



OPERATORS MANUAL

T-650 MRI Ambiance Solution

MRI Compatible LED Monitor

32" or 55" (optional)
1920 x 1080 (16:9)
Full HD
Fiber optic connection
Compatible with fMRI examinations

MRI Compatible Projector

1920x1080 Full HD
Brightness (Lumens): 3200
Color Contrast: 30.000:1
Display Size (in.): 30 - 300 in.
Fiber optic connection
Integrated Speakers: 40 W

RGB LED Light

1 million color range
The software runs algorithm which real-time analyze the video on the screen, find main RGB color code and stream it to the LED RGB light.



MRI In - Bore Movie Experience



In - bore MRI Sound System



MRI Entertainment Software

Real time media integration playback
Over 250 animations, videos and images to choose.
Run LED monitor, projector, room ambient sound, headset sound and LED lights dynamically by the click of the button of touch screen.
Real-time streaming of patient experience content



MRI CONDITIONAL
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ISO 13485:2016

Introduction







The MRI Ambiance solution is used to present visual stimulus within the MRI environment. It is an add-on to the FMRI Hardware System. The Ambiance solution uses a standard HDMI signal input, convert it to fiber optic and transfer the optical signal to the ambiance solution. So, can be connected to any desired computer.

This User Manual covers all important information regarding the operation of the Ambiance solution.

Our hardware team strongly suggests the full review of this manual prior to operation of the Ambiance solution to ensure safe operation of the in the MRI environment.

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	Protect from direct sunlight		Protect from rain and humidity		MRI conditional up to 3 Tesla
	Read user manual		Manufacturer		ISO13485 ISO 9001 Class I medical devises



The Troyka Med 32" Ambiance solution complies with the EU regulations for active medical devices, Medical Device Directive 93/42/EEC, classified as a medical Device Class I product.



1. Safety Information

1.1 General Safety Information and intended use




The Ambiance solution must only be operated by personnel properly trained in MR Safety.

The intended use for the ambiance solution is to present visual stimuli within the MRI environment. It's important that the use of the screen is kept within the MRI environment where the temperature and humidity is kept on a stable level. Any use other than described is not permitted.

The ambiance solution must only be operated by personnel properly trained in identifying interference problems such as artifacts, streaks and distortions in image data. It is required that as personnel handling the ambiance solution are familiar with the safety instructions given in the manual and other documentation provided to ensure safe operation of the ambiance solution and associated equipment.

When connecting the ambiance solution to a PC, it must be verified that the PC complies with IEC/UL 60950-1. This will ensure safe operation. Note: must standard PCs sold by established vendors comply with this standard.

1.2 Electrical Safety

	<p>Warning Any electromagnetic signal can cause interference on the Ambiance solution or data collection within the MRI suite. In order to minimize such interference, all ferrous or RF signal emitting devices should be placed far from the scanner, and not come within 200 Gauss (20 mT) of the scanner.</p>
	<p>Warning The introduction of electromagnetic equipment (such as is introducing with the Shielded Interface Unit) can cause interference in the function of the MR scanner or in the data collected. It may also affect the function of the Ambiance solution, other medical electronic equipment and systems within the MR suite.</p>
	<p>Warning Contain electric components in the device require several hundred volts to operate properly. In order to prevent potentially lethal electric shock, it is essential to disconnect the device from its power source during installation, and prior to servicing or repair. Some capacitors will remain charged with dangerous voltage levels even after the power is off. In order to prevent any possible electric shock, please wait several minutes for all capacitors to become completely discharged before proceeding.</p> <p>Do not operate the device near the water, where it can become moist, or near excessive heat. Operation under such conditions could result in failure of the Ambiance solution, possible electric shock, or fire. Don't handle the power cable with wet hands. High voltages present could cause lethal electric shock.</p> <p>If any foreign substances enter the device such as liquid, metal chips or dust, immediately turn off power of the ambiance solution. Under no circumstances shall tools or foreign objects being inserted into the device, as this could result in failure of the device, electric shock or fire.</p>





	<p>If smoke, noxious odors or unusual noise should come from the device, immediately turn off power of the ambiance solution. If the device is incapable of displaying a picture after it has been turned on, turn it off and do not attempt to operate.</p> <p>Do not damage the power cable of the device. Do not attempt to modify the power cable should it malfunction. Should the power cable become damaged or frayed, it must be replaced. Do not attempt to use an alternative power cable. Use only what was supplied with the Ambiance solution.</p> <p>If transportation of the Ambiance solution is necessary, switch off the power, disconnect all power and signal cables and then move it to its new position with care.</p> <p>To disconnect the equipment from the power supply, the power cord must first be removed from the power outlet.</p> <p>Do not attempt to remove the back panel of the Ambiance solution, as this presents an electric shock hazard. Any and all service should be conducted by qualified service personnel only.</p> <p>Do not operate the Ambiance solution if any cables are damaged.</p> <p>Switch off and unplug the Ambiance solution if it is not in use for one day or more.</p> <p>If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of equipment.</p>
	<p>Warning If the MRI Ambiance solution is modified, appropriate inspection and testing must be conducted to ensure continued safe use of the LED.</p>
	<p>Warning To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.</p>

