

Preparing Two T2 iDDRs for Synchronized 4K Playback

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APPLICATION NOTE



This application note explains how to set up multiple T2 units for synchronized 4K playback.

Introduction

The Grass Valley, a Belden Brand, T2 iDDR has two independent, Full HD output channels that can be used for multiscreen events, digital signage and projection mapping when playback is synchronized. This application note explains how to set up multiple T2 units for synchronized playback.

UHD and UltraHD are marketing terms that are often used to describe QFHD, a video resolution with four times the number of pixels of full HD. We are familiar with Full HD being described as 1080p, and in the same way QFHD, because it has a resolution of 3840x2160, can also be referred to 2160p or 4K (an approximation of the number of horizontal pixels).

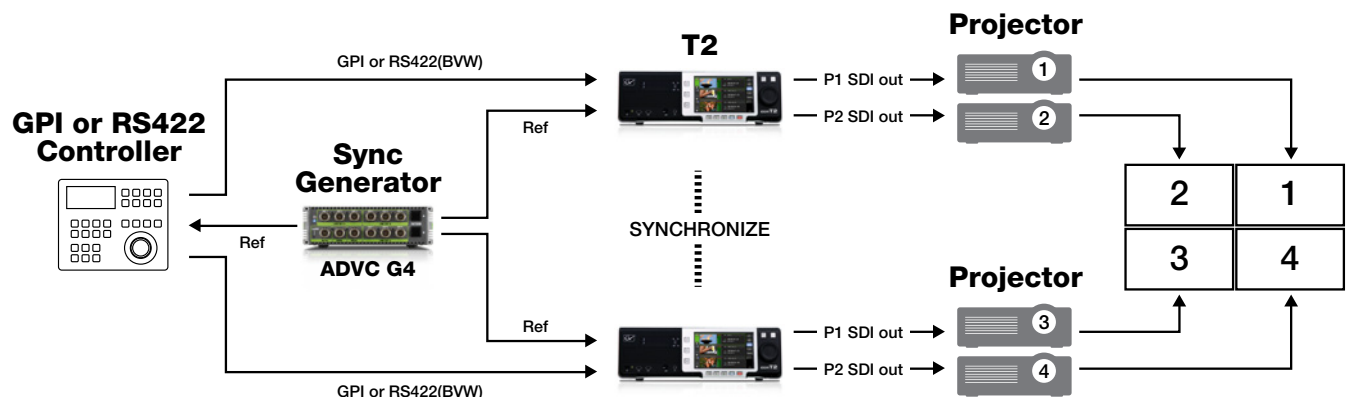
Tools Used

- Multiple T2 units
- GPI or RS-422 controller
- Sync Generator

Note: To prepare 4K clips for playback on T2 using the Grass Valley EDIUS nonlinear editing system, see the application note: Using EDIUS to Prepare 4K (QFHD) Material for Playback on Two T2 iDDRs.

System Overview

Schematic of 4K/QFHD (3840x2160) playback from two synchronized T2 units:



- Recommended system requirements are as follows:

T2

- Multiple T2 units — preferably same model and same software version
- T2 Elite/Pro/Express (Service Pack 2.0 or later)
- T2 Classic (Service Pack 4.4 or later)
- Playback on T2 is 1920x1080 59.94i/50i via SDI
- Supported synchronized operations are “PLAY” and “STOP”

