



TDS3PRT THERMAL PRINTER (for TDS3000 & TDS3000B Series only)

Instruction Manual
070-A831-01

www.tektronix.com

Safety Summary

The TDS3PRT thermal printer is designed for exclusive use with TDS3000 and TDS3000B Series oscilloscopes. When you use this printer, consult the oscilloscope user manual as well as this manual.

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

Symbols and Terms

The following symbol may appear on the product.



Indicates Caution, Warning or Danger. Refer to the manual.

The following term may appear in this manual.



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

TDS3PRT power

For TDS3000 Series oscilloscopes, power is supplied to the TDS3PRT printer even if the front-panel stand-by switch is in the Off position.

To power off the printer, disconnect the power cord from the oscilloscope, or disconnect the mini-plug cable from the **15VDC Out** terminal on the back panel.

For TDS3000B Series oscilloscopes, the front-panel stand-by switch also powers off the TDS3PRT.

Do not remove the cover

Do not remove the cover from this printer. There are no user-servicable components inside the printer.

Do not operate in an explosive or corrosive atmosphere

Do not use this printer in an explosive gas environment. To prevent equipment failure caused by erosion or corrosion of metal components, do not use this printer in a corrosive gas environment.

Operating environment

Do not operate this printer in extremely high or low temperatures or humidity, in direct sunshine, in a strong electromagnetic field, or in a dusty environment.

Operating in an automobile

Do not leave this printer in an automobile. Doing so may result in printer failure due to high temperatures.

Caution: The TDS3PRT is a dedicated printer for the TDS3000 and TDS3000B Series oscilloscopes. Do not connect the TDS3PRT printer to any equipment or device other than a TDS3000 or TDS3000B Series oscilloscope.



Caution: To avoid personal injury and/or unexpected equipment failure, disconnect the power cord from the rear panel of the oscilloscope before installing or removing the printer from the oscilloscope.

Thermal Paper

The TDS3PRT uses thermal paper, which creates images through a thermo-chemical reaction process. Because the paper is affected by temperature, humidity, and chemical agents, read the following instructions carefully before handling and storing the paper.

Handling Thermal Paper

- Use only TDS3PRT-specific thermal paper (Tektronix part number 016-A323-00).
- Touch the paper as little as possible with your hands. Fingerprints and skin oils can cause paper discoloration.
- Do not scratch the paper with a hard object.
- Exposing the paper to chemical agents, organic solvents, or oil can cause paper discoloration or darken already printed paper.
- Liquid or paste glues cause the paper to discolor where the glue contacts the paper.

Storing Thermal Paper

- Store thermal paper in a dry, cool, and dark place. The paper can gradually darken at temperatures above 70 degrees C.
- Use thermal printer paper as soon as possible after removing the printer paper from the package.
- Avoid placing thermal paper in long-term contact with vinyl chloride films, pencil erasers, or adhesive tapes.
- Do not place thermal paper on top of or between just-copied diazo-process or wet-process copy paper.

Firmware Update (TDS3000 Series only)

(If your oscilloscope is a TDS3000B Series, ignore this section)

If your current oscilloscope firmware version is earlier than 2.24, you need to update your firmware in order to use the TDS3PRT thermal printer. To update the oscilloscope firmware, use the floppy disks provided with the software package. You do not need to update your firmware if your current firmware version is 2.24 or greater.

Note: The following procedure applies to TDS3000 Series oscilloscopes with firmware ver.1.10 or greater. If your TDS3000 Series firmware is ver. 1.00, contact your local Tektronix dealer or sales representative, or visit the Tektronix web site for specific ver. 1.00 update procedures. You can see your oscilloscope's firmware version number on the power-up display screen, or by pushing **UTILITY > System: Config > Version** on the oscilloscope.

