User Manual

TDS3SDI
601 Digital Video
Application Module

071-0787-00

WARRANTY SUMMARY

www.tektronix.com

Contacting Tektronix

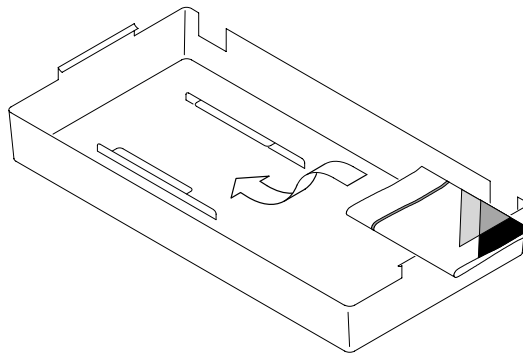|	
Product Support	For questions about using Tektronix measurement products, call toll free in North America: 1-800-833-9200 6:00 a.m. – 5:00 p.m. Pacific time
	Or contact us by e-mail: support@tektronix.com
	For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Tektronix offers a range of services, including Extended Warranty Repair and Calibration services. Contact your local Tektronix distributor or sales office for details.
	For a listing of worldwide service centers, visit our web site.
Toll-free Number	In North America: 1-800-833-9200 An operator can direct your call.
Postal Address	Tektronix, Inc. Department or name (if known) P.O. Box 500 Beaverton, OR 97077 USA
Web Site	www.tektronix.com

Contents

Manual Storage

The oscilloscope front cover has a convenient place to store this manual.

Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

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.

To Avoid Fire or Personal Injury

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Safety terms in this manual

⚠ **CAUTION**. *These statements identify conditions or practices that could result in damage to the equipment or other property.*

Preventing Electrostatic Damage

⚠ **CAUTION**. *Electrostatic discharge (ESD) can damage components in the oscilloscope and its accessories. To prevent ESD, observe these precautions when directed to do so.*

Use a Ground Strap. Wear a grounded antistatic wrist strap to discharge the static voltage from your body while installing or removing sensitive components.

Use a Safe Work Area. Do not use any devices capable of generating or holding a static charge in the work area where you install or remove sensitive components. Avoid handling sensitive components in areas that have a floor or benchtop surface capable of generating a static charge.

Handle Components Carefully. Do not slide sensitive components over any surface. Do not touch exposed connector pins. Handle sensitive components as little as possible.

Transport and Store Carefully. Transport and store sensitive components in a static-protected bag or container.

Installation

This section describes how to install and check the TDS3SDI 601 Digital Video application firmware and module.

Installing the Application Module Firmware

> **NOTE**. *You must install the application module firmware the first time you install a new application module. If you do not install the firmware, the new application module may not function at all, or may not function correctly. It is strongly recommended that you install new firmware when the oscilloscope indicates that an update is necessary.*

To install the application module firmware, do these steps:

1. Save any oscilloscope settings and/or reference waveforms to floppy disk before doing these steps.

2. Power off the oscilloscope.

3. If the application module came with one or more floppy disks, insert floppy disk 1 into the floppy disk drive.

4. Power on the oscilloscope. The oscilloscope checks whether or not the firmware update is necessary. If an update is necessary, go to page 5. If an update is not necessary, go to page 7.

Firmware Update Required.

If a firmware update is necessary, the oscilloscope displays the following message:

> This procedure will replace the firmware in the instrument with firmware from the floppy disk. This procedure will take approximately 5 minutes.

> Caution: Do not turn the instrument off or eject the floppy disk until prompted.

> Push 'OK Load New Firmware' to proceed.
> Push MENU OFF to abort this procedure.

1. Push **OK Load New Firmware** to begin loading the firmware. The oscilloscope shows a clock icon on the screen while the firmware upgrade is in process. If a second firmware floppy disk is required, the oscilloscope will instruct you to eject the first disk and insert the second disk.

   If you do not want to upgrade the firmware, push **MENU OFF**.

   When the firmware upgrade is complete, the oscilloscope will restart automatically with the new firmware.

