Technical Reference

Tektronix

**WFM6100, WFM7000, and WFM7100
Waveform Monitors
System Integration**

071-1983-00

www.tektronix.com

Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

For product information, sales, service, and technical support:
- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

Table of Contents

General 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.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect and Disconnect Properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

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.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Powering Off. The power cord provides Mains disconnect.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

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.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:

WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.

CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an 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:

CAUTION
Refer to Manual

WARNING
High Voltage

Protective Ground
(Earth) Terminal

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

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

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Preface

This document is provided as an aid for system integrators who are designing systems for high-definition (HD) and standard-definition (SD) digital video content where the Tektronix WFM6100, WFM7000, & WFM7100 Waveform Monitors are to be deployed.

Related User Documents

The following related user documents are available:

- *WFM6100, WFM7000, and WFM7100 Waveform Monitors Release Notes* (Tektronix part number 071-1895-XX). This document describes any known problems or behaviors that you might encounter while using the waveform monitor.

- *WFM6100, WFM7000, and WFM7100 Waveform Monitors Quick Start User Manual* (Tektronix part numbers: English, 020-2705-XX; Japanese, 020-2706-XX; Simplified Chinese, 020-2707-XX). This document is a printed Quick Start User Manual and contains the basic operating information for the instrument. Included in the manual is a CD-ROM containing PDFs of the user documents.

- *WFM6100, WFM7000, and WFM7100 Waveform Monitors User Technical Reference* (Tektronix part number 071-1894-XX). This document contains the detailed operating information for the instrument.

- *WFM6100, WFM7000, and WFM7100 Waveform Monitors Specifications and Performance Verification Technical Reference* (Tektronix part number 071-1897-XX). This document contains the complete published specifications for the instrument and the performance verification procedure.

- *WFM6100, WFM7000, and WFM7100 Waveform Monitors Service Manual* (Tektronix part number 071-1896-XX). This document provides servicing information for the waveform monitor and is intended for qualified service personnel only.

- *WFM Series Waveform Monitors and WVR Series Waveform Rasterizers Management Information Base Technical Reference* (Tektronix part number 071-1592-XX). This document contains information about using the Management Information Base (MIB) to control the waveform monitor.

Related Reference Documents

The following related reference documents are available at the Tektronix Web site (www.tektronix.com):

- *Preventing Illegal Colors*. This application note describes how the Diamond, Arrowhead, and Lightning displays can be used to help prevent the undesired impact of color gamut violations and to simplify the assessment of proper gamut compliance.

- *Understanding Colors and Gamut*. This poster provides a large visual display of how the Diamond, Arrowhead, and Lightning displays can be used to help prevent the undesired impact of color gamut violations.

- *A Guide to Standard and High Definition Digital Video Measurements*. This book is a primer for understanding the basics for making standard and high-definition, digital-video measurements.

- *Analog and Digital Audio Monitoring*. This application note describes how to monitor analog and digital audio signals. Also discussed are specific differences in the methods used to monitor analog audio versus digital audio, and how to plan the transition from monitoring analog audio to monitoring digital audio.

- *Audio Monitoring*. This application note describes balanced and unbalanced audio signals, and explains the physical and electrical characteristics and the specific strength and weaknesses of the different digital audio signal formats.

- *Monitoring Surround Sound Audio*. This application note describes the basics of 5.1-channel surround sound audio and tells how to use the Surround Sound display to visualize key audio-level and phase relationships in this audio format.

System Integration

The WFM6100, WFM7000, and WFM7100 Waveform Monitors offer the monitoring capabilities needed in the production, post-production, distribution, and transmission of high-definition (HD) and standard-definition (SD) digital video content. With available digital audio monitoring support, you can expand the capabilities to monitor both digital video and audio in a single instrument.

The following table lists the available waveform monitor models. The illustrations on the following pages show the front panel of the waveform monitor, and also show the rear panel of the waveform monitor when Option EYE or PHY is not installed and when one of the two options is installed. The location of the SDI video connectors changes when Option EYE or PHY is installed.

Table 1: Waveform monitor models

Model	Usage	Features
WFM6100	For quality assessment and control in video production, distribution and broadcast systems using SD digital video	▪ Extended event logging and video/audio session screens ▪ Triggered data capture ▪ Automated quality checking with Tektronix certification of quality ▪ Optional digital and analog audio monitoring
WFM7000	For basic quality assessment in video production and post-production applications using HD digital video formats or in mixed SD/HD environments	▪ Two SDI video inputs compatible with SMPTE292M (with available support for SMPTE259M formats), loop-through external reference, switched video outputs, picture monitor output ▪ Fault monitoring, alarm generation, and basic event logging ▪ Waveform, vector, gamut, picture and timing displays, including Split Diamond, Arrowhead, and Lightning ▪ Standard graticules and time/voltage cursors ▪ Ancillary data detection, including decoding of closed caption (teletext) information ▪ Optional digital and analog audio monitoring
WFM7100	For quality assessment and control in video production, distribution, and broadcast systems using HD digital video formats or in mixed SD/HD environments	WFM7000 capabilities plus: ▪ Extended event logging and video/audio session screens ▪ Triggered data capture ▪ Automated quality checking with Tektronix certification of quality ▪ Tektronix quality dashboard with Red light/Green light status displays
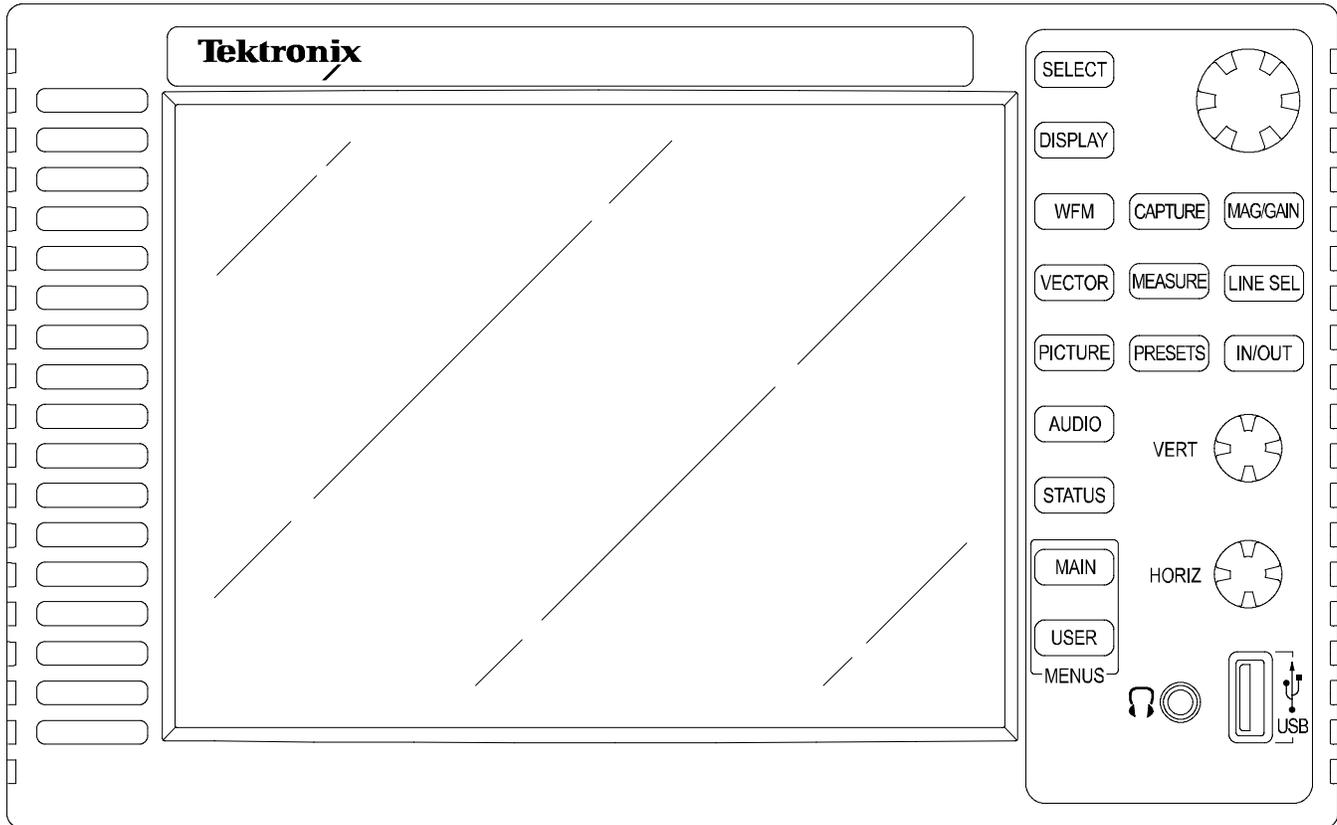
Figure 1: Front panel

