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A **BELDEN** BRAND

# T2 4K Series

Digital Recorder/Players

T2 4K I/O Card Kit (SDI x8) Installation Manual

Version 3.1.0

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## Manual Explanation

- If there are any variations between the explanation in this manual and the actual application method, priority is given to the actual application method.
- This manual is a common manual for T2 4K Series. Screenshots and illustrations in this manual may vary from those of the actual product.
- The screenshots used as examples in this manual are those of the development stage, so they may vary from those in the final product.
- This manual is written for users who have a basic knowledge of how to use a computer.
- If there are no special instructions, perform the same operation as a normal computer operation.
- The contents of this product may modify without prior notice.

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# Safety Summaries

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## General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

While using this product, you may need to access other parts of the system. Read the *General Safety Summary* in other system manuals for warnings and cautions related to operating the system.

### Injury Precautions

#### Use Proper Power Cord

To avoid fire hazard, use only the power cord specified for this product.

#### Ground the Product

This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

#### Do Not Operate Without Covers

To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

#### Do Not Operate in Wet/Damp Conditions

To avoid electric shock, do not operate this product in wet or damp conditions.

#### Do Not Operate in an Explosive Atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

#### Avoid Exposed Circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

### Product Damage Precautions

#### Use Proper Power Source

Do not operate this product from a power source that applies more than the voltage specified.

#### Provide Proper Ventilation

To prevent product overheating, provide proper ventilation.

#### Do Not Operate With Suspected Failures

If you suspect there is damage to this product, have it inspected by qualified service personnel.

## Battery Replacement


To avoid damage, a battery must be replaced once every five years. Please contact Grass Valley Product Support to replace the battery.

# Safety Terms and Symbols

## Terms in This Manual

These terms may appear in this manual:

 **WARNING:** *Warning statements identify conditions or practices that can result in personal injury or loss of life.*

 **CAUTION:** *Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.*

## Terms on the Product

These terms may appear on the product:

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.


WARNING indicates a personal injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

## Symbols on the Product

The following symbols may appear on the product:


 DANGER high voltage

 Protective ground (earth) terminal

 ATTENTION – refer to manual

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## Service Safety Summary

 **WARNING:** *The service instructions in this manual are intended for use by qualified service personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries before performing service.*

### Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

### Disconnect Power

To avoid electric shock, disconnect the main power by means of the power cord or, if provided, the power switch.

### Use Care When Servicing With Power On

Dangerous voltages or currents may exist in this product. Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

## Certifications and Compliances

### Canadian Certified Power Cords

Products that are relocated to other countries should use nationally certified power cords and plugs to ensure safe operation of the product.

### FCC Emission Control

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 not installed and used in accordance with the instruction manual, 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. Changes or modifications not expressly approved by Grass Valley can affect emission compliance and could void the user's authority to operate this equipment.

### Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This product must not be used in residential areas.

**EMC Directive  
Class A Warning**

This product must not be used in residential areas.

**FCC Emission Limits**

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, and (2) this device must accept any interference received, including interference that may cause undesirable operation.


# Installation procedure of the video I/O card


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## Precautions before operations

This chapter mainly describes installation procedure of the video I/O card. Unless otherwise documented, installation procedures will be in reverse order of removals. If any installation instructions are documented, be sure to follow them.

**NOTE:** Do not discard any of the removed parts such as screws or stays.

 **WARNING:** Be sure to turn off the system and disconnect the power cord from the product body prior to install the video I/O card. Otherwise, electric shock or product failure may result.

 **WARNING:** When you attach parts of T2, be sure to use exactly the same screws as were originally used on the parts.


 **WARNING:** Part of T2 may be damaged by electrostatic discharge or physical impacts. When you work on your system, be sure to wear a wrist strap for preventing electrostatic discharge (ESD) and provide grounding.

