ADIO-1

Manual

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Revision History

Version	Date	Author	Reason
2.0	29.8.2018	J. Bullacher	ADIO only
2.1	4.6.2024	S. Philipp	Updated company name Updated chap. 7.4.2 power supply Updated certifications
2.2	7.6.2024	S. Philipp	Updated device name to ADIO-1 Corrected chap 5.1 ADIO-1 power supply
2.3	26.7.2024	S. Philipp	Updated chap 5.1 ADIO-1 power supply Added chap 2 mounting warning
2.4	28.8.2024	S. Philipp	Added Power Supply Type Added French safety precautions Changed FCC to class A
2.5	10.12.2025	S. Philipp	Updated declaration of conformity, chap 1.2 Remove UL classified notice Removed 60601 from Electrical Safety & EMC Specifications, chap

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1 Regulatory Compliance Statements

Your Tritec product is marked to indicate its compliance class: A
Of the Federal Communications Commission (FCC) — USA

1.1 FCC Class A Notice

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1.This device may not cause harmful interference.
2.This device must accept any interference received, including interference that may cause undesired operation.

Note:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Modifications:
Any modifications made to this device that are not approved by Oracle may void the authority granted to the user by the FCC to operate this equipment.

1.2 EC Declaration of Conformity

CE

EU Declaration of Conformity

TRITEC Electronic GmbH

declares under our sole responsibility that the product named below conform to:

2014/30/EU (EMC)

Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

2014/35/EU (LVD)

Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

2011/65/EU (RoHS)

Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Product Name: **ADIO-1**

The following standards were used to assess the product:

EN 55032:2015 + AC:2016 + A11:2020 + A1:2020, Class B
EN 55035:2017 + A11:2020
EN 61000-3-2:2014
EN 61000-3-3:2013

EN IEC 62368-1:2020 + A11:2020

EN IEC 63000:2018

Manufacturer: **TRITEC Electronic GmbH**
Carl-Zeiss-Straße 41, 55129 Mainz, Germany

Date: 23.08.2024

Name, Signature: Uwe Schmidt, U. Schmidt

Function: Quality Manager

2 Safety Agency Compliance Statements

Read this section and the caution statements at the unit before beginning any procedure.
The following text provides safety precautions to follow when installing a Tritec Electronic GmbH product.

2.1 English Safety Precautions and Warnings

This product is only suitable for a patient environment, but not for contact with a patient.

If the unit begins to emit smoke, smells like something is burning, or makes strange noises, disconnect all power connections immediately and contact your local representative for advice. Attempting to use a malfunctioning unit may result in fire, electric shock, or equipment damage.

Safety Precautions
For your protection, observe the following safety precautions when setting up your equipment:

Follow all cautions and instructions marked on the equipment.
Ensure that the voltage and frequency of your power source match the voltage and frequency printed on the equipment's electrical rating label.
Never push objects of any kind through openings in the equipment.
Dangerous voltages may be present.
Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Caution
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Connections
The device must be connected to IEC 62368 approved equipment.

Do not open the cabinet or modify the unit.
Opening the cabinet or modifying the unit may result in fire, electric shock, or burn.

Modifications to Equipment
Do not make mechanical or electrical modifications to the equipment. Tritec Electronic GmbH is not responsible for regulatory compliance of a modified Tritec product.

Use the unit in an appropriate location.

- Not doing so may result in fire, electric shock, or equipment damage.
- Do not place outdoors.
- Do not place in a dusty or humid environment.
- Do not place near heat generating devices or a humidifier.
- Do not place in an in flammable gas environment.
- Do not place in environments with corrosive gases (such as sulphur dioxide, hydrogen sulphide, nitrogen dioxide, chlorine, ammonia, and ozone).
- Do not place in environments with dust, components that accelerate corrosion in the atmosphere (such as sodium chloride and sulphur), conductive metals, and so on.
- The installation height must not exceed 2m.

For operation use the provided power supply GTM96180-1807-2.0-T3 only.
The enclosed power supply is for use with this product only. Do not use the power supply with other equipment. Connecting to power sources that do not match the power ratings of the power supply may result in fire or electric shock.

Use power cords compliant to your country's' standard only.
Be sure to remain within the rated voltage of the power cord. Not doing so may result in fire or electric shock. Power supply: 100-120/200-240VAC 50/60Hz

To power off the unit, unplug the mains power cord from the wall outlet.
The unit has no separate power switch.

The power adapter and power cord must be placed in such way that the user can reach it anytime to disconnect the power cord.

For electrical safety, do not connect or disconnect the power cord in the presence of patients.

Caution–Not all power cords have the same current ratings.
Do not use the power cord provided with your equipment for any other products or use. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Tritec product.

The following caution applies only to devices with multiple power cords:
Caution–For products with multiple power cords, all power cords must be disconnected to completely remove power from the system.

Caution-Do not attempt to repair this product yourself as opening or removing covers may result in electric shock, or equipment damage.

Caution–Before connecting or removing any input or output connectors unplug the mains power cord.

Mind that the unit and the AC adapter become hot during use.
Do not cover or place anything on top of the unit. Do not place the unit on top of things that trap heat such as carpets, blankets, etc. Keep the unit away from direct sunlight and heat sources such as heaters. Not doing so may result in fire.

Do not touch with bare hands. Doing so may result in burns.
Before moving the unit and AC-adapter, be sure to disconnect the power plug from the power outlet, and wait until it has cooled completely.

If you plan to leave the unit unused for an extended period, disconnect the power cord from the wall socket after turning off the power switch for the safety and the power conservation.

2.2 Français précautions

Ce produit est uniquement adapté à un environnement patient, mais pas au contact avec un patient.

Si de la fumée provient du moniteur, que celui-ci sent le brûlé ou émet des bruits anormaux, débranchez immédiatement tous les cordons secteur et prenez contact avec votre représentant local. Il peut être dangereux d'utiliser un système au fonctionnement défectueux.

Ne démontez pas la carrosserie et ne modifiez pas le système. Le démontage de la carrosserie ou la modification du système peut causer un choc électrique ou une brûlure.

Confiez toute intervention à un technicien qualifié. Ne tentez pas de dépanner vous-même cet appareil, l'ouverture ou la dépose des capots vous expose à un risque d'incendie, de choc électrique ou de dégâts à l'appareil.

Éloignez les petits objets ou les liquides de l'appareil. L'introduction accidentelle de petits objets ou de liquide dans les fentes de ventilation de la carrosserie peut entraîner un choc électrique, un incendie ou des dégâts à l'appareil. Si un objet tombe dans la carrosserie ou si du liquide se répand sur ou à l'intérieur de l'appareil, débranchez immédiatement le cordon secteur. Faites contrôler l'appareil par un technicien qualifié avant de l'utiliser à nouveau.

Systèmes avec alimentation redondante:
La consommation de courant en résumé est indépendante du fait qu'un ou les deux modules d'alimentation sont en service (répartition automatique de la charge).

Mise en garde - Pour mettre un système équipé de plusieurs cordons d'alimentation hors tension, il est nécessaire de débrancher tous les cordons d'alimentation.

Mise en garde - Utilisez uniquement un émetteur-récepteur optique de classe 1 conforme aux normes de performance de la FDA pour les produits laser, à l'exception de la conformité à la norme IEC 60825-1 Ed. 3, comme décrit dans l'avis laser n° 56 du 8 mai 2019.

Instructions de montage en rack La mise en garde suivante s'applique aux racks et aux systèmes montés en rack.

Température ambiante de fonctionnement élevée: en cas d'installation dans un châssis fermé ou contenant plusieurs appareils, la température ambiante de fonctionnement au niveau du rack peut être supérieure à la température ambiante de la pièce. En conséquence, il convient de veiller à installer le matériel dans un environnement compatible avec la température ambiante maximale (Tma), spécifiée par le fabricant.