NOTE. *If you power off the oscilloscope, eject the floppy disk before prompted, or if there is a power outage during the firmware upgrade process, you must restart the firmware upgrade procedure starting at step 2 on page 4.*

2. The oscilloscope may also display the following message:

   WARNING! This instrument is not calibrated. You must run Signal Path Compensation (SPC) in order to calibrate the instrument.

   SPC is adversely affected by input signals with AC components. Disconnect or otherwise remove these signals prior to running SPC. SPC will take approximately 10 minutes to run.

   Push 'OK Compensate Signal Paths' to begin the calibration procedure. Or, you may run SPC in the UTILITY Cal menu.

3. If the instrument has been operating for 20 minutes or longer in the ambient temperature at which it will be used, Push **OK Compensate Signal Paths** to run SPC. You can also skip this step for now and run SPC at a later time.

4. Proceed to step 1 of *Firmware Update Not Necessary* on page 7 to finish the firmware installation.

Firmware Update Not Required.

If a firmware update is not necessary, the oscilloscope displays the following message:

   A floppy disk containing instrument firmware has been detected. However, the firmware on the disk is not newer than the instrument firmware. Therefore, no firmware upgrade is required.

   Push MENU OFF to remove this message.

1. Push the **MENU OFF** button.

2. Eject the floppy disk.

3. You are done installing the firmware. Go to *Installing the Application Module* on page 8.

Installing the Application Module

The following figures show how to install the TDS3SDI application module.

⚠️ **CAUTION.** *Turn off power before installing or removing a module. To avoid damaging the oscilloscope or application module, observe the ESD precautions described on page 3.*

ITU-R 601
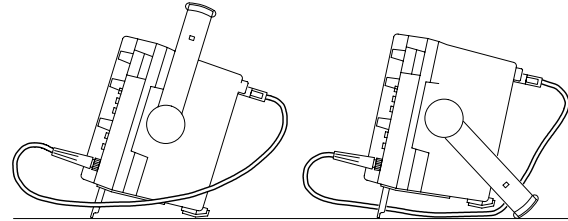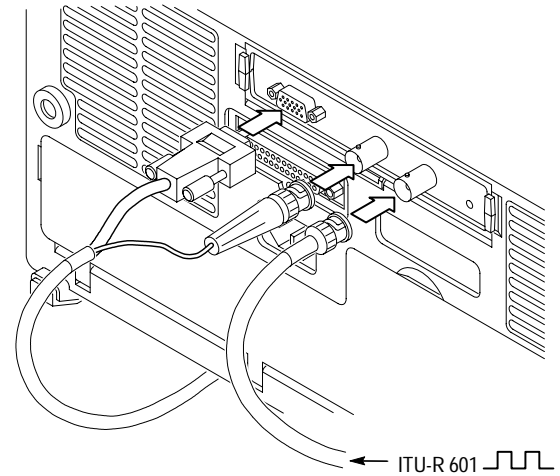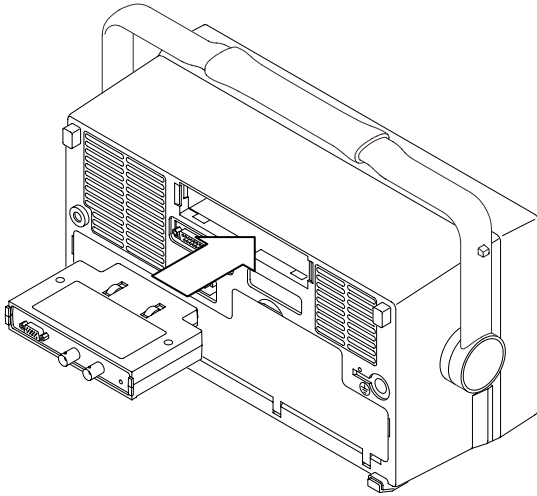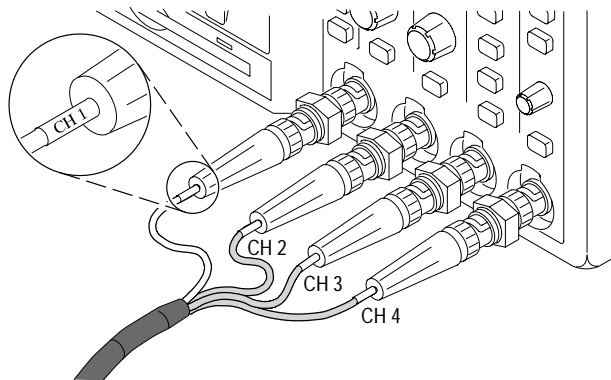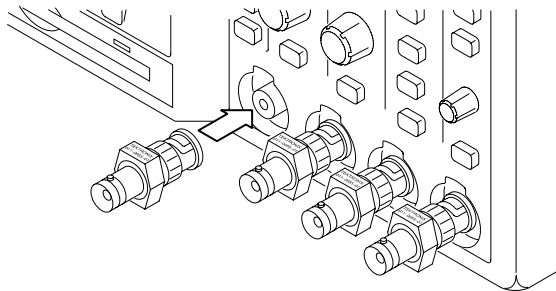
Checking Module Installation

