Software Version 7.13.2

TD140 Installation Guide



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WHAT'S NEW IN TD140 INSTALLATION VERSION 7.13.2?

Feature ID	Description	Refer to:
F-02349	GTP Session Persistency on TD140	Network Connectivity
	GTP session mapping data can now be persisted at the G10	Requirements
	probes that are bound to a TD140. To minimize data loss	
	when a TD140 is rebooted, the bound G10 probes send the	Configure Network
	GTP session mapping data for open sessions back to the	Connectivity
	TD140 once it has recovered so it may continue to distribute	
	the session traffic to the original probes.	Ethernet Cabling Diagram
	 ETH port on PPM40 Blade 1 is required for the TD140 to receive persisted session data from the G10 probes 	
	 An additional Ethernet cable and IP address are needed to support the new persistence data port 	

TD140 Installation Overview

OVERVIEW

The TD140 Traffic Distributor is a GTPv1/GTPv2 load balancing network element used as a Gn/LTE monitoring solution that distributes coherent GTP sessions from the S1-U, S11, S5/S8, S4, and Gn interfaces among a pool of G10 probes. This product provides a complete, independent solution with software and hardware integrated into a common environment.

The TD140 supports all standalone G10 hardware configurations; up to 16 G10 probes are supported per TD140.



Figure 1.1 - TD140 Traffic Distributor

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TD140 HARDWARE COMPONENTS

The TD140's architecture consists of the components listed in Table 1.1:

Table 1.1 - TD140 Components

Element	Function
Chassis	Shelf Management Controller (ShMC)
	 Two redundant and hot-swappable PEMs
	 Two pluggable, hot-swappable fan trays
	Removable fan filter
Shelf Management	The ShMC has two Gigabit Ethernet ports with RJ-45 connectors:
Controller (ShMC)	 Port A - Used during initial TD140 configuration; not used during normal probe operation
	 Port B - OAM interface for communicating with Iris server
Packet Processing Module (PPM40)	The PPM40 packet processing module provides high-performance packet processing for the TD140. The PPM delivers I/O processing for 10 gigabit and 1 gigabit (Gb) Ethernet interfaces. Each PPM40 blade provides four egress port connections to the G10 probes.
	 PPM40 ETH port (Slot 1) - Used as OAM interface for receiving session data from the probes.
PPM40 Rear Transition Module	The PPM40 supports the PPM40 RTM, which connects to the back of the TD140 chassis. Each RTM provides the PPM40 with twelve ports:
(RTM)	 Eight ingress ports for connection to monitored network
	 Four egress ports for connection to G10 probes

Figure 1.2 shows the front view of the TD140.



Figure 1.2 - TD140 Front View

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Figure 1.3 - TD140 Rear View

GET STARTED

After installing the TD140, you can find more information about the hardware in the **TD140 Hardware** *Maintenance Guide*.



Installation of the TD140 units must be performed by persons with advanced technical knowledge of electrical wiring. The installer will be stripping wires, attaching lugs, and wiring several components together. Wiring the components incorrectly can result in damage to the TD140 and other components.



To protect the TD140 from electrostatic discharge (ESD) damage, be sure to wear an anti-static device while working with the hardware.

Electrostatic discharge can cause permanent damage to static-sensitive components in this product. Important ESD procedures include:

- Keep the product in its ESD shielding bag until a step tells you to remove it.
- Put on a grounded wrist strap before you move near or touch the product.
- Install the product only in a grounded work area.

Tektronix Communications ships the TD140 with all the components necessary for connectivity to your network. Unpack the hardware and verify the contents of each shipment with the accompanying packing slip to ensure you have received all components. The main components you will install are:

- TD140 Chassis (with or without baffle) An optional baffle can be installed to provide front-to-back airflow. If your deployment does not require front-to-back airflow, skip the baffle installation.
- PPM40 Blades and PPM40 RTMs (2 each)
- AC Rectifier (optional for AC deployments)

Before You Begin

You will need the following supplies for G10 installations:

- Two Phillips head screwdrivers (#1 and #2)
- A Flat head screwdriver
- A laptop or PC with an Ethernet cable to connect to the G10 probe, which requires Web access for probe configuration
- Rackmount screws for mounting equipment to the rack/cabinet (Tektronix Communications provides brackets for two-post and four-post racks)
- Wire cutter
- □ Wire stripper
- Wire crimper tool (Tektronix Communications provides crimper tool for K.S. lugs)
- Power cables for connecting the AC rectifier to the power supply (Optional)

Rack Space Considerations

All equipment is suitable for mounting in a standard 19-inch wide equipment rack or cabinet. TD140 installation varies depending on which components are installed. Locate and identify the correct amount of rack space for your deployment (Table 1.2).

Equipment	Rack Space
TD140 Chassis	5U
Baffles	3U
AC Rectifier	1U

Figure 1.4 shows an example TD140 rack installation.



Figure 1.4 - Example Rack Installation

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TD140 Rack Space Requirement (with Baffle)



The following diagrams show the rack space requirements when installing the TD140 with the baffle option. **Figure 1.5** shows the top view.

Figure 1.5 - Example Rack Installation - Top View





Figure 1.6 - Example Rack Installation - Front and Side Views



When planning rack space, be aware that a gap of only 1-inch exists between the TD140 front mounting bracket and the baffle side air duct (Figure 1.7).