Débit d'air réduit : l'installation du matériel dans un rack doit être effectuée de façon à ne pas compromettre le débit d'air nécessaire pour un fonctionnement sûr de ce matériel.

Charge mécanique: le montage de l'équipement en rack doit être réalisé de manière à éviter toute situation dangereuse résultant d'une charge déséquilibrée.

Surcharge de circuit: il convient de prendre les précautions nécessaires pour la connexion du matériel au circuit d'alimentation et de réfléchir aux conséquences d'une éventuelle surcharge des circuits sur la protection de surintensité et sur le câblage d'alimentation. En l'occurrence, les valeurs nominales de la plaque signalétique du matériel doivent être prises en compte.

Mise à la terre fiable: une mise à la terre fiable du matériel monté en rack doit être assurée. Une attention toute particulière est requise pour les raccordements d'alimentation autres que ceux effectués directement sur le circuit principal (par exemple, en cas d'utilisation de blocs multiprises).

Pour le fonctionnement, utilisez uniquement l'alimentation fournie GTM96180-1807-2.0-T3.
Le bloc d'alimentation fourni est destiné à être utilisé uniquement avec ce produit. N'utilisez pas l'alimentation avec d'autres équipements. La connexion à des sources d'alimentation qui ne correspondent pas aux puissances nominales du bloc d'alimentation peut entraîner un incendie ou un choc électrique.

Utilisez l'appareil dans un endroit approprié.

- Ne pas le faire pourrait entraîner un incendie, un choc électrique ou des dommages matériels.
- Ne pas placer à l'extérieur.
- Ne pas placer dans un environnement poussiéreux ou humide.
- Ne pas placer à proximité d'appareils générateurs de chaleur ou d'un humidificateur.
- Ne pas placer dans un environnement de gaz inflammable.
- Ne pas placer dans des environnements contenant des gaz corrosifs (tels que le dioxyde de soufre, le sulfure d'hydrogène, le dioxyde d'azote, le chlore, l'ammoniac et l'ozone).
- Ne pas placer dans des environnements contenant de la poussière, des composants qui accélèrent la corrosion dans l'atmosphère (tels que le chlorure de sodium et le soufre), des métaux conducteurs, etc.
- La hauteur d'installation ne doit pas dépasser 2 m.

2.3 Product Markings

Read this manual and the caution statements at the unit before beginning any procedure.

European Union—Disposal Information

The symbol above means that according to local laws and regulations your product and/or its battery shall be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of your product and/or its battery at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

EU conformity mark in accordance with the provisions of Council Directive 93/42/EEC and 2011/65EU.

Manufacturer and date of manufacturing.

Alternating current.

Direct current.

Functional Earth.

2.1 Cleaning

Unplug the unit before cleaning it.

Cleaning the unit while it is plugged into a power outlet may result in electric shock.

Do not use chemicals on a frequent basis. Chemicals such as alcohol and antiseptic solution may cause gloss variation, tarnishing, and fading of the cabinet.

Never use any thinner, benzene, wax, and abrasive cleaner, which may damage the cabinet or panel.
Do not let chemicals come into direct contact with the unit.
Gently wipe off any dirt on the cabinet or panel surface with a soft cloth soaked in a small amount of water or one of the chemicals listed below.

Chemicals that may be used for cleaning

Material name	Product name
Ethanol	Ethanol
Isopropyl alcohol	Isopropyl alcohol
Glutaral	Sterihyde
Glutaral	Cidex Plus28
Chlorhexidine	Hibitane

3 General

The Tritec ® ADIO-1 is an **A**nalog-**D**igital-video-**I**nput-**O**ptical converter, which converts one DVI, HDMI, SDI, VGA or analog video input to a HDMI video output.
It has an USB input for keyboard and mouse and service tool connection.
It can extend the signals up to 36m with optical isolation bundle.
It has built in repeaters and buffers.

This document should be used to install ADIO-1 products.

Tritec ® ADIO-1 is available with different optional inputs and outputs. This document describes the ADIO version with all options installed. Table 1: Order numbers and options shows a list of available options and order numbers.

Order Number	Optical Isolation	Output Connector	Repeater Outputs	Inputs	Packaging list
ADIO-1H-AH	No	HDMI	yes	HDMI, VGA, analog	ADIO-1H Unit
ADIO-1H-AHDUS	No	HDMI	yes	DVI, DP, HDMI, VGA, analog, USB, SDI	ADIO-1H-AHDUS Unit
ADIO-1H-VHDS	No	HDMI	no	DVI, DP, HDMI, VGA, SDI	ADIO-1H-VHDS Unit
ADIO-1O-AH	yes	HDMI	yes	HDMI, VGA, analog	ADIO-1H Unit, Optical Bundle[1]
ADIO-1O-AHDUS	yes	HDMI	yes	DVI, DP, HDMI, VGA, analog, USB, SDI	ADIO-1H-AHDUS Unit, Optical Bundle[1]
ADIO-1O-VHDS	yes	HDMI	no	DVI, DP, HDMI, VGA, SDI	ADIO-1H-VHDS Unit, Optical Bundle[1]
ADIO-1-PSU				Power supply	One power supply with adapter cable

Table 1: Order numbers and options

[1] Optical bundle includes:

- Power Supply for ADIO Unit, GTM96180-1807-2.0-T3
- Optical Transmitter
- 36m of Optical Cable
- Optical Receiver
- Cable to supply Optical Receiver with power from MDM Power Break Out Board
- Cable to connect the Optical Receiver to the MDM HDMI input connector with lock

Other customer dependent option available.

For technical details of the Inputs refer to Table 2: Technical details of input connectors.

Figure 1: ADIO-1 digital connectors (Model ADIO-1H-AHDUS)

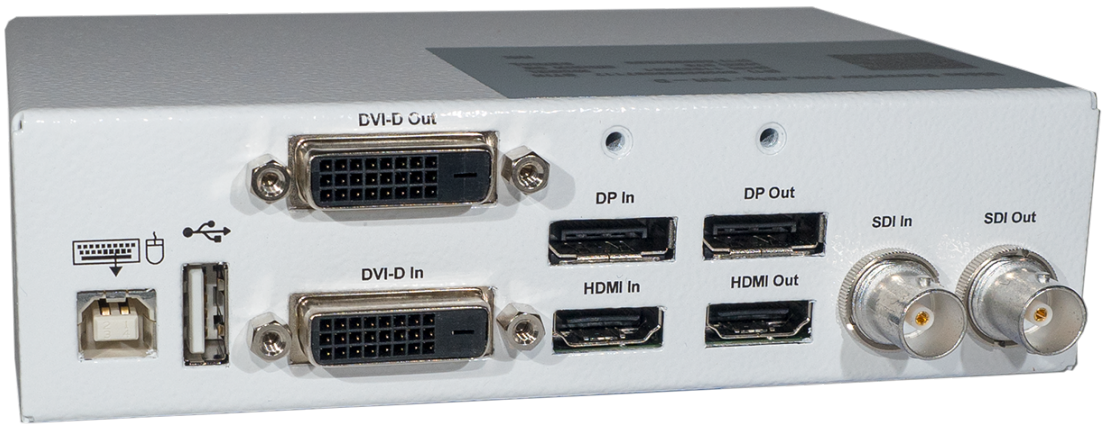


Figure 2: ADIO-1 analog connections and output side (Model ADIO-1H-AHDUS)

Figure 3: ADIO-1 input connector side (Model ADIO-1H-VHDS)

