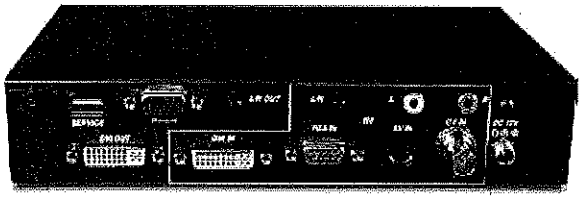
MFS-DVI

LINK BRIDGE™
MULTI-FORMAT SCALER SYSTEM



BROADATA
COMMUNICATIONS, INC.

SAFETY INSTRUCTIONS AND COMPLIANCE DECLARATIONS

PLEASE OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AS OUR PRODUCTS CONTAIN

CLASS I LASER PRODUCTS

WARNING

This product is a **CLASS I LASER PRODUCT** only when the units are connected with a fiber optical cable. Do not disconnect the fiber optic connector while the unit is powered up. Exposure to laser radiation is possible when the
laser fiber optic connector is disconnected while the unit is powered up. It should be noted that when the fiber is disconnected, the product will have **CLASS IM INVISIBLE LASER RADIATION.**

Although the fiber optic connectors in this product emit only Class 1 energy that is below the levels considered to be hazardous, one should never stare directly into a fiber optic connector or an unconnected fiber end unless one can be certain that no exposure to laser energy could occur.

CAUTION

Only service personnel are intended to access the interior of the units. It should be cautioned that CLASS 3 INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO THE BEAM. The use of controls, making adjustments, or performing operations other than those specified may result in hazardous radiation exposure. This product has operating wavelengths at 778nm, 800nm with average -0.5dB to 0dBm optical power per wavelength, 825nm, 911nm, and 980nm. The laser is operated in pulse mode within 1 KHz frequency and ¼ duty cycle. The following label or equivalent is located on the surface of laser products. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

CAUTION

This symbol alerts the user that important literature concerning the operation of this unit has been included. Therefore, it should be read carefully in order to avoid potential problems.

Manufacturer: This symbol shall be accompanied by the name and address of the manufacturer adjacent to the symbol, and the date of manufacture where the date shall be located adjacent to the symbol.

SN Serial Number: Indicates the manufacturer's serial number so that a specific medical device can be identified.

DO NOT remove cover (or back). There are no user serviceable parts inside. Refer servicing to qualified service personnel.

Product Safety:
This product meets the medical safety requirements.

North American Safety Compliance:
ANSI/AAMI ES60601-1:2005/(R):2012 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
CAN/CSA-C22.2 No. 60601-1-08 (3rd Ed.) Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY

EEC Safety Compliance:
These products meet the requirements of EN 60601-1:2005 so as to conform to the Medical Device
Directive 93/42/EEC (general safety information) as amended by 2007/47/EC.

This equipment is energized from 100-240 VAC 50 / 60 Hz power source. It is the responsibility of the installer to ensure that the equipment is installed in accordance with applicable hospital, local and national electrical codes.

To power unit down, remove power cable from unit or disconnect power cord from power receptacle. The power supply is the only recognized disconnect device, disconnect the power supply from the AC mains.

Power Switch:

The Power Switch symbol is shown to the left. The power switch is push on / push off. When the switch is off the status LED above the switch is not illuminated. When the switch is on, the LED above the switch is illuminated green.

MFS Power Supply: 80275-1230 BridgePower 12V 2.5A Desktop with Locking Collar

Power Cord: Use a hospital grade power cord with the correct plug for your power source.

Recycling:

Upon termination of the service life of this product please return unit to the manufacturer for proper waste disposal, or follow local governing ordinances and recycling plans regarding the recycling or disposal of this equipment , or contact the Electronic Industries Alliance (www.eiae.org).

Declarations of Conformity

FCC and Council Directives of European Standards:

This device complies with Part 15 of FCC rules and 93/42/EEC of the Council Directives of European Standards Directive as amended by 2007/47/EC. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable results.