Figure 1.7 - Example Rack Installation - One-inch Gap

Deployment Requirements

Deployments must adhere to the following requirements in order to reach maximum capacity on the TD140 and to maximize processing efficiency:

- All customer inputs must be on the TD140 16 x 1G/10G inputs. 1G and 10G can be mixed in any combination.
- G10 Probes must connect directly to the TD140; no router/switch can be installed between the probes and TD140.
- Physical inputs must be distributed as evenly as possible across the four ingress port groups. For example, if the deployment has 3 ingress 10G feeds, each feed must be connected to groups 1, 2 and 3 (see Figure 1.8).
- Traffic volume (bits per second) must be distributed evenly across the 4 ingress port groups.
- Traffic volume of 22 Gbps cannot be exceeded on any port group.

Figure 1.8 shows the rear view of the TD140.



Figure 1.8 - TD140 Rear View - PPM40 RTM Ingress Ports

From one to four 10G Ethernet connections are required between the TD140 and each G10 Probe. The number of connections will be determined by probe processing capacity which may be affected by the following:

- G10 Probe hardware configuration (that is, IIC200, IAP200).
- Features enabled (for example, DPC or full-URL will reduce the maximum probe capacity).
- Specific traffic models that differ significantly from the standard sizing model.

Network Connectivity Requirements

A TD140 deployment currently requires the customer provide two Ethernet connections and associated addresses as described in **Table 1.3**. See **Chapter 4** for details about TD140 Network Connectivity Configuration. Note that you must know the IrisView Provisioned Heartbeat and SNMP Trap Ports in order to complete network connectivity for the TD140.

Port	Location	Details
OAM	OAM port on ShMC	 Provides connectivity to Iris server for maintenance and configuration.
		 Provides timing connection; can be configured as Precision Time Protocol (PTP) or Network Time Protocol (NTP)
		 Supports 100/1000 Mbps Ethernet physical connections. It requires at least 100Mbps connectivity and supports IPv6.
		 1G Ethernet, 1000base-T via RJ45 (single port)
Persistence Data Port	ETH port on PPM40 Blade 1	 Receives session data from the probes
		 ETH port on PPM40 blade 1; connects to same LAN/WAN as OAM ports on probes
		 Supports 100/1000 Mbps Ethernet physical connections. It requires at least 100Mbps connectivity and supports IPv6.
		 1G Ethernet, 1000base-T via RJ45 (single port)

Table 1.3 - TD140 Network Connectivit

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IrisView Provisioned Heartbeat and SNMP Trap Ports

As part of the TD140 configuration, you will need to know the port numbers that are provisioned on the IrisView server for Heartbeat and SNMP Traps. You will define these ports during *TD140 Network Connectivity Configuration. Only Tektronix Communications personnel can access this information, contact Customer Support for assistance.*

To find the provisioned ports on the IrisView server, access IrisView Admin>SystemConfig>System>AdvancedProperties.

Heartbeat Port

Find the system property shown in (**Figure 1.9**). The default provisioned heartbeat port is 10160, but the value is configurable based on customer requirements. Record the value of the Heartbeat Port to use during *TD140 Network Connectivity Configuration*.

Note that the EnableHeartbeatListener property must be set to TRUE in order for the IrisView server to receive the heartbeats from the TD140.



Figure 1.9 - Provisioned Heartbeat Port on IrisView Server

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SNMP Trap Receiver Port

Find the system property shown in (Figure 1.10). The default provisioned SNMP Trap Receiver port is 10161, but the value is configurable based on customer requirements. Record the value of the SNMP Trap Receiver Port to use during *TD140 Network Connectivity Configuration*.

Note that the snmpReceiverEnabled property must be set to **true** in order for the IrisView server to receive SNMP traps from the TD140.

Servers Customization	Advanced Propert	ies
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🕀 🧰 alarmProcessor		Dr
😑 😋 collectors		
🖃 😋 134z64z37z161z11101	Provisioned	
- 📰 ipAddress(134.64.37.161)	SNMP Trap	
- 🔁 name(tenax-vm1:11101)	Receiver Port	
- 🖃 port(11101)		
snmpReceiverEnabled(true)		
snmpTrapReceiverPort(10161)		
threadPoolSize(4)		
🗄 🦲 emailProcessor		
🕀 🦲 snmpProcessor		
\Xi processingEnabled(true)		
🗄 🧰 com.tektronix.iris.server.alarms.policyweb		
🕀 🦲 com.tektronix.iris.server.cache	E	
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Figure 1.10 - Provisioned SNMP Trap Port on IrisView Server

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TD140 Installation Process



To protect the TD140 from electrostatic discharge (ESD) damage, be sure to wear an anti-static device while working with the hardware.

Table 1.4 summarizes the TD140 installation steps. Refer to the respective pages for each step for more details.

Table 1.4 - TD	140 Installation	Summary
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Step	Installation Steps	Refer to Page:
1	Install TD140 Hardware	Page 16
2	Connect Power Cabling and Power Up the TD140	Page 33
3	Configure Network Connectivity	Page 39
4	Connect TD140 Ethernet Cabling	Page 45
5	TD140 Administration (IrisView Admin GUI)	Page 49

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TD140 Hardware Installation

TD140 HARDWARE INSTALLATION PROCESS



Refer to Chapter 1 for details about Rack Space Considerations, Deployment Requirements, and Network Connectivity Requirements prior to starting the installation process.