To update firmware, do the following steps:

- Power off the oscilloscope.
- Insert Disk 1 into the floppy disk drive of the oscilloscope.
- Power on the oscilloscope.
- Press the OK Install menu button; the oscilloscope starts the firmware update process. Wait until Disk 1 is done loading.
- When prompted, remove Disk 1 and insert Disk 2.
- Press the OK Install menu button to continue the firmware update.
- When Disk 2 is done loading, the oscilloscope reboots itself.
- The display language returns to English after the firmware update is done. To reset the oscilloscope to your local language, push **UTILITY > System: Config** and select the appropriate language from the side menu.
- Push **UTILITY > System: Hard Copy > Format** and select Tektronix TDS3PRT Thermal Printer from the side menu. Figure 1 shows the Hard Copy Format screen.

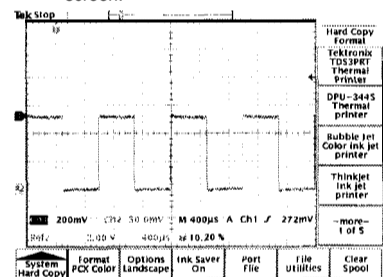


Figure 1. Utility > System: Hard Copy screen with new TDS3PRT format menu item

Product Overview

The TDS3PRT thermal printer features include:

- Ease of operate.
- Automatic or manual paper loading mechanism.
- Small size and light weight to maintain oscilloscope portability.

Figure 2 shows the TDS3PRT thermal printer.

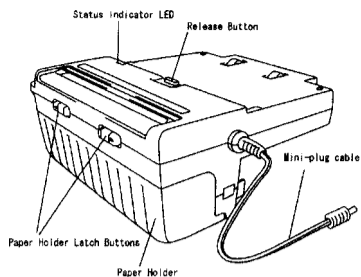


Figure 2. Parts of the TDS3PRT thermal printer

- Status Indicator LED -The status indicator LED turns on during printer power-up, when the thermal paper is used up, when the paper release lever is open, or if there is an error condition in the TDS3PRT.
- Release Button – Disconnects the printer from the oscilloscope when pressed down.
- Paper Holder Latch buttons – Slide these latch buttons towards the center of the printer to open the paper holder.
- Paper Holder-A swing-down cover that contains the thermal printer paper roll.
- Mini-plug cable -Connect this cable to 15VDC Out terminal located on the rear panel of the oscilloscope.
- Paper Release Lever -The lever to hold the print paper down (refer to Figure 6).
- Paper Feed Knob -The knob for paper feeding (refer to Figure 6).

Accessories

- Standard Accessories
 - Thermal paper (1 roll)
 - Instruction Manual (this document)
 - Software package (1 set)
- Optional Accessories/Parts
 - Thermal paper (10m) 10 rolls (Tektronix Part number 016-A323-00)
 - Paper holder (Tektronix Part number 200-A516-00)

Before Installing the Printer

- Do not use the TDS3PRT printer to carry, or help carry, the oscilloscope.
- Because the TDSJPRT is installed in the same opening as a communication module, you cannot use the TDS3PRT printer and a communication module (such as TDS3GV) simultaneously.
- You cannot operate the TDS3PRT printer from the rechargeable battery pack in a TDS3000 Series oscilloscope. This printer requires AC power to operate when installed in a TDS3000 Series oscilloscope.
- You can operate the TDS3PRT from the rechargeable battery pack in TDS3000B Series oscilloscopes.
- You cannot use the TDSJPRT printer with a TDS3000 or TDS3000B Series oscilloscope that is installed in the optional rackmount.

Installing the TDS3PRT

Printer

Do the following steps to install the TDSJPRT printer in your oscilloscope:

1. Disconnect the power cord from the oscilloscope rear panel.
2. (If present) Press down on the blank panel latch tab to remove the blank panel
3. Attach the front cover to the oscilloscope.
4. Place the oscilloscope so that its front side faces downward.