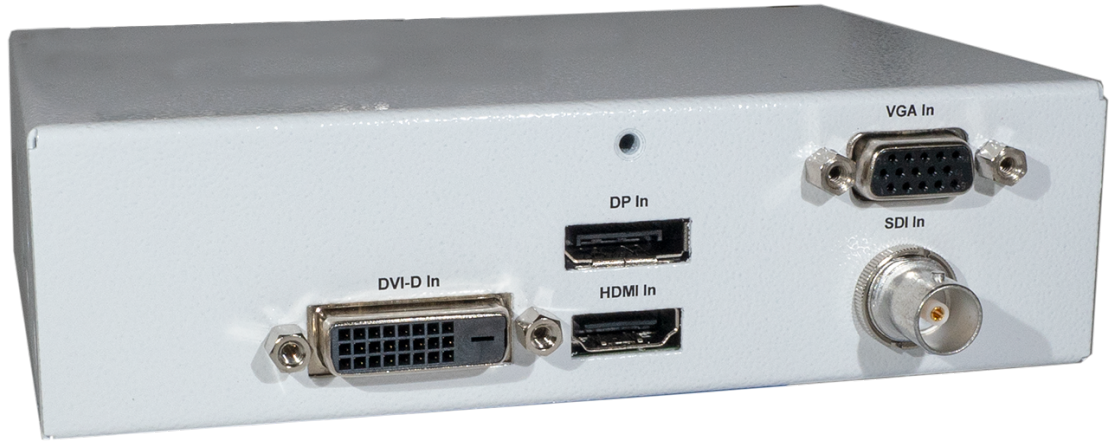
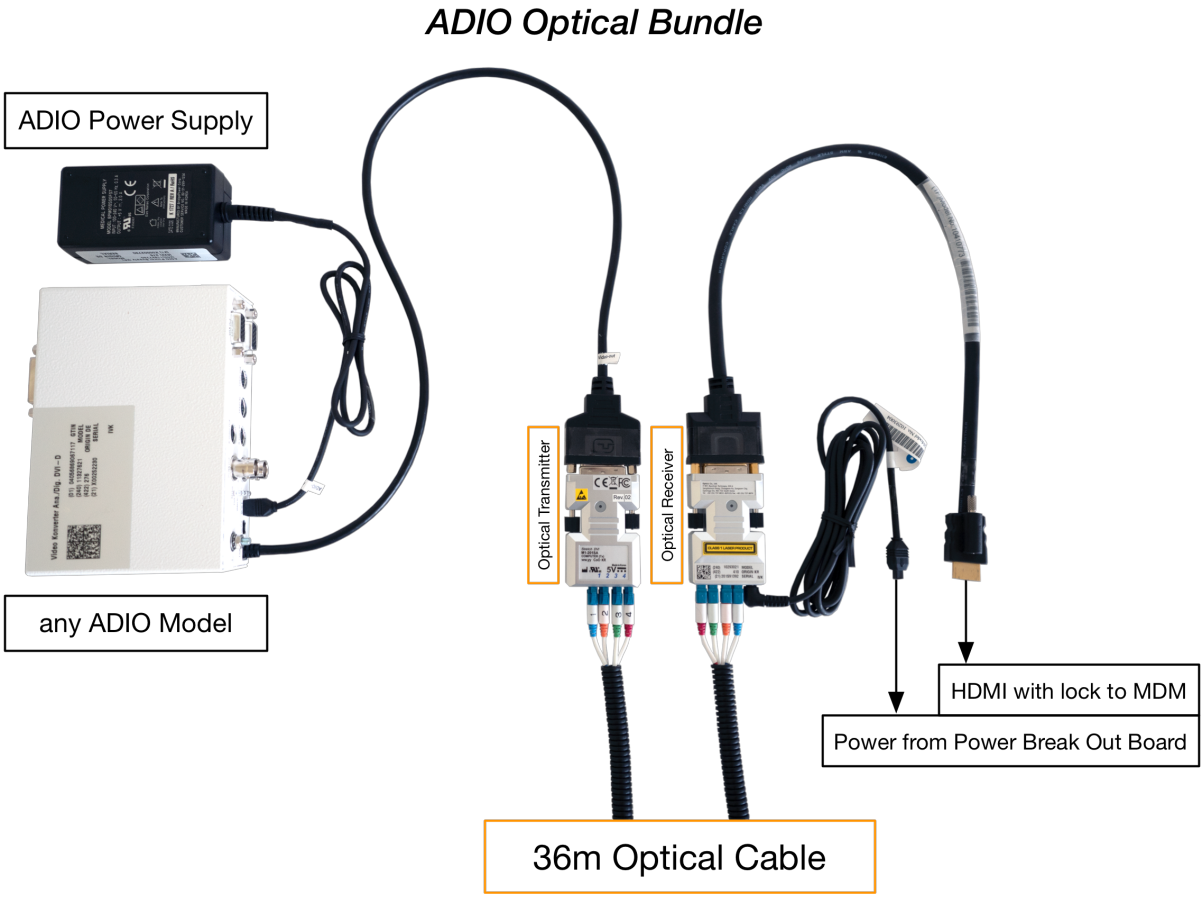


Figure 4: ADIO-1 analog output side (Model ADIO-1H-VHDS)

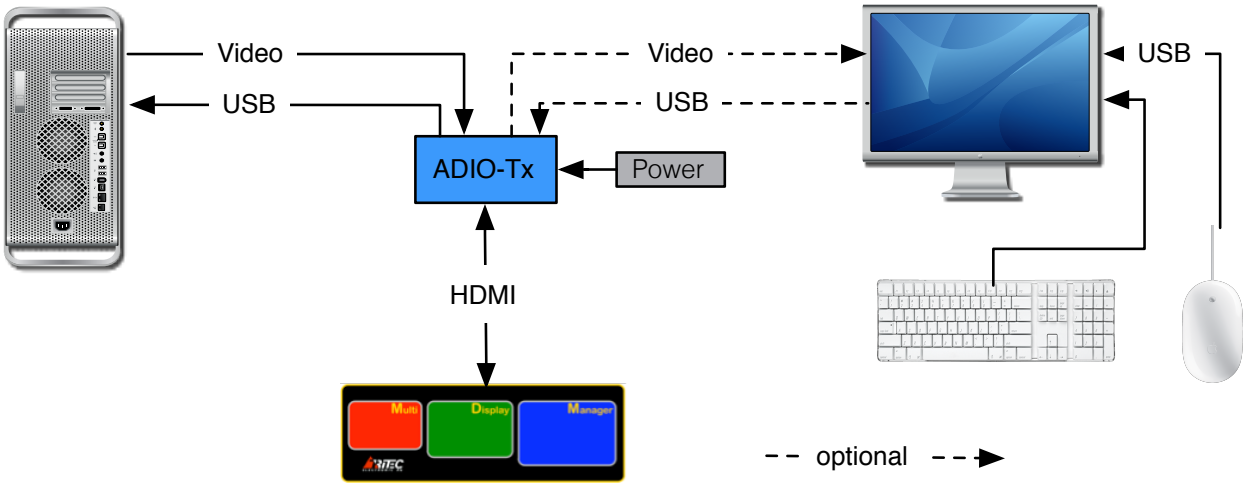
Figure 5: ADIO with Optical Isolation



4 Usage of ADIO-1

The following figures show the typical use of the ADIO-1.
Refer to Table 2: Technical details of input connectors to find which video sources and USB versions are supported.

