig. 24)

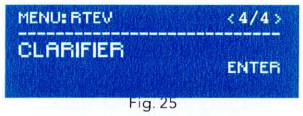


Fig. 25

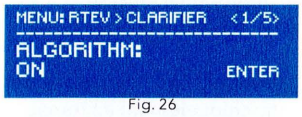


Fig. 26

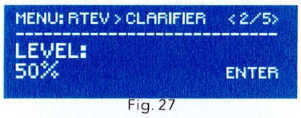


Fig. 27

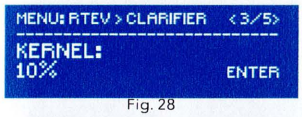


Fig. 28

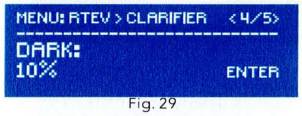


Fig. 29

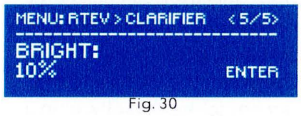


Fig. 30

RTEV CONT.

CLARIFIER

The RTEV Clarifier is a unique, proprietary implementation of very-large-kernel, locally-adaptive contrast enhancement for real-time video. For each point on the image, enhancement operations are performed (within the active enhancement area) as a function of the data in the nearby neighborhood of that point. As a result, imaging efficacy can be greatly improved, simultaneously equalizing overall image brightness and improving local contrast, e.g., pulling subtle details out of areas of shadow and glare. (Fig. 25)

ALGORITHM - Toggle to Enable or Disable the current algorithm. (Fig. 26)

LEVEL - Adjusts the intensity of higher spatial frequency (detail) emphasis in the Clarifier algorithm. A higher setting will greatly increase local contrast in video imagery. (Fig. 27)

KERNEL - Adjusts the size of the effective convolution kernel used in Clarifier algorithm operations, determining the boundary between what are considered higher and lower spatial frequencies. Generally, a larger kernel size will produce smoother, more natural effects, while a smaller kernel size will further emphasize detail visibility. (Fig. 28)

DARK - Preferentially increases clarifier enhancement in predominantly dark areas of the image. (Fig. 29)

BRIGHT - Preferentially increases clarifier enhancement in predominantly bright areas of the image. (Fig. 30)

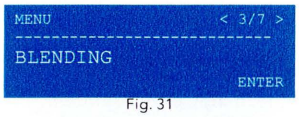


Fig. 31

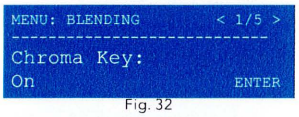


Fig. 32

Fig. 33

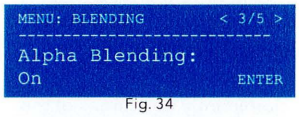


Fig. 34

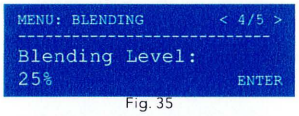


Fig. 35

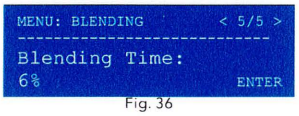


Fig. 36

ON SCREEN MENU OVERVIEW

BLENDING

Allows user to enable Chroma Key and Alpha Blending features. When used, a Primary Input and Mask Input signal must be provided to the Meridiem System. The resolution of each input signal must be identical or an error will occur (see the 'Display Warnings' table below). (Fig. 31)

CHROMA KEY - When enabled, this feature allows for compositing (layering) two images or video streams together based on color hues. The process by which a specific color element (chroma) is removed from a video scene and replaced (keyed) with a different element. When enabled, a color range in the mask input footage is made transparent, allowing separately filmed Primary Input footage or a static image to be inserted into the scene. Both a Primary Input and Mask Input signal are required for this feature. (Fig. 32)