Table 1: Electrical safety signs and descriptions



1.3. Safety Precautions and Maintenance





	<p>Caution An eye injury can be caused by the light beam of the fiber transmitter. Never look directly into the optical connectors or fiber optic cables.</p>
	<p>Warning Do not allow liquid near the ambiance solution. If liquid accidentally comes in contact with the ambiance solution, turn the equipment off and unplug the mains immediately and take it to the Troyka Med team for assessment and/or repair.</p> <p>Clean the equipment only when it is switched off and unplugged. Use only a slightly damp cloth to clean the LED, do not use alcohol or ammonia-based products.</p> <p>Do not place objects on top of the display cabinet or the shielded interface unit, which could fall into vents or which could cover them and prevent proper cooling of the electronics.</p> <p>Do not expose the display to rain or excessive moisture to prevent shock or permanent damage.</p> <p>Contact a service technician if the ambiance solution does not operate normally when the operating instructions are followed.</p>
	<p>Warning For a small percentage of the population, viewing certain types of video that contain flashing patterns of light may trigger epileptic seizures. The following users are cautioned to consult a physician before using the ambiance solution:</p> <ul style="list-style-type: none"> • children under 5 years, • anyone with a history of epilepsy or a family history of epilepsy, • anyone who has ever experienced epileptic seizures or sensory disturbances triggered by flashing effects.
	<p>Warning Self-heating of cables due to improper cable routing! Injury to equipment and/or operating personnel.</p> <ul style="list-style-type: none"> • Cables should not be looped crossed. • Sound system pipes and earmuff

Table 2: Safety precautions and maintenance signs and descriptions



1.4. Product Marking and Labeling







	<p>Consult Accompanying Documentation This is a general symbol used to encourage users to get familiar with the accompanying documentation and safety precautions before using the system.</p>
	<p>MR Safe An item considered safe for use anywhere inside the magnet room.</p> <ul style="list-style-type: none"> • Fiberoptic Cables • Cable Protection Spiral
	<p>MR Conditional An item that has been demonstrated to pose no known hazards in a specified MR environment with specified conditions of use. This marking applies to:</p> <ul style="list-style-type: none"> • LED Monitor • Sound System Speakers • Projector • Shielded Interface Unit (SIU) • 25 Pin Low Pass Filter • LED Stand, Projector Stand • RGB Lights <p>See the installation guide for each product for safe operating conditions</p>
	<p>MR Unsafe An item that is known to pose hazards in all MR environments and must not be brought into the MR suite. This marketing applies to:</p> <ul style="list-style-type: none"> • Fiber transmitter • Shielded Interface Unit (SIU) • Tablet
	<p>Power ON The power on symbol, appearing on one end of a toggle switch indicates that the control places the equipment into a fully powered state.</p>
	<p>Power OFF The power off symbol on a toggle switch indicates that using the control will disconnect power to the device.</p>

Table 3: Product marking, labeling and descriptions.



2. General Information

2.1 Inspection of Delivered Goods

Each of ambience solutions has been thoroughly tested prior to delivery and is ready for immediate use. Upon receipt, please report any transportation damage or missing accessories immediately. Troyka Med can only accept liability for such damage if it is claimed prior to initial operation. In case of transportation damage, please contact the Troyka Med service department. For faster support please have ready all shipment details, serial numbers and damage description. It is recommended to keep and store the original crate/box used to ship the ambience solution for all future transportation needs.

2.2 Power Connection Information

The ambience solution operates on the line voltages 90-250V AC and 50/60 Hz. It is not necessary to double check line voltages or change any fuses. The equipment should be near the power outlet in the MR suite and the outlet should be easily accessible.

Stabilizing circuits ensures satisfactory performance within supply variations specified. If the supply voltage in your location is not 90-250V AC, please consult your Troyka Med Sales or Service office.

Always use the power supply card supplied in the original shipping carton.

If the enclosed power card could not be used due to a different standard in your country, use a power card that conforms to the following regional standards:

United States (UL)	United Kingdom (BASEC/BS)
Germany (VDE)	Switzerland (SEV)
Canada (CSA)	Japan (MITI)

In other regions, please use an AC power cord that complies with the country's safety regulations.