Figure 6: ADIO connection to MDM



	Digital Inputs				Analog Inputs				USB
	DVI	HDMI	Display-Port	SDI	VGA	Com-ponent	S-Video	CVBS	USB
Supported Standards	DVI SL	HDMI 1.1	Display Port 1.1	3G SDI HD SMPTE 292M, 424M	Analog	YPbPr	S-Video	CVBS/ FBAS	USB 1.1 Keyboard & mouse device
Connector Type	DVI-I	HDMI	Display-Port	BNC	D-Sub VGA	7 pin mini DIN, Adaptor to cinch included	4 pin mini DIN	BNC	USB Type A
Input signal equalizer	yes	yes	yes	yes	-	-	-	-	HUB
Repeater output	yes, cable driver	yes, cable driver	yes, cable driver	yes, reclocked cable driver	yes, buffered	yes, buffered	yes, buffered	yes, buffered	yes, USB Type B
max . pixel clock [MHz]	165	165	165	3,000	165	165	-	-	n/a
Max. Resolution @60Hz	1920x 1200	1920x 1200	1920x 1200	-	1920x 1200	-	-	-	n/a
Color Formats	RGB	RGB, YCbCr	RGB	YCbCr	RGB	YPbPr	YC	-	n/a
Video Format	-	up to 1080p	-	up to 1080p progressive only	up to 1080p		PAL, SECAM, NTSC, 525i, 625i		n/a

Table 2: Technical details of input connectors

Notes:

- Details may vary depending on the ADIO version.
- Only one input can be active.
- Input pixel clocks above 165Mhz are available only when the connected video capture card can handle these resolutions.
- When a repeater cable is connected to a monitor, EDID data is provided by the monitor otherwise from ADIO.
- ADIO will use the input signal of the first connector plugged in.

5 Hardware Installation

This part of the installation refers to ADIO with all options installed.
Mounting points to fix ADIO-1 mechanically can be found
in: Figure 8: Mounting Brackets, Dimension and Figure 9: ADIO-1 Mechanical Dimensions

For the technical details and the marking of all inputs and output refer to chapter 7 Technical Specifications.

5.1 Minimum installation for ADIO connection

The minimum connections for ADIO connection are:

- Connect the HDMI cable (marked with 'Link') of the ADIO-1 unit to the input of the frame grabber or MDM.
- Connect the provided power supply to the ADIO-Tx unit power input (DC in 1 or DC in 2). The second input DC in 2 (if present) is not necessary for normal operation; it's for redundant systems only.

⇨ The 'Link' LED should light orange or green.
⇨ The MDM or frame grabber should display a test pattern (**Tx**1920) of a resolution of 1920x1080. See: Figure 7: Test Pattern ADIO-1 unit 1920x1080

- Connect the video output of the PC or modality to the equivalent video input type of the ADIO-1 unit.

⇨ The 'Video in' LED should light green.
⇨ The MDM or frame grabber should display the image of the connected input.

Figure 7: Test Pattern ADIO-1 unit 1920x1080

5.1.1 LED information for ADIO-1 without optical connection

When power is turned on the following LED lights should be visible:

- Link LED:
  - Green if connected to a Tritec MDM input board MDI-7 or higher (communication from MDM to ADIO-1 is possible)
  - Orange if connected to any other video input board, without communication.
  - Red if the HDMI output cable is not connected to a PC.
- Video in LED:
  - Green if the video input has a valid input signal and is transmitted to the video output
  - Orange if the video input has a valid input signal but is not transmitted to the video output
  - Red no valid video input signal
- DC in 2 LED:
  - Off if power is not connected
  - Green if power is connected
- DC in 1 LED: same as DC in 2 LED

When both LEDs ('Link' and 'Video in') are blinking, the input channel where this ADIO is connected to has been selected in the MDM 'Administration' tab.

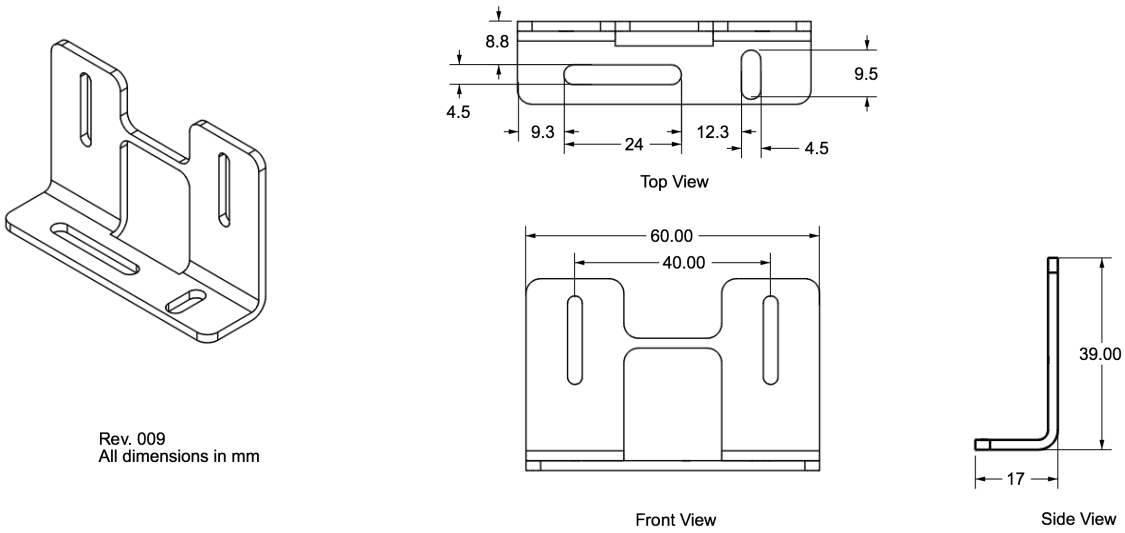


Figure 8: Mounting Brackets, Dimensions

Chassis for TX-Module

31. August 2016

Mechanical dimensions

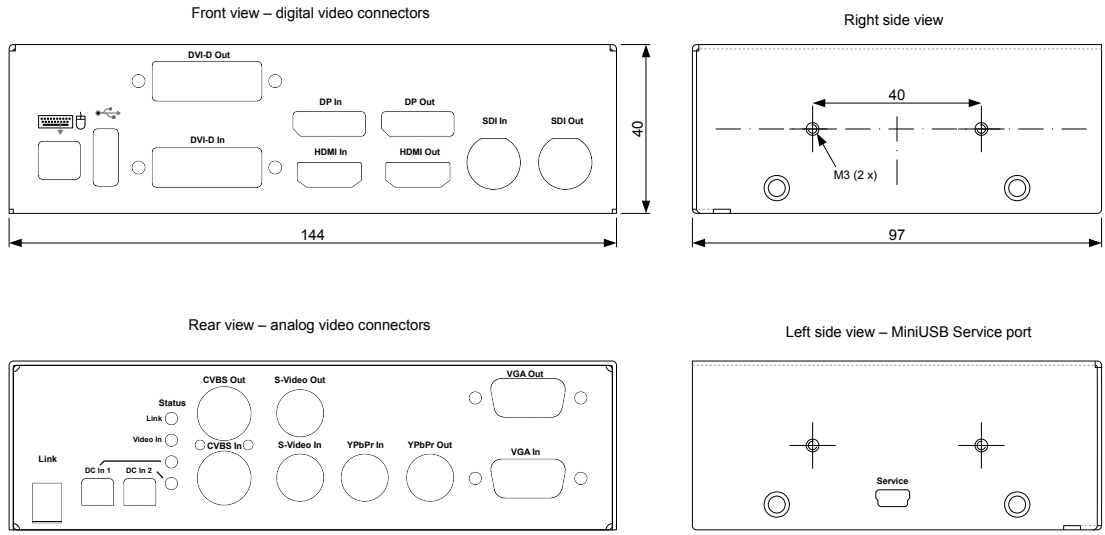


Figure 9: ADIO-1 Mechanical Dimensions

5.2 Additional connections for ADIO

5.2.1 Video repeater output

In addition to the video input connection a video output connection to a monitor can be made. The video input of the ADIO-1 unit is repeated to the equivalent video output.

- Connect the video output of the ADIO-1 unit to the monitor. The connected video output must be of the same type as the input video source. ADIO-1 does not convert any video input signal to any other video type at the repeater output. It converts any video input signal to the HDMI cable output only.

