

# Arm<sup>®</sup> DSTREAM-HT

Version 1.0

## Getting Started Guide



# Arm® DSTREAM-HT

## Getting Started Guide

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### Release Information

### Document History

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0100-01	13 December 2019	Non-Confidential	Documentation update for version 1.0 release

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- Recycle it using local WEEE recycling facilities. These facilities are now very common and might provide free collection.
- If purchased directly from Arm, Arm provides free collection. Please e-mail [weee@arm.com](mailto:weee@arm.com) for instructions.

The CE Declaration of Conformity for this product is available on request.

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It is recommended that ESD precautions be taken when handling this product.

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- Ensure attached cables do not lie across any sensitive equipment.
- Reorient the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Note

It is recommended that wherever possible shielded interface cables be used.

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# Preface

This preface introduces the *Arm® DSTREAM-HT Getting Started Guide*.

It contains the following:

- [About this book on page 8.](#)

## About this book

Describes the DSTREAM-HT debug and trace system which enables you to debug and optimize your software on Arm® processor-based hardware targets.

## Using this book

This book is organized into the following chapters:

### Chapter 1 Introduction

DSTREAM-HT is a debug and trace hardware system that enables software debug and trace for the optimization of software running on Arm processor-based targets.

### Chapter 2 Set up your DSTREAM-HT

This chapter contains instructions about connecting the DSTREAM-HT system to your host PC and target system.

### Chapter 3 Work with your DSTREAM-HT

Arm DSTREAM-HT is a comprehensive solution for the development and debug of complex Arm-based devices. This chapter explains some of the ways you can use DSTREAM-HT to work with your targets.

### Chapter 4 Troubleshooting

This chapter describes the steps that you need to take when your DSTREAM-HT system does not function as expected.

## Glossary

The Arm® Glossary is a list of terms used in Arm documentation, together with definitions for those terms. The Arm Glossary does not contain terms that are industry standard unless the Arm meaning differs from the generally accepted meaning.

See the [Arm® Glossary](#) for more information.

## Typographic conventions

### *italic*

Introduces special terminology, denotes cross-references, and citations.

### **bold**

Highlights interface elements, such as menu names. Denotes signal names. Also used for terms in descriptive lists, where appropriate.

### `monospace`

Denotes text that you can enter at the keyboard, such as commands, file and program names, and source code.

### monospace

Denotes a permitted abbreviation for a command or option. You can enter the underlined text instead of the full command or option name.

### `monospace italic`

Denotes arguments to monospace text where the argument is to be replaced by a specific value.

### `monospace bold`

Denotes language keywords when used outside example code.

### <and>

Encloses replaceable terms for assembler syntax where they appear in code or code fragments. For example:

```
MRC p15, 0, <Rd>, <CRn>, <CRm>, <Opcode_2>
```



#### SMALL CAPITALS

Used in body text for a few terms that have specific technical meanings, that are defined in the *Arm® Glossary*. For example, IMPLEMENTATION DEFINED, IMPLEMENTATION SPECIFIC, UNKNOWN, and UNPREDICTABLE.

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- The product revision or version.
- An explanation with as much information as you can provide. Include symptoms and diagnostic procedures if appropriate.

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- The number 101760\_0100\_01\_en.
- If applicable, the page number(s) to which your comments refer.
- A concise explanation of your comments.

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## Other information

- *Arm® Developer*.
- *Arm® Information Center*.
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- *Technical Support*.
- *Arm® Glossary*.

# Chapter 1

## Introduction

DSTREAM-HT is a debug and trace hardware system that enables software debug and trace for the optimization of software running on Arm processor-based targets.

DSTREAM-HT provides an interface between a host such as Arm Development Studio and an Arm processor-based target using a hardware interface such as JTAG or Serial Wire Debug (SWD). DSTREAM-HT also enables the collection of up to six lanes of HSSTP trace for powerful code optimization.