1. Use the specified cables with this device so as not to interfere with radio and television reception. Use of other cables and / or adapters may cause interference with other electronic equipment.

2. This equipment has been tested and found to comply with the limits pursuant to FCC part 15 and CISPR 11. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

IEC:

This equipment has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity.

FCC, Council Directives of European Standards and IEC:

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 off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Accessory equipment connected to this monitor must be certified according to the respective IEC Standards (i.e., IEC 60950-1) for data processing equipment and IEC 60601-1 for medical equipment). Anyone who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of system standard IEC 60601-1-1. Whoever is responsible for securing the monitor to a system needs to insure that the mounting equipment used with this display complies to IEC standard 60601-1. If in doubt, consult the technical services department or your local representative.

About this Manual

This manual is designed to assist the user with installation, setup and operation of the MFS-DVI-VO product series.
The functional descriptions in this manual are representative of:

60712-0100	MFS-DVI
60712-0200	MFS-DVI-T-M-SC
60712-0300	MFS-DVI-T-HDBT

Manual ID Number: 60000-MFSDVI1RU-060314

Intended Use and Contraindications

Intended Use:
This device is intended for use in a medical environment to transmit high quality video and graphic images .
Contraindications:
This device is not intended for life support applications.

Operational Failure Conditions and Mitigation

Operational Failure:
End user cannot view the video data from a connected video source due to Incompatibility with video source equipment, or degraded video data, or the unit cannot be powered on.
Mitigation:
Bypass the device by connecting via a failsafe cable from the output of the video source directly to a monitor.

For mission critical applications, we strongly recommend that a replacement unit be immediately available.

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

TABLE OF CONTENTS

1.0 PRODUCT DESCRIPTION

The Digital Video Scaler has CV, SV, VGA & DVI inputs and can scale the signal to DVI or optional single fiber output with embedded audio. This high performance digital video scaler supports all the primary DVI resolutions up to 1080p /WUXGA as selected from the OSD (On Screen Display) menu. The unit supports a wide range of AV input signals as demonstrated by the multiple video connections and then scales them to a high-Definition output signal. Further, with OSD, IR remote, RS-232 and on-panel controls, these make the unit controllable either locally or remotely depending upon the needs of the user.

Features

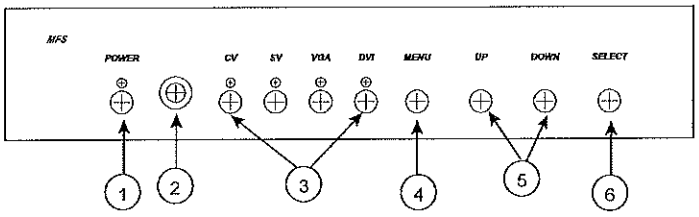
- Supports multiple video inputs scaled to DVI output
- Supports video and audio synchronized for display
- Supports 3D de-interlace, noise reduction and Comb filter
- Supports frame rate conversion
- Supports OSD, RS-232, IR Remote and front panel controls

Package Contents

- MFS-DVI Digital Video Scaler
- IR Remote Control
- Power Adaptor
- User Manual

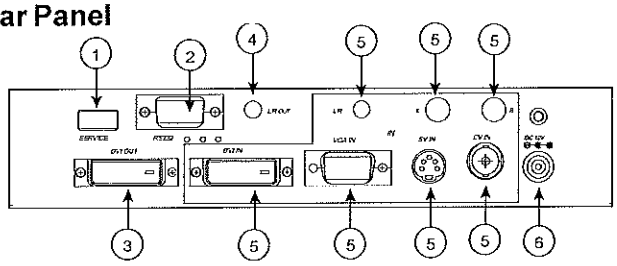
2.0 OPERATION CONTROLS AND FUNCTIONS

2.1 Front Panel



1. **Power and LED**: Press this button to switch ON or set the device to standby mode. Once the device is connected with power supply the LED will illuminate and the device will switch to ON automatically.
2. **IR**: This IR window receives the IR signal from the remote control included with the unit.
3. **Input button and LEDs**: Press each button to switch in between the input sources manually. LED will illuminate accordingly to the selected input source.
4. **Menu**: Press this button to enter into the OSD menu.
5. **-/+**: Press these buttons to scroll down and up in the OSD selection.
6. **Select**: Press this button to confirm the selection.