5.2.2 USB connection

This connection can be used with MDM and MDI-7 input boards only. USB keyboard and mouse information are sent from MDM to the attached PC or modality.

- Connect a USB cable between the PC (‘normal USB connector type’) and the ADIO-1 unit USB connector marked with  (‘square USB-B connector type).
- Optionally a repeater type USB connection can be made from the ADIO-1 unit to a mouse and/or keyboard  (a USB hub may have to be added). In this case, the MDM ‘mouse’ and the directly connected mouse work are working parallel.

5.3 Important to know

For proper working please obey the following rules:

- Connect only one video source at a time. If you want to switch from one video input type to another first disconnect all video inputs, then reconnect the desired video input.
- Check that ADIO-1 has a valid video input signal. The ‘Video in’ LED must be green.
- The source of the EDID data (available resolutions) depends on various parameters:
    - If a display is connected to the video repeater this attached display provides the EDID data.
    - If the repeater output is not connected; ADIO-1 provides the EDID data.
        - If not connected to a MDI-7 board the maximum preferred timing depends on the possibility of the frame grabber / MDI board. The preferred timing can be changed with ‘ADIO-Service-Tool’.
        - If connected to a MDI-7 board the preferred timing can be select in the administration part as usual.

For more details of the EDID data refer to chapter 7.8

5.4 Features available with MDM and MDI-7 input board

The following features are available only if the ADIO is connected to an MDI-7 board of a MDM. (If not connected to MDI-7 refer to chapter: 6.1 Features available with the 'ADIO-Service-Tool'). For more details, refer to the MDM manual.

- The MDM browser tab 'About' returns the firmware / hardware revision and serial number of each attached ADIO-1 board.
- The MDM browser tab 'Administration' returns or allows to change:
  - 'ADIO connected' status
  - 'USB connected' status
  - Video input signal type and connection (DVI, VGA, etc)
  - Setting of the analogue input values (phase, brightness, resolution)
  - Setting of the preferred resolution (EDID data)
- When MDM 'Administration' tab selects an input, the connected ADIO LEDs start blinking. This helps to identify which ADIO is connected to which MDM input channel.
- Firmware update of the ADIO-1 units.
- USB connections for the KVM mode of the MDM. This saves an extra USB connection between MDM and PC.

6 Service

ADIO-1 has no serviceable parts.
No calibration is necessary.

In case of a defect, the unit has to be returned to the factory.

6.1 Features available with the 'ADIO-Service-Tool'

If ADIO is not connected to a Tritec MDI-7 board the 'ADIO-Service-Tool' can be used to:

1. Check the serial number and the firmware / hardware revision of the ADIO-1 unit
2. Check which input connector is used and which resolution the input signal has
3. Check if the unit is connected to a host
4. Setting of the preferred resolution (EDID data).
5. Setting of the analogue input values (phase, brightness, contrast).
6. Setting of the position and size of S-Video and CVBS video signals.
7. Setup up to 8 customer timings for analog VGA inputs.
8. Firmware update of the ADIO-1 unit.
9. Save and restore parameter settings of the above-mentioned items (4. to 7.).

The service tool is available at:
https://www.multi-display-manager.com/download/adio_service_tool.zip

It needs a mini-USB to USB connection between the service port of the ADIO-1 unit and any PC running Windows 7 or later.
For more details, refer to the 'Readme' file of the ADIO Service Tool.

6.2 Trouble Shooting

If one of the LEDs is not showing a green or orange light a problem may happen.
First check that at least one of the 'DC in' LED a shows green light. If not:

- Check the power supply and power cord.
- Check the power connectors

If no green light shows up either the power or the ADIO-1 unit is defect.
Remove the power cord and return the part to the manufacturer. Do not dispose it to household trash.

If the 'DC in' shows a green light check the 'Link' LED. If it's red, then

- Check plug connector at the PC side
- Check the PC is turned on
- check another input of the PC or connect it to a display with a HDMI input.

If no green or orange light shows up most likely the ADIO unit is defect. Remove the power cord and return the part to the manufacturer. Do not dispose it to household trash.

7 Technical Specifications

7.1 Video Input / Repeater Output Specifications

7.1.1 DVI Input

Input	
Marking	DVI-D input
Connector Type	DVI-D female connector
Signal Type	According to DVI with equalization and Pre-emphasis
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz for Single Link
Horizontal Display timing	Min. 640 Pixel; max 4096 Pixel
Vertical Display timing	Min. 480 Lines; max. 2560 Lines
Interlace	Non-interlace only, progressive
EDID Data	When no repeater plugged in provided internally. For details see separate table.

7.1.2 DVI Repeater Output

Repeater Output	
Marking	DVI-D output
Connector Type	DVI-D female connector
Signal Type	According to DVI with equalization and Pre-emphasis
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz for Single Link
EDID Data	When repeater plugged in provided by external display.

7.1.3 HDMI Input

Input	
Marking	HDMI in
Connector Type	HDMI female connector
Signal Type	According to HDMI standard 1.4b with equalization and Pre-emphasis
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz for Single Link
Horizontal Display timing	Min. 640 Pixel; max 4096 Pixel
Vertical Display timing	Min. 480 Lines; max. 2560 Lines
Interlace	Non-interlace only, progressive
EDID Data	When no repeater plugged in provided internally. For details see separate table.

7.1.4 HDMI Repeater Output

Repeater Output	
Marking	HDMI out
Connector Type	HDMI female connector
Signal Type	According to HDMI standard 1.4b with equalization and Pre-emphasis

ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz for Single Link.
EDID Data	When repeater plugged in provided by external display.

7.1.5 DisplayPort Input

Input	
Marking	DP in
Connector Type	DisplayPort connector, with lock
Signal Type	According to DP v1.1 standard
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz; HBR data rates
Lanes	4 lanes
Streams	Single stream only.
Interlace	Non-interlace only, progressive
EDID Data	When no repeater plugged in provided internally. For details see separate table.

7.1.6 DisplayPort Repeater Output

Repeater Output	
Marking	DP out
Connector Type	DisplayPort connector, with lock
Signal Type	According to DP v1.1 standard
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165Hz; HBR2 data rates
EDID Data	When repeater plugged in provided by external display.

7.1.1 SDI Input

Input	
Marking	SDI in
Connector Type	BNC, 75Ohm
Signal Type	SDI, 3G, Level A only
Equalization	Equalized cable lengths up to 200m
Clock	2.97Gbps
Standards	HD, SMPTE 292M, 424M, progressive only

7.1.2 SDI Repeater Output

Repeater Output	
Marking	SDI out
Connector Type	BNC, 75Ohm
Signal Type	SDI, 3G, Level A only
Clock	2.97Gbps
Output Signal	Re-clocked cable driver
Standards	HD, SMPTE 292M, 424M, progressive only

7.1.3 VGA Input

Input	
Marking	VGA in
Connector Type	VGA female connector
Signal Type	R,G,B: 0,7 Vpp, 75 Ohm Separate Syncs: TTL 5V or Sync on Green (G): 1 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 170Mhz with 12-Bit ADC
Horizontal Display timing	Min. 640 Pixel; max. 1920 Pixel
Vertical Display timing	Min. 480 Lines; max. 1600 Lines
Interlace	Non-interlace only, progressive
EDID Data	When no repeater plugged in provided internally
Resolution settings	For analog input timing presets see chapter 7.9 Analog Pre-set Timings. When connected to MDI-7 additional timings can be added via the browser interface.

7.1.4 VGA Repeater Output

Repeater Output	
Marking	VGA out
Connector Type	VGA connector
Signal Type	Analog amplified input signal R,G,B: 0,7 Vpp, 75 Ohm Separate Syncs: TTL 5V or Sync on Green (G): 1 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 170Mhz
EDID Data	When repeater plugged in provided by external display.