The DSTREAM-HT debug system is made up of a standard Arm DSTREAM-ST unit, along with an additional Arm HSSTP probe, enabling:

- Debug on Arm processors from Armv4 to Armv8.
- USB 3.0 and remote Gigabit Ethernet host connections.
- Code download speeds of up to 12MB per second.
- JTAG clock of up to 180MHz.
- Serial Wire Debug of up to 125MHz (standard single-ended signaling).
- A wide range of target connectors.
- Up to six lane HSSTP trace support (up to 60Gbps maximum trace bandwidth).
- Up to two lanes of SETM trace.
- Flexible HSSTP lane rates of up to 12.5Gbps.
- Up to 4-bit parallel trace support (up to 2.4Gbps maximum trace bandwidth).
- Flexible DDR trace clock timing of up to 300MHz (600Mbits/s, per pin).
- 8GB of trace memory storage on the HSSTP probe.
- Support for up to 1022 CoreSight™ devices.
- Remote target reset.
- Device bring-up and test utilities.
- Flexible architecture to support third party IP and debuggers.

For more feature information, see the [DSTREAM-HT web page](#) on the Arm Developer website.

For the purposes of this content:

- The term DSTREAM-ST refers only to the DSTREAM-ST unit.
- The terms DSTREAM-HT or DSTREAM-HT system refer to both the DSTREAM-ST unit and HSSTP probe working in combination.

This chapter describes the DSTREAM-HT hardware.

It contains the following sections:

- [1.1 Buy Arm® DSTREAM-HT](#) on page 1-12.
- [1.2 Arm® DSTREAM-HT box contents](#) on page 1-13.
- [1.3 The DSTREAM-ST unit](#) on page 1-16.
- [1.4 The HSSTP probe](#) on page 1-21.

## 1.1 Buy Arm® DSTREAM-HT

Arm has over 100 trusted distributors around the world offering products, training, and support.

You can [contact them](#) to buy DSTREAM-HT.

For debug unit product comparisons, and more information about purchasing options, see the **Debug Probe** subset of tools in the [Arm Developer Store](#).

For OEM licenses, contact Arm directly at [salesinfo@arm.com](mailto:salesinfo@arm.com).

### *Related concepts*

[1.2 Arm® DSTREAM-HT box contents](#) on page 1-13

## 1.2 Arm® DSTREAM-HT box contents

The DSTREAM-HT product box contains the required components to set up and connect your host PC to your Arm architecture-based development board.

The items are:

- DSTREAM-ST unit.



Figure 1-1 DSTREAM-ST unit

- High Speed Serial Trace (HSSTP) probe.



Figure 1-2 HSSTP Trace probe

- Power supply unit and associated cables.



Figure 1-3 DSTREAM-HT power supply and cables

- 60-way Auxiliary (AUX) host port cable



Figure 1-4 60-way Auxiliary (AUX) host port cable

- CoreSight 10/20-way 0.05" pitch ribbon cable.



**Figure 1-5 CoreSight 10/20-way 0.05" pitch ribbon cable**

- CoreSight Short 20-way 0.05" pitch ribbon cable.



**Figure 1-6 CoreSight Short 20-way 0.05" pitch ribbon cable**

- JTAG 20-way 0.1" pitch ribbon cable.



**Figure 1-7 JTAG 20-way 0.1" pitch ribbon cable**

- HSSTP 40-way co-axial ribbon cable.



**Figure 1-8 HSSTP 40-way co-axial ribbon cable**

- JTAG 14-way Texas Instruments adapter.



**Figure 1-9 JTAG 14-way Texas Instruments adapter**

- MICTOR 38-way 4-bit adapter.



**Figure 1-10 MICTOR 38-way 4-bit adapter**

- Ethernet cable.  
(Not pictured)
- USB 3.0 cable.  
(Not pictured)

***Related concepts***

*1.1 Buy Arm® DSTREAM-HT on page 1-12*

***Related tasks***

*2.3 Connect and power up the DSTREAM-HT system on page 2-28*

## 1.3 The DSTREAM-ST unit

The DSTREAM-ST unit provides the hardware interface to connect the host computer to your target.

### Rear

The rear of the DSTREAM-ST unit contains ports for connecting to the network, host PC, and the power source. It also contains the **RESET** button and the **USER IO** port.