NOTE. You can locate copies of some of the illustrations from this document in JPEG format on the Tektronix Web site (www.tektronix.com) and on the User Documents CD that accompanies the WFM6100, WFM7000, and WFM7100 Quick Start User Manual.

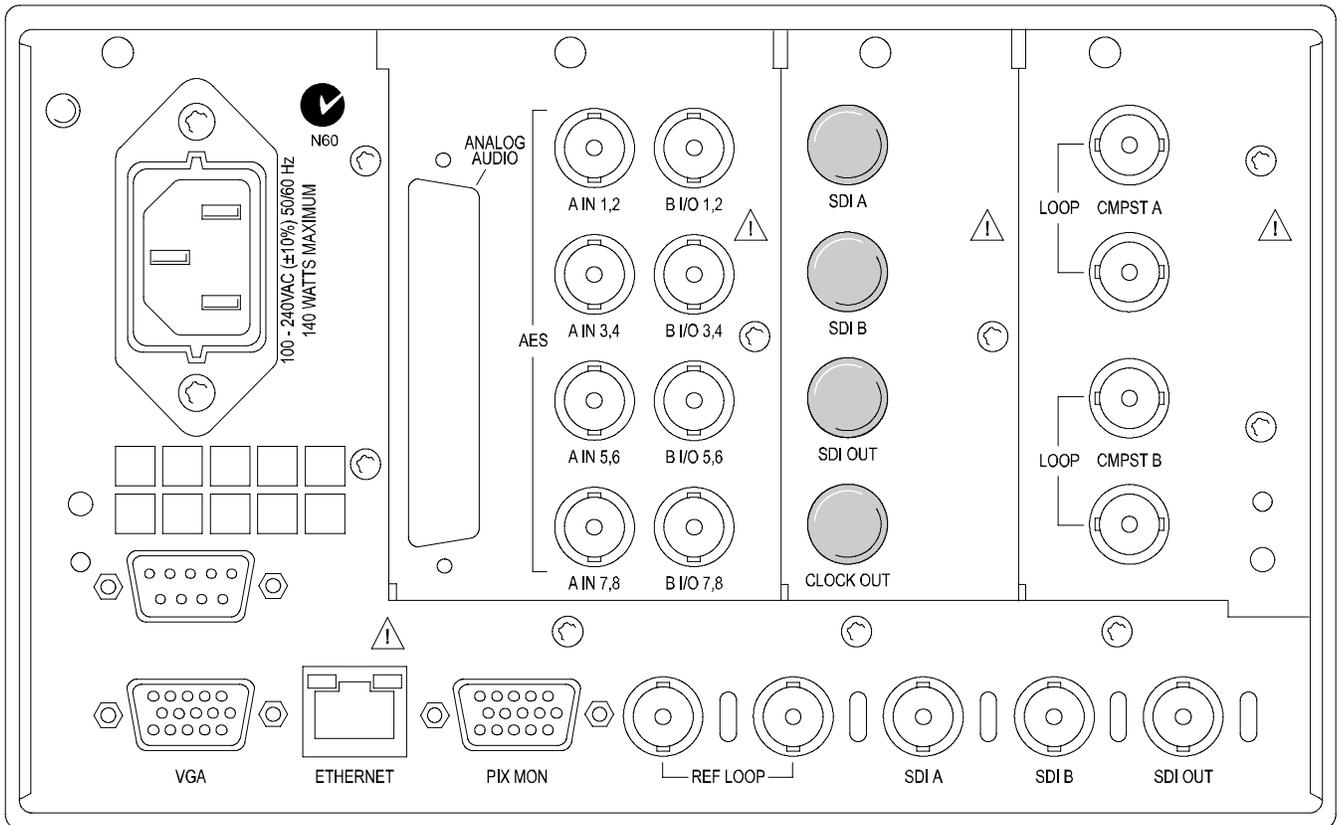*The following illustrations are available: Figure 1, Figure 2, Figure 3, Figure 10, Figure 11, and Figure 12.*