## Required tools

Phillips screwdriver #1, nippers

## Turning off the T2 and disconnecting the power cord

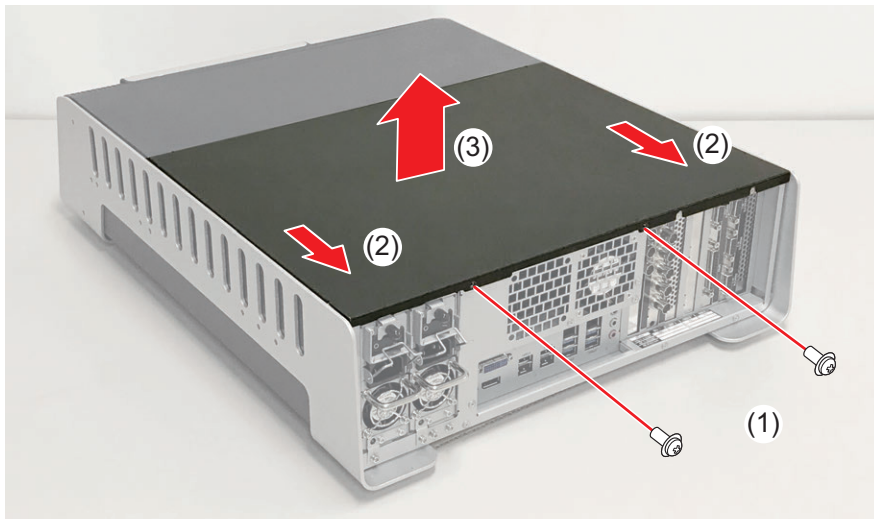
You must always turn off your T2 and disconnect the power cord from the product body prior to install the video I/O card.

 **CAUTION:** Be sure to shut down T2 with a proper procedure prior to turning off the system. For instructions on how to shut down the system from the maintenance mode, refer to Service Manual. For instructions on how to shut down the system from the CommandCenter mode, refer to User Manual.

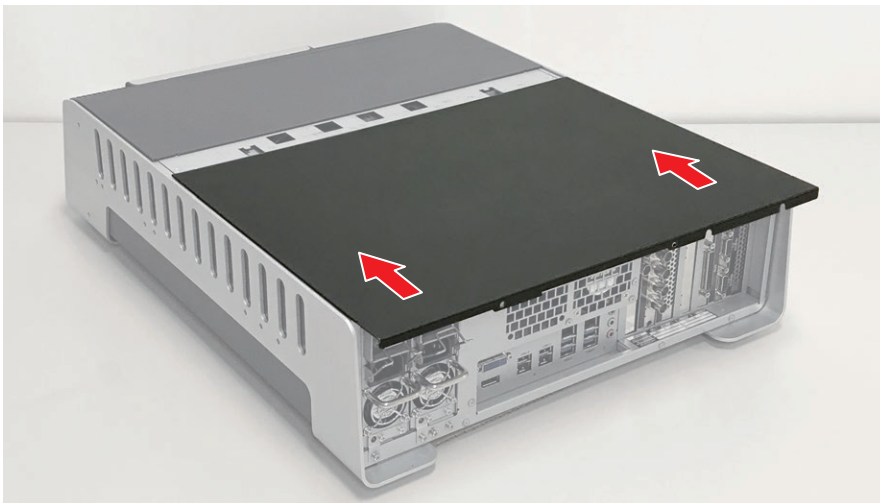
1. Turn off the main power switch.
2. Push the power cable clamp (a) to unlock the power cord.
3. Unplug the power cord from the AC inlet.
4. Perform steps 1 to 3 on the other power supply. (T2 4K Elite only)

## Disassembling the T2 4K

1. Remove the top cover (rear).
  - (1) Remove 2 screws (with springs and large washers) on the rear side.
  - (2) Hold the top cover (rear) with both hands to slide it out.
  - (3) Remove the top cover (rear).