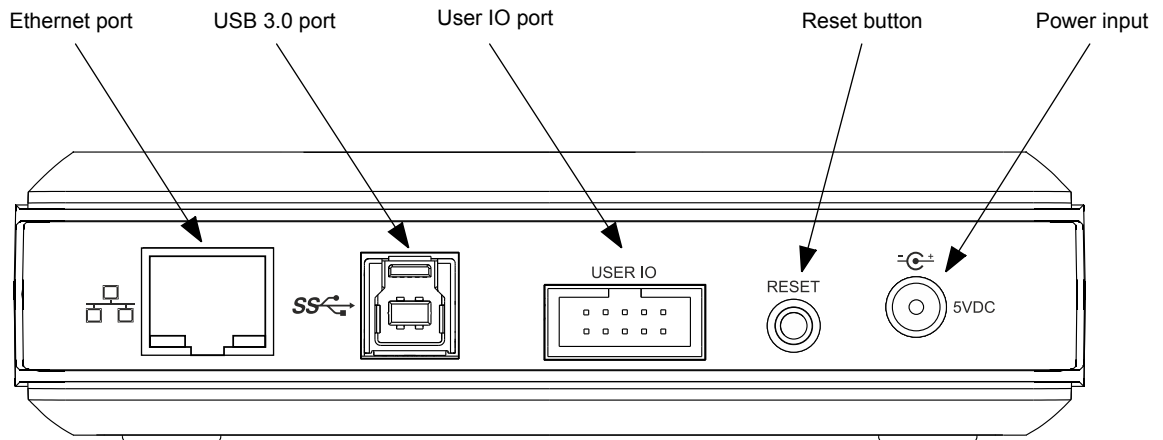


Figure 1-11 Rear of the DSTREAM-ST unit

### Ethernet port

If you want to access your DSTREAM-ST unit over a local area network, use the Ethernet port.

The green LED indicates that the Ethernet link is up and running. The yellow LED indicates that activity is taking place. Supported data rates are: 10/100/1000 Mbps.

DSTREAM-ST is a Gigabit Ethernet (GbE) device. To achieve the maximum GbE data transfer rate:

- Your PC must support the GbE standard.
- Your network infrastructure must support the GbE standard.
- You must use the included GbE cable.

### USB 3.0 port

To connect the DSTREAM-ST unit directly to your host PC, use the USB 3.0 port.

DSTREAM-ST is a USB 3.0 device. To achieve the maximum USB 3.0 data transfer rate:

- Your PC must have a USB 3.0 port.
- You must use the included USB 3.0 data cable.

Longer or lower-quality cables might not operate at USB 3.0 data transfer rates because of higher signal loss. In this event, DSTREAM-ST reverts to USB 2.0 mode.

### USER IO port

Use the USER IO port to set up custom input or output connections to your target. See the [Arm DSTREAM-HT System and Interface Design Reference Guide](#) for more details.



## RESET Button

To reset the DSTREAM-ST unit, press and release the RESET button. The RESET button operates immediately and performs a full internal power-cycle. This also resets any attached probes.

### Warning

Always use the RESET button to power-cycle your DSTREAM-ST unit. Disconnecting and re-connecting the DC plug to power-cycle your target might cause ground-loop issues.

### Note

If you continue to hold the RESET button for 10 seconds more, the STATUS LED flashes red rapidly. When you release the RESET button after this point, DSTREAM-ST reboots and defaults back to factory installed firmware. Use the [Debug Hardware Firmware Installer view](#) in Arm Development Studio to update the firmware of your DSTREAM-ST unit.

## Power input

Connect the power adapter provided with the DSTREAM-ST unit to this port.

### Note

When using DSTREAM-ST with the HSSTP probe, you must use the dual power cable provided with the power supply unit.

## Front

The front of the DSTREAM-ST unit contains ports for connecting to your target.

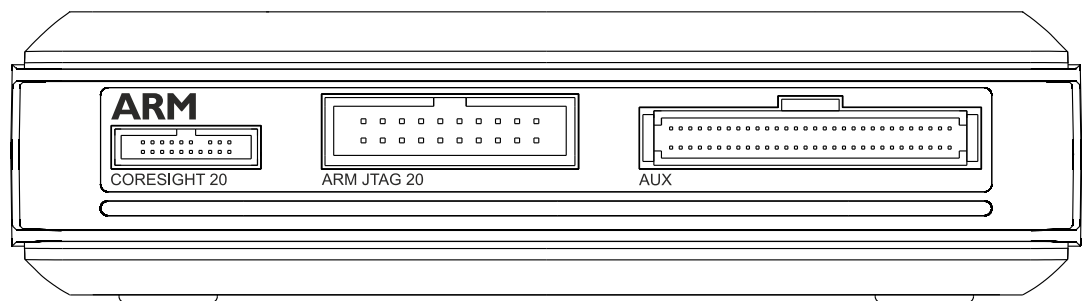


Figure 1-12 Front of the DSTREAM-ST unit.