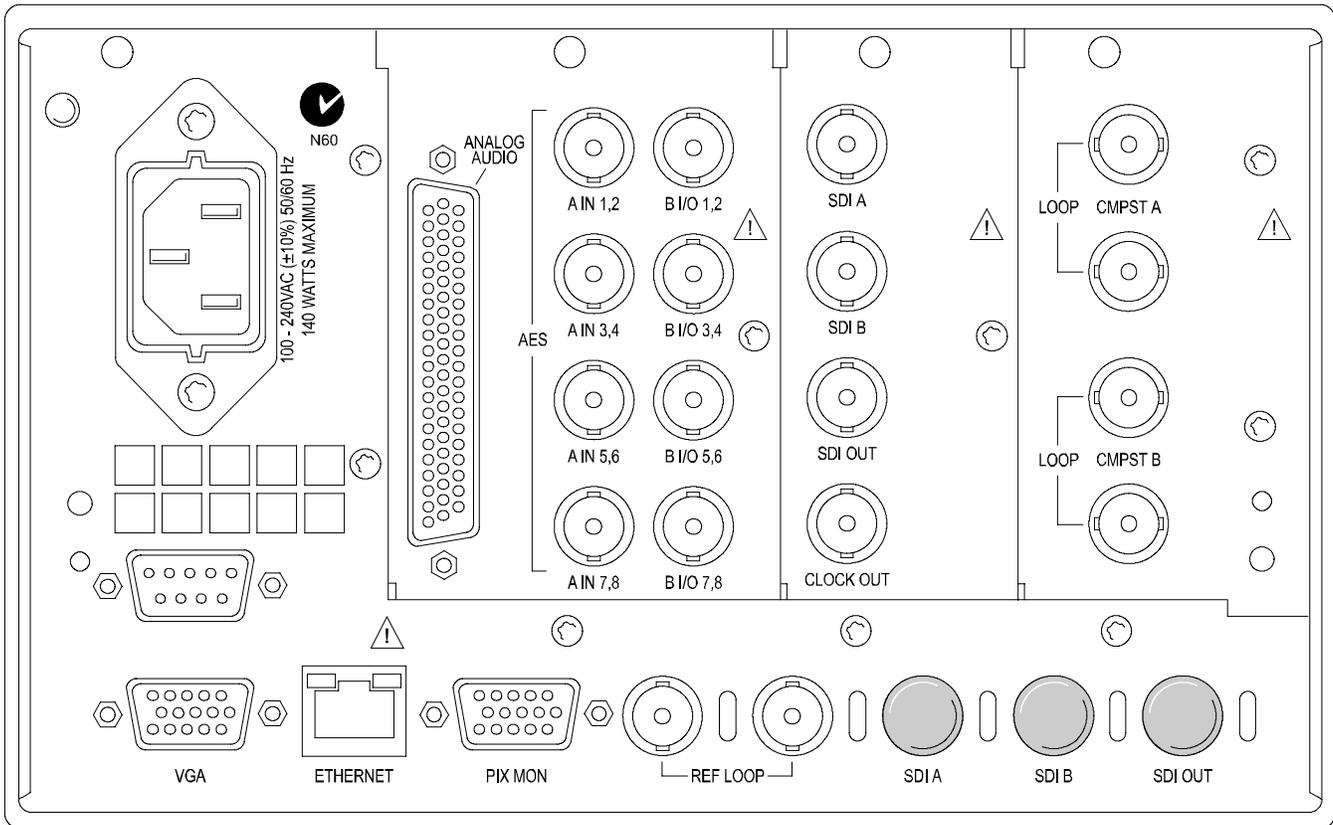**Figure 2: Rear panel with neither Option EYE nor PHY installed**

Figure 3: Rear panel with Option EYE or PHY installed

Installation Considerations

The waveform monitor is shipped in a wrap-around chassis that covers the instrument bottom and two sides. A cover is installed on the chassis, and the rear panel is made up of the module rear panels.

You can operate the waveform monitor in the instrument chassis (be sure the top cover is on) or installed in an approved portable cabinet or rack adapter. (See page 15, *Rackmount Installation*.) You can also install the waveform monitor in a custom installation, such as a console.

⚠ **CAUTION.** *To prevent damage to the waveform monitor and the cabinet, do not install the waveform monitor in any cabinet except those that are approved by Tektronix, such as the WFM7F02 and WFM7F05.*

If you install the waveform monitor in a custom application, such as a console, be sure to provide adequate airflow. Follow these guidelines:

■ Do not block the ventilating holes.

■ Adhere to the clearance requirements. (See Table 2 on page 6.)

Power and Environmental Specifications

The waveform monitor operates from a single-phase power source with the neutral conductor at or near earth ground. The line conductor is fused for over-current protection. A protective ground connection through the grounding conductor in the power cord is essential for safe operation.

NOTE. *Power systems with both current-carrying conductors live with respect to ground (such as phase-to-phase in multiphase systems) are not recommended as power sources.*

The waveform monitor does not need any power configuration, except for using the proper power cord for your installation site. Refer to the *WFM6100, WFM7000, and WFM7100 Waveform Monitors Quick Start User Manual* for a list of the available power cords.

To connect power to the waveform monitor, insert the supplied power cord into the rear-panel power connector. There is no power switch on the waveform monitor, so the instrument will turn on as soon as you apply power.

The following table lists the power and environmental specifications for installing the waveform monitor. Refer to the *WFM6100, WFM7000, and WFM7100 Waveform Monitors Specifications and Performance Verification Technical Reference* for additional information on power and environmental requirements.

Table 2: Power and environmental specifications

Characteristic	Description
Power	
Input Voltage	100 to 240 VAC ±10%
Input Power Frequency	50/60 Hz
Power Consumption, typical	50 to 110 VA at 110 or 240 VAC
Temperature	
Operating	0 °C to +40 °C
Non-operating	−20 °C to +60 °C
Humidity	
Operating	20% to 80% relative humidity (% RH) at up to +40 °C, non-condensing
Non Operating	5% to 90% RH (relative humidity) at up to +60 °C, non-condensing
Altitude	
Operating	3,000 m (9,842 ft)
Non-operating	12,192 m (40,000 ft)
Pollution Degree	2, Indoor use only
Dimensions	
Height	133.4 mm (5.25 in)
Width	215.9 mm (8.5 in)
Depth (front to back including handles and BNCs)	460.4 mm (18.125 in)
Weight	
Net	5.5 kg (12 lbs)
Shipping	9.6 kg (21 lbs) approximately
Required Clearances	Top None Bottom None Left side 2 in (51 mm) Right side 2 in (51 mm) Front None Rear 2 in (51 mm)

Connector Specifications

The waveform monitor has connectors on the front and rear panels. The following pages describe the connector types and associated signal requirements.

Front Panel   The following table describes the front-panel connectors. (See page 2.)

Table 3: Front panel connectors

Connector	Description
Headphone	Standard 1/4-inch stereo phone jack, capable of driving a 6.25 dBu sine wave into 32 Ω or 16 Ω
USB	
Type	Host
Speed	Complies with USB 1.1 and 2.0 Full Speed Specification (12 Mb/s)

Rear Panel   The following table describes the rear-panel connectors. (See page 4.) Refer to *Connector Pin Assignments* for information about the pin numbering and signal assignments for the multi-pin connectors. (See page 9.)