The TD140 hardware installation process is comprised of the following steps. See also TD140 Installation Process for an overview of the entire TD140 installation process.

- Install Baffle (Optional Installed only if front-to-back cooling is required) If your deployment does not require front-to-back airflow, skip this step and refer to Install TD140 Chassis).
- 2. Install TD140 Chassis
- 3. Install AC Rectifier (Optional Installed only if AC power is required)
- 4. Install TD140 Blades

Figure 2.1 shows the TD140 installed in the rack with the baffle. The baffle consists of four components: an upper plenum assembly, a lower plenum assembly, and two side air ducts.



Figure 2.1 - TD140 Installed in Rack with Baffle

Install Baffle

An optional baffle can be installed to convert the side-to-side airflow direction to a front-to-back airflow. If your deployment does not require front-to-back airflow, skip this section and refer to Install TD140 Chassis.

The baffle is comprised of a lower plenum, upper plenum, and side air ducts. You install the baffle components in the following order:

- 1. Install Lower Plenum
- 2. Install Side Air Ducts
- 3. Install Upper Plenum

Install Lower Plenum

Determine the location in the rack where you will install the lower plenum (see Rack Space Considerations). You install the lower plenum in the lowest "U" position of the rack. Use the #12 hardware provided: (4) flat washers; (4) split lock washers; (4) Phillips pan headed screws.

Perform the following steps to install the lower plenum.

Step	Action
1.	Loosen or remove the #10-32 nylon insert lock nuts securing the adjustable section of the rear mounting brackets (Figure 2.2).

2. Insert the lower plenum into the rack, ensuring the "UP" arrow indicators on the sides of the plenum are facing upward during installation (Figure 2.2).



Figure 2.2 - Lower Plenum Assembly

3. Secure the plenum to the rack by first securing the front brackets to the front rack rails and then securing the rear brackets to the rear rack rails (Figure 2.3).



Figure 2.3 - Lower Plenum - Securing Brackets

When properly mounted the plenum should appear as shown in Figure 2.4.



Figure 2.4 - Lower Plenum Rack Installation

4. Continue with Install Side Air Ducts.

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Install Side Air Ducts

Perform the following steps to install the two baffle side ducts.

Step Action

1. Locate the three large tabs on the bottom of one of the side air ducts (Figure 2.5).



Figure 2.5 - Side Air Duct Tabs

2. Install the air duct on the right side of the rack, behind the front vertical mounting rail. Angle the duct bottom towards the lower plenum and insert the three large tabs into the corresponding rectangular openings in the lower plenum (Figure 2.6).



Figure 2.6 - Side Air Duct Tabs

3.

After insertion, the side air duct should now be self supporting by resting on the bottom of the Lower Plenum and against parts of the rack.



Figure 2.7 - Side Air Duct Tabs

- 4. Repeat this procedure to install the side air duct on the opposite side of the rack.
- 5. Continue with the next procedure.

Install Upper Plenum

You install the upper plenum in the uppermost "U" position of the designated rack space (see Rack Space Considerations). Use the #12 hardware provided: (6) flat washers: (6) split lock washers; (6) Phillips pan-headed screws.

Perform the following steps to install the upper plenum.

Step	Action

 Loosen or remove the #10-32 nylon insert lock nuts securing the adjustable section of the rear mounting brackets (Figure 2.8). 2.

2

Insert the lower plenum into the rack, ensuring the UP arrow indicators on the sides of the plenum are facing upward during installation (Figure 2.8).



Figure 2.8 - Upper Plenum Assembly

3. Secure the plenum to the rack by first securing the front brackets to the front rack rails and then securing the rear brackets to the rear rack rails (Figure 2.9).



Figure 2.9 - Upper Plenum - Securing Brackets

When properly mounted the plenum should appear as shown in Figure 2.10.



Figure 2.10 - Upper Plenum Rack Installation

- 4. Secure the air ducts to the upper plenum (Figure 2.11).
 - Rotate the duct towards the upper plenum.
 - Insert the two tabs with the clinch nuts installed into the corresponding opening in the side of the upper plenum.



Figure 2.11 - Secure Side Air Ducts to Upper Plenum

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 Using 2 #6-32 Phillips flat head screws, secure the side air duct to the bottom of the upper plenum as shown in Figure 2.12. Repeat steps for the air duct on the opposite side.



5. Continue with Install TD140 Chassis.

Install TD140 Chassis

Perform the following steps to install the TD140 chassis.

Step	Action
1.	If you did not install the baffle, only perform Step 4.
2.	Verify that all mounting hardware for the upper and lower plenums and both side air ducts has been properly installed and tightened.
3.	Insert the 5U ATCA Card Cage on the top front of the lower air plenum and slide it all the way back until the outer flanges contact the vertical mounting rails of the rack.
4.	Secure the front of the 5U ATCA Card Cage to the rack using the #12 hardware provided: (4) flat washers; (4) split lock washers; (4) Phillips pan-headed screws

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Figure 2.13 - Secure Chassis to Front of Rack

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5. Baffle Install Only: At the rear of the rack, secure the rear of the TD140 chassis to the lower plenum using the M5 hardware provided: (4) flat washers, (4) split lock washers; (4) Phillips pan headed screws.