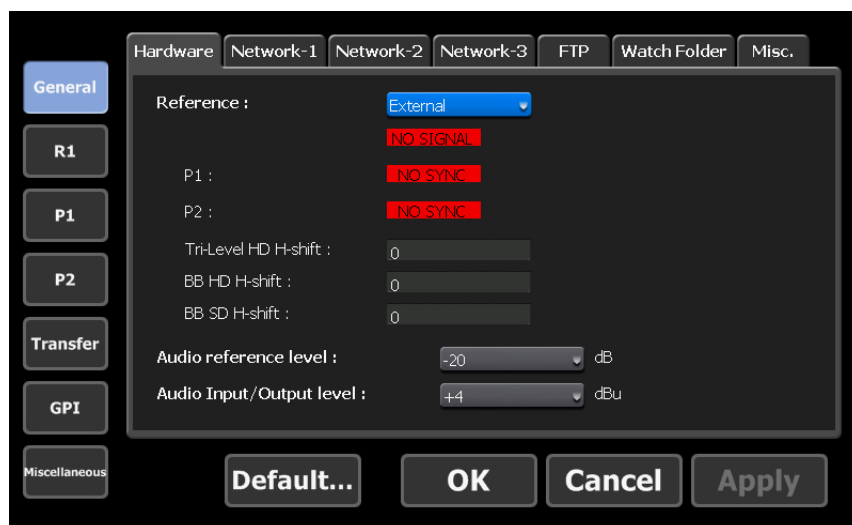
GPI or RS-422 controller

- GPI
 - Sends trigger signal with V Sync
 - Exclude 3 ms before and after V Sync frame
 - Requires multiple GPI output channels
 - TWO channels are required to synchronize two T2 units: T2 (1) GPI + T2 (2) GPI

- RS-422 (BVW protocol)
 - Synchronized with reference signal
 - Requires multiple RS-422 output channels
 - FOUR channels are required to synchronize two T2 units: T2 (1) P1 + T2(1) P2 + T2 (2) P1 + T2(2) P2
- Note: Using GPI and RS-422 controllers simultaneously is NOT supported

Sync Generator

- Tri-level sync support required
- Requires multiple output channels
 - To synchronize two T2 units, THREE reference out channels are required: T2 (1) + T2 (2) + Controller
- Recommended : Grass Valley ADVC-G4

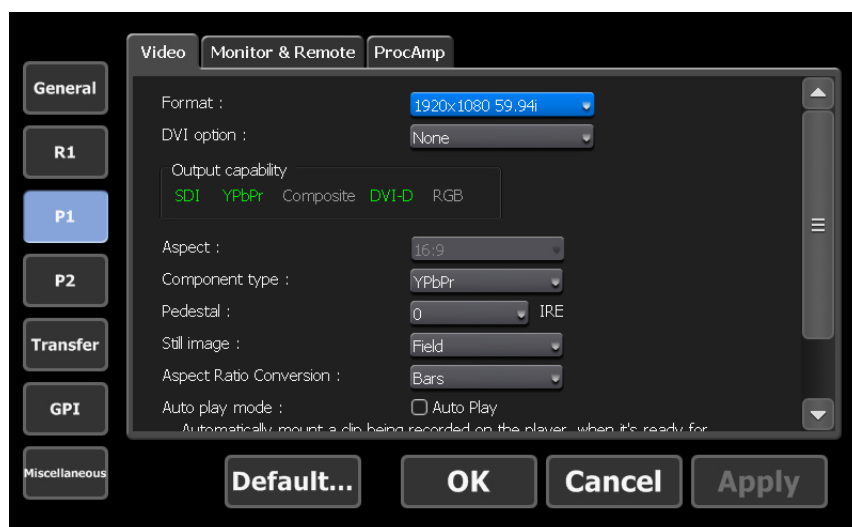


T2 Settings

- The following process uses Front Panel mode
- These settings should be applied to ALL synchronized T2 units