5. Insert the printer into the oscilloscope as shown in Figure 3. Make sure that the Centronics connectors snugly mate and correctly align with each other while observing the printer insertion from the side (refer to Figure 4).

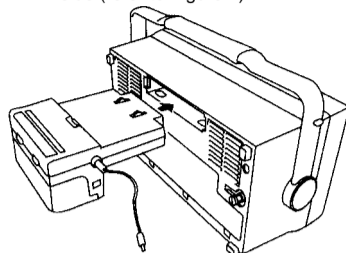


Figure 3. Direction of Printer Insertion

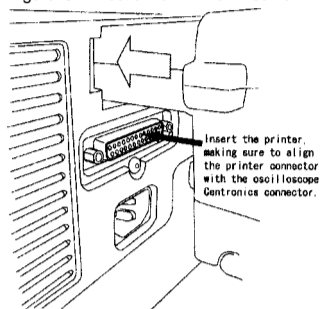


Figure 4. Position adjustment of connectors

6. Insert the printer until release button comes to its raised position.
7. Place the oscilloscope to its upright position, then remove the front cover.

Caution: Do not hold the oscilloscope's carrying handle during printer installation or removal. Your hand may be caught by the carrying handle and result in personal injury. Hold the oscilloscope instead of the carrying handle. After installing the printer into the TDS3000 or TDS3000B Series oscilloscope, adjust the oscilloscope carrying handle if necessary to prevent the handle from contacting or interfering with the TDSJPRT operation.

6. Connect the mini-plug cable to the 15VDC Out terminal on the right side of the rear panel.
9. Connect the power cord to the rear panel of the oscilloscope.

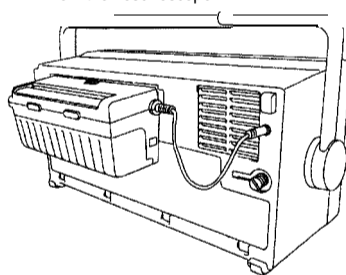


Figure 5. Installed printer

Removing the TDS3PRT Printer

To remove the TDS3PRT, do the following steps:

1. After turning the power off, disconnect the power cord from the rear panel of the oscilloscope.
2. Disconnect the mini-plug cable from the

15VDC Out terminal located on the rear of the oscilloscope.

3. Press the release button at the top of the printer while pulling the printer out of the oscilloscope. Use a gentle side-to-side rocking motion while pulling on the printer.

Caution: To reduce the potential of personal injury and/or unexpected equipment failure, install the blank panel on the oscilloscope when the printer is not installed.

Loading the Printer Paper

You can load the thermal printer paper using an automatic method or a manual method.

Automatic Paper Loading

To load the thermal printer paper automatically, do the following steps:

1. Check that the oscilloscope is providing power to the printer (AC or battery for the TDS3000B Series, AC only for the TDS3000 Series).
2. Slide the pair of paper holder latch buttons towards the center of the printer to open the paper holder. The paper holder will swing down.
3. If you are removing paper from the printer before installing new paper, push the paper release lever until it clicks in the released (open) position and remove the old paper roll. Refer to Figure 6.

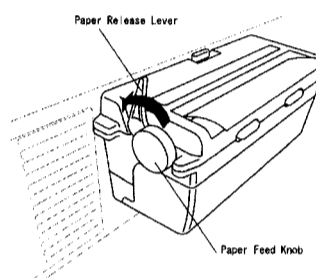


Figure 6. Paper release lever and paper feed knob

4. Push the paper release lever to its locked (closed) position.

Note: The automatic loading mechanism does not work if you do not return the paper release lever to its locked position.

5. Align the edge of the new roll paper strip with the direction shown in Figure 7, and insert it into the paper feed port. The paper is automatically fed until the tip of roll paper is visible on the paper cutter.