## CORESIGHT 20

A high-density connector that supports 10-way or 20-way CoreSight standards in addition to a subset of the MIPI debug connection standards. It provides support for Serial Wire and JTAG interface modes in a 20-pin (0.05") connector.

### Note

To achieve the highest possible trace data rate, Arm recommends using the short, 15cm ribbon cable.

## ARM JTAG 20

JTAG 20 provides support for Serial Wire and JTAG interface modes in a 20-pin (0.1") connector.

## AUX

This port is included to connect DSTREAM-ST with external probe units such as the HSSTP probe.

### Other connectors

Included with DSTREAM-ST are:

- **Texas Instruments 14-way adapter** - Used in conjunction with the Arm JTAG 20 cable, provides debug access to any target with a TI JTAG 14 header.
- **MICTOR adapter** - Used in conjunction with the Arm JTAG 20 and CoreSight 20 cables, this adapter provides debug and trace access to any target with a MICTOR socket.

#### **Note**

To achieve full MICTOR connectivity, you must use both the Arm JTAG 20 and CoreSight 20 cables.

### Optional adapters

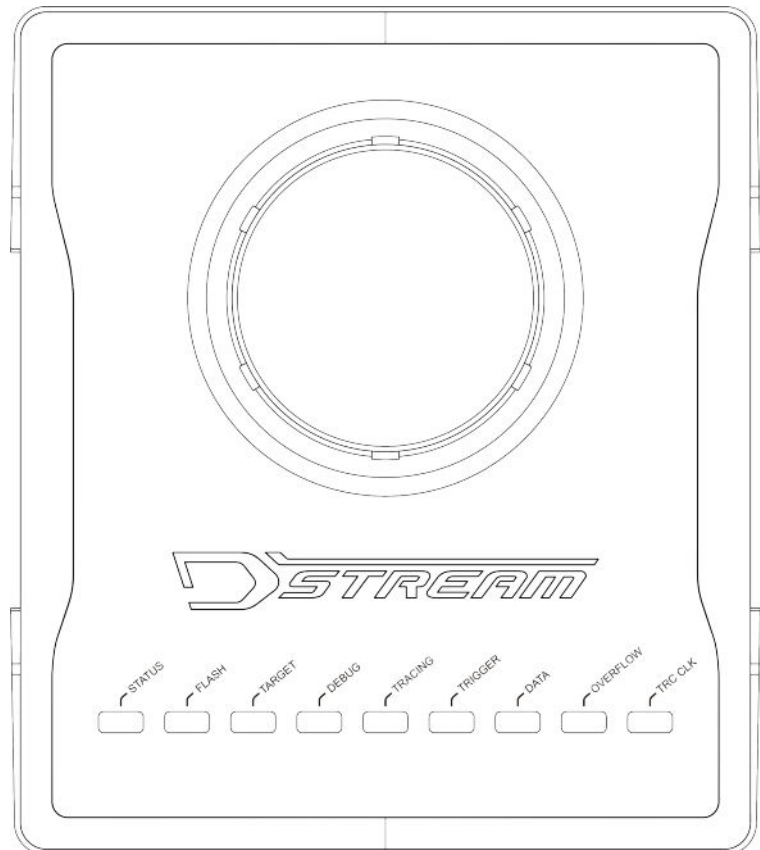
The following adapters are also available for use with DSTREAM-ST. Each of these allows DSTREAM-ST to capture up to 4-bit wide ETM trace, and also allows the use of separate debug and trace power domains.

- **MIPI-34 adapter** - This adapter connects directly to the front panel of DSTREAM-ST. The adaptor is supplied with a MIPI-34 ribbon cable to provide debug and trace access to any target with a MIPI-34 header.
- **MIPI-60 adapter** - This adapter plugs into a target's MIPI-60 socket and converts it to a MICTOR socket for use with the DSTREAM-ST MICTOR adapter.

To obtain optional adapters, [contact Arm support](#) with your requirements.

### Indicator LEDs on the top

When you power up the DSTREAM-ST unit, the LEDs on top of the unit indicate the status of the unit.