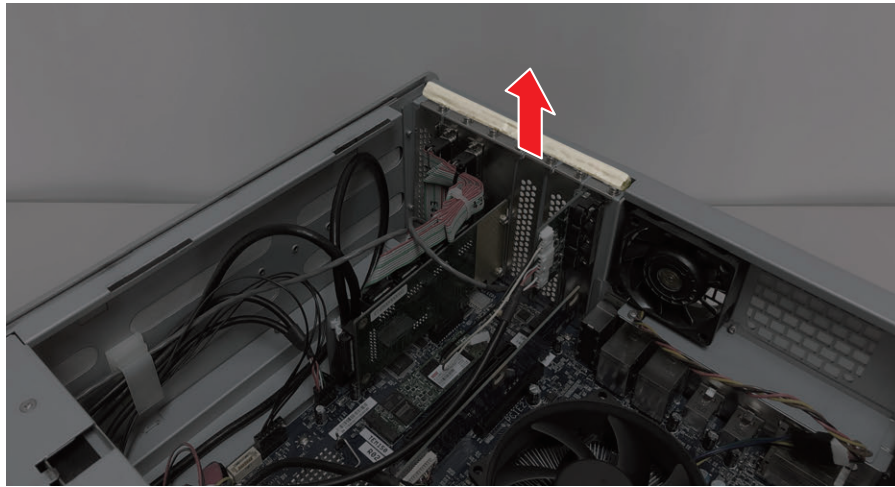


**NOTE:** To install the top cover (rear), place it at the position in the following figure, and then slide it with both hands.