2.2 Rear Panel



1. **Service**: Reserved for factory use only. Contact BCI for any firmware updates.
2. **RS-232**: Connect via RS-232 to send commands to control the device. Refer to Appendix A for available command codes.
3. **DVI Output**: Connect to device DVI input for video or graphical display. Compatible with HDMI when using HDMI to DVI adaptor.
4. **L/R Out**: Connect to speaker or amplifier for audio output in stereo forman.
5. **Input Section**

   DVI: Connect to DVI source equipment such as PC/ Laptop or Blu-Ray player. Compatible with HDMI when using DVI to HDMI adaptor.

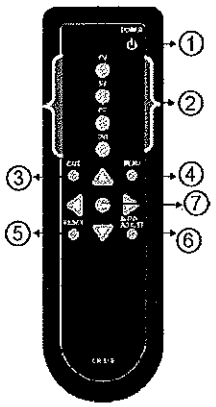
   L/R: Connect to source equipment's L/R audio output with 3.5mm jack for stereo audio signal.

   VGA: Connect with PC/Laptop source equipment for video signal input via D-Sub 15pin connector.

   CV + L/R: Connect to composite video source equipment such as video/DVD player and stereo audio signals via the Left and Right RCA connectors provided.

   SV + L/R: Connect to S-Video source equipment such as video/DVD player and audio stereo audio signals via the Left and Right RCA connectors provided.
6. **DC 12V**: Plug the power adaptor included in the package and connect it to the AC wall outlet for power supply.

2.3 Remote Control



1. **POWER**: Press this button to switch ON or set the device to standby mode. Once the device is connected with power supply it is on automatically.
2. **CV/SV/PC/DVI**: Press these hot keys to switch input source instantly.
3. **EXIT**: Press this button to exit the menu or the current selection under OSD.
4. **MENU**: Press this button to enter into the OSD menu.
5. **RESET**: Press this button to set the device back into the factory default setting.
6. **AUTO ADJUST**: Press this button to automatically adjust picture to the input resolution.
7. **OK & ▲▼◀ ▶**: Press OK to confirm the selection, or press the arrow buttons to scroll the OSD menu selections.

3.0 ON SCREEN DISPLAY (OSD) MENU

3.1 Display Selection

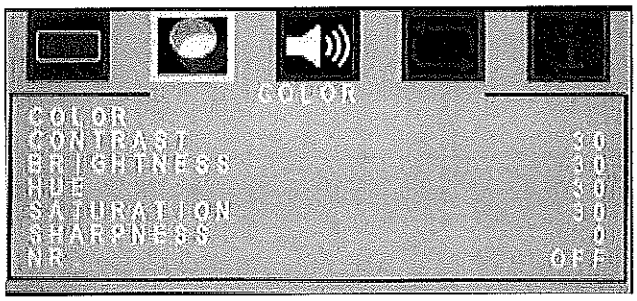
Output: Select the desired **output** resolution from the list below.

Native
640X480 60
800x600 60
1024x768 60
1280x768 60
1360x768 60
1280x720 60
1280x800 60
1280x1024 60
1440x900 60
1400x1050 60
1680x1050 60
1600x1200 60
1920x1080 60
1920x1200 60
720X480P 60
1280X720P 60 — Default
1920X1080I 60
1920X1080P 60 – Initial setting
720X576P 50
1280X720P 50
1920X1080I 50
1920X1080P 50

Size: Select the desired image **size** from the list below:
OVER SCAN
FULL — Default
ASPECT RATIO – Initial setting
PAN SCAN
LETTER BOX
UNDER 2
UNDER 1