Primary Input Mask Input Final Output

CHROMA COLOR RGB - Chroma keying can be done with backgrounds of any color that are uniform and distinct, but green and blue backgrounds are more commonly used because they differ most distinctly in hue. No part of the subject being filmed or photographed may duplicate the color used as the backing. Color is represented by three numbers (red, green and blue levels). Chroma key is achieved by a simple numerical comparison between the video and the preselected color. If the color at a particular point on the screen matches (either exactly, or in a range), then the Mask Input at that point is replaced by the alternate background. Chroma colors range on a scale from 0 - 255 and can be adjusted individually. The overall color can be on a range from 0 - 128. (Fig. 33)

ALPHA BLENDING - When enabled, Alpha Blending is the process of combining a translucent foreground color with a background color at each point in the image, thereby producing a new blended color. The degree of the foreground color's translucency may range from completely transparent to completely opaque. Alpha Blending may be used alone or together with Chroma Key. (Fig. 34)

BLENDING LEVEL - Allows user to blend a percentage of the Primary Input with the Mask Input. The Blending Level Ranges from 0 - 100%. (Fig. 35)

BLENDING TIME - Set the time (in seconds) for the Alpha Blend level to stabilize. (Fig. 36)

DESTINATION DISPLAY WARNINGS

Display Color	Primary Input	Mask Input	AB/CK*	Error
Yellow	No	Yes	On	No Primary Input signal detected when and AB/CK feature activated.
Yellow	No	Yes	Off	No Primary Input signal detected.
Cyan	Yes	No	On	No Mask Input signal detected when AB/CK feature activated.
Grey	Yes	Yes	On	Resolutions do not match. Primary Input and Mask Input require the same resolution.
Black	No	No	On	No Primary Input and Mask Input signal detected when AB/CK feature activated.

*AB/CK = Alpha Blending and/or Chroma Key feature

ON SCREEN MENU OVERVIEW

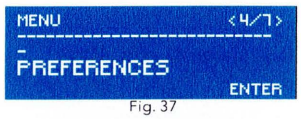


Fig. 37

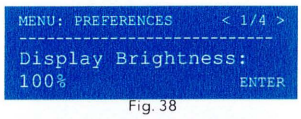


Fig. 38

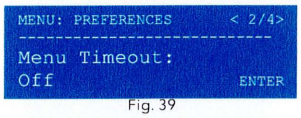


Fig. 39

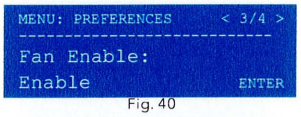


Fig. 40

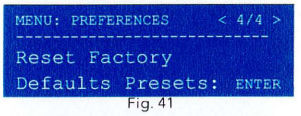


Fig. 41

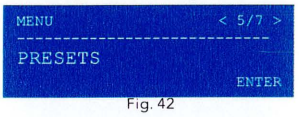


Fig. 42

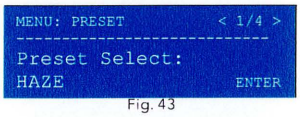


Fig. 43

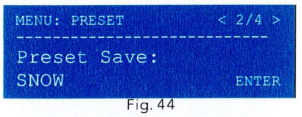


Fig. 44

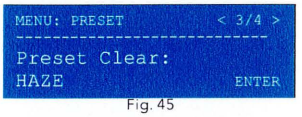


Fig. 45

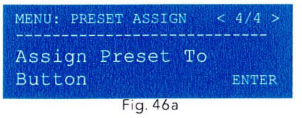


Fig. 46a

PREFERENCES

Allows user to adjust the Display Brightness, Menu Timeout, chassis Fan or Reset Factory Settings. (Fig. 37)

DISPLAY BRIGHTNESS

Adjusts the brightness level of the UI display. (Fig. 38)

MENU TIMEOUT

Allows user to adjust the time it takes for the on-screen display to revert back to the home screen. (Fig. 39)