Figure 2.14 - Secure Chassis to Rear of Rack (Baffle Install Only)

Install AC Rectifier

For TD140 installations requiring AC power, install an AC rectifier by securing it to the front of the rack with four rackmount screws.



Figure 2.15 - AC Rectifier (AC Deployments Only)

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Install TD140 Blades

The TD140 chassis ships with filler panels installed in the blade and Rear Transition Module (RTM) slots. You must install the following components after the chassis is installed in the rack (see Install TD140 Chassis for details).

- Install the Shelf Management Controller (ShMC) (1)
- Install SFP or SFP+ Transceivers
- Install the PPM40 RTM (2)
- Install the PPM40 (2)



The TD140 chassis must be wired to ground before installing any blades. Refer to Chapter 3 for information about ground cabling.

Figure 2.16 shows the front view of the TD140.



Figure 2.16 - TD140 Front View

Figure 2.17 shows the rear view of the TD140.



Figure 2.17 - TD140 Rear View

Install the Shelf Management Controller (ShMC)

Follow these instructions to install the ShMC into the shelf.

Step	Action
1.	Using standard ESD precautions, remove the ShMC from its anti-static bag. Hold the ShMC by its circuit board edges and its front panel; avoid touching any components and connector pins.
2.	Open the ShMC ejector handle and insert the module into the shelf card guides for the shelf manager slot.
3.	Keep the ejector handle open and carefully slide the ShMC completely into the slot. When the ejector latch engages the shelf card guide, rotate the ejector handle toward the front panel until the ejector handle is locked in place and the ShMC is fully seated in the shelf.

4. Secure the ShMC into the shelf slot by tightening the retaining screw on the ShMC front panel.

SFP or SFP+ Transceivers

The PPM40 and its RTM have sockets for installing SFP (small form-factor pluggable) or 10 Gb SFP+ transceiver modules. SFP/SFP+ transceivers provide external connections to Ethernet interfaces. The sockets are accessed from the PPM40 or RTM front panel.

Standard PPM configurations come with SFP/SFP+ filler plugs installed as dust covers to protect the internal components of the PPM. Filler plugs are installed in unused sockets.

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Supported SFP or SFP+ Transceivers

Port	Interconnection
Ingress from aggregation/ distribution layer ^a	 Up to 16, 10G or 1G Ethernet, LC-type fiber via SFP+ modules; any combination of the following is supported:
	- 10Gbase-SR (850nm, multi-mode)
	- 10Gbase-LR (1310nm, single-mode)
	- 1000base-SX (850nm, multi-mode)
	- 1000base-LX (1310nm, multi- or single-mode)
	- 1000base-T (Cat5e/Cat6, RJ-45)
	 All 16 ingress ports will be on rear of chassis
Egress to G10 Probes	 Up to 16, 10G Ethernet, LC-type fiber via SFP+ modules; recommend same as ingress but any combination will work.
	 1-4 10G Ethernet connections from TD140 to each G10 probe depending on probe sizing capacity
	 10Gbase-SR (850nm, multi-mode); maximum 200m TD140 to probe
	 10Gbase-LR (1310nm, single-mode); maximum 6000m TD140 to probe
	 8 egress ports will be on front and 8 will be on rear of chassis
	 G10 Probes must connect directly to the TD140. (No router/switch in between.)

a. **Ingress** refers to the ports on which data from the network is entering the TD140. **Egress** refers to ports on which packet data updated with metadata is transmitted out of the TD140 to the G10 probes.

SFP Installation

Tektronix Communications recommends installing SFP and SFP+ transceivers **PRIOR TO** installing the PPM or RTM in the shelf to avoid later cable/transceiver access difficulties.

The following steps describe the correct orientation for inserting an SFP or SFP+ transceiver. The transceivers you use may vary in appearance depending on the manufacturer, but you should use the same insertion guidelines.

Step	Action

- 1. On the PPM and RTM front panels, remove the filler plugs from the sockets where the transceivers will be installed.
 - Keep the filler plugs in place for any unused or empty sockets to protect the sockets and to control airflow.
 - If SFP or SFP+ transceivers are removed, install either replacement transceivers or filler plugs in the sockets to protect the sockets and control airflow.
- 2. Make sure the transceiver's bail clasp (the latch on the cable side of the transceiver) is in the closed position. This ensures that the transceiver snaps into position when inserted

into the socket (Figure 2.18).



Figure 2.18 - SFP Orientation

- 3. Insert the transceiver so the connector side is down (Figure 2.18).
- 4. Carefully slide the transceiver into the socket until its connector is fully seated and snaps into position.
- 5. Repeat the previous steps for each transceiver being installed on the PPM40 blades and their associated RTMs.
- 6. For transceivers with cable plugs installed, keep the plugs in place until you are ready to connect cables to the transceivers. The cable plugs protect the transceiver internal components.

Install the PPM40 RTM

Install the PPM40 RTM PRIOR to installing the PPM40 front module in the TD140 chassis.

- 1. Remove the filler panel in the rear shelf slot where the RTM will be installed.
 - 2. Open both ejector latches on the RTM (Figure 2.19).