Table 4: Rear panel connectors

Connector	Description
Serial Digital Video Interface	
Input Type; Quantity	75 Ω BNC, internally terminated; 2 inputs
Input Level	800 mV ± 10%
Output Type; Quantity	75 Ω BNC, internally terminated; 1 output
Output Level	800 mV ± 10% into 75 Ω load
Clock Output	75 Ω BNC, 1 V signal; serial bit rate divided by 10 for SD (27 MHz), and divided by 20 for HD (74.176 or 74.25 MHz)
Composite Video Interface	
Input Type; Quantity	BNC, passive loop through 75 Ω compensated; 2 inputs
Maximum Operating Amplitude with Clamp off (DC coupled)	-1.8 V to +2.2 V, DC + peak AC
Maximum Absolute Input Voltage	-6.0 V to +6.0 V, DC + peak AC
External Reference	
Input Type	BNC, passive loop through 75 Ω compensated
Input Level	-6 to +6 dB
Maximum Operating Input Voltage	± 5 V, DC

Table 4: Rear panel connectors (Cont.)

Connector	Description
Maximum Absolute Input Voltage	$\pm$ 5 V, DC
AES Audio	
Input Type	BNC, 75 Ω terminated, unbalanced (meets requirements of AES 3-ID and SMPTE 276M-1995)
Input Amplitude Range	0.1 $V_{p\text{-}p}$ to 2 $V_{p\text{-}p}$
Output Type	BNC, 75 Ω terminated, unbalanced (meets requirements of AES 3-ID and SMPTE 276M-1995)
Output Amplitude Range	0.9 V to 1.1 V Pk-Pk into 75 Ω
Analog Audio	
Input Type	62 pin, 3 row, DSUB, balanced, unterminated
Maximum Input Level	+24 dBu $\pm$ 0.3 dBu
Output Type	62 pin, 3 row, DSUB, balanced, unterminated; ground negative output to support unbalanced mode
Maximum Output Level	+24 dBu $\pm$ 0.5 dBu (intended to drive a $\geq$ 600 load)
Picture Monitor (PIX MON) Output	
Output Connector	VGA DSUB
Output Format	Y, Pb, Pr with sync on Y; RGB with sync on all
Active Video Accuracy	700 m$V_{p\text{-}p}$ $\pm$ 5% (Y-Pb-Pr mode)
Composite Amplitude	1 V $\pm$ 5% including sync and 100% white video
External VGA/XGA (EXT DISPLAY) Output	
Output Connector	VGA DSUB
Output Levels	Selectable for 0.7 V or 1 V for RGB signals; fixed 5 V for H and V sync signals
LTC Time Code Input / Ground Closures (REMOTE)	
LTC Input Connector	9 pin DSUB, balanced, unterminated
LTC Input Signal	Longitudinal Time Code per IEC Publication 461
LTC Signal Amplitude Range	0.2 $V_{p\text{-}p}$ to 5.0 $V_{p\text{-}p}$ balanced differential or single-ended
Ground Closure Input Signal	TTL thresholds, 5 V max input, -0.5 min input; pull low to assert
Ground Closure Output Signal	One open collector output
Ethernet	RJ-45 LAN supporting 10/100 BaseT; supports manual and DHCP address modes

Connector Pin Assignments

The following pages list the pin assignments for the multi-pin connectors on the rear panel of the waveform monitor. The previous table describes the signal requirements for each of the rear panel connectors.

Analog Audio Connector   The following figure shows the pin numbering of the Analog Audio connector. The following table lists the signals assigned to each pin. Note that pins 43 through 62 are not used.
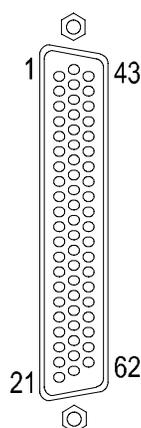
Figure 4: Analog Audio connector pin numbering

Table 5: Analog Audio connector pin assignments

Pin	Description
1	Balanced differential analog audio input; Ch. 1, line A, positive
2	Balanced differential analog audio input; Ch. 1, line B, positive
3	Balanced differential analog audio input; Ch. 2, line A, positive
4	Balanced differential analog audio input; Ch. 2, line B, positive
5	Balanced differential analog audio input; Ch. 3, line A, positive
6	Balanced differential analog audio input; Ch. 3, line B, positive
7	Balanced differential analog audio input; Ch. 4, line A, positive
8	Balanced differential analog audio input; Ch. 4, line B, positive
9	Balanced differential analog audio input; Ch. 5, line A, positive
10	Balanced differential analog audio input; Ch. 5, line B, positive
11	Balanced differential analog audio input; Ch. 6, line A, positive

Table 5: Analog Audio connector pin assignments (Cont.)

Pin	Description
12	Balanced differential analog audio input; Ch. 6, line B, positive
13	Ground
14	Balanced differential analog audio output; Ch. 1, positive
15	Balanced differential analog audio output; Ch. 2, positive
16	Balanced differential analog audio output; Ch. 3, positive
17	Balanced differential analog audio output; Ch. 4, positive
18	Balanced differential analog audio output; Ch. 5, positive
19	Balanced differential analog audio output; Ch. 6, positive
20	Balanced differential analog audio output; Ch. 7, positive
21	Balanced differential analog audio output; Ch. 8, positive
22	Balanced differential analog audio input; Ch. 1, line A, negative
23	Balanced differential analog audio input; Ch. 1, line B, negative
24	Balanced differential analog audio input; Ch. 2, line A, negative
25	Balanced differential analog audio input; Ch. 2, line B, negative
26	Balanced differential analog audio input; Ch. 3, line A, negative
27	Balanced differential analog audio input; Ch. 3, line B, negative
28	Balanced differential analog audio input; Ch. 4, line A, negative
29	Balanced differential analog audio input; Ch. 4, line B, negative
30	Balanced differential analog audio input; Ch. 5, line A, negative
31	Balanced differential analog audio input; Ch. 5, line B, negative
32	Balanced differential analog audio input; Ch. 6, line A, negative
33	Balanced differential analog audio input; Ch. 6, line B, negative
34	Ground
35	Balanced differential analog audio output; Ch. 1, negative
36	Balanced differential analog audio output; Ch. 2, negative
37	Balanced differential analog audio output; Ch. 3, negative
38	Balanced differential analog audio output; Ch. 4, negative
39	Balanced differential analog audio output; Ch. 5, negative
40	Balanced differential analog audio output; Ch. 6, negative
41	Balanced differential analog audio output; Ch. 7, negative
42	Balanced differential analog audio output; Ch. 8, negative
43 - 62	Not used

Ethernet Connector   The following figure shows the pin numbering of the Ethernet connector. The following table lists the signals assigned to each pin.