Mode Info: Select the desired **mode** from the list below:
OFF
INFO – Displays the input resolution overlay temporarily — Default
ON — Displays the input resolution overlay constantly
PC : Unused

3.2 Color Selection



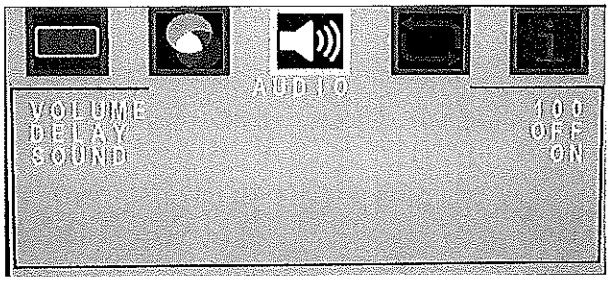
Color: Set the following **color** attributes:

R – adjust color between 0 to 1024. Default is **512**.
G – adjust color between 0 to 1024. Default is **512**
B – adjust color between 0 to 1024. Default is **512**
R OFFSET – adjust color between 0 to 1024. Default is **512**
G OFFSET – adjust color between 0 to 1024. Default is **512**
B OFFSET – adjust color between 0 to 1024. Default is **512**

Contrast: Set the **contrast** between 0 to 60. Default is **30**.
Brightness: Set the **brightness** between 0 to 60. Default is **30**.
Hue: Set the **hue** between 0 to 60. Default is **30**.
Saturation: Set the **saturation** between 0 to 60. Default is **30**.
Sharpness: Set the **sharpness** between 0 to 30. Default is **0**.

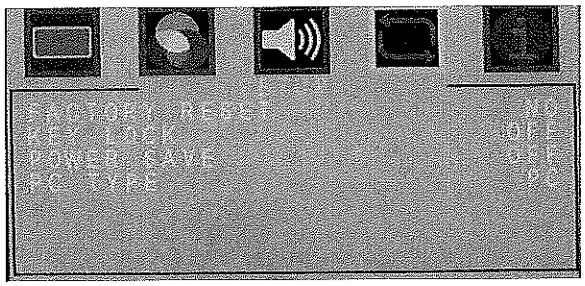
NR: Select **Noise Reduction** setting from the following list:
OFF — Default
LOW
MIDDLE
HIGH

3.3 Audio Selection



Factory Reset: This selection resets all settings to the factory default.
Key Lock: Select the **key lock** mode from the following list:
OFF — Default
ON
Power Save: Select the **power save** mode from the following list:
OFF — Default
ON
PC Type: Select the **PC type** mode from the following list:
PC – VGA input Format—Default
YPbPr – Component input format

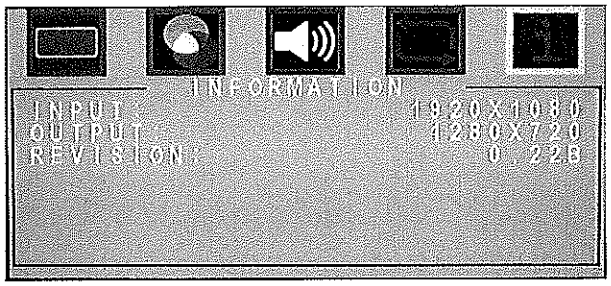
3.4 Setup Selection



Factory Reset: This selection resets all settings to the factory default.

Key Lock: Select the **key lock** mode from the following list:
OFF — Default
ON
Power Save: Select the **power save** mode from the following list:
OFF — Default
ON
PC Type: Select the **PC type** mode from the following list:
PC - VGA input Format--Default
YPbPr - Component input format

3.5 Information Selection

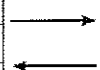


INPUT : Displays input resolution
OUTPUT : Displays output resolution
REVISION : Displays the firmware revision

4.0 SERIAL CONTROL

4.1 RS-232 Pin Assignment

PIN	Assignment
1	NC
2	TX
3	RX
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



PIN	Assignment
1	NC
2	RX
3	TX
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

4.2 RS-232 Communication Protocol

Baud Rate: 19200bps
Data Bit: 8 bits
Parity: None
Flow Control: None
Stop Bit: 1

4.3 RS-232 Command Set

Refer to **Appendix A** for a full listing of the RS-232 command set.