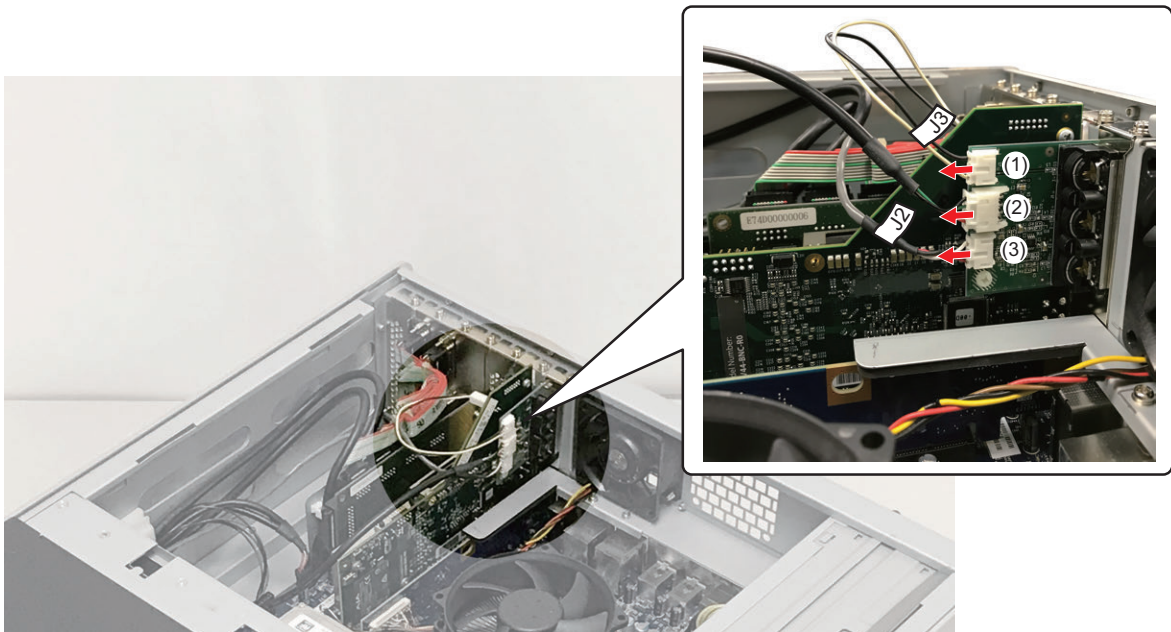


2. Remove the shield gasket.



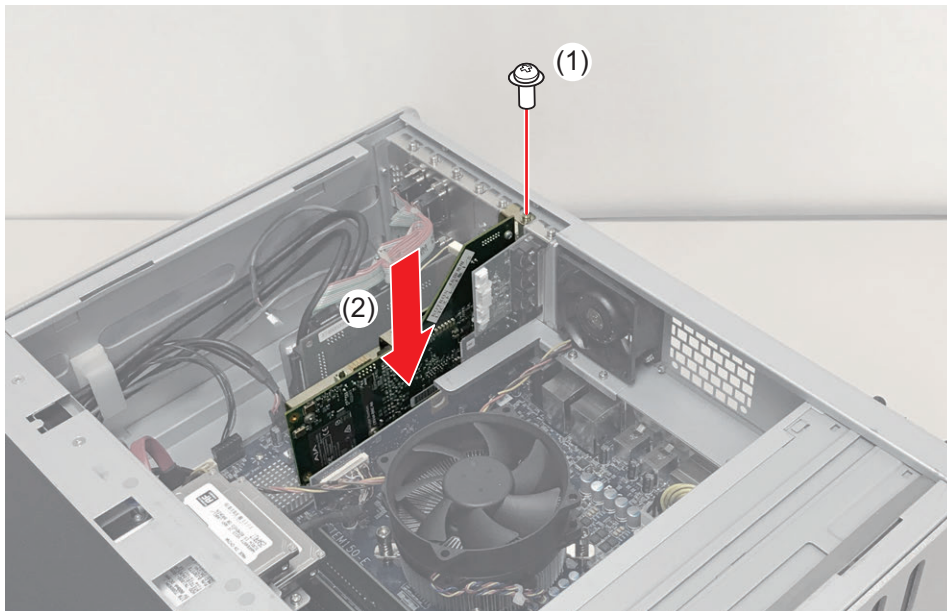
3. Disconnect following cables from the LTC/Monitor audio interface board.

- (1) The LTC In cable
- (2) The power cable of the LTC/Monitor audio interface board
- (3) The LTC Out/Monitor audio Out cable