Do these steps to check that the TDS3SDI 601 Digital Video application firmware and module are correctly installed.

1. Power on the oscilloscope. Look at the oscilloscope startup screen; it should list the 601 module. If the oscilloscope displays a message stating that there is incompatible firmware, power off the oscilloscope and do the steps in the *Installing the Application Module Firmware*, starting at step 2 on page 4.

2. Push the **QUICKMENU** panel button.

3. Push the **Menu** bottom button to select **Video**.

4. Push the **SUBMENU** bottom button to check that it displays **SDTV/HDTV** and **ITU-R 601**.

If the oscilloscope does not show these menu items, do the steps in *Troubleshooting Module Installation* on page 12.

> **NOTE**. *You do not need to reinstall the firmware if you remove and reinstall an application module. However, the features provided by that application module are not available until you reinstall the module.*

Troubleshooting Module Installation

If the oscilloscope does not recognize the application module at power-on, do these steps:

1. Power off the oscilloscope.

2. Follow the ESD precautions listed on page 3 as you remove the application module.

3. Examine the oscilloscope and application module contacts for damage.

4. Reinstall the application module into the oscilloscope.

5. Reinstall the firmware (page 4).

6. Power on the oscilloscope. If the oscilloscope still does not display the application menu items as listed in *Checking Module Installation* on page 11, power off the oscilloscope and contact the nearest Tektronix service center.

The 601 Digital Video Module

The following figure and table describe the 601 Digital Video module connectors and indicators.
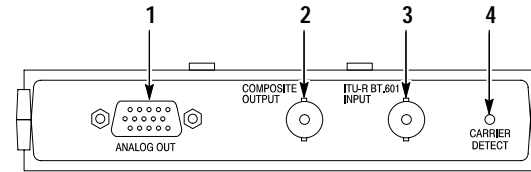
Item	Description
1	15-pin connector for analog component signal output. Connect the output to oscilloscope channels 2 through 4 using the supplied cable assembly.
2	BNC connector for composite video output signal. Connects to channel 1 of the oscilloscope. You can also connect this signal to a video monitor.
3	BNC connector for ITU-R 601 video signal input.
4	Green LED that lights when the module recognizes a valid 601 video signal.

601 Digital Video Conventions

The following conventions apply to the 601 Digital Video module:

- This firmware update adds alternating trigger source capability to the oscilloscope. Refer to page 36 for an explanation of the alternating trigger source function.

- You can use other menus while using the video QuickMenu. For example, you can push the MEASURE button to set up and take waveform measurements, and then push the QUICKMENU button to return to the video QuickMenu.

- You can trigger on and view SDTV and HDTV analog signals. The 601 Digital Video module does not convert HDTV digital formats (SMPTE 292M) to analog.

- You cannot use video triggering to arm B triggering.

- The oscilloscope does not have video signal clamping. Tektronix offers an optional Video Display Clamp module (013-0278-00) that provides video signal clamping.

