WaveRunner 6 Zi / HRO 6 Zi, 8-Channel Sync

Introduction

The WR6Zi-8CH-SYNCH option for your Teledyne LeCroy WaveRunner 6 Zi or HRO 6 Zi oscilloscope enables the capture and transfer of waveforms from one oscilloscope to the other for simultaneous display, measure, and analysis of up to eight waveforms. You can display all acquired channels on the Master for easy viewing and analysis.

The Master serves as the source from which all simple or complex triggers are selected. Slave channels are not available as sources for triggering. The Master is utilized for all measurements, analysis, and documentation for any and all eight channels.

The Slave oscilloscope acquires data, which is then sent to the Master. All Slave channel vertical settings are made on the Slave, not on the Master.

When the WR6Zi-8CH-SYNCH option setup is complete, the Master instrument's Vertical pull-down menu provides functionality for:

- Connecting to the Slave using a manually provided IP Address
- Displaying up to 8 waveform channels
- Disconnecting from the Slave

The WR6Zi-8CH-SYNCH software option automatically accounts for the propagation delay (waveform transfer times) between the Slave and the Master.

Installation and Set Up

Master and Slave Selection

You can select any model of the WaveRunner 6 Zi and HRO 6 Zi family of oscilloscopes as the Master. This is also true of the Slave units. It's recommended, however, that you use oscilloscopes with the same bandwidth and the same 8-bit or 12-bit vertical resolution. This will maintain signal integrity, and appropriate measurements and analysis results, between all 8 oscilloscope channels.

Installation and Set Up

To set up the WR6Zi-8CH-SYNCH on your WaveRunner 6 Zi or HRO 6 Zi Oscilloscopes:

1. Designate one instrument as the Master and the second as the Slave. On the Master, enable the software key code, named 8CH-SYNCH. You do not need to enable this option on the Slave.
2. Ensure Master and Slave are running the same firmware version.

NOTE: All 6 Zi oscilloscopes used with WR6Zi-8CH-SYNCH should be running firmware version 6.9.x.x or later.

3. Physically connect the Slave to the Master using both the LBUS and LAN cables provided.

LBUS

The LBUS cable locks the Slave Reference Clock to the one on the Master. Additionally, it transfers Slave waveform data to the Master. Insert one end of the LBUS cable into the LBUS connector at the lower-right of the front panel on the Master and the other into the same port on the Slave.

NOTE: You can plug-in the LBUS cable when the instruments are already on.

LAN

The LAN connections are used for communication between the Master and the Slave. Connect a LAN cable (either standard 802.11 or the provided crossover cable) from the Master to the Slave using the Ethernet ports on the side I/O panels. Alternatively, you may choose to establish communication by connecting both the Master and Slave directly to a router or network adaptor.

Operation

Connecting Slave to Master

Follow these steps to open the communication link between the Master and Slave instruments.

1. From the menu bar of the Master oscilloscope, choose **Vertical → Remote Slave DSO** to display the Remote Slave DSO dialog.
2. Confirm that the **L-Bus cable Connected box** is checked, signaling that the cable is correctly connected to both instruments.
3. From the menu bar of the Slave oscilloscope, choose **Utilities Setup → Remote**. Note the Slave IP Address shown.
4. In the **Slave IP Address** field on the Master Remote Slave DSO dialog, enter either the Slave IP Address or oscilloscope name (host name).
   - The Master will display a brief message in the lower left-hand part of the display confirming successful connection to the Slave.
   - The **Connect Slave DSO** control will be disabled, and **Disconnect Slave DSO** will be enabled.
5. Confirm **Slave Connected box** is checked.

Disconnecting Slave from Master

Follow this disconnection procedure to close the communication and waveform transfer between Master and Slave instruments.

1. On the Master oscilloscope, choose **Vertical → Remote Slave DSO**.
2. Click the **Master Only** button. This will return the Slave timebase reference clock source to Internal.
3. Click the **Disconnect Slave DSO** button. This closes the Ethernet communication link.
4. Optionally, disconnect the Ethernet cable and LBUS cable connecting the two instruments.