5.0 MAINTENANCE AND TROUBLESHOOTING

5.1 Maintenance

There is no operator maintenance other then keeping the units clean.

5.2 Troubleshooting

If the MFS-DVI units do not operate properly after installation, check for possible cable breaks, loose connections, and incorrect cable connections. If a problem exists on the fiber link, please check your fiber connectors for improperly cleaned fiber cables and connectors. If problems persist that may be fiber related, contact BCI at 1-800-214-0222 for further assistance.

For electrical problems, perform the following troubleshooting procedures:

1. **If the POWER indicator is OFF, check for the following:**
   a. The line cord is plugged into the unit and your outlet has power.
2. **If the POWER indicator is ON, but the units are not working, check for the following:**
   a. Make sure the appropriate (Multimode) fibers are being used.
   b. Fiber and fiber connectors are not broken.

6.0 SPECIFICATIONS

Video Bandwidth	165MHz
Input Port	1 x Composite, 1 x S-Video, ,1 x VGA, 1 x DVI, 1 x L/R, 1 x USB (service only), 1 x RS-232
Output Port	1 x DVI, 1 x L/R
Supports Input Resolution	Up to UXGA & 1080p
Supports Output Resolution	Up to WUXGA & 1080p
Power Supply	V / A DC (US/EU standards, CE/FCC/UL certified)
Dimensions	215mm(W) x 65mm(D) x 47mm(H) (8.46" x 5.7" x .67")
Weight	970
Chassis material	Metal
Box Color	Black
Operating Temperature	0° ~ 40°C / -4° ~104°F
Storage Temperature	-20° ~ 60°C / -4° ~140°F
Relative Humidity	20 ~ 90% RH (non-condensing)
Power Consumption	5.7w
Power Supply	
Part Number	80275-1230
Description	BridgePower 12V 2.5A Desktop with Locking Collar
Rating	110 – 240v AC 50/60 Hz, 12v @ 2.0 A DC

7.0 SERVICE PROCEDURE

7.1 Replacement Policy

Standard products found defective on arrival (DOA) will be replaced, based on availability, within 24 to 48 hours anywhere in the U.S. Please call Customer Service at **800-214-0222** for information.

7.2 Return/Repair Service

The Link Bridge MFS-DVI System contains no user serviceable components. If you have a problem with your unit, please contact the Customer Service Department. To facilitate our return/repair processing please contact Broadata Communications, Inc. to obtain a Return Material Authorization (RMA). Please include the following information:

- Product model number
- Serial Number
- Complete description of problem
- Hardware installation description

Broadata Communications, Inc.
2545 West 237th Street, Suite K
Torrance, CA 90505
1-800-214-0222
(310) 530-1416
(310) 530-5958 (Facsimile)
e-mail: CustomerService@Broadatacom.com
Website: www.broadatacom.com

8.0 LIMITED WARRANTY

Broadata Communications, Inc. (BCI) warrants, for a period of one year from date of shipment, each product sold shall be free from defects in material and workmanship. BCI will correct, either by repair, or at BCI's election, by replacement, any said products that in our sole discretion prove to be defective and are returned to the manufacturing location within 30 days after such defect is ascertained. All warranties are limited to defects arising under normal use and do not include malfunctions or failure resulting from misuse, abuse, neglect, alterations, electrical power problems, usage not in accordance with product instructions, improper installation, or damage determined by BCI to have been caused by the Buyer or repair made by a third party. Limited warranties granted on products are to the initial customer end-user and are not transferable. OUR LIABILITY UNDER THIS WARRANTY SHALL IN ANY CASE BE LIMITED TO THE INVOICE VALUE OF THE PRODUCT SOLD AND BCI SHALL NOT BE LIABLE TO ANYONE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM THE USE OF ITS PRODUCTS OR THE SALE THEREOF. We make NO WARRANTY AS TO THE MERCHANTABILITY OF ANY GOODS, OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE OR END APPLICATION NOR DO WE MAKE ANY WARRANTY, EXPRESSED OR IMPLIED OTHER THAN AS STATED ABOVE.