**Figure 1-13 Indicator LEDs**

## DSTREAM logo

The DSTREAM logo on the top of the unit illuminates and the **STATUS** LED begins to flash when you power up the DSTREAM-ST unit. The DSTREAM logo also flashes when you click the **Identify** button in the *Debug Hardware Configure IP view* or the *Debug Hardware Firmware Installer view* in Arm Development Studio.

## STATUS

Illuminates green to show that DSTREAM-ST is in its ready state.

If a critical error is detected, the **STATUS** LED illuminates as continuous red. If the **STATUS** LED is red, then you must reset the DSTREAM-ST unit to the factory settings before you can continue using it. If the DSTREAM-ST unit fails to boot after a reset, *contact Arm support*. For more information, see *Restore a DSTREAM-HT system on page 4-43*.

## FLASH

Illuminates when the unit is accessing its internal flash storage.

## TARGET

Illuminates when a valid target VTREF is detected.

## DEBUG

Illuminates when debug data transfer takes place.

## TRACING

Indicates that DSTREAM-ST is attempting to capture data and synchronize with the trace stream.

## TRIGGER

Indicates that a trigger is present in the trace data.

## DATA

Indicates that trace synchronization is complete and DSTREAM-ST is capturing trace data. Trace synchronization is when the DSTREAM-ST unit detects a full synchronization packet and aligns with the trace data stream.

## OVERFLOW

Indicates an overflow-condition during trace capture. An overflow condition occurs if it has not been possible to stream trace data to the host PC at a high enough rate. For example, if the USB port is only operating in USB 2.0 mode, if the Ethernet port is only operating at 100Mbps, or if other applications on the host PC are using too much USB or Ethernet bandwidth.

In general, when streaming trace data, the best practice is to keep usage of other applications, on the host PC, to a minimum.

## TRC CLK

This LED is for parallel trace only.

If the **TRC CLK** LED is green, it indicates that a valid trace clock is detected. This is the normal condition when capturing trace data from a target.

If the **TRC CLK** LED is off, then no parallel trace clock signal is detected.

If the **TRC CLK** LED is red and flashing, it indicates that the received trace clock frequency is too high or too low to be captured.

## Related concepts

*1.4 The HSSTP probe on page 1-21*

***Related tasks***

*2.3 Connect and power up the DSTREAM-HT system on page 2-28*

## 1.4 The HSSTP probe

The HSSTP probe provides the hardware interface to connect the DSTREAM-ST unit to the HSSTP port of your target.