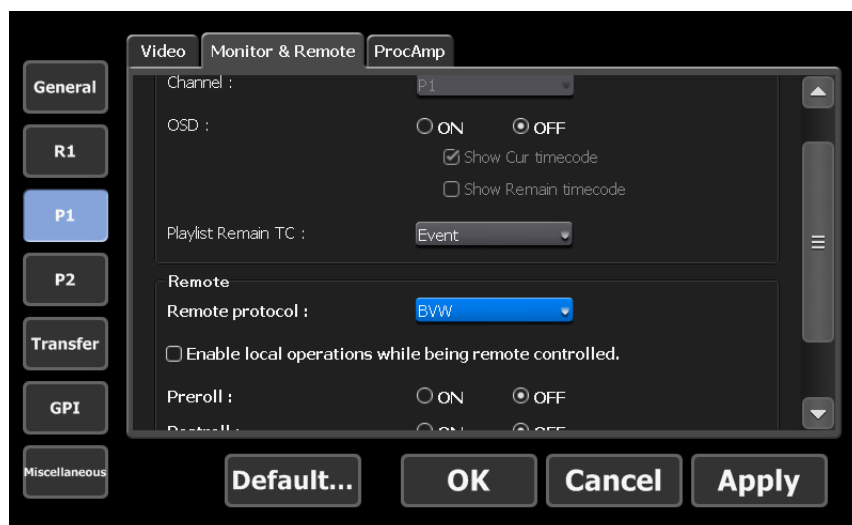
1. Set Reference (common to GPI and RS-422 synchronization)

Tap [Config] > [General] > [Hardware] tabs and select [External] from the Reference drop-down list. After selecting, tap [Apply].



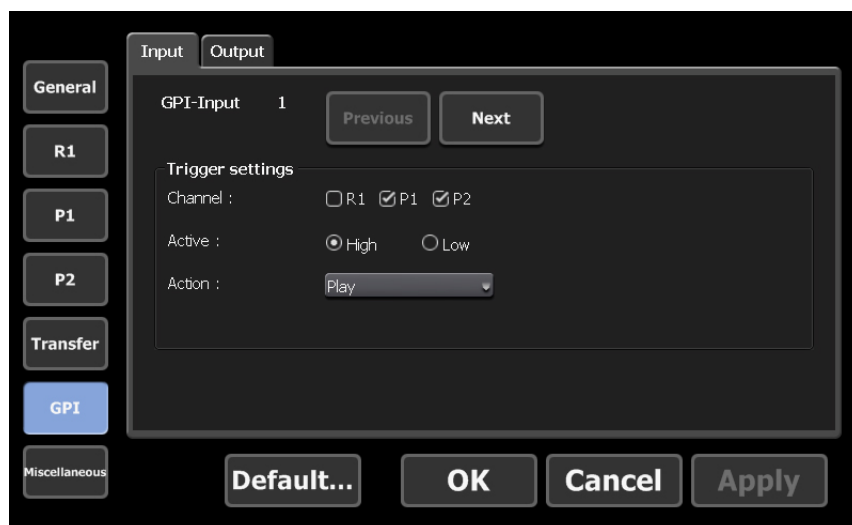
2. Set Output Channel Format (P1/P2) (common to GPI and RS-422 synchronization)

Tap [Config] > [P1 or P2] > [Video] tabs and select [1920x1080 59.94i or 50i] from the Format drop-down list. After selecting, tap [Apply].



3. Set Remote Protocol (P1/P2) (RS-422 only)

Tap [Config] > [P1 or P2] > [Monitor & Remote] tabs and select [BVW] from the Remote Protocol drop-down list. After selecting, tap [Apply].