The Ethernet connector includes built-in green and yellow LEDs to indicate signal status as indicated below:

■   Lit green LED indicates connection is active

■   Lit yellow LED indicates a 100 MB transmission rate

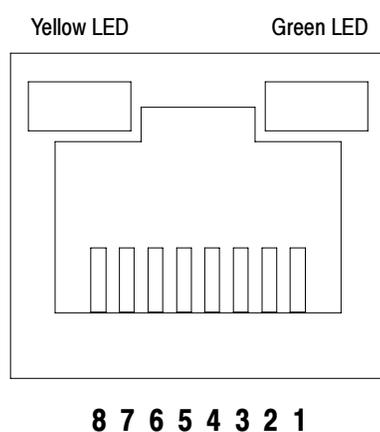■   Unlit yellow LED indicates a 10 MB transmission rate

Yellow LED   Green LED

8 7 6 5 4 3 2 1

Figure 5: Ethernet connector pin numbering

Table 6: Ethernet connector pin assignments

Pin/LED	Name	Description
1	TX_D1+	Transceive Data+
2	TX_D1-	Transceive Data-
3	RX_D2+	Receive Data+
4		Not used
5		Not used
6	RX_D2-	Receive Data-
7		Not used
8		Not used

Remote Connector   The following figure shows the pin numbering of the Remote connector. The following table lists the signals assigned to each pin.
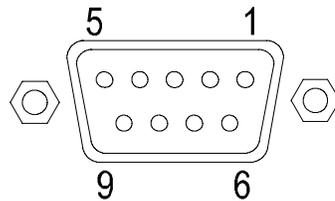

Figure 6: Remote connector pin numbering

Table 7: Remote connector pin assignments

Pin	Description	Direction	Notes
1	Ground	Out	
2	Time Code+	In	LTC time code input
3	Time Code–	In	LTC time code input
4	Ground	Out	
5	Ground Closure Output	Out	Open collector output
6	Preset Recall 1	In	Ground this pin to select preset 1
7	Preset Recall 2	In	Ground this pin to select preset 2
8	Preset Recall 3	In	Ground this pin to select preset 3
9	Preset Recall 4	In	Ground this pin to select preset 4

External Display Connector

The following figure shows the pin numbering of the External Display connector. The following table lists the signals assigned to each pin.

Figure 7: External Display connector pin numbering

Table 8: External Display connector pin assignments

Pin	Description
1	Red output
2	Green output
3	Blue output
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	Not used/SDA
13	Horizontal sync output
14	Vertical sync output
15	Not used/SCL

Picture Monitor Connector   The following figure shows the pin numbering of the External Display connector. The following table lists the signals assigned to each pin.
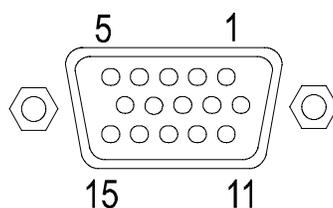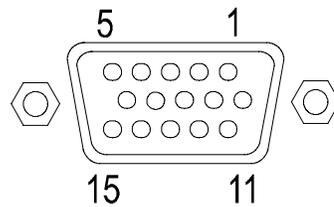

Figure 8: Picture Monitor connector pin numbering

Table 9: Picture Monitor connector pin assignments

Pin	Description
1	Red output
2	Green output
3	Blue output
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	Not used
13	Horizontal sync output
14	Vertical sync output
15	Not used

Rackmount Installation

To install the waveform monitor in a 19-inch equipment rack, you must use the WFM7F05 Rack Adapter kit. The WFM7F05 is designed to house two half-rack instruments side-by-side in a rack. (See Figure 9 on page 16.)

To accommodate different products, two types of sleeves are available: The two sleeves are designed to properly fit only the following products:

⚠️ **CAUTION.** *Be sure to use the correct sleeve for your product. If you use the wrong sleeve, it could damage the instrument and cause overheating problems.*

The ventilation holes and EMI shielding on the sleeves are specially designed to meet the requirements of the instruments for which they were intended.

Table 10: Rack adapter sleeves and supported products

Sleeve type	Tektronix part number	Supported products
WFM7F00	390-1210-XX	WFM6100, WFM7000, and WFM7100
		WFM700A, WFM700HD, and WFM700M
		MTX100A, RTX100A, and RTX130A
1700F00A	390-1211-XX	1700 Series instruments
		WFM601 Series instruments
		Older half rack instruments
		760A and 764

Rack Adapter Configuration

The type of sleeves included with the rack adapter kit is configured by the option ordered. The available configurations are:

■ Two 1700F00A sleeves (Option OO)

■ One 1700F00A sleeve and one WFM7F00 sleeve (Option ON)

■ Two WFM7F00 sleeves (Option NN)

You can also install a sleeve in one side of the rack adapter and a blank panel (1700F06) or an accessory drawer (1700F07) in the other side of the adapter to improve airflow and appearance.
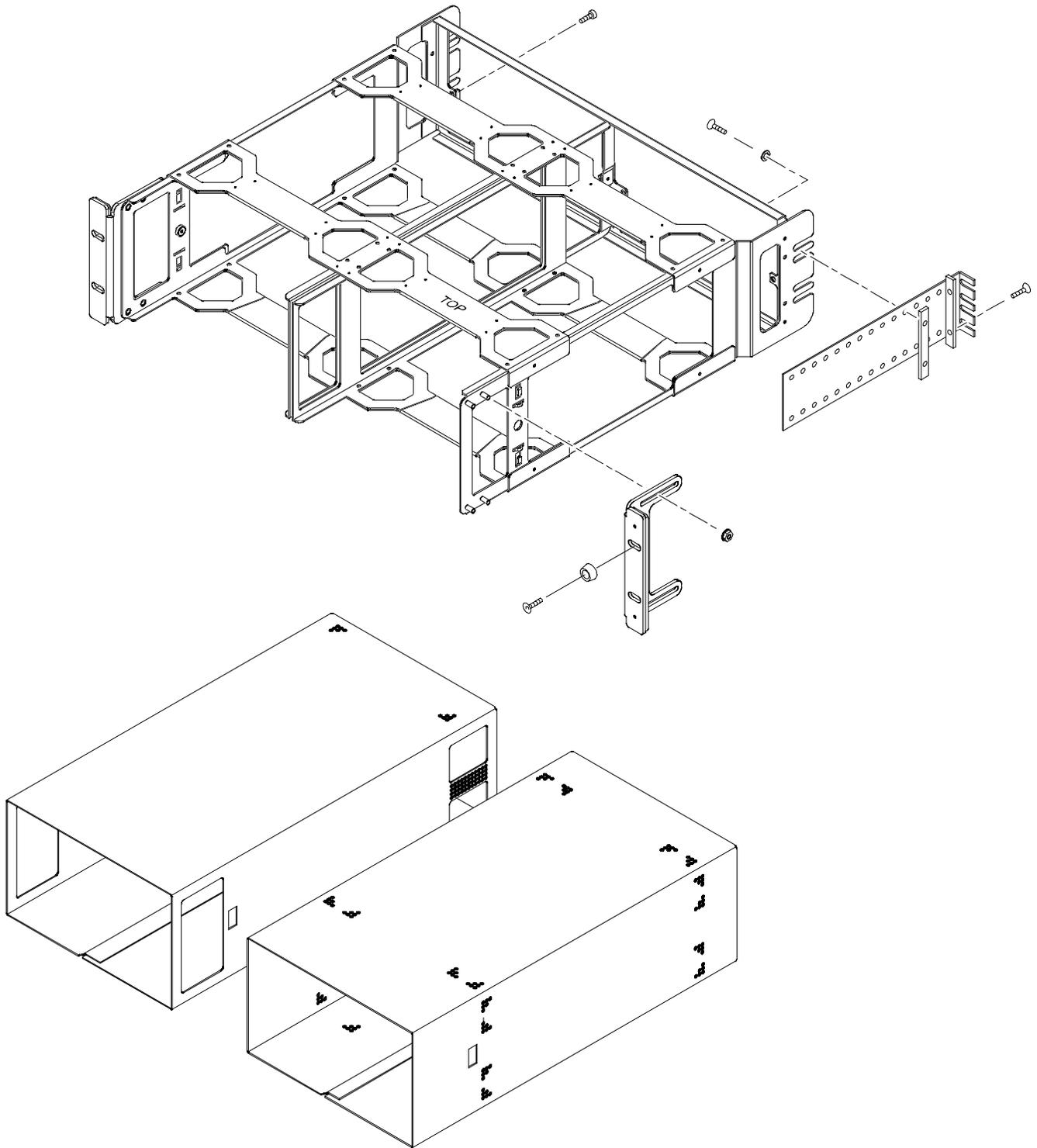
Figure 9: WFM7F05 exploded view