In order to prevent electrical hazard, the cord set must use a three-core cable of at least 6A/0.75mm² and have an earth ground contact on both the free socket and the plug. If the main cord is damaged, use only an original replacement cable.



Warning

The fuse holder for the main fuse is integrated into the power inlet in the shielded interface Unit (SIU). For continued protection against the risk of fire, only replace the fuse with same type, characteristics and voltage rating. Disconnect power before changing the main fuse.

Note: Incorrect cable connections may result in an irregular ambience solution function, damage to the Ambience solution quality/components and may shorten the life of the unit.



3. System Overview

3.1 Technical Specifications

Ambience Software	
Real time media integration playback	
Over 250 animations, videos and images to choose.	
Run Ambience solution, projector, room ambient sound, headset sound and LED lights dynamically by the click of the button of touch screen.	
Custom developed media software and hardware	
Wireless tablet interface for easy patient interaction	
Integration with DVD and other media streaming devices.	
Real-time streaming of patient experience content	
The software runs algorithm which real-time analyze the video on the screen, find main RGB color code and stream it to the LED RGB light.	
Projector	
Brightness (Lumens):	3200
Resolution Type:	1080p
Resolution:	1920x1080 Full HD
Color Contrast:	30.000:1
Throw Distance:	4.5 – 5.1 ft
Throw Ratio:	1.2~1.6
Display Size (in.):	30 - 300 in.
Aspect Ratio:	16:9
Connection:	Fiberoptic (LC Type)
Power:	100~240VAC (Auto Switching), 50-60Hz
Light Source Life, Normal (hours):	4500
Light Source Life, Eco-Mode (hours):	7500
Internal Speakers:	20 W
RGB LED Light	
30 m RGB LED lights	V:24, W:14,4/m
Color Range	1 Million
Case	Aluminum
MRI Room Camera	
Resolution	1920x1080 2MP
Lens support	2.8-12mm VF
IR Led - IR Cut	36 Led / 25 meter - Automatic
Standards	AHD
Operating voltage	DC 12V / 1A
Minimum lightning	0.01Lux@; F1.2/AGC ON
Electronic Parameter	1/25s;1/100,000s



25fps @1080p – 30fps @1080P	
High speed, long distance, real time transmission	
Full HD and standard definition switch	
Day/night (ICR), 3D-DNR,	
MRI Ambiance solution	
Diagonal dimension:	32"
Panel Type:	60 Hz
Resolution:	1920 x 1080 (16:9)
Pixel Spacing:	0,12125 (Y) x 0,36375 (D)
Effective Screen Size:	698,4 (Y) x 392.85 (D)
Brightness:	350 nit
Contrast Ratio:	5000:1
Viewing Angle:	178:178
Reaction Time:	8 ms
Display Color:	16,7 M
Color Gamut:	72%
H-Scanning Frequency:	30 ~ 81 kHz
Maximum Pixel Frequency:	148,5 MHz
V-Scanning Frequency:	48 ~ 75 HZ
Dynamic Contrast Ratio:	50000:1
Fiber Optic Extender	
Input Signal	HDMI
Electricity Connection	HDMI
Optical Connection	SC
Max Data Transfer Rate	1.65Gpbs
Max Data Transfer Distance	20 km
EMI Interface Unit	
Voltage	90 – 250 VAC
Frequency	50/60 Hz
Fuse	T 3.15A
Power Consumption	~ 120 VA
Dimensions	25 x 25 x10 cm
Optical Input / Output	Single SC-Connector
Working Conditions	
Storage Temperature	-10, 90 °C
Working Temperature	0, 50 °C
Humidity	%10, %90
Panel Surface Temperature	65 °C
Static Magnetic Field	Max 3 Tesla
Working Time	30.000 hours



MRI Compatible Sound System	
Sound Amplifier	
Working Power	60 Watt
Internal Speakers	2 x 10 Watt
Inputs	2 x Aux, Microphone, USB Flash Disk
Mute Circuit	Yes
Dimensions	31 x 26 x 10 cm
Microphone	
Characteristic	Uni-direction
Frequency Range	80-12000 Hz
Impedance	600Ω ± 30%
Sensitivity	-72dB ± 3dB
Cable	4m
Weight	811g (Kablosuz)
Case	Die cast zinc
MRI Speakers	
Frequency Range	0,8kHz ila 20kHz
Sensitivity	93dB @1m/1W
Max Power Capacity	100 W
Max Working Power	400 W
Typical Impedance	0,8 μF Empedans
Weight	214,4 g