### Rear

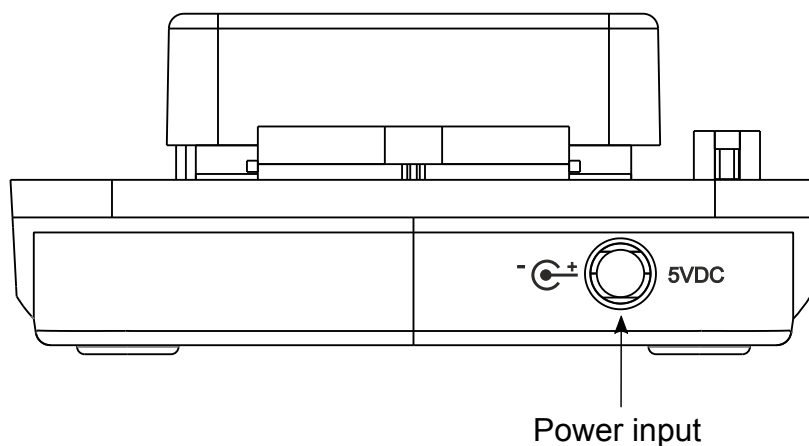


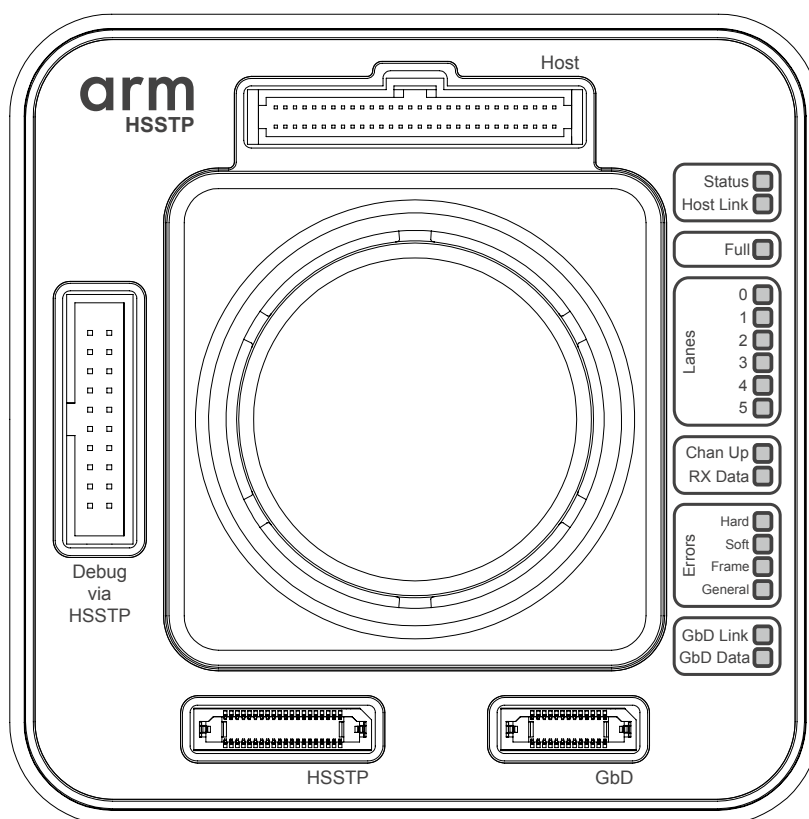
Figure 1-14 Rear of HSSTP Trace probe

### Power input

Connect the power supply unit to **Power input** port using the dual power cable.

### Top

The top of the HSSTP probe has connectors for connecting to a DSTREAM-ST unit and to a target.



**Figure 1-15 Top of HSSTP Trace probe**

### Host connector

Connects to the DSTREAM-ST unit using a 60-way ribbon cable. The **Host** connector also controls the HSSTP probe and retrieves trace data from it.

### Debug via HSSTP connector

Passes debug signals from DSTREAM-ST unit to the trace connector. When used, it connects to the DSTREAM-ST unit using the Arm JTAG 20 cable.

If the target uses separate debug and trace connectors, the debug connection must be made directly between the DSTREAM-ST unit and the target, leaving this connector, on the HSSTP probe, unused.

### HSSTP connector

Connects to the target trace connector via an HSSTP 40-way co-axial ribbon cable.

### GbD connector

This connector is currently reserved, and is not used in Arm Development Studio.

### Indicator LEDs

When you power-up the HSSTP probe, the LEDs on top of the unit indicate the status of the unit.

## Status

At power-up, the **Status** LED:

1. Briefly illuminates red, to indicate that the probe is powered and initializing.
2. Illuminates green, to indicate that the probe is in its ready state.

---

### Note

If the **Status** LED remains red, the HSSTP probe has failed to boot. Ensure that your DSTREAM-ST firmware is version 5.4, or later. For more information on updating the DSTREAM-ST firmware, see [Update the DSTREAM-HT system firmware on page 2-33](#). If the firmware is the correct version, restore the DSTREAM-ST unit. To restore the DSTREAM-ST unit, follow the instructions in [Restore a DSTREAM-HT system on page 4-43](#).

---

## Host Link

At power-up, the **Host Link** LED:

1. Briefly flashes blue, to indicate that the link to the DSTREAM-ST unit is initializing.
2. Illuminates green, to indicate that the link is ready.

---

### Note

If the **Host Link** LED does not flash blue, or continues to only flash blue, see [Host Link issues on page 4-40](#)

---

## VTREF

Illuminates green when a valid **VTREF** or **TRACE\_VTREF** signal is detected.

---

### Note

- If debug and trace use the same power domain, it is referred to as **VTREF**.
  - If debug and trace use separate trace and debug power domains, they are referred to as **TRACE\_VTREF** and **DEBUG\_VTREF** respectively.
  - The **TARGET** LED on the DSTREAM-ST unit indicates the state of **DEBUG\_VTREF** for targets which use separate debug and trace power domains.
- 

For more information about Target Voltage Reference (**VTREF**) signals, see [Target Voltage Reference \(VTREF\) signals](#) in the Arm DSTREAM-HT System and Interface Design Reference Guide.

## Full

Illuminates green to indicate that the trace buffer is full.

## Lanes [0-5]

The Lane LEDs indicate the numbers of the lanes that are expected to be used during the debug session.

Illuminates green to indicate that the numbered lane has