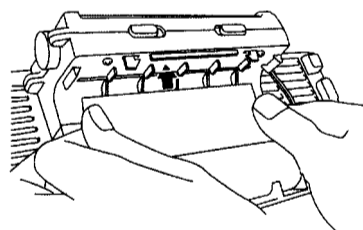


Figure 7. Inserting paper into the printer feed slot

6. If the paper is not feeding straight, raise the paper release lever, adjust the paper position, and then close the release lever.

- Close the paper holder. This completes the automatic paper loading process.

Note: The print paper has a printing side and a non-printing (back) side. If the paper is loaded incorrectly, no image is printed. Load the paper as shown in Figure 7 so that it is pulled out of the downside of the paper roll.

Manual Paper Loading

To load the thermal printer paper manually, do the following steps. You can do the following procedure with the printer installed in the oscilloscope or with the printer not installed.

- (If installed in the oscilloscope) Remove power from the printer (unplug the mini-plug cable).
- Slide the pair of paper holder latch buttons towards the center of the printer to open the paper holder. The paper holder will swing down.
- If you are removing paper from the printer before installing new paper, push the paper release lever until it clicks in the released (open) position and remove the old paper roll. Refer to Figure 6. Keep the release lever in the released (opened) position.
- Align the edge of the new roll paper strip with the direction shown in Figure 7, and insert it into the paper feed port.
- Move the paper release lever to its intermediate position.
- Turn the paper feed knob so that the tip of the paper comes out of the paper cutter slot at the top of the printer (refer to Figure 8).

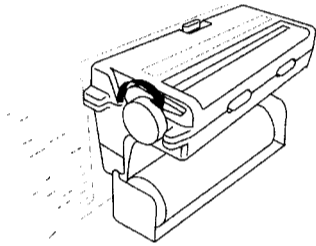


Figure 8. Turn the paper feed knob in arrow direction

- If the paper is not feeding straight, raise the paper release lever, adjust the paper position, and then close the release lever.
- Close the paper holder. This completes the manual paper loading process.
- Connect the mini-plug power cord to the **15VDC** Out terminal on the rear panel of the oscilloscope (or install the printer into the oscilloscope).

Before Printing a Document

Before starting to print with the TDS3PRT, be sure to check that:

- The printer is installed properly in the oscilloscope.
- The mini-plug cable is connected to the **15VDC** Out terminal on the rear of the oscilloscope.
- The print paper does not slant relative to the paper feed direction. If the paper is slanted, raise the paper release lever to its released (open), align the paper, and then close the paper release lever. Refer to Figure 6.
- The paper is loaded in the correct

direction.

- Select **Tektronix TDS3PRT Thermal Printer** in the oscilloscope **UTILITY > System: Hard Copy > Format** menu.

Printing a Document

To print a document, do the following steps:

- Set the printer format to **TDS3PRT Thermal Printer (UTILITY > System: Hard Copy > Format)** menu).
- Set the printer port to **Centronics (UTILITY > System: Hard Copy > Port)** menu).
- Push the front panel Hardcopy button.

About the Power Supply

Power is supplied to the TDS3PRT through the mini-plug cable from the ISVDC Out terminal located on the rear panel of the oscilloscope. For TDS3000B Series oscilloscopes, there is printer power when operating from either AC power or the optional rechargeable battery pack. For TDS3000 Series oscilloscopes, there is printer power only when operating from AC power.



Caution: Applying any voltage other than that supplied by the ISVDC Out terminal may result in failure of the printer. Do not connect the mini-plug cable to any terminal other than the **15VDC** Out terminal.

About the Status Indicator LED

The status indicator LED is lit in any of the following three cases:

- When the paper release lever is in its released (open) position, regardless of presence or absence of paper.
- When the paper release lever is in the locked position and there is no paper in the printer.
- When any printer errors occur.

About Hardcopy options in the oscilloscope SYSTEM menu

- The TDS3PRT always uses Landscape print mode regardless of the setting in the Hard Copy menu.
- The TDS3PRT always uses Ink Saver mode regardless of the setting in the Hard Copy menu.