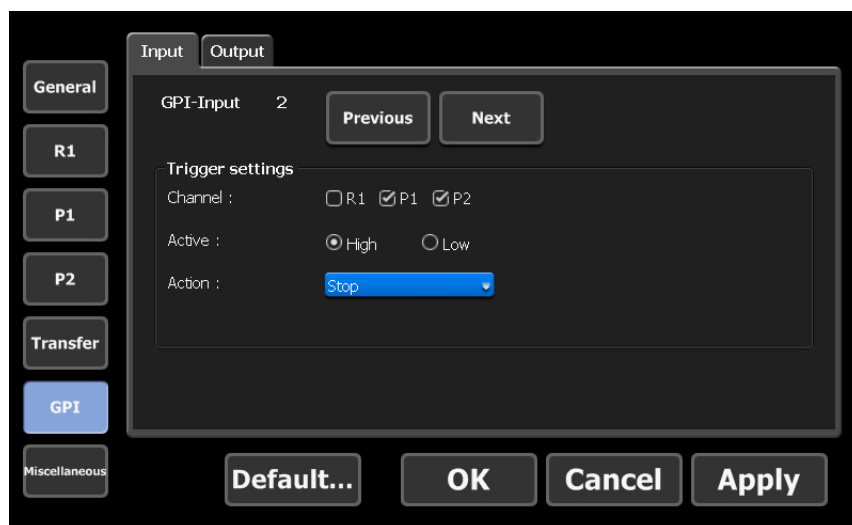


4. Set GPI Input (GPI only)

Tap [Config] > [GPI] > [Input] tabs.

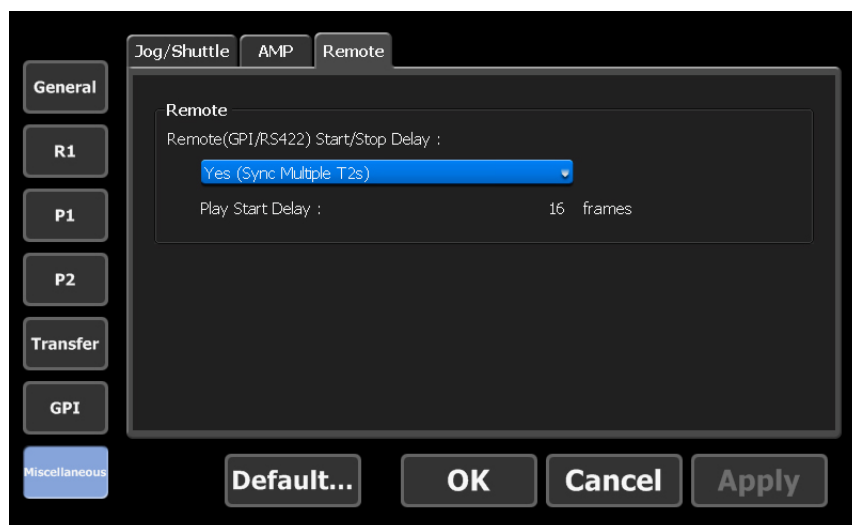
- PLAY both P1 and P2 with GPI Input 1

Set [GPI-Input 1], check [P1] and [P2] in the Channel section. Select [Play] from the Action drop-down list. After setting, tap [Apply].



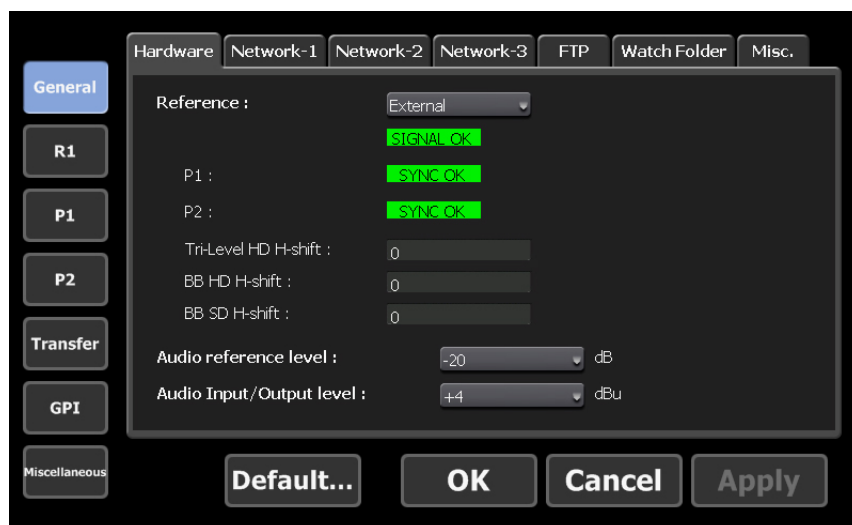
- STOP both P1 and P2 with GPI Input 2

Tap [Next] and move to [GPI Input 2]. Check [P1] and [P2] in the Channel section. Select [Stop] from the Action drop-down list. After setting, tap [OK].