Figure 2.19 - RTM Handle Locking Latch



If the RTM uses locking ejector latches, do not force the ejector latch open. Make sure the release is pushed in before pulling the handle out. Refer to Figure 2.19.

- 3. Slide the RTM into the empty rear shelf slot.
- 4. Close both ejector latches and tighten the two retaining screws.

Install the PPM40

This procedure assumes you are installing the PPM in an ATCA shelf and the shelf power is on. The ATCA shelf architecture lets you insert and remove the PPM from the shelf without powering down the system.

1. Open both PPM locking ejector handles outward as indicated in the illustration below.



Do not force the ejector latches open. Make sure the release is pushed in before pulling the handle out. Refer to Figure 2.19.



Figure 2.20 - PPM40 Handle Locking Latch

- With both ejector handles fully open, slide the PPM into the shelf node slot until the ejector latches touch the front of the shelf. The PPM is correctly aligned and inserted when:
 - The PPM edges fit within the narrow shelf guide rails.
 - A hook on each ejector latch slides into a notch in the shelf just before the latch touches the shelf.
 - The PPM mates with the alignment receptacles of the corresponding RTM (if installed).
- 3. When the PPM is inserted all the way into the shelf, simultaneously close both ejector handles inward. This seats the PPM connectors into the shelf backplane (Figure 2.21).



Figure 2.21 - Close Handles

- 4. Secure the PPM in its slot by hand-tightening the retaining screws on each end of the PPM front panel.
- 5. For initial TD140 installs, continue with **Chapter 3** to connect power cables to the TD140 and power the unit up.

TD140 Power Cabling and System Power Up

CABLING OVERVIEW

This chapter provides the following cabling information. See also TD140 Installation Process for an overview of the entire TD140 installation process.

- Connect Power Cabling
 - Power Cabling Lug Specifications
- Power Up the TD140

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CONNECT POWER CABLING

This section provides the following procedures:

- Connect the Shelf Ground Cable
- Connect the Power Feed Cables to the PEMs



An electrical voltage of up to 75 VDC may be present at any power connection. Take safety precautions or consult an electrician when installing or connecting electrical equipment. Failure to follow electrical precautions may result in personal injury or damage to electronic equipment. Examples of safety precautions include:

- Before powering up the shelf, connect shelf ground terminals to the grounded conductor/protective earth (PE) of the building.
- Do not touch a power cable when power is supplied.
- Do not place wires, screwdrivers, meter probes, oscilloscope probes, or other electrically conducting material into contact with a live power cable or anything connected to a live power cable.
- Do not wear any watches, bracelets, or rings when working with a live power cable or anything connected to a live power cable.
- Disconnect power from both Power Entry Modules (PEMs) before servicing.

Power Cabling Lug Specifications

Table 3.1 provides information about power and grounding lugs.

PEM Power Lugs	 Dual M4, 21mm lugs Tek PN: 131865800 Manufacturer: K. S. Terminals TCLH16-4-2A-IDB019 Accepts 6 AWG wire 	9 9 9 9 9 9 9 9 9 9 9 9 9 9
Crimper for 6 AWG PEM lug	 Tek PN: 003193600 Manufacture: KS Terminal KST2000D-1516 Will use Die Index 16 for the K.S. Terminal lug listed above. 	

Table 3.1 - Power Lug Specifications

Grounding Lug SAE dual ½ Accepts 14	a" x 5/8" lug 10 AWG wire	M6 15,9 mm	
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Table 3.1 - Power Lug Specifications (Continued)

Connect the Shelf Ground Cable

Perform the following steps to connect the shelf ground cable to the platform.

with ground cable attached

Step	Action
1.	If you are wearing an ESD wrist strap, take it off. For maximum safety, keep one hand behind your back and use tools with properly insulated handles.
2.	Verify the shelf's connections to the supply circuit will not overload the circuit's over- current and supply wiring. The supply should be capable of delivering the equipment nameplate ratings of -48 V @ 40 A or greater or -60 V @ 40 A or greater.
3.	Use a wrench to remove the hex nuts and washers from the shelf ground terminals at the left rear part of the shelf, then set them aside.
4.	Connect the shelf ground cable to the shelf ground terminals.
5.	Reattach the washers and hex nuts. Torque the hex nuts to 5.1 Nm (45 lbf-in). See Figure 3.1 .
	Shelf ground terminals



6. Connect the other end of the shelf ground cable to a high-quality facility ground connection. Failure to connect the shelf to a high-quality ground connection may reduce the performance and availability of the shelf and the equipment that connects to it. Improper grounding may also increase electrical noise in the shelf, causing data loss and other performance degradation.

Connect the Power Feed Cables to the PEMs

Perform these steps to route the power feed cables and connect them to the power entry modules (PEMs) located on the back of the TD140.



Ensure that power to the power feed cables is OFF before routing and connecting the cables.

Route the Cables and Remove the PEM Hardware

Step Action

1. Route two power feed cables to one of the PEMs at the rear of the shelf, but do not yet attach them to a power connection. Route the power feed cables so they do not block access to the other components on the rear of the shelf.



Do not remove the PEM safety cover if power is applied to the shelf.