7.1.5 S-Video Input

Input	
Marking	S-Video in
Connector Type	S-Video connector, 4 pin mini DIN
Signal Type	Y: 1,0 Vpp, 75 Ohm; Pb,Pr: 0,7 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Formats	525i, 625i with deinterlacer
Color	YC
Pixel Clock	Max. 170Mhz

7.1.6 S-Video Repeater Output

Repeater Output	
Marking	S-Video out
Connector Type	S-Video connector, 4 pin mini DIN
Signal Type	Analog amplified input signal Y: 1,0 Vpp, 75 Ohm; Pb,Pr: 0,7 Vpp, 75 Ohm

ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz

7.1.7 Component YPbPr Input

Input	
Marking	YPbPr in
Connector Type	7 pin mini DIN, Adaptor to cinch included
Signal Type	Y: 1,0 Vpp, 75 Ohm; Pb,Pr: 0,7 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Video Formats	525p, 625p, 720p, 1080p
Pixel Clock	Max. 170Mhz

7.1.8 Component YPbPr Output

Repeater Output	
Marking	YPbPr out
Connector Type	7 pin mini DIN, Adaptor to cinch included
Signal Type	Analog amplified input signal Y: 1,0 Vpp, 75 Ohm; Pb,Pr: 0,7 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz

7.1.9 CVBS Input

Input	
Marking	Video in
Connector Type	1x BNC
Signal Type	Analog, 1 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Video Formats	525i, 625i with deinterlacer
Pixel Clock	Max. 170Mhz

7.1.10 CVBS Repeater Output

Repeater Output	
Marking	Video out
Connector Type	1x BNC
Signal Type	Analog amplified input signal, 1 Vpp, 75 Ohm
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz

7.2 USB Input / Output

USB input works with MDI-7 boards only. No support for all other input MDI boards.
A build in USB hub is used for a local mouse & keyboard connection and to connect MDM remotely.

7.2.1 USB Input (internal hub connection to host PC)

Input / Output	
Marking	
Connector Type	USB type B connector (square)
Signal Type	USB version 1.1
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM

1.1.1. USB Output (internal hub connection to mouse)

Input / Output	
Marking	
Connector Type	USB type A connector
Signal Type	USB version 1.1
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM

7.3 Video Output

This specification relates either to the ADIO-1, when no optical connection is used, or to the ADIO-Rx when optical isolation is used.

7.3.1 HDMI Output

Output	
Marking	Link
Connector Type	HDMI female connector, with lock and 1.6m cable length
Signal Type	According to DVI, no HDMI signaling
ESD Protection	8KV contact per IEC6100-4-2 and 2KV HBM
Pixel Clock	Max. 165MHz for Single Link
Horizontal Display timing	Min. 640 Pixel; max 4096 Pixel
Vertical Display timing	Min. 480 Lines; max. 2560 Lines
Interlace	Non-interlace, progressive only

7.4 Electrical Specifications

7.4.1 ADIO-1 unit electrical input

Marking	DC in 1, DC in 2 (HRS RP 34L-5R-2PD)
Connector Type	Hirose 2 pin
Voltage	5VDC +/- 5%
Input current	1.9A typ. 2.1 A max. with all options 0.95A typ. 1.0 A max. with analogue and HDMI inputs only

7.4.2 Power supply for ADIO-1 unit

The power supply has to be ordered separately.

Connector Type	IEC 320/C8
Input Voltage	100 - 240 VAC
Input Frequency	50/60Hz
Input current	Max. 0.6A@230VAC
Isolation	4KV AC
Output Voltage	5VDC
Output	Cable with Hirose connector (HRS RP 34L-5PA-2SC) length appr. 0.6m

7.4.3 Electrical Safety & EMC specifications

Electrical Safety	IEC62368, EN62368, UL62368
EMC	According EN 55032:2015 +A11:2020 EN 55035:2017 + A11:2020 EN 61000-4-2:2009 EN 61000-4-3:2006+A1:2008+A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2014 EN 61000-4-6:2014

	EN 61000-4-8.2010 EN 61000-4-11:2004 EN IEC 61000-3-2:2019 EN IEC 61000-3-3:2013 + A1:2019
Radiated Emission	FCC class B
Immunity	IEC 610004 2-11
Markings	UL, CE, WEEE

7.5 Mechanical Specifications

ADIO-1 Unit	
Unpacked Size	(w)140x(h)40x(d)99 mm plus optional HDMI cable
Unpacked Weight	0,65 kg

Power supply	
Unpacked Size	(w)110x(h)30x(d)50 mm
Unpacked Weight	0,17kg

ADIO-1 Unit packed	
Packed Size	300 x 255 x 90 mm
Packed Weight	<0,5kg

7.6 Environmental Specifications

Environmental Requirements
Unpackaged Operating: Temperature 5 °C according EN 60068-2-1 Temperature 35 °C according EN 60068-2-2.
Unpackaged Operating Humidity: Damp heat, 25°C, 10 to 80% RH (non-condensing) according EN 60068-2-38.
Unpackaged Operating Pressure: 700-1060 hPa (525 -795 mmHg) or up to 3050m (10,000ft).
Packaged Non-Operating Temperature (Storage, Transportation): Temperature -20 °C according EN 60068-2-1 Temperature +70°C according EN 60068-2-2.
Packaged Non-Operating Humidity: +25°C 10 to 95% RH (non-condensing) according 60068-2-38.
Packaged Non-Operating Pressure: 500 -1060 hPa (375 -795 mmHg) or up to 5,050m (18,000 ft).
Packaged Tests Continuous Shock: according EN 60068-2-29 and EN60721-3-2, class 2M2.
Package Drop Test: according EN 24180-2.
Sound Noise Level: No noise emitted.

7.7 Reliability

ADIO-1H	85,000h
ADIO-1H-AHDUS	85,000h
External power supply	300,000h

7.8 EDID Timings

7.8.1 Standard EDID Timings

	Analog EDID for VGA input	Digital EDID for HDMI, DVI, DP
(EDID V1.3)		
Vendor ID / Product ID	TRT / 8213 (x2015)	TRT / 8213 (x2015)
Analog / Digital	Analog	Digital
Preferred timing mode	**x**	**x**
Established Timings:		
720x400x70	**x**	**x**
720x400x88	.	.
640x480x60	**x**	**x**
640x480x67	**x**	**x**
640x480x72	**x**	**x**
640x480x75	**x**	**x**
800x600x56	**x**	**x**
800x600x60	**x**	**x**
800x600x72	**x**	**x**
800x600x75	**x**	**x**
832x624x75	**x**	**x**
1024x768x87	.	.
1024x768x60	**x**	**x**
1024x768x70	**x**	**x**
1024x768x75	**x**	**x**
1280x1024x75	**x**	**x**
1152x870x75	**x**	**x**
Standard Timings:		
Timing ID #1	1152x864x60	1152x864x60
Timing ID #2	1280x720x60	1280x720x60
Timing ID #3	1280x800x60	1280x800x60
Timing ID #4	1280x960x60	1280x960x60
Timing ID #5	1280x1024x60	1280x1024x60
Timing ID #6	1400x1050x60	1400x1050x60
Timing ID #7	1440x900x60	1440x900x60
Timing ID #8	.	1600x900x60
Timing ID #9	1600x1200x60	1600x1200x60
Timing ID #10	1680x1050x60	1680x1050x60
Timing ID #11	1920x1080x60	1920x1080x60

7.8.2 Additional Progressive Video Timings for HDMI inputs

„progressive video“	
Common features:	Underscan, Audio, YCbCr 444, YCbCr 422
Video formats:	1920x1080p @ 59,94/60, 50, 29,97/30, 25, 23,98/24 Hz
	1280x720p @ 59,94/60, 50, 29,97/30, 25, 23,98/24 Hz
	720x480p @ 59,94/60 Hz
	720x576p @ 50 Hz
	640x480p @ 59,94/60 Hz
Audio:	L-PCM, 48kHz, 44,1kHz, 32kHz, 16bits
Deep Color:	36bit, 30bit, Y444
Max TMDS Clock:	165MHz
Content:	HDMI Video Present

7.8.3 Preferred Timing

These are the preferred timings; which can be selected in the MDM ‘Administration’ or the ‘ADIO-Service-Tool’.