5. Set Remote Start/Stop Delay (common to GPI and RS-422 synchronization)

Tap [Config] > [Miscellaneous] > [Remote] tabs and select [Yes (Sync Multiple T2s)] from the Remote (GPI/RS422) Start/Stop Delay drop-down list. After selecting, tap [Apply].



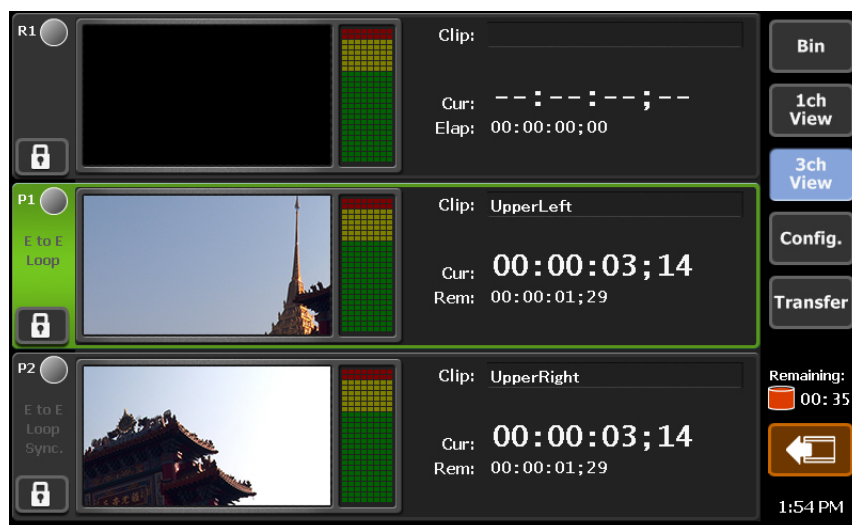
Connect the Sync Generator or Controller

The sync generator should be set to generate an HD reference signal (Tri-level). Please refer to the user manual of the sync generator or controller.

Check the Sync Settings of each T2

Tap [Config] > [General] > [Hardware] tabs and confirm the following:

- Reference : [SIGNAL OK] is green
- P1 : [SIGNAL OK] is green
- P2 : [SIGNAL OK] is green

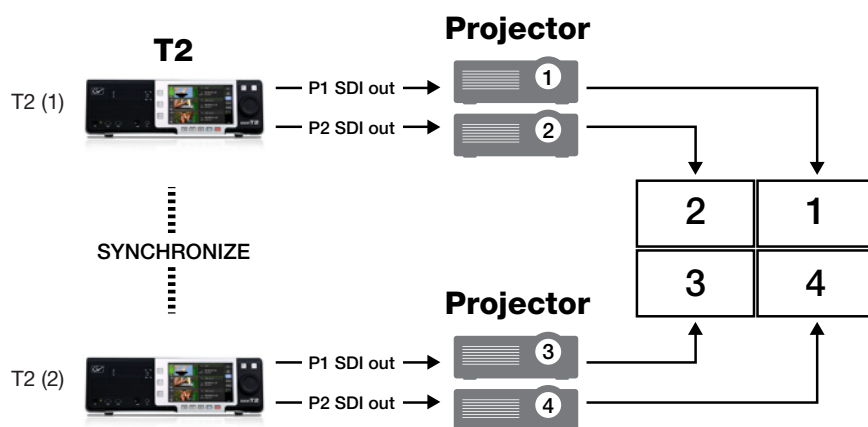


Operation

Now that the T2s are correctly synchronized, you can import media into each T2 unit.