- The TDS3SDI module is optimized for the TDS3054 DPO oscilloscope. The module provides reduced performance in other TDS3000 Series oscilloscopes.

Accessing 601 Digital Video Functions

The 601 Digital Video application module changes several menus. The following sections describe how to access the changed menus.

Video QuickMenu

The video QuickMenu contains bottom and side menu items that are useful for quickly displaying and measuring analog SDTV/HDTV and 601-encoded video signals. Vectorscope and Video Picture are accessible from the video QuickMenu.

To display the video QuickMenu, do these steps:

1. Push the **QUICKMENU** panel button.

2. Push the **Menu** bottom button to select **Video**.

3. Push the **SUBMENU** button to select a video signal standard (**SDTV/HDTV** or **ITU-R 601**) and display bottom and side menus for that video type.

Video Trigger Settings in the Trigger Menu

To access the new video trigger functions, do these steps:

1. Push the Trigger **MENU** panel button.

2. Push the **Type** bottom button to select **Video**. The new video trigger functions are part of the Standard trigger menus.

> NOTE. *601 digital video functions are not available in the Trigger menu.*

ITU-R 601 Settings in the UTILITY > Apps Menu

To access the 601 Digital Video functions, do these steps:

1. Push the **UTILITY** panel button.

2. Push the **System** bottom button to select **Apps**.

3. Push the **Module** button to select **ITU-R 601**. The bottom and side menus change to show the 601 functions.

> NOTE. *The Autoset menu shows which component signal is connected to which oscilloscope input. This information is not shown in the video QuickMenu.*

Video Autoset Settings in the Acquire Menu

Video Autoset automatically sets up the oscilloscope to trigger and display a composite video waveform. Video Autoset is available in the ACQUIRE or QuickMenu menus.

To access the video autoset function from the Acquire menu, do these steps:

1. Push the Acquire **MENU** front panel button to display the Acquire menu.

2. Push the **Autoset** bottom button to display the Autoset side menu.

3. Push the **Video Autoset** side button to automatically display a composite video waveform triggered on all lines.

> NOTE. *The AUTOSET front-panel button always runs the standard oscilloscope edge-trigger autoset function.*

Vectorscope and Video Picture in the DISPLAY Menu

To access Vectorscope or Video Picture functions from the Display menu, do the following:

1. Push the **DISPLAY** panel button.

2. Push the **Vectorscope** bottom button to display the Vectorscope side menu.

3. Push the **Video Picture** bottom button to display the Video Picture side menu.

> **NOTE**. *The DISPLAY Video Picture menu lets you change the picture contrast and brightness settings. These settings are not available in the video QuickMenu.*

Video Graticules (IRE/mV) in the DISPLAY Menu

To change the screen graticule to IRE or mV format, do the following:

1. Push the **DISPLAY** panel button.

2. Push the **Graticule** bottom button to display the graticule side menu. Push the **-More-** button to display the IRE and mV buttons if they are not already displayed.

3. Select **IRE** or **mV** on the side menu.

Menu Changes

The 601 Digital Video application module changes several menus. The following sections list the menu changes and describe the menu functions.

Video QuickMenu

The video QuickMenu displays bottom and side menus that contain commonly-used functions useful for displaying and measuring standard broadcast, ITU-R 601, and HDTV video signals.

There are two video types in the SUBMENU button: ITU-R 601 and SDTV/HDTV. The following descriptions apply to both video types unless marked otherwise.

Video QuickMenu: bottom menu

Menu item	Value	Description
SUBMENU	SDTV/HDTV ITU-R 601	Displays the bottom and side menu items for the selected video standard.
AUTOSET	Lines Fields	Automatically displays a composite video waveform in a video graticule, triggered on all lines or all fields.

Video QuickMenu: bottom menu (cont.)