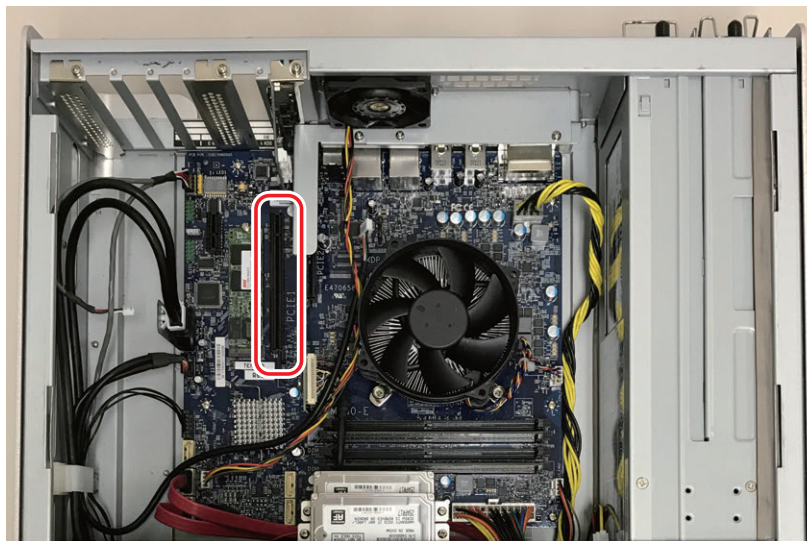


## Installing the video I/O card

1. Remove the PCI-e slot cover.
2. Install the video I/O card.

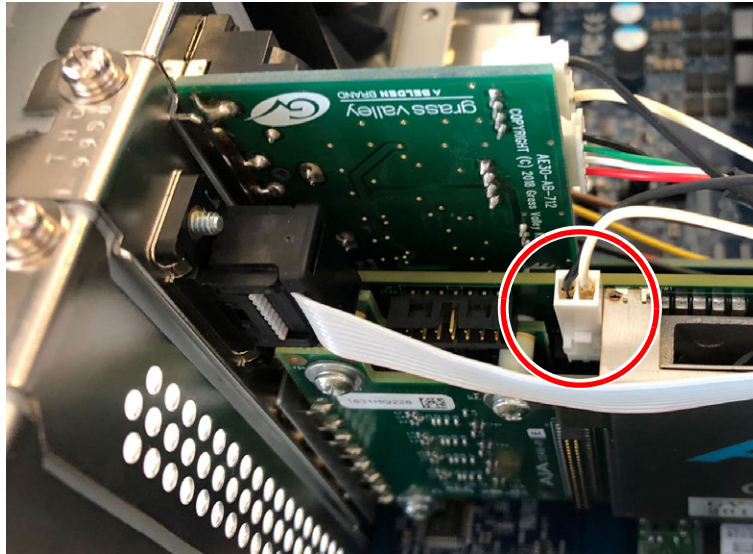


**NOTE:** To install the video I/O card, insert it into the PCI Express x16 slot.



**CAUTION:** When installing the video I/O card, take care not to damage the motherboard.

3. Reconnect three cables to the LTC/Monitor audio interface board.
4. Connect the LTC In cable to the connector of video I/O card.



5. Install a new shield gasket as before.

# Commissioning

## Confirm hardware detection

Confirm if the installed video I/O card is correctly detected by both Windows Device Manager and T2 Command Center software.

### Confirm on Windows Device Manager

1. Start the T2 in maintenance mode.
2. Open Windows Device Manager.
3. Open Sound, video and game controllers pane then confirm if "AJA Corvid88 SDI I/O" appears without "!" or "X" mark.
4. Close Windows Device Manager.

### Confirm in T2 Command Center software

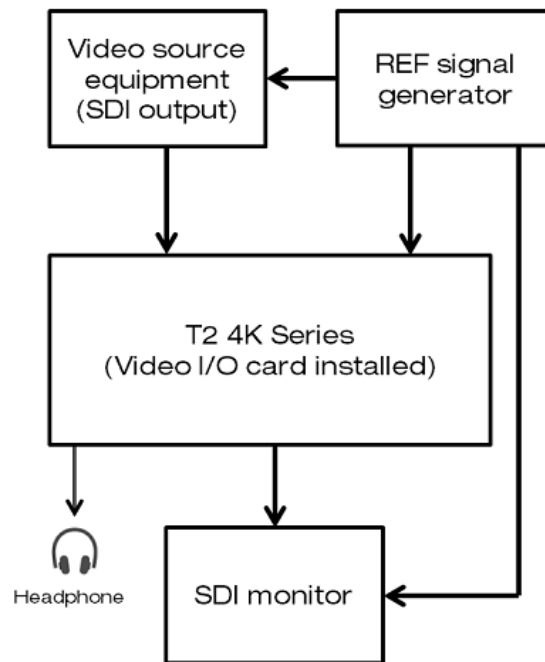
1. Start the T2 in Command Center mode.
2. Tap **Bin** > **Menu** > **Tools** > **About T2**.
3. Version info will appear. Choose **System info**.
4. At "I/O card", confirm if "AJA Corvid 88" appears.



5. Tap **OK** button.

## Connect equipment for commissioning

Connect required equipment for commissioning the T2 4K Series.



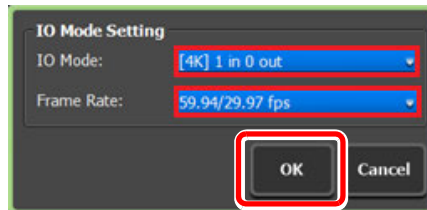
**NOTE:** Required specification of source, monitor will be vary depending record or playback format in the workflow.

**NOTE:** If the system works on internal sync, connecting REF signal generator is not required.

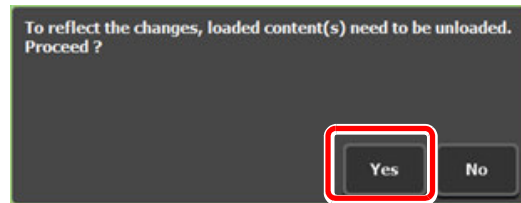
**NOTE:** If multiple playout works, connect multiple monitor or repeat to disconnect and connect single monitor for the test.