WFM7F05 Dimensions

The following three figures show the dimensions of the WFM7F05 rack adapter hardware and the sleeves.
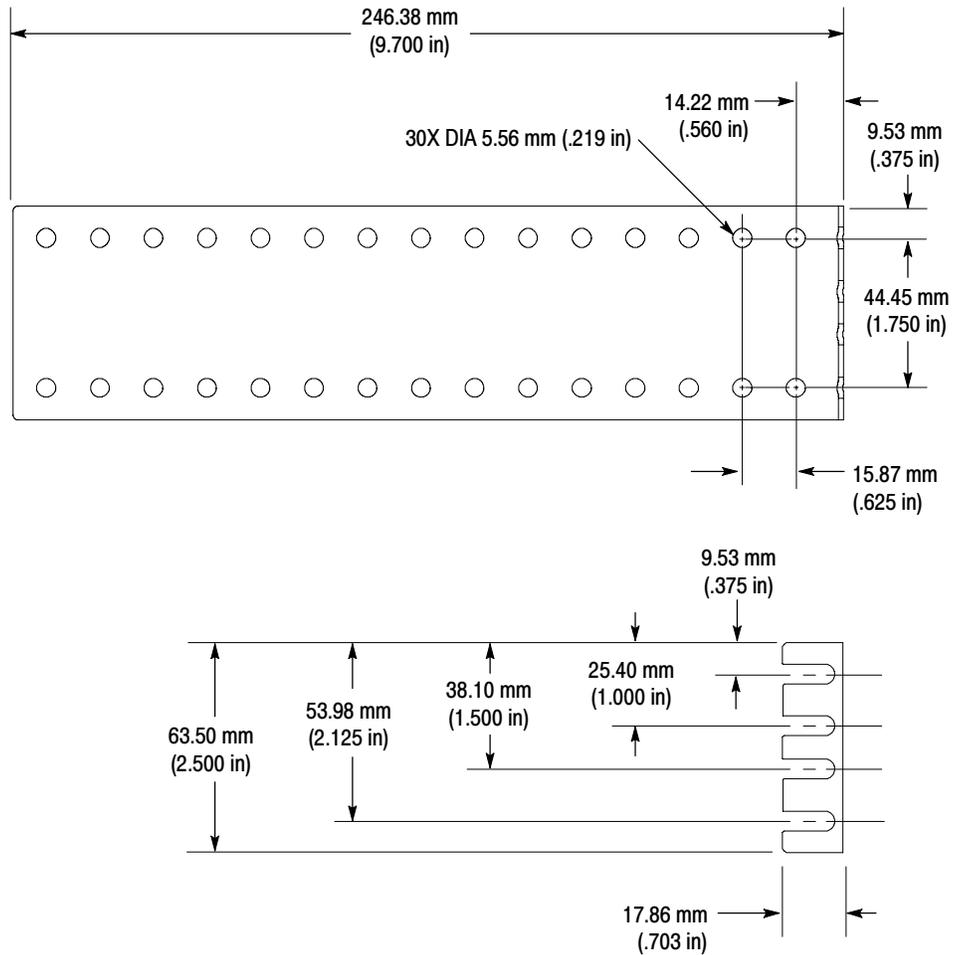

Figure 10: WFM7F05 rear-bracket guide dimensions

Top View

482.32 mm
(18.989 in)

444.73 mm
(17.509 in)

449.30 mm
(17.689 in)

Side View

132.92 mm
(5.233 in)
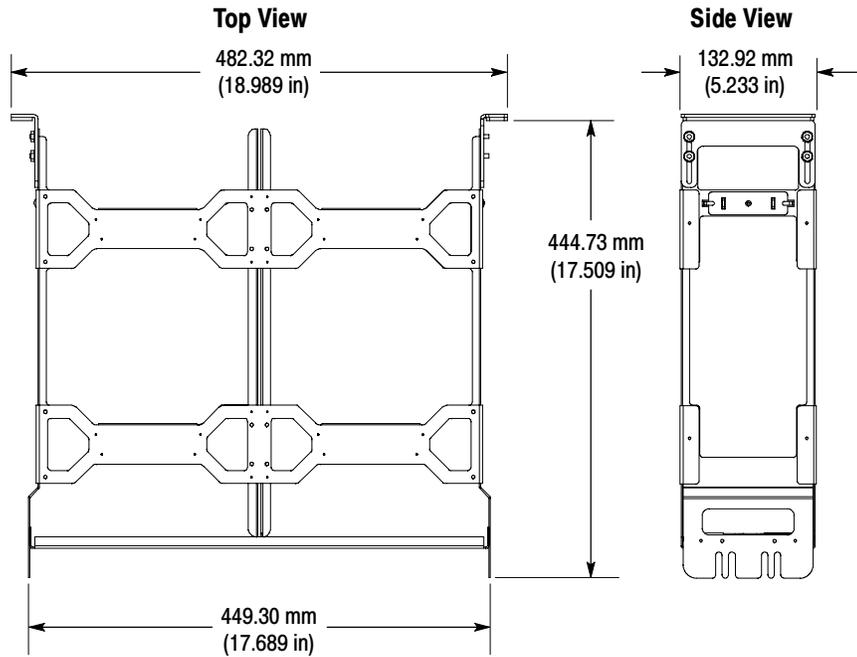
Figure 11: WFM7F05 rack adapter dimensions