Menu item	Value	Description
AUTOSET (cont.)	YPbPr RGB YC (601 only)	Displays the 601 signal component waveforms in the selected format.
ACQUIRE (SDTV/ HDTV only)	Fast Trig	Sets the acquisition mode to Fast Trigger (500 points).
	Normal	Sets the acquisition mode to Normal (10K points).
DISPLAY: Waveform	Full	Turns off the Vectorscope or Video Picture and displays waveforms using the full oscilloscope graticule.
	IRE mV	Turns off the Vectorscope or Video Picture and displays waveforms using an IRE or mV video graticule with the vertical scale set to 143 mV/div.
DISPLAY: Vector- scope	75% 100%	Turns on the Vectorscope and selects 75% or 100% color bars. Select the DISPLAY Waveform or Picture menu button to turn off Vectorscope.

Video QuickMenu: bottom menu (cont.)

Menu item	Value	Description
DISPLAY: Picture (SDTV and 601 only)	On Off	Turns on or off the Video Picture to display an image of the composite or luminance signal connected to channel 1.

Video QuickMenu: side menu

Menu item	Value	Description
Format (SDTV/ HDTV only)	SDTV HDTV	Sets the oscilloscope to trigger on standard (SDTV) or high-definition (HDTV) analog video signals.
Standard (SDTV only)	525/NTSC 625/PAL SECAM	Sets the SDTV video standard on which to trigger. Displayed when SDTV is selected in the Format side menu.
HDTV (HDTV only)	1080i 60 50 1080p 24 25 1080/24sF 720p/60 480p/60	Sets the HDTV analog video standard on which to trigger. Displayed when HDTV is selected in the Format side menu.
Holdoff	Time	Sets the trigger holdoff time value. Use the general purpose knob to change the holdoff time value.

Menu item	Value	Description
Holdoff (cont.)	Fields	Sets the trigger holdoff fields value. Use the general purpose knob to change the holdoff fields value, from 0 to 8.5 fields, in increments of 0.5.
Source (SDTV/HDTV only)	Ch 1 2 3 4 Ch 1 2	Sets which input to use for triggering the oscilloscope. To trigger on alternating video signal sources, use the front-panel Trigger menu.
Field/Line	Even	Triggers the oscilloscope on all even video fields.
	Odd	Triggers the oscilloscope on all odd video fields.
	All Fields All Lines	Triggers the oscilloscope on all fields or all lines.
	O/E Line *n*	Triggers the oscilloscope on a specific video field (**O**dd or **E**ven for 525/NTSC) and line number (*n*). Use the general purpose knob to change the line value.

Menu item	Value	Description
EDH (601 only)	On Off	Turns on or off EDH detection and error count status readouts. Turning EDH on resets the error count to zero.
Input (601 only)	525 625	Sets the oscilloscope to decode and trigger on 525 or 625-line video signals.
	Auto Detect	Sets the oscilloscope to automatically detect and trigger on either 525 or 625-line video signals.

Video QuickMenu Key Points

Video Submenus and Triggers. Selecting a submenu (ITU-R 601 or SDTV/HDTV) does not automatically enable the corresponding video trigger. Because some video signal types have more than one video standard, you must select a video standard in the side menu to trigger on that type of video signal.

The oscilloscope uses the currently-enabled video trigger setting until you select a new trigger. For example, if you are triggering on an HDTV signal and then select the ITU-R 601 submenu, the oscilloscope continues to use the HDTV trigger setting until you select a trigger in the ITU-R 601 side menu.

601 Signal Strength Meter. The 601 module equalizes weak input signals to compensate for connecting cable losses. A signal strength meter directly above the side menu shows the relative strength of the 601 digital signal.

No Signal

No signal   Weak signal   Strong signal
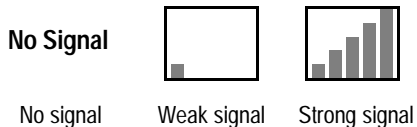
601 Autoset. When in the ITU-R 601 submenu, pushing **AUTOSET Lines/Fields** turns off the 601 module component signal output, turns off oscilloscope channels 2 through 4, and turns on oscilloscope channel 1 to display the composite video waveform. Pushing **AUTO-SET YPbPr/RGB/YC** turns on the 601 module component signal output, turns off oscilloscope channel 1, and turns on channels 2 through 4 (or 3 and 4 for YC) to display the component signal waveforms.