## Configure I/O mode

1. Tap **Config** > **General** > **Hardware**.
2. Tap **Settings** button.
3. I/O mode settings will appear. Choose I/O mode and format from the drop-down list then tap **OK** button.

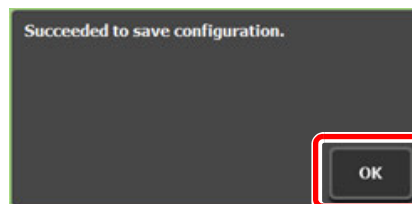


4. Tap **Yes** button.



## Configure sync mode

1. Tap **Config** > **General** > **Hardware**.
2. At "Reference", choose sync mode due to the workflow.
3. If you switch to another mode, below message will appear. Tap **OK** button.



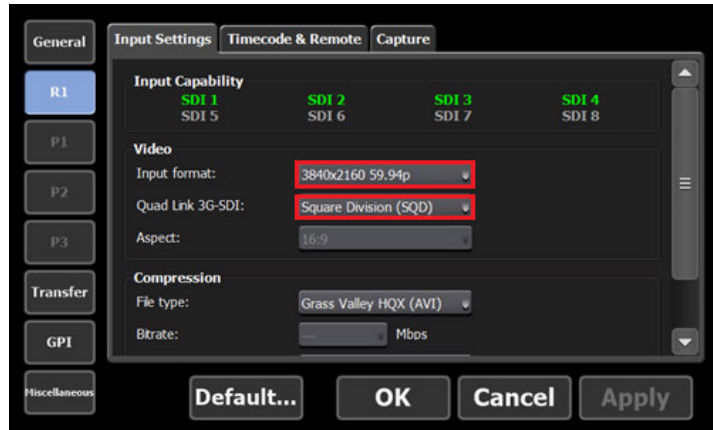
4. If you choose **External**, confirm if "SIGNAL OK" status appears.



5. Close the configuration screen.

## Configure recording format

1. Tap **Config** > **R1** > **Input Settings**.
2. Choose input format and SDI cabling mode from the drop-down list.



3. Tap **OK** button.

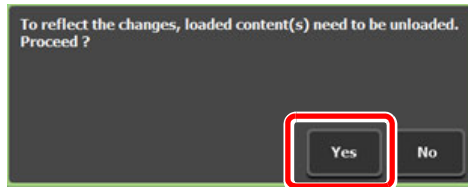
## Test video recording

1. Switch to 1ch view mode.
2. Press **R1** button.
3. Input source video and audio to the T2. Confirm if video correctly appears on the preview window and audio can be heard via headphone.
4. Press **Rec** button to start video recording. Record a video for several minutes.
5. Press **Stop** button.

## Test clip playback

### 4K video

1. Tap **Config** > **General** > **Hardware**.
2. Tap **Settings** button.
3. I/O mode settings will appear. Choose [4K] 0 in 1 out mode and format\* from the drop-down list then tap **OK** button.
  - \* Same format as step 3 in "[Configure I/O mode](#)" on page 14 needs to be selected.
4. Tap **Yes** button.



5. Tap **Config** > **P1** > **Video**.
6. Configure below settings:
  - Format: Choose same format as recorded clip.
  - Quad-link 3G-SDI, 3G SDI Level: Choose proper mode depends on cabling.

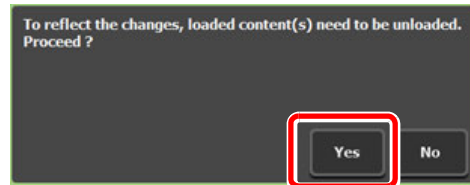


7. Load recorded clip to P1 channel.
8. Playback the clip. Confirm if correct video appears on both front panel preview screen and connected monitor. Also confirm if T2 plays correct audio via headphone.