Troubleshooting

If the printer does not operate correctly or any trouble occurred, check the following list. If the trouble persisted after such checking, contact your local Tektronix dealer or sales representative.

Failed to power on from AC:

Possible Causes	Solution
No power to the oscilloscope.	Make sure that the oscilloscope power cord is connected to an AC outlet. (TDS3000B Only) If operating from the battery pack, make sure the battery is charged.
Printer is being used outside of the allowed temperature range.	Use the printer within the specified temperature range (5 to 40).

Printer failed to operate:

Possible Causes	Solution
No power to the oscilloscope.	Make sure that the oscilloscope power cord is connected to an AC

	outlet. (TDS3000B Only) If operating from the battery pack, make sure the battery is charged.
No power to the printer.	Make sure that the mini-cable connector is plugged into the 15VDC Out connector on the rear panel. (TDS3000 Only) The printer cannot be powered from the rechargeable battery in a TDS3000 Series oscilloscope.
The printer is not ready.	Check that the printer is installed correctly and has a good connection with the Centronics printer port.

Error message "Hard copy device not responding" appears:

Possible Cause	Solution
Improper connection.	Correctly install the printer.

Paper feed failed:

Possible Causes	Solution
Paper is incorrectly set.	Correctly set the paper.
Paper feed port jammed.	Check the paper feed route and remove any foreign obstacles or p impede r .
Status indicator LED is on.	Attention is required. If the paper is out, install a new paper roll.

Print failed, or print is interrupted:

Possible Causes	Solution
Improper connection.	Correctly install the printer.
Status indicator LED is on.	Attention is required. If the indicator is on, an error may have occurred. Verify that the printer is installed correctly.
Incorrect thermal paper installed.	Use only specified roll paper.
Thermal paper installed incorrectly.	Correctly install the paper.
Hard copy settings incorrect.	Verify the UTILITY > System: Hard copy settings are correct: Format: Tektronix TDS3PRT Thermal Printer Port: Centronics
Printer is being used outside of the allowed temperature range.	Use the printer within the specified temperature range.
Print buffer full.	After the print is completed, send the data again. A print can fail if the data is sent while the print buffer is full (i.e., the print was not completed).

Print is too dark or too pale:

Possible Causes	Solution
Printer is being used outside of the allowed temperature range.	Use the printer within the specified temperature range.
Incorrect thermal printer paper installed.	Use only specified roll paper.

Thermal paper is old, or stored at too high a temperature.	If the roll paper quality is poor, replace the paper with new one.
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Incorrect characters:

Possible Cause	Solution
Selected wrong hard copy format in the oscilloscope menu.	Select Tektronix TDS3PRT Thermal Printer in the oscilloscope UTILITY > System: Hard Copy > Format menu.

Correct the error conditions

The TDS3PRT printer detects errors under the following conditions and turns the status indicator LED on (the indicator is not turned on if any error occurs in the drive circuit of the indicator, however):

- An error was detected during the self-test sequence.
- Tried to print when temperatures were extremely high or low.

If the indicator is turned on, do the following procedure:

- Disconnect the printer's mini-plug cable from the rear panel of the oscilloscope.
- Resolve the cause of error such as "Paper feed failed".
- Connect the printer's mini-plug cable to the rear panel of the oscilloscope.
- Perform the print.

If this error correction procedure fails, repeat the procedure several times.

User Maintenance

Clean the exterior surfaces of the printer with a dry lint-free cloth. If any dirt remains, use a cloth dipped in a solution of water and neutral detergent; squeeze the excess moisture out of the cloth so that it is only slightly damp. Then wipe the exterior surface with a dry soft cloth.

If any foreign objects, such as fragments of paper or dust are stuck onto the paper holder, the paper cutter, or the print head, remove the foreign objects with a thin cotton swab (refer to Figure 9).