Waveform. Pushing the Waveform button turns off the Video Picture or the Vectorscope and returns the oscilloscope to the state prior to turning on Video Picture or the Vectorscope, except for any values changed while in the Video Picture display.

Vectorscope. Pushing the Vectorscope button the first time turns on the Vectorscope. Subsequent button pushes select 75% or 100% color bars.

As Vectorscope uses the oscilloscope XY mode, the math waveform, cursor, zoom, and autoset functions do not work in the Vectorscope.

Picture. Video Picture is not available when triggering on SECAM, Custom, or HDTV signals.

AUTOSET Lines/Fields and Trigger All Lines/All Fields. The AUTOSET Lines/Fields functions (video QuickMenu bottom menu) differ from the All Fields/All Lines side menu functions in that the AUTOSET Lines/Fields functions change a number of instrument settings in addition to the video trigger type. The All Fields/All Lines side menu only changes the video trigger type.

New Apps > ITU-R 601 Module Menu

The 601 Digital Video module adds ITU-R 601 to the UTILITY > System > Apps > Module menu. The following table describes the new menu functions. Most of these functions are available in the video QuickMenu.

Bottom	Side	Description
Input	Auto Detect	Sets the module to automatically detect and trigger on a 525 or 625-line video signal.
	525 625	Sets the module to decode and trigger on either 525 or 625-line video signal.
Autoset	Lines Fields	Automatically displays a composite video waveform in a video graticule, triggered on all lines or all fields.
	YPbPr RGB YC	Displays the 601 signal component waveforms in the selected format.
Error Detection	On Off	Turns on or off detection and counting of EDH signal errors.
	EDH Detected	Status readout that indicates if an error detection handling (EDH) signal is present in the 601-encoded data.
	Errors	Status readout that lists the total number of EDH errors.
	Set to 0	Resets the error count to zero.

Changes to the Video Trigger Menu

The 601 Digital Video application module adds the following functions to the video trigger menu:

Video Trigger menu

Standard menu	Bottom	New side menu items
525/NTSC 625/PAL SECAM HDTV (new) Custom (new)	Source	Alternate Source. Refer to page 36 for an explanation of the alternating trigger source function.
	Trigger On	Line Number and Odd/Even fields. Refer to page 28 for a description.
	Mode & Holdoff	Holdoff (Fields). Refer to page 29 for a description.
HDTV (new)	Format	Displays a list of analog HDTV signal formats on which to trigger.
Custom (new)	Trigger On	Progressive/Interlaced: Trigger on interlaced or progressive (non-interlaced) video wave-forms.
		Odd/Even: Trigger on odd or even fields. Only enabled when Interlaced is selected.

| Standard menu	Bottom	New side menu items
Custom (cont.)	Scan Rate	Displays custom horizontal scan rate ranges on which to trigger.

Video Trigger Menu Key Points

Trigger On Line Number. Sets the specific video field and line number on which to trigger. Use the general purpose knob to change values.

For 525/NTSC, the range of values is 1 through 263 for odd fields, and 1 through 262 for even fields. Increasing the line count when at odd field line 263 changes the setting to even field line 1. You can also push the Odd/Even button to switch between odd and even fields of the same line number.

For 625/PAL and SECAM, the range of values is 1 through 625. Increasing the line count when at line 625 changes the setting to line 1.

For Custom scan rates, the range of values is 1 through 3000.

Holdoff (Fields). This function lets you specify a number of fields to wait before re-arming video triggering. For example, when you specify to trigger on an odd field, the oscilloscope triggers on all odd-numbered fields.

Field 1	Field 2	Field 3	Field 4	Field 1 ...
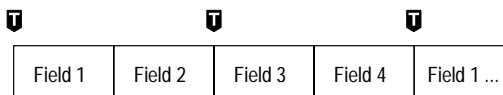
T = trigger points

You can use Holdoff Fields to trigger the oscilloscope on the same odd or even field. The holdoff process begins when the oscilloscope recognizes a video trigger event. The oscilloscope acquires the signal and disables the trigger system until the specified number of fields have passed. The oscilloscope then re-arms the trigger system and waits for the next valid video trigger. This enables the oscilloscope to always trigger on the same field.