## HD/SD video

1. Tap **Config** > **General** > **Hardware**.
2. Tap **Settings** button.
3. I/O mode settings will appear. Choose I/O mode depends on the workflow and format\* from the drop-down list then tap **OK** button.
  - \* Same format as step 3 in "[Configure I/O mode](#)" on page 14 needs to be selected.
4. Tap **Yes** button.



5. Tap **Config** > **P1** > **Video**.
6. Configure below settings:

Format: Choose same format as recorded clip.

Quad-link 3G-SDI, 3G SDI Level: Choose proper mode depends on cabling.



7. Load recorded clip to P1 channel.
8. Playback the clip. Confirm if correct video appears on both front panel preview screen and connected monitor. Also confirm if T2 plays correct audio via headphone.

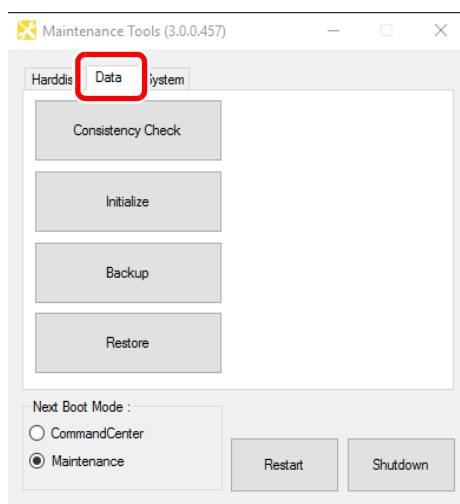
**NOTE:** If you use multiple output channel, repeat step 5 to 8 for each playout channel.

# Initializing the data

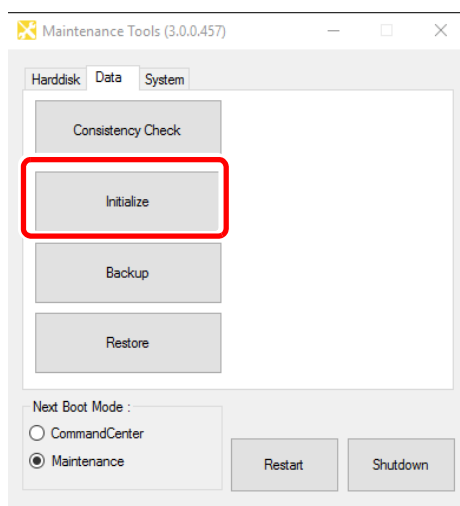
You can initialize the database, the media drive (V: drive), and configuration.

**⚠ CAUTION: Current data will be lost. Backup the data beforehand.**

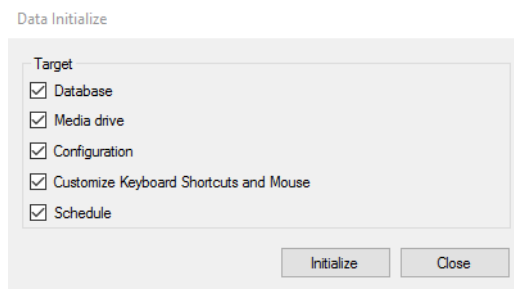
1. In the Maintenance Tools main screen, select the **Data** tab.



2. Click **Initialize**.



3. Check the items you want to initialize.



- **Database** - Delete the database contents.

- **Media drive** - Format the media drive and initialize the folder structure.
  - **Configuration** - Initialize the configuration.
  - **Customize Keyboard Shortcuts and Mouse** - Initialize the settings of the keyboard shortcuts and mouse customization.
  - **Schedule** - Initialize the settings of Schedule Recording.  
Schedule Recording function automatically starts capturing operation at a specified time, and ends it at a specified time in the R1-live mode. For more information, refer to the User Manual.
4. Click **Initialize**.
  5. Click **Yes**.
    - Initialization will be performed for the selected item.
  6. When you see the completion message, click **OK**.
  7. Click **Close**.