FAN ENABLE

Enable or disable the back chassis fan. This does not change the heatsink fan operation. (Fig. 40)

RESET FACTORY DEFAULTS PRESETS

Select to reset the first five factory presets (Dark, Snow, Change, Detail & Haze) if cleared by user. (Fig. 41)

PRESETS

This menu allows the user to save/clear up to 38 enhancement configurations to the Meridiem System for future use. (Fig. 42)

PRESET SELECT

This menu will display any enhancement configurations that have previously been saved. To select a PRESET configuration, use the front panel buttons to select the desired PRESET #. Selecting a PRESET # will override any current configuration not saved on the display. (Fig. 43)

PRESET SAVE

To save an enhancement configuration, apply the preferred enhancement settings (including window position/mode). Once applied, access the PRESET > SAVE menu and assign the setting to an available PRESET # within the menu. (Fig. 44)

PRESET CLEAR

To clear an enhancement configuration, access PRESET > CLEAR and select the PRESET # to be deleted. (Fig. 45)

ASSIGN PRESET TO BUTTON

Assign Presets to front panel buttons 1, 2, 3,4 and 5 (Fig. 46a & Fig. 46b)

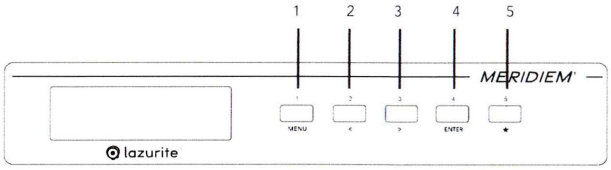


Fig. 46b

ON SCREEN MENU OVERVIEW

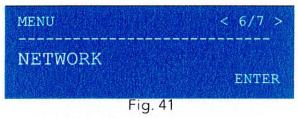


Fig. 41

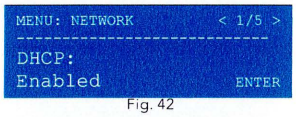


Fig. 42

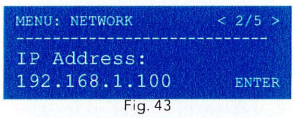


Fig. 43

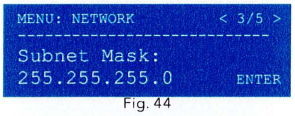


Fig. 44

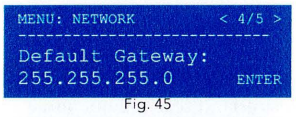


Fig. 45

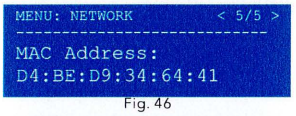


Fig. 46

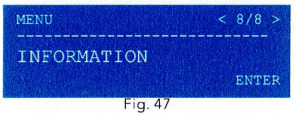


Fig. 47

NETWORK

Allows user to enable/disable the DHCP, set IP Address, Subnet Mask and Default Gateway. (Fig. 41)

DHCP
Toggle to enable or disable DHCP. (Fig. 42)

IP ADDRESS
Place to set static IP address. (Fig. 43)

SUBNET MASK
Place to set static subnet mask. (Fig. 44)

DEFAULT GATEWAY
Place to set static gateway. (Fig. 45)

MAC ADDRESS
Displays the system MAC address. (Fig. 46)

INFORMATION

Displays various information about the Meridiem® Image Enhacement system including: internal temperature, model number, serial number, manufacturing date, firmware versions and customer service contact information. The information in these menus cannot be changed. (Fig. 47)