Holdoff Fields = 2.5

Field 1	Field 2	Field 3	Field 4	Field 1 ...
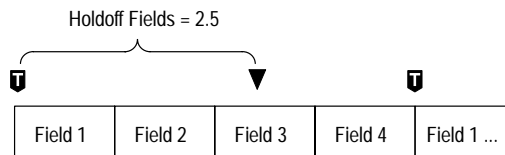
T = trigger points   ▼ = Video trigger armed

Although holding off field triggering enables you to trigger on the same field, it does not allow you to specify the exact field on which to trigger. Use the SINGLE/ SEQ button to retrigger the oscilloscope on a particular field

HDTV Format. The HDTV Format function lets you select the analog HDTV signal format on which to trigger. Available HDTV formats are:

Format	Description
1080i/60	1125 Lines (1080 active), 1920 x 1080 pixel, interlaced, 60 fps
1080i/50	1125 lines (1080 active), 1920 x 1080 pixel, interlaced, 50 fps
1080p/24	1125 lines (1080 active), 1920 x 1080 pixel, progressive, 24 fps
1080p/25	1125 lines (1080 active), 1920 x 1080 pixel, progressive, 25 fps
1080/24sF	1125 Lines (1080 active), 1920 x 1080 pixel, progressive (sF), 24 fps
720p/60	750 lines (720 active), 1280 x 720 pixel, progressive, 60 fps
480p/60	525 lines (480 active), 640 or 704 x 480 pixel, progressive, 60 fps

Custom. The Custom video menu lets you select horizontal scan rate ranges to view non-broadcast video waveforms from security, computer, and medical equipment. Scan Rate sets the oscilloscope to search for negative sync pulses within the selected range.

Rate 1	Rate 2	Rate 3	Rate 4	Rate 5
15-20 kHz	20-25 kHz	25-35 kHz	35-50 kHz	50-65 kHz

The oscilloscope can display video waveforms for signals with scan rates greater than 65 kHz. However, the waveform data (such as line count) may not be accurate because the oscilloscope is triggering on the next-detected sync pulse. The oscilloscope may miss some sync pulses when scan rates are greater than 65 kHz.

> **NOTE**. *The Trigger On Line Number function's range of values is 1 to 3000 while you are in custom video.*
>
> *Since the oscilloscope counts all sync pulses in custom video, including vertical half-line pulses, the line count value may not be the actual line count of the displayed signal.*

Changes to the Display Menu

The 601 Digital Video module adds the following functions to the DISPLAY menu:

Display menu

Bottom	Side	Description
Graticule	IRE mV	Displays an IRE or mV measurement graticule and sets the vertical scale to 143 mV/div.
Vector-scope (new)	Off	Turns off vectorscope display format.
	Ch *N* vs Ch *N* (Pb vs Pr)	Turns on the vectorscope display format. The menu item shows which component signal connects to which oscilloscope input channel *N*. The oscilloscope selects the Pb and Pr input channels.
	Color Bars	Sets vectorscope display for 75% or 100% color bars.
Video Picture (new)	Picture On Off	Turns on or off displaying a 4:3 ratio monochrome picture of the luminance or composite video signal connected to channel 1. Use this function to verify the signal source.

Display menu (cont.)

Bottom	Side	Description
Video Picture (cont.)	Auto Contrast On Off	Turns on or off automatic contrast adjustment for the Video Picture. The Contrast and Brightness menu items are not selectable when Auto Contrast is On.
	Contrast	Adjusts the video picture contrast from 0 (minimum) to 100 (maximum). The default value is 54.
	Brightness	Adjusts the video picture brightness from 0 (minimum) to 100 (maximum). The default value is 41.
	Line Number	Displays the current video trigger line number (and even/odd field value for NTSC). This value corresponds to the position of the horizontal line drawn on the picture. You can use the general purpose knob to change these values. You can also push the side menu button to toggle between even and odd fields of the same line for NTSC signals.