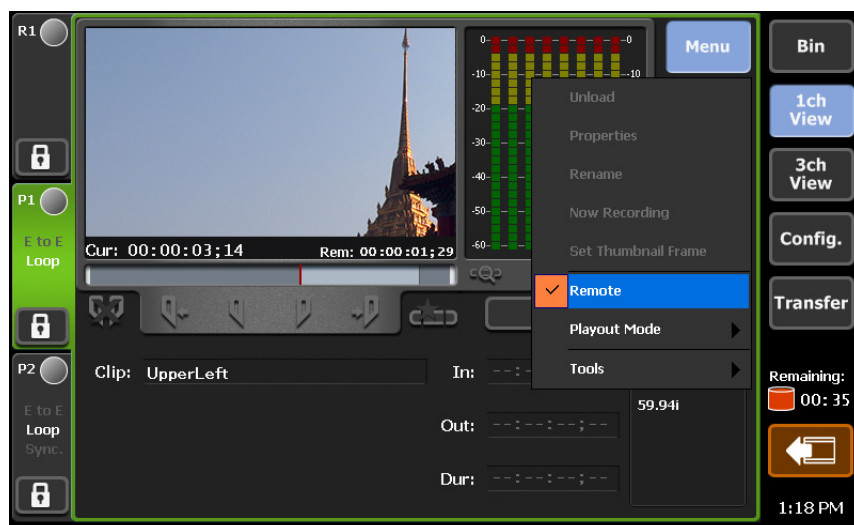
1. Import and mount clips on P1 and P2 in each T2 unit (common to GPI and RS-422 synchronization)

- Do not use [Sync mode] on P2
- Recommended media format is Grass Valley HQ, approx. 150 Mb/s



To configure two T2 units to play 4K/QFHD (3840x2160) video, the four sectional clips are allocated to each channel as follows:

- Upper Right clip > T2 (1) P1
- Upper Left clip > T2 (1) P2
- Lower Left clip > T2 (2) P1
- Lower Right clip > T2 (2) P2

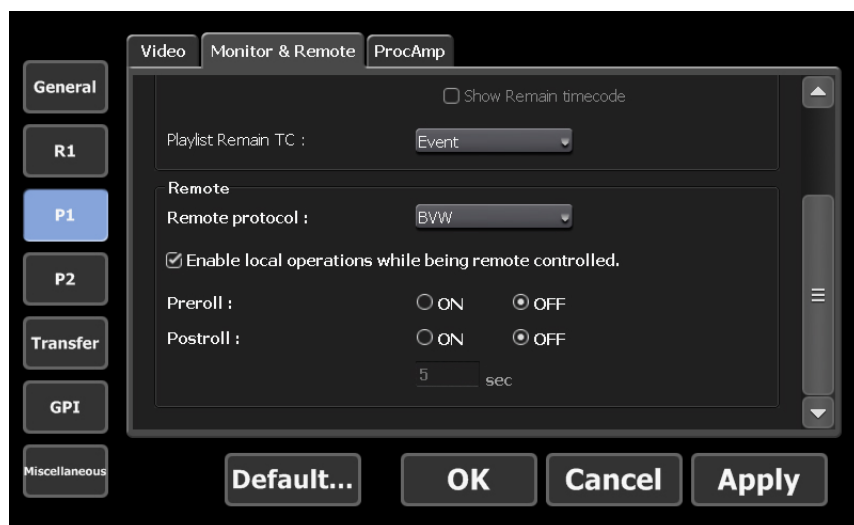


2. Cue up the Clips (common to GPI and RS-422 synchronization)

Cue up the clips to the chosen timecode on all output channels.

3. Set Remote Mode on P1 and P2 (RS-422 only)

Tap [1ch view] > [Menu] tabs and select [Remote] on both P1 and P2 channels.



Note: Once you have switched to Remote mode, operations such as Play or Stop from the touch-screen cannot be used. You can override this by tapping [Config] > [P1] or [P2] and checking [Enable local operations while being remote controlled] in the [Monitor & Remote] tab. Please note that this may result in synchronized playback becoming unstable.

4. Playback by Controller (common to GPI and RS-422 synchronization)

All preparations are complete. You can play back synchronized clips using the controller.