- 2. Unclip the safety covers. Remove the covers and expose the power connectors.
- 3. Use a wrench to remove the hardware from each of the power connector posts on the PEM, then set the hardware aside.

Attach the Power Feed Cables

The power feed cables must be attached so they do not block access to shelf components, such as PEM switches. When the power feed cable is attached to the PEM, ensure the shrink tubing completely covers the terminal lug so no lug metal is exposed (Figure 3.2).

Two methods are described for attaching the cables, with the preferred method strongly recommended for minimizing blockages:

- Preferred Method
- Alternate Method

Preferred Method

Figure 3.2 shows the power feed cables connected to the PEMs. Connect the power feed cables with terminal lugs to the appropriate PEM connectors as shown in **Figure 3.2**. Check the labels next to the connectors for polarity.



Figure 3.2 - Connected Power Feed Cables (Preferred Method)

Alternate Method



The power feed cables are not modified for this alternate method.

Step	Action

 Connect the power feed cables to the appropriate PEM connectors as shown in Figure 3.3. Note that the cables for the left PEM are routed to the right side of the PEM connector. Check the labels next to the connectors for polarity.

Figure 3.3 also shows the rear of the optional AC power supply positioned on top of the shelf.



Figure 3.3 - Connected Power Feed Cables (Alternate Method)

Reattach the PEM Hardware and Safety Cover

- Step Action
- 1. Reattach the removed PEM hardware. Torque the nuts to 1.5Nm / 13 in LB.
- 2. Reattach the PEM safety covers by clipping them into place.
- 3. Repeat the steps for the other PEM.

Power Up the TD140

Perform the following steps to power up the TD140:

- 1. Make sure the shelf ground terminals are connected to the grounded conductor/ protective earth (PE) of the building before powering up the shelf.
- 2. One at a time, switch the PEM circuit breakers to the ON position.
- 3. Verify the power LEDs on the PEMs are solid green.
- Observe the four LED status lights on the ShMC. If the module is operating properly, the LEDs display the states shown in Table 3.2.

Idule 3.2 - SIING LED Sidles	Table	3.2 -	ShMC L	LED	States
------------------------------	-------	-------	--------	-----	--------

LED	State	Explanation
Out of Service (OOS)	Off	Operating normally
Power Good (PG)	Green On	Power is good from all supplies
Active (ACT)	Amber On	Active (performing assigned application)
Hot Swap (HS)	Off	Running

5. Verify the link and port status for the ShMC by observing the Ethernet port LEDs and referring to **Table 3.3**.

Table 3.3 - Link and Port Status

LED purpose	Color	State	Explanation	LED location
Link status	Green or amber	Steady green	1000 Mbps	
		Steady amber	100 Mbps	Link Port
		Blinking	Link active	
		Off	No link established	
Port status	Green	Green	Port enabled	
		Off	Port disabled	

- 6. Verify the following LEDs on the PPM40 and PPM40 RTM:
 - OOS LED is OFF indicating no errors
 - PWR LED is green, indicating power to the blade is normal



- *If LEDs are behaving differently than described in this procedure, contact Tektronix Communications Customer Support prior to continuing.*
 - 7. Continue with Chapter 4, TD140 Network Connectivity Configuration.

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TD140 Network Connectivity Configuration

CONFIGURE NETWORK CONNECTIVITY

A Web-based configuration GUI enables you to configure the following parameters required for TD140 network connectivity:

Configure TD140 Name	The configured name appears on TD140 web console and RSM shell prompt (for Tektronix Communication engineers).	
Configure IrisView	Configure the IP address and ports for communications with the IrisView server. Note that you must know the IrisView Provisioned Heartbeat and SNMP Trap Ports in order to complete network connectivity for the TD140. See also TD140 Installation Process for an overview of the entire TD140 installation process.	
Configure Public Management	 Configure the IP address and port for OAM access on Port B of the ShMC. Port B has two IP addresses: ETH3:1 configured with IP address and port you assign for OAM access ETH3 with default settings (you will disable this IP address when configuration of ETH3:1 is complete) IP = 192.168.101.194 NM = 255.255.255.0 GW = 192.168.101.1 	
Configure Persistency IP Configure the IP address for the TD140 to receive persistence data.		

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Perform the following steps required to configure network connectivity for the TD140.

 Connect an Ethernet cable to a laptop or PC and to Port A (Figure 4.1) on the TD140 Shelf Management Controller (ShMC). DO NOT connect the OAM cable to Port B until Network Connectivity is complete.



Figure 4.1 - TD140 ShMC Port A

 Connect an Ethernet cable to the ETH port on the front of the PPM40 blade in Slot 1 (Figure 4.2).



Figure 4.2 - TD140 PPM40 Blade

3. On the laptop or PC, set the Local Area Connection properties for TCP/IPv4 to the following:

IP Address	10.90.91.100
Subnet Mask	255.255.255.0
Gateway	10.90.91.1

 Open a Web browser. In the Web browser Address field, enter the following URL and press enter: http://10.90.91.93:3002/lbipconf.html (all lowercase). A login page appears (Figure 4.3).