Display Menu Key Points

IRE and mV Graticules. Selecting either the IRE or mV graticule sets the vertical scale to 143 mV and displays labeled graticule marks that are useful for manually measuring video signals. Also, Hbar-cursor values are shown in IRE units when the IRE graticule is active.

Changing from the IRE or mV graticule to any other graticule style does not reset the volts/division scale from 143 mV. Use the Vertical SCALE knob to change the volts/division setting when changing to a non-video graticule.

Video Picture. Video Picture does not display a picture for SECAM, Custom, or analog HDTV signals. Also, many of the oscilloscope controls are disabled while in Video Picture.

To best display a picture, push the **AUTOSET Lines** or **Fields** bottom button to turn on channel 1 and trigger on a composite signal, then push the **DISPLAY Picture** button to display the picture.

Video Picture draws a bright horizontal line on the picture. This line-select cursor lets you visually select the Video Picture line on which to trigger. Select **Line** in the Field/Line trigger side menu and use the general purpose knob to move the line-select cursor to set the line trigger value.

The oscilloscope draws the picture using either even or odd fields of data, based on the current field/line trigger setting when Video Picture is turned on. Changes to the field/line trigger settings do not change the video picture until the next time Video Picture is turned on. The following table lists which fields are used to draw the picture for each field/line trigger setting.

Field/Line setting	Fields used to draw the video picture
Even, Even-numbered line	Even
Odd, All Fields, All Lines, Odd-numbered line	Odd

The default Video Picture contrast and brightness settings correspond to a black level of 7 IRE and a white level of 100 IRE.

Changes to the Acquire Menu

The 601 Digital Video application module adds the following new side menu item to the Acquire Autoset menu:

Side	Description
Video Autoset	Executes the video autoset function to automatically display a video waveform triggered on all lines.

Alternating Trigger Source

The 601 Digital Video firmware update includes a new oscilloscope function: alternating trigger source. Alternating trigger source sequentially uses each active channel as a trigger source, from the lowest-numbered active channel to the highest-numbered active channel. The alternating trigger source function is available in all trigger menus except for logic triggers, whether or not the 601 Digital Video module is installed.

Due to image persistence, all active channels may appear to be synchronized. However, this does not mean that the displayed signals are synchronized.

Alternating trigger source uses the current trigger settings to trigger on all active channels; there is not a separate trigger setup for each channel. Also, alternating trigger source does not use EXT or Line signals as trigger sources.

Because alternating trigger uses the same trigger settings for all source signals, the trigger settings must be able to trigger on all active signals in order to produce a stable triggered display. If one or more of the source signals do not meet the trigger settings, the oscilloscope either waits for that source channel to trigger (Normal trigger mode) or autotriggers (Autotrigger mode).

Specifications

This section describes the TDS3SDI 601 Digital Video application module specifications. All specifications are guaranteed unless labeled 'typical.' Typical specifications are provided for your convenience but are not guaranteed.

Table 1: Specifications

Characteristic	Description	
Input signal	270 Mb/s; complies with ITU-R BT.601-5 and SMPTE 259M	
Input impedance	75 Ohms ±3% DC, single-ended terminated	
Output impedance	75 Ohms, nominal (output levels set for double termination)	
Return loss	Minimum 15 dB measured at 135 MHz.	
Signal accuracy, typical (signals to oscilloscope input channels)	Ch 1: Composite	±6%
	Ch 2: Pb (Blue)	±3%
	Ch 3: Pr (Red or Chrominance)	±3%
	Ch 4: Y (Green)	±6%
	Sync on R, G and B	

Table 1: Specifications (cont.)

Characteristic	Description	
Vectorscope		
accuracy, typical	525 (NTSC) and 625 (PAL)	±3%
Target box size	3% from center to any edge	
Cable equalization range, typical	Up to 250 meters of Belden 8281 cable or equivalent	
Picture mode	Monochrome, compressed video image in 4:3 format	
Video error detection	EDH (Error Detection and Handling) per SMPTE RP165	
Environmental, Mechanical and EMI	Refer to the TDS3000 Series instrument specifications for environmental, mechanical, and EMI specifications	