9.0 APPENDIX A: RS-232 COMMAND SET

Command	Description	Contents
S SOURCE 1~4	Select input source	DVI(1) / CV(2) / SVIDEO(3)/ PC(4)
R SOURCE	Inquire input source	
S OUTPUT 1~25	Select output timing	Native(0)/640*480(1)/800*600(2)/1024*768(3)/1280*768(4)/1360*768(5)/1280*720(6)/1280*800(7)/1280*1024(8)/1440*900(9)/1400*1050(10)/1680*1050(11)/1600*1200(12)1920*1080(13)/1920*1200(16)/ 480p(17)/720p 60(18)/1080p 60(19)/1080i 60(20)/ 576p(22)/720p 50(23)/1080p 50(24)/1080i 50(25)
R OUTPUT	Inquire output timing	
S SIZE 0~6	Select output size	OVERSCAN(0) / FULL(1) /BEST FIT(2) / PAN SCAN(3)/LETTER BOX(4) /UNSER 2(5) / UNDER 1(6)
R SIZE	Inquire output size	
S CONTRAST 0~60	Contrast Setting	
R CONTRAST	Inquire contrast setting	
S BRIGHTNESS 0~60	Brightness setting	
R BRIGHTNESS	Inquire brightness setting	
S HUE 0~60	Hue setting	
R HUE	Inquire hue setting	
S SATURATION 0~60	Saturation setting	
R SATURATION	Inquire saturation setting	
S SHARPNESS 0~30	Sharpness setting	
R SHARPNESS	Inquire sharpness setting	
S NR 0~3	Noise reduction setting	OFF(0) / LOW (1) / MIDDLE(2) / HIGH(3)
R NR	Inquire noise reduction setting	
S AUDIODELAY 0~3	Audio delay setting	OFF(0) / 40ms (1) / 110ms(2) / 150ms(3)
R AUDIODELAY	Inquire audio delay setting	
S AUDIOMUTE 0/1	Audio mute setting	ON(0) / MUTE(1)
RAUDIOMUTE	Inquire audio mute setting	
S KEY LOCK 0/1	Key lock setting	ENABLE(0) / DISABLE(1)
R KEY LOCK	Inquire key lock setting	
FW	Firmware checking	
S RESET 1	Pre-reset	
S POWER 0/1	Power On/Off	OFF(0) / ON(1)
R POWER	Power Status	
EXIT	Exit	

10.0 APPENDIX B: SUPPORTED INPUT RESOLUTIONS

Input Resolution	PC	DVI/HDMI	AV/SV
NTSC			✓
PAL			✓
VGA640*480 (@60/72/75Hz)	✓	✓	
SVGA800*600@56/60/72/75Hz)	✓	✓	
XGA1024*768 (@60/70/75Hz)	✓	✓	
XGA+1152*864@75Hz	✓	✓	
1280*720@60Hz	✓	✓	
1280*768@60Hz	✓		
1280*800@60Hz	✓	✓	
1280*960@60Hz	✓	✓	
1280*1024 (@60/75Hz)	✓	✓	
1360*768@60Hz	✓	✓	
SXGA+1400*1050@60Hz	✓	✓	
WXGA+1440*900@60Hz	✓	✓	
UXGA1600*1200@60Hz	✓	✓	
SWXGA1680*1050 RB@60Hz	✓	✓	
1920*1080@60Hz	✓	✓	
1920*1200 RB@60Hz	✓	✓	
480I/576i		✓	
480P/576P		✓	
720P (@50/60Hz)		✓	
1080I (@50/60Hz)		✓	
1080P (@24/30/50/60Hz)		✓	

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