TD140 Conf	iguration
User ID	
Password	•
Log In	

Figure 4.3 - TD140 Web GUI - Login

5. Log in using the user ID and password provided by Tektronix for TD140 configuration.

6. A configuration menu page appears (Figure 4.4).



Figure 4.4 - TD140 Web GUI - Menu

7. Select Configure TD140 Name. The following Web page appears (Figure 4.5).

TD140 C	onfiguration	
Configure TE	0140 name	
Configure Iris	View	
Configure Pu	blic Management	
Configure Pe	rsistency IP	
TD140 name	TD140_DFW	*
Apply Reset		

Figure 4.5 - TD140 Web GUI - Configure TD140 Name

8. Enter a descriptive name for the device. The configured name appears on TD140 web console (Figure 4.6) and RSM shell prompt (for Tektronix Communication engineers).



Figure 4.6 - TD140 Web GUI - Menu

9. Select **Configure IrisView**. The following Web page appears (Figure 4.7).



See Chapter 1 for details about Network Connectivity Requirements. Note that you must know the IrisView Provisioned Heartbeat and SNMP Trap Ports in order to complete network connectivity for the TD140.

TD140 Configuration	
Configure TD140 name	
Onfigure IrisView	
Configure Public Management	
Configure Persistency IP	
 Configure IP Address Configure Port Ip Address (IPv4/IPv6) 	*
Apply Reset	

Figure 4.7 - TD140 Web GUI - IrisView Configuration - IP Address

- 10. Enter the IP address of the IrisView server, and click Apply.
- 11. Select Configure Port. The following Web page appears (Figure 4.8).

TD140 C	onfiguration	
Configure TI	D140 name	
Configure Iri	sView	
Configure Pu	iblic Management	
Configure Pe	ersistency IP	
Configure IP	Address Configure Port	
Choose Port	◉ Heartbeat Port © Trap	
Port Number		*
	1	

Figure 4.8 - TD140 Web GUI - IrisView Configuration - Port

- 12. Select **Heartbeat Port**, enter the Heartbeat port provisioned on the IrisView server and click **Apply**. See **IrisView Provisioned Heartbeat and SNMP Trap Ports** for details.
- Select Trap, enter the SNMP Trap Receiver port provisioned on the IrisView server, and click Apply. See IrisView Provisioned Heartbeat and SNMP Trap Ports for details.

 Select Configure Public Management. The following Web page appears (Figure 4.9). The asterisks (*) indicate mandatory fields.



The Public Management IP can be configured only once through web console. If already configured, the Configure Public Management IP option is disabled and can only be reconfigured by Tektronix Communications Engineers using CLI.

TD140 Configuration	
Configure TD140 name	
Configure IrisView	
Configure Public Management	
Configure Persistency IP	
◉ IpV4 © IpV6	
Ip Address	*
Netmask	*
Gateway	
Apply Reset	

Figure 4.9 - TD140 Web GUI - Public Management Configuration

15. Enter the IP address and Netmask the TD140 will use for the OAM Port B and click Apply.

When you apply the configuration, a page displays indicating whether the configuration was successful or if the configuration failed. If the configuration failed, click the **Try Again** link and try the configuration again; if it fails a second time, contact Tektronix Communications Customer Support for assistance in checking the /tmp/oamm/oamm.log log file.

 Select Configure Persistency IP. The following Web page appears (Figure 4.10). The asterisks (*) indicate mandatory fields.

TD140 Con	figuration	
Configure TD140	name	
Configure IrisViev	V	
Configure Public 1	Management	
Configure Persiste	ncy IP	
◉ IpV4 ◎ IpV6		
Ip Address		*
Netmask		*
Gateway		
Apply Reset		

Figure 4.10 - TD140 Web GUI - Persistency IP Configuration

17. Enter the IP address and Netmask the TD140 will use for the Persistence Data port and click **Apply**.

If the configuration failed, click the **Try Again** link and try the configuration again; if it fails a second time, contact Tektronix Communications Customer Support for assistance in checking the /tmp/oamm/oamm.log log file.

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TD140 Ethernet Cabling

CABLING OVERVIEW

This chapter provides the following Ethernet cabling information. See also TD140 Installation Process for an overview of the entire TD140 installation process.

- Ethernet Cabling Diagram
- Default Port Settings
- TD140 Ingress/Egress Data Flow

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Ethernet Cabling Diagram

Figure 5.1 shows the ingress and egress cable connections for the TD140 load balancer. See also Supported SFP or SFP+ Transceivers for SFP details. *DO NOT connect the OAM cable to Port B until Network Connectivity is complete.*



Figure 5.1 - TD140 Ethernet Ports

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Table 5.1 lists the TD140 Ethernet Cables/Connections.

Table 5.1 -	- TD140 Ethernet Cabl	les/Connections
-------------	-----------------------	-----------------

Cable Type		TD140 Connection	Connects To
1	CAT5e or CAT6, Shielded 1G Ethernet, 1000base-T via RJ45	Shelf Management Controller (ShMC) OAM port PPM40 blade 1, ETH port	Local Area Network
2	10G Fiber Optic	PPM40 blades, Ports 1-4 PPM40 RTMs, Ports 5-8	G10 probes TRM100 RTM or IIC200 10G ports
3	1G or 10G Fiber Optic	PPM40 RTMs Ports 9-16	Taps, spans, or aggregation

Default Port Settings

Table 5.2 lists the default port settings for the TD140.