SUPPORTED RESOLUTIONS / MAINTENANCE & CLEANING

SUPPORTED RESOLUTIONS

HDMI			3G-SDI
480 @60	1024 x 768 @ 60	1280 x 1024 @ 85	480 @60
576 @50	1024 x 768 @ 70	1366 x 768 @ 60	576 @50
640 x 480 @60	1024 x 768 @ 75	1440 x 900 @ 60	1280 x 720 @50
640 x 480 @72	1024 x 768 @ 85	1600 x 1200 @ 60	1280 x 720 @59.94
640 x 480 @75	1152 x 864 @ 75	1680 x 1050 @ 60	1280 x 720 @60
640 x 480 @85	1280 x 720 @ 50	1920 x 1080 @60	1920 x 1080 @24
720 x 400 @70	1280 x 720 @ 59.94	1920 x 1080 @59.94	1920 x 1080 @25
720 x 480@ 60	1280 x 720 @ 60	1920 x 1080 @50	1920 x 1080 @30
720 x 576 @ 50i	1280 x 768 @ 60	1920 x 1080 @24	1920 x 1080 @50
800 x 600 @ 60	1280 x 768 @ 75	1920 x 1080 @25	1920 x 1080 @59.94
800 x 600 @ 75	1280 x 1024 @ 60	1920 x 1080 @30	1920 x 1080 @60
800 x 600 @ 85	1280 x 1024 @ 75	1920 x 1200 @ 60	

MAINTENANCE NOTIFICATIONS

- All device operations and maintenance should be performed by qualified personnel. It is recommended that you do not perform any maintenance or cleaning of the device that is not described herein. Performing any operation or action on the device that is not described herein, whether performed correctly or incorrectly, may damage the device and furthermore may void the manufacturer's warranty.
- It is recommended that users do not service this device. User maintenance is restricted to operations described in this document and related to the installation/removal of modules and commercial off-the-shelf (COTS) parts, as well as cleaning, as described below.

CLEANING WARNINGS

- To avoid the risk of electric shock, do not disassemble the device housing. Users CANNOT service this product.
- Do not spray water or cleaning solution directly onto the device. Apply first to a lint-free cloth.
- Do not use benzene, thinner, ammonia or any other volatile substance to clean this product. These chemicals could cause damage to the device.

CLEANING INSTRUCTIONS

1. Disconnect the device from its power source before cleaning.
2. Using 99% isopropyl alcohol, apply onto a clean polycell non-woven cloth.
3. Wipe down the exterior of the unit.

SERVICE LIFE

The Meridiem system is designed for a service life of five (5) years under normal conditions of use, transport, storage, and maintenance, as specified in this manual.

DISPOSAL OF WASTE EQUIPMENT

The Meridiem system contains electronic components and must not be disposed of as unsorted municipal waste. At the end of its useful life, this product should be disposed of in accordance with local regulations for the disposal of electrical and electronic equipment. Please contact ZMicro or your local distributor for proper return or recycling procedures.

CUSTOMER SUPPORT

TECHNICAL SUPPORT

For Technical Support, please contact us at:

Phone: 858.831.7040
Email: techsupport@zmicro.com

Before calling/emailing, please have the following information available:

1. Name of the institution using the product.
2. Model and serial number of the product.
3. Description of the problem or issue.

REPAIR & PARTS REPLACEMENT

If you experience any issue with your product or need a part replacement, please contact our Customer Service Department for assistance. If it is determined that your product will need to be replaced/repaired, a return merchandise authorization (RMA) number will be issued by the Customer Service Department. The RMA number will be required to return the product for service.

For Customer Service, please contact us at:

Phone: 858.831.7040
Email: customerservice@zmicro.com

Before calling/emailing, please have the following information available:

1. Name of the institution using the product.
2. Model and serial number of the product.
3. Description of the problem or issue.

RMAs should be returned to the following address:

ZMicro
ATTN: <RMA#>
9820 Summers Ridge Rd.
San Diego, CA 92121

CUSTOMER FEEDBACK

We want to hear from you! If there is anything we can do to make your experience or product better, please email us at customer.service@zmicro.com.

zmicro

ZMicro, Inc.
9820 Summers Ridge Road
San Diego, CA 92121
P: 858.831.7000
F: 858.831.7001
www.zmicro.com