	Resolution name:	Note:
Standard timings:	640x480,60Hz	DMT
	800x600,60Hz	DMT
	1024x768,60Hz	DMT
	1152x864,60Hz	CVT
	1280x720,60Hz	CEA
	1280x800,60Hz	CVT
	1280x960,60Hz	DMT
	1280x1024,60Hz	DMT
	1400x1050,60Hz	CVT
	1440x900,60Hz	CVT
	1600x900,60Hz	CVT
	1600x1200,60Hz	DMT
	1680x1050,60Hz	CVT
	1920x1080,60Hz	CEA
	1920x1200,60Hz	CVT RB
	1536x2048,30Hz	special
	2048x2048,30Hz	special
	2048x2560,25Hz	special
	2560x1440,30Hz	CVT RB
	2560x1600,30Hz	CVT RB

7.9 Analog Pre-set Timings

The following table shows all factory pre-set analog timings.

Table 3: Analog Pre-set Timings

Pixel Clock	H-width	H-f. por	H-Sync	H-b. por	H-Total	H-syc pol	Vert. hight	V-f. por	V-b. por	V-blanc	V-Total	V-syn pol	Name
28.287.000	720	16	108	56	900	0	400	11	2	36	449	0	0 - 720x400@70Hz VGA BIOS
23.856.000	640	16	64	80	800	0	480	1	3	13	497	0	1 - 640x480@60Hz VESA GTF
25.680.000	696	16	64	80	856	0	480	10	3	7	500	0	2 - 696x480@60Hz SC 6000 EKG
24.000.000	640	16	64	80	800	0	480	3	4	13	500	0	3 - 640x480@60Hz VESA CVT
31.500.000	640	16	64	120	840	0	480	1	3	16	500	0	4 - 640x480@75Hz VESA DMT
30.722.400	640	24	64	88	816	0	480	1	3	18	502	0	5 - 640x480@75Hz VESA GTF
30.844.800	640	24	64	88	816	0	480	3	4	17	504	0	6 - 640x480@75Hz VESA CVT
35.713.600	640	32	64	96	832	0	480	1	3	21	505	0	7 - 640x480@85Hz VESA GTF
35.165.520	640	24	64	88	816	0	480	3	4	20	507	0	8 - 640x480@85Hz VESA CVT
25.000.000	640	6	88	66	800	0	480	0	2	32	514	0	9 - 640x480@60Hz SC 6802XL
25.200.000	640	16	96	48	800	0	480	10	2	33	525	0	10 - 640x480@60Hz VESA DMT
38.215.680	800	32	80	112	1024	0	600	1	3	18	622	0	11 - 800x600@60Hz VESA GTF
38.338.560	800	32	80	112	1024	0	600	3	4	17	624	0	12 - 800x600@60Hz VESA CVT
49.500.000	800	16	80	160	1056	0	600	1	3	21	625	0	13 - 800x600@75Hz VESA DMT
48.906.000	800	40	80	120	1040	0	600	1	3	23	627	0	14 - 800x600@75Hz VESA GTF
39.790.080	800	40	128	88	1056	0	600	1	4	23	628	0	15 - 800x600@60Hz VESA DMT
49.062.000	800	40	80	120	1040	0	600	3	4	22	629	0	16 - 800x600@75Hz VESA CVT
57.084.300	800	50	88	128	1066	0	600	1	3	26	630	0	17 - 800x600@85Hz VESA GTF
56.818.080	800	48	80	128	1056	0	600	3	4	26	633	0	18 - 800x600@85Hz VESA CVT
64.108.800	1024	56	104	160	1344	0	768	1	3	23	795	0	19 - 1024x768@60Hz VESA GTF
63.584.640	1024	48	104	152	1328	0	768	3	4	23	798	0	20 - 1024x768@60Hz VESA CVT
78.720.000	1024	16	96	176	1312	0	768	1	3	28	800	0	21 - 1024x768@75Hz VESA DMT
81.804.000	1024	56	112	168	1360	0	768	1	3	30	802	0	22 - 1024x768@75Hz VESA GTF
82.110.000	1024	64	104	168	1360	0	768	3	4	30	805	0	23 - 1024x768@75Hz VESA CVT
64.995.840	1024	24	136	160	1344	0	768	3	6	29	806	0	24 - 1024x768@60Hz VESA DMT
94.386.720	1024	64	112	176	1376	0	768	1	3	35	807	0	25 - 1024x768@85Hz VESA GTF
94.620.640	1024	72	104	176	1376	0	768	3	4	34	809	0	26 - 1024x768@85Hz VESA CVT
94.500.000	1024	26	128	142	1320	0	800	2	4	31	837	0	27 - 1024x800x84 DG2 SUN
101.250.000	1280	26	112	150	1568	0	800	3	7	36	846	0	28 - 1280x800x76 DG2 SUN
94.500.000	1152	50	128	198	1528	0	900	2	4	31	937	0	29 - 1152x900x66 DG2 SUN
108.000.000	1152	42	128	182	1504	0	900	2	8	33	943	0	30 - 1152x900x76 DG2 SUN
135.000.000	1440	50	160	230	1880	0	900	2	3	39	944	0	31 - 1440x900x76 DG2 SUN
135.000.000	1600	49	136	183	1968	0	1000	2	5	32	1039	0	32 - 1600x1000x66 DG2 SUN
108.883.200	1280	80	136	216	1712	0	1024	1	3	32	1060	0	33 - 1280x1024@60Hz VESA GTF
109.191.360	1280	80	136	216	1712	0	1024	3	7	29	1063	0	34 - 1280x1024@60Hz VESA CVT
107.964.480	1280	48	112	248	1688	0	1024	1	3	38	1066	0	35 - 1280x1024@60Hz VESA DMT
134.881.458	1280	66	192	222	1760	0	1024	0	3	39	1066	0	36 - 1280x1024@72Hz A02
134.955.600	1280	16	144	248	1688	0	1024	1	3	38	1066	0	37 - 1280x1024@75Hz VESA DMT
134.810.624	1280	28	144	212	1664	0	1024	3	7	32	1066	0	38 - 1280x1024@76Hz PD81 76