Table 5.2 - TD140 Default Port Settings

TD140 Port	Speed	Negotiation	Data Transmission
OAM Port (Shelf Management Module)	1 Gbps	Auto	Full duplex
ETH Port (PPM40 Blade 1)	1 Gbps	Auto	Full duplex
10G ports (PPM40 Ingress and Egress ports)	10 Gbps	Auto	Full duplex

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TD140 Ingress/Egress Data Flow

Figure 5.2 shows the ingress and egress data flow for the TD140 traffic distributor. Ingress refers to the ports on which data from the network is entering the TD140. Egress refers to ports on which packet data updated with metadata is transmitted out of the TD140 to the G10 probes.

Figure 5.2 - TD140 Ingress/Egress Data Flow Diagram

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TD140 Administration

TD140 Administration (IrisView Admin GUI)

Once the TD140 is physically installed, the system installer configures the TD140 with the IP address it needs to establish communications with the Iris Server for configuration and maintenance (see Configure Network Connectivity).

After the TD140 connects to the IrisView server, you can view it in the Iris system using a URL defined at system install (for example, http://<iris server>:8080). After logging in, go to Admin>System Config>Probes. All G10 probes and TD140s appear in the Probe Tab (see Figure 6.1).

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Figure 6.1 shows the Probe List in the Probe tab.

Filter list by type, group												
or connection status												
Probe List	Ports		Details	Details		Managed Probes						
TODE LISK	Port Set	tings for Td14	10 4104									
Type: Filter by Type Y Group: Filter by Group Y												
Connection Status: Filter by Connection Status	Ingress	Ports							Egress Ports			
- 📰 FAKE003	ID	Name	Direction	Gb	Enabled	TXEnabled	Op Mode	Member Of	ID	Name	Gb	Linked G1
Tort40 4102 Tort40 4103 Tort40 4104 Solution Tree view shows probes managed by TD140 shows by TD140 shows Tree view shows probes managed by TD140 shows by TD140 sh	161	Port 01-09	Tx	10	true	true	Negotiate		145	Port 01-01	10	None
	162	Port 01-10	Tx	10	true	true	Negotiate		146	Port 01-02	10	None
	163	Port 01-11	Tx	10	true	true	Negotiate		147	Port 01-03	10	None
	164	Port 01-12	Tx	10	true	true	Negotiate		148	Port 01-04	10	None
	165	Port 01-13	Tx	10	true	true	Negotiate		149	Port 01-05	10	None
🔁 g307	166	Port 01-14	Tx	10	true	true	Negotiate		150	Port 01-06	10	None
··· 털 g309	167	Port 01-15	Tx	10	true	true	Negotiate		151	Port 01-07	10	None
i go12 	168	Port 01-16	Tx	10	true	true	Negotiate		152	Port 01-08	10	None
3	169	Port 02-09	Tx	10	true	true	Negotiate		153	Port 02-01	10	None
	170	Port 02-10	Tx	10	true	true	Negotiate		154	Port 02-02	10	None
	171	Port 02-11	Tx	10	true	true	Negotiate		155	Port 02-03	10	None
	172	Port 02-12	Tx	10	true	true	Negotiate		156	Port 02-04	10	None
	173	Port 02-13	Tx	10	true	true	Negotiate		157	Port 02-05	10	None
	174	Port 02-14	Tx	10	true	true	Negotiate		158	Port 02-06	10	None
	175	Port 02-15	Tx	10	true	true	Negotiate		159	Port 02-07	10	None
	176	Port 02-16	Tx	10	true	true	Negotiate		160	Port 02-08	10	None
Paging controls added to												
manage long list of configured												
probes and TD140s												
probes and 10 140s												
I I Page 1 of 1 ▶ ▶ 1-9 of 9	۲											
5 of 11 total devices connected	Delete TD140 Device Add to Group Save Cancel											
									_			

Figure 6.1 - Probe Tab - Probe List

When you select a TD140 in the list, the right side pane shows the following three tabs.

- Ports
- Details
- Managed Probes

Refer to the Admin Online help or the *Operations, Administration, and Maintenance Guide* for complete details on TD140 GUI.

TD140 CONFIGURATION WORKFLOW

For first time setup, it is recommended you follow these steps to ensure optimum provisioning of the TD140.

- 1. Bind G10 Probes to TD140
- 2. Define TD140 Ingress and Egress Port Settings
- 3. Define TD140 Details
- 4. Define Managed Probe Details
- 5. Define TD140 Physical Links
- 6. Configure G10 Settings

Refer to the Admin Online help or the O*perations, Administration, and Maintenance Guide* for complete details on TD140 configuration.

TD140 System Alarms

The TD140 sends alarms to the IrisView server; you can view the alarms in the Alarms Dashboard. Refer to the Iris online help for details about the TD140 alarms, including probable cause and recommended action.

TD140 SOFTWARE UPGRADES

You can perform TD140 software upgrades using the Software tab in Iris Admin to create upgrade campaigns. A campaign is a defined set of configuration parameters for upgrading software packages for one or more TD140s. Campaigns enable you to:

- Perform individual or multi-TD140 software upgrades
- Schedule TD140 activation during non-peak hours

Refer to the Admin Online help or the **Operations, Administration, and Maintenance Guide** for complete details on TD140 software upgrades.

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