NOTE: You can reestablish communication between Master and Slave by clicking **Connect Slave DSO**. Waveform transfer and display from Slave to Master is reestablished by clicking **Master + Slave**.

Eight Channel Operation

After establishing a synchronized connection between the Master and Slave instruments, on the Master's Remote Slave DSO dialog, select **Master + Slave** control. The Slave channels will now become available for display. These are identified as C5 through C8, which correspond to each of the Slave channels.

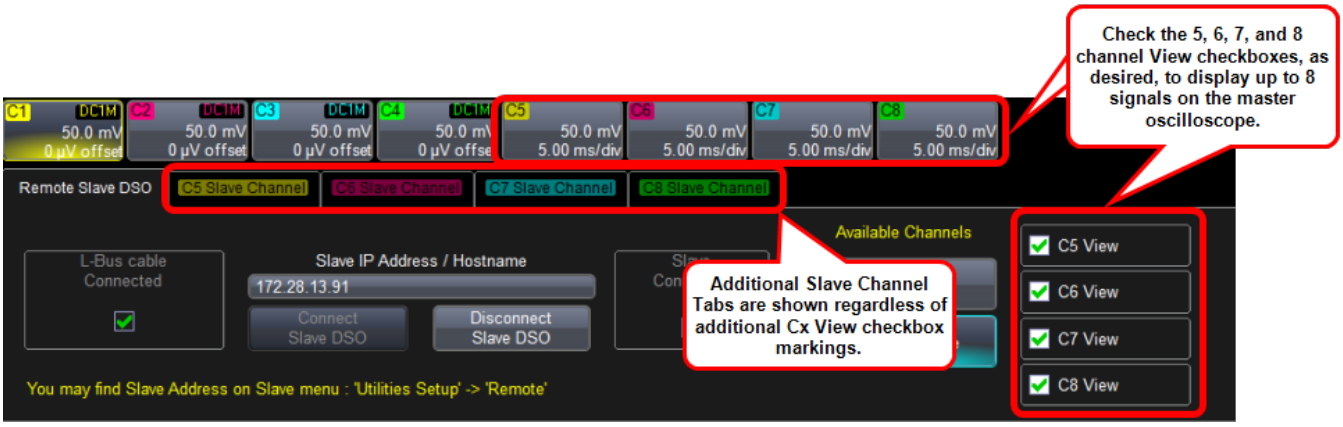
Check the View boxes for the desired channels to display up to 8 signals on the Master oscilloscope.

Under proper operation:

- Waveform data and trace descriptor labels for channels 5 through 8 move from the Slave to the Master instrument.
- Slave timebase settings, now controlled by the Master, are updated on the Slave's Timebase dialog. Master and Slave timebases will be identical.
- Slave trigger descriptor now states L-Bus as the trigger source.
- Slave timebase clock source dialog reports Reference Clock as External.
- Colors for Slave waveforms and trace descriptor labels, are displayed on the Master as a lighter color. (e.g., Slave channel 1, listed as C5 on the Master, is a lighter yellow of Master channel 1).

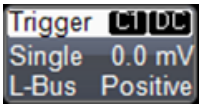
MASTER

Tabs for Slave Channels 5- 8 appear across the top of the Remote DSO dialog. These tabs appear regardless of which View boxes are checked. Annotation boxes for those channels selected for display are appear above the tabs.



SLAVE

On the Slave, the Trigger descriptor label, L-BUS is identified as the trigger source.



Deskewing Master and Slave Channels

Deskewing is a procedure primarily used to synchronize the timing of the waveforms displayed on screen in order to account for propagation delays through probes and cables, and transfer times from the Slave to the Master oscilloscope.

When you select **Master + Slave** control, the WR6Zi-8CH-SYNCH software automatically accounts for the propagation delay of the supplied LBUS cable. When making other types of connections between the instruments, each of the Slave and Master channels can be fine adjusted for skew.

Both the WaveRuner 6 Zi and the HRO 6 Zi scopes have a fast edge output using the front panel Aux Output port. This fast edge represents the common signal from which to adjust the deskew values.

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