Rear

126.11 mm
(4.965 in)

209.55 mm
(8.250 in)

410.21 mm
(16.150 in)

Bottom
1700FOOA sleeve

Rear

126.37 mm
(4.975 in)

209.55 mm
(8.250 in)

407.67 mm
(16.050 in)

Bottom
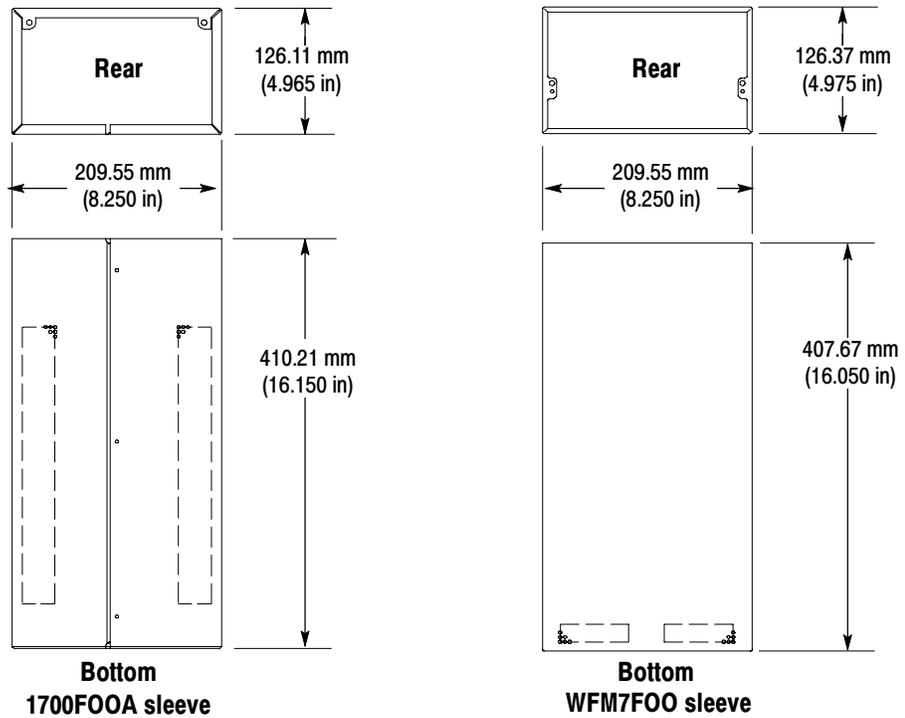**WFM7FOO sleeve**

Figure 12: WFM7F05 sleeve dimensions

Rack Adapter Installation

Install the rack adapter into the equipment rack before you install an instrument into the adapter. During installation, be aware of the following:

■ The rack adapter is marked with the word "TOP" to indicate which side of the adapter should face up.

■ You can adjust the position of the handle brackets to mount the adapter flush with other equipment in the rack.

After you install the rack adapter, install the instrument(s) into the rack adapter following the instructions that accompany the WFM7F05 Rack Adapter Kit.
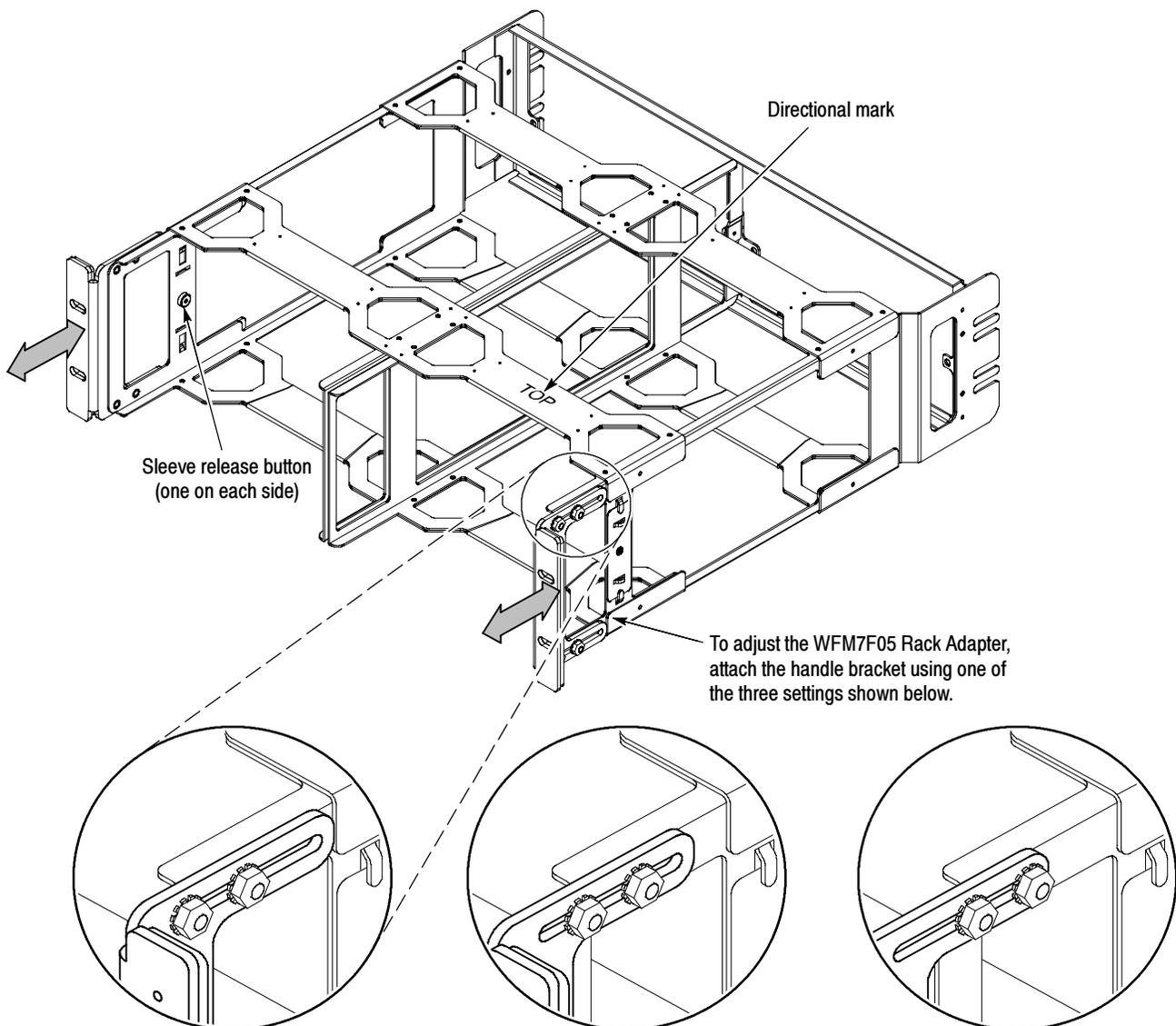
Directional mark

TOP

Sleeve release button
(one on each side)

To adjust the WFM7F05 Rack Adapter,
attach the handle bracket using one of
the three settings shown below.