Pixel Clock	H-width	H-f. por	H-Sync	H-b. por	H-Total	H-syc pol	Vert. hight	V-f. por	V-b. por	V-blanc	V-Total	V-syn pol	Name
135.000.000	1280	25	144	215	1664	0	1024	2	8	32	1066	0	39 - 1280x1024x76 DG2 SUN
117.000.000	1280	25	112	215	1632	0	1024	2	8	33	1067	0	40 - 1280x1024x67 DG2 SUN
135.007.988	1280	66	192	222	1760	0	1024	0	3	40	1067	0	41 - 1280x1024@72Hz A02
138.542.400	1280	88	136	224	1728	0	1024	1	3	41	1069	0	42 - 1280x1024@75Hz VESA GTF
138.931.200	1280	88	136	224	1728	0	1024	3	7	38	1072	0	43 - 1280x1024@75Hz VESA CVT
159.358.000	1280	96	136	232	1744	0	1024	1	3	47	1075	0	44 - 1280x1024@85Hz VESA GTF
159.802.720	1280	96	136	232	1744	0	1024	3	7	44	1078	0	45 - 1280x1024@85Hz VESA CVT
162.000.000	1920	66	104	102	2192	0	1200	2	6	24	1232	0	46 - 1920x1200@60Hz Custom
154.000.000	1920	48	80	32	2080	0	1200	2	7	26	1235	0	47 - 1920x1200@60Hz WUXGA
160.963.200	1600	104	176	280	2160	0	1200	1	3	38	1242	0	48 - 1600x1200@60Hz VESA GTF
161.352.000	1600	112	168	280	2160	0	1200	3	4	38	1245	0	49 - 1600x1200@60Hz VESA CVT
162.000.000	1600	64	192	304	2160	0	1200	1	3	46	1250	0	50 - 1600x1200@60Hz VESA DMT
163.745.280	1200	96	128	224	1648	0	1600	1	3	52	1656	0	51 - 1200x1600@60Hz VESA GTF
162.351.360	1200	88	128	216	1632	0	1600	3	10	45	1658	0	52 - 1200x1600@60Hz VESA CVT?
31.500.000	640	32	64	96	832	0	400	1	3	41	445	0	54 - 640 x 400 @ 85Hz
28.322.000	720	15	108	51	894	0	400	11	2	32	445	0	55 - 720 x 400 @ 70Hz
35.500.000	720	36	72	108	936	0	400	1	3	42	446	0	56 - 720 x 400 @ 85Hz
25.175.000	640	16	96	48	800	0	480	10	2	33	525	0	57 - 640 x 480 @ 60Hz
31.500.000	640	24	40	128	832	0	480	9	3	28	520	0	58 - 640 x 480 @ 72Hz
36.000.000	640	56	56	80	832	0	480	1	3	25	509	0	60 - 640 x 480 @ 85Hz
36.000.000	800	24	72	128	1024	0	600	1	2	22	625	0	61 - 800 x 600 @ 56Hz
40.000.000	800	40	128	88	1056	0	600	1	4	23	628	0	62 - 800 x 600 @ 60Hz
50.000.000	800	56	120	64	1040	0	600	37	6	23	666	0	63 - 800 x 600 @ 72Hz
56.250.000	800	32	64	152	1048	0	600	1	3	27	631	0	65 - 800 x 600 @ 85Hz
73.250.000	800	48	32	80	960	0	600	3	4	29	636	0	66 - 800 x 600 @ 120Hz CVT RB
33.750.000	848	16	112	112	1088	0	480	6	8	23	517	0	67 - 848 x 480 @ 60Hz
75.000.000	1024	24	136	144	1328	0	768	3	6	29	806	0	69 - 1024 x 768 @ 70Hz
78.750.000	1024	16	96	176	1312	0	768	1	3	28	800	0	70 - 1024 x 768 @ 75Hz
94.500.000	1024	48	96	208	1376	0	768	1	3	36	808	0	71 - 1024 x 768 @ 85Hz
115.500.000	1024	48	32	80	1184	0	768	3	4	38	813	0	72 - 1024 x 768 @ 120Hz CVT RB
108.000.000	1152	64	128	256	1600	0	864	1	3	32	900	0	73 - 1152 x 864 @ 75Hz
68.250.000	1280	48	32	80	1440	0	768	3	7	12	790	0	76 - 1280 x 768 @ 60Hz CVT RB
79.500.000	1280	64	128	192	1664	0	768	3	7	20	798	0	77 - 1280 x 768 @ 60Hz
102.250.000	1280	80	128	208	1696	0	768	3	7	27	805	0	78 - 1280 x 768 @ 75Hz
117.500.000	1280	80	136	216	1712	0	768	3	7	31	809	0	79 - 1280 x 768 @ 85Hz
140.250.000	1280	48	32	80	1440	0	768	3	7	35	813	0	80 - 1024 x 768 @ 120Hz CVT RB
71.000.000	1280	48	32	80	1440	0	800	3	6	14	823	0	81 - 1280 x 800 @ 60Hz CVT RB
83.500.000	1280	72	128	200	1680	0	800	3	6	22	831	0	82 - 1280 x 800 @ 60Hz
106.500.000	1280	80	128	208	1696	0	800	3	6	29	838	0	83 - 1280 x 800 @ 75Hz
122.500.000	1280	80	136	216	1712	0	800	3	6	34	843	0	84 - 1280 x 800 @ 85Hz
146.250.000	1280	48	32	80	1440	0	800	3	6	38	847	0	85 - 1280 x 800 @ 120Hz CVT RB
108.000.000	1280	96	112	312	1800	0	960	1	3	36	1000	0	86 - 1280 x 960 @ 60Hz
148.500.000	1280	64	160	224	1728	0	960	1	3	47	1011	0	87 - 1280 x 960 @ 85Hz
108.000.000	1280	48	112	248	1688	0	1024	1	3	38	1066	0	89 - 1280 x 1024 @ 60Hz
135.000.000	1280	16	144	248	1688	0	1024	1	3	38	1066	0	90 - 1280 x 1024 @ 75Hz
157.500.000	1280	64	160	224	1728	0	1024	1	3	44	1072	0	91 - 1280 x 1024 @ 85Hz
85.500.000	1360	64	112	256	1792	0	768	3	6	18	795	0	93 - 1360 x 768 @ 60Hz
148.250.000	1360	48	32	80	1520	0	768	3	5	37	813	0	94 - 1360 x 768 @ 120Hz CVT RB
101.000.000	1400	48	32	80	1560	0	1050	3	4	23	1080	0	95 - 1400 x 1050 @ 60Hz CVT RB

Pixel Clock	H-width	H-f . por	H-Sync	H-b. por	H-Total	H-syc pol	Vert. hight	V-f. por	V-b. por	V-blanc	V-Total	V-syn pol	Name
121.750.000	1400	88	144	232	1864	0	1050	3	4	32	1089	0	96 - 1400 x 1050 @ 60Hz
156.000.000	1400	104	144	248	1896	0	1050	3	4	42	1099	0	97 - 1400 x 1050 @ 75Hz
88.750.000	1440	48	32	80	1600	0	900	3	6	17	926	0	100 - 1440 x 900 @ 60Hz CVT RB
106.500.000	1440	80	152	232	1904	0	900	3	6	25	934	0	101 - 1440 x 900 @ 60Hz
136.750.000	1440	96	152	248	1936	0	900	3	6	33	942	0	102 - 1440 x 900 @ 75Hz
157.000.000	1440	104	152	256	1952	0	900	3	6	39	948	0	103 - 1440 x 900 @ 85Hz
119.000.000	1680	48	32	80	1840	0	1050	3	6	21	1080	0	111 - 1680 x 1050 @ 60Hz CVT RB
146.250.000	1680	104	176	280	2240	0	1050	3	6	30	1089	0	112 - 1680 x 1050 @ 60Hz
138.500.000	1920	48	32	80	2080	0	1080	3	5	23	1111	0	122 - 1920 x 1080 @ 60Hz RB
148.500.000	1920	88	44	148	2200	0	1080	4	5	36	1125	0	123 - 1920 x 1080 @ 60Hz
154.000.000	1920	48	32	80	2080	0	1200	3	6	26	1235	0	124 - 1920 x 1200 @ 60Hz CVT RB
81.750.000	1152	64	120	184	1520	0	864	3	4	26	897	0	133 - 1152 x 864 @ 60Hz CVT
74.250.000	1280	110	40	220	1650	0	720	5	5	20	750	0	134 - 1280 x 720 @ 60Hz
118.250.000	1600	88	168	256	2112	0	900	3	5	26	934	0	135 - 1600 x 900 @ 60Hz CVT
30.234.000	640	64	64	96	864	0	480	3	3	39	525	0	136 - 640 x 480 @ 67Hz
57.283.000	832	32	64	224	1152	0	624	1	3	39	667	0	138 - 832 x 624 75Hz
136.384.994	1600	104	168	272	2144	0	1024	3	3	30	1060	0	140 - 1600 x 1024 @ 60Hz hsync : 63.6kHz