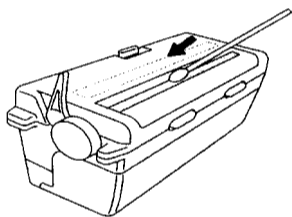


Figure 9. Cleaning the printer

- Note:** Do not use volatile chemicals such as thinner, benzene, etc.
- Note:** Do not soak inside of the printer with water, etc.
- Note:** Do not insert your finger into the paper cutter.
- Note:** Cotton swabs used for cleaning shall be thin enough so that it can be inserted into the paper ejection port.

Specifications

Print system	Thermal line dot system
Number of dots	832 dots / line
Resolution	8 dots / mm

Paper feed pitch	0.125mm /line
Printing width	104mm
Printing speed	Inversely proportional to the number of printed black dots. Refer to the note below.
Printing length	140mm / screen approx.
Printing depth	Depends upon the oscilloscope's intensity.
Compatible print paper	112mm (width)
Life	> 30km, or 5 x 10 ⁷ pulses

Note on printing speed:
Common settings:
Input: Connect PROBE COMP signal to CH1 & CH2.
Vertical axis scale: 2 V
Vertical axis position: CH1 = 0 div., CH2 = -3 div.
Coupling: DC
Acq. mode: Sample
Menu: Off
Printing speed:
21 sec approx. (Horizontal axis scale: 40 S)
40 sec approx. (Horizontal axis scale: 40ms)

Paper width	112 +/-1mm
Paper thickness	65 +/- 5 m
Outer diameter of paper roll	30mm
Paper roll length	10m
Thermal sensitive surface	Outer surface

Source voltage	15V DC, 1A
Power connector's polarity	Center conductor – positive side

Dimensions	148mm (W) x 68mm (H) x 148mm (D)
Weight	450g approx. (without roll paper) 550g approx. (with roll paper)

Temperature (operating)	5 to +40
Temperature (non-operating)	-20 to +60
Humidity (operating)	20% to 80%, noncondensing
Humidity (non-operating)	5% to 90%, noncondensing
Altitude (operating/non-operating)	3,000m/15,000m

Vibration (operating)	3.04m/s ² , 5Hz to 500Hz, 10 minutes on each of three major orthogonal axes
Vibration (non-operating)	24.1 m/s ² , 5Hz to 500Hz, 10 minutes on each of three major orthogonal axes

EMC Compliance: European Union	Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility when installed in a Tektronix product. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities: EMC requirements for Class A electrical equipment for measurement, control and laboratory use
EN 61326	

IEC 61000-4-Z	Electrostatic discharge immunity (Crit.B)
IEC 61000-4-3	RF electromagnetic field immunity (Crit.A)
IEC 61000-4-4	Electrical fast transient /burst immunity (Crit.B)
IEC 61000-4-5	Power line surge immunity (Crit.B)
IEC 61000-4-6	Conducted RF immunity (Crit.A)
IEC 61000-4-11	Voltage dips and interruptions immunity (Crit.C)
EN 61000-3-Z	AC power line harmonic emissions

EMC Compliance: Australia / New Zealand
Meets the intent of Australian EMC Framework as demonstrated to the following specification:
AS/NZS 2064.1/2

EMC Compliance: U.S.A.
Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A limits.

Warranty Summary

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of six (6) months from the date of shipment from an authorized Tektronix distributor. If a product proves defective within the respective period, Tektronix will provide repair or replacement as described in the complete warranty statement. To arrange for service or obtain a copy of the complete warranty statement, please contact your nearest Tektronix sales and service office.

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Service support	1-800-833-9200, select option 2 [*]
Technical support	Email: techsupport@tektronix.com 1-800-833-9200, select option 3 [*] 1-503-627-2400 6:00 a.m. – 5:00 p.m. Pacific time

^{*} This number is toll free in North America. After office hours, please leave a voice mail message. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.