Figure 13: Adjusting the position of the handles

System Installation

The waveform monitor can operate almost anywhere in the video distribution system. To monitoring the video bitstream of a serial receiver, route the incoming serial signal into one of the waveform monitor SDI inputs.

NOTE. *Refer to the* WFM6100, WFM7000, and WFM7100 Specifications and Performance Verification Technical Reference *for the maximum cable lengths allowed for the input signal.*

To monitor serial digital signals around a routing switcher, connect your serial sources through a patch panel to a serial router. Connect the output of the serial router to an SDI input for comparison.

Line Termination

The waveform monitor uses passive loop-through analog and reference inputs. Accordingly, the loop-through must be terminated externally. It is important that this external termination meet accuracy and return loss requirements.

If the waveform monitor is installed to monitor an operating link, the destination receiver and the connecting cable serve as the termination. This monitoring connection is best because it checks the performance of the entire path. The return loss of the waveform monitor is sufficiently high that, in most cases, the destination receiver sets the system return loss.

In cases where the waveform monitor is placed at the end of a link, a BNC termination must be installed on one side of the loop-through analog or reference connector. The termination must be 75 Ω and DC coupled (good return loss extends to DC). Return loss should exceed 40 dB from DC to 6 MHz for composite. An appropriate terminator would be Canare part number BCP–TA. It is a 75 Ω, 1%, BNC, 26 dB return loss to 2 GHz, end-of-line termination.

Compatibility of BNC Center Pins

Most video equipment BNC connectors, whether 50 or 75 Ω, use a 50 Ω standard center pin. Some laboratory 75 Ω BNC connectors use a smaller diameter center pin. The BNC connectors on the waveform monitor are designed to work with the 50 Ω standard (large diameter) center pins.

CAUTION. *To prevent intermittent signal connections, do not use connectors or terminators with the smaller diameter center pins.*

Network Operation

This section provides the following information for operating the waveform monitor on a local LAN network:

- How to configure the instrument for operation on an IP network

- How to configure the instrument to send and/or receive SNMP remote commands

- How to use a Web browser to start a remote application to enable control of the instrument, or to download the Event and Diagnostic log files, or to capture images of the instrument display

IP Settings Configuration

To allow network access to the instrument, you need to set the IP address. Network addresses can be assigned either automatically (DHCP) or manually. If your network does not use DHCP, you will have to manually enter the address for the instrument. To obtain a valid IP address, contact your LAN administrator.

Perform the following steps to configure the IP settings on the waveform monitor:

1. Press the MAIN button to display the Main menu.

2. Touch Config to display the Configuration menu, and then touch Utilities.

3. Touch Communications to display the Communications submenu.

4. Touch Config Mode, and then select Manual or DHCP, depending on your network setup. Touch Close Config Mode to close the submenu.

5. If you selected Manual mode, touch Network Setup to open the Network Setup dialog box.

NOTE. If you cannot use DHCP mode, you will have to set the Subnet Mask and Gateway Address parameters in this menu; contact your LAN administrator for required values. (Be sure to use compatible addresses between the PC and the waveform monitor.)

6. If desired, touch Instrument Name to assign the waveform monitor a network name.

7. Press the MAIN button to close the menu.

SNMP Remote Control Configuration

SNMP remote control is primarily intended for instrument access using automated systems. If you intend to use SNMP commands to control the instrument, you must first configure the SNMP settings on the waveform monitor.

NOTE. *The SNMP commands are contained in a MIB (Management Information Base). Refer to the* WFM Series Waveform Monitors and WVR Series Waveform Rasterizers Management Information Base Technical Reference *(Tektronix part number 071-1592-XX) for information about using the MIB to control the waveform monitor.*

The procedure to configure SNMP settings is similar to that previously described for configuring the IP settings. Touch SNMP Setup in the Communication submenu of the Main menu to configure the following SNMP parameters:

- Remote SNMP Mode. Use this setting to configure the remote access to the instrument via SNMP. You can select enabled, disabled, or read only.

- SNMP Traps. Use this setting to enable or disable the SNMP traps that are sent from the instrument when error conditions are detected.

- Trap Destination Address. Use these settings to enter up to four different IP addresses to which SNMP traps will be sent when error conditions are detected.

NOTE. *A value of all zeroes for the IP address will disable that trap output.*

- Private Community String. Use this menu setting to enter the Private Community string, which effectively is a password. Without this string, SNMP commands cannot change values in the waveform monitor.

NOTE. *Use the Private Community String to control the ability of SNMP commands to make changes to the waveform monitor. Use the Public Community String to control the ability of SNMP commands to read information from the waveform monitor.*

- Public Community String. This menu entry allows you to set the Public Community string. This string is effectively a password. Without this string, SNMP commands cannot read information from the instrument.

Web Browser Operation   You can connect to a waveform monitor installed on an Ethernet IP network without installing any software and using only a Web browser. Using the Web browser, you can perform the following functions:

- Start a remote application to enable control of the instrument

- Download the Event and Diagnostic log files

- Capture images of the instrument display

Perform the following steps to connect to the waveform monitor using a Web browser:

1. Verify that the waveform monitor has been configured for IP network operation. (See page 21, *IP Settings Configuration*.)

2. Open the Network Setup dialog box and note the IP address assigned to the waveform monitor.

3. Set the Remote Web Interface mode to Enabled.

4. Touch OK to close the Network Setup dialog box.

5. Press the MAIN button to close the Configuration menu.

6. On your PC, start your Web browser and enter the network address of the waveform monitor into the URL entry box like this:

   http://123.123.123.123/

NOTE. *Many Web browsers do not correctly interpret IP addresses with leading zeros. If the IP address shown in the Configuration menu contains leading zeros, remove any leading zeros when you enter the address in the browser.*

For example, the IP address 124.161.038.092 should be entered as follows: 124.161.38.92.

---

7. The Web browser will display the remote interface for the waveform monitor. To make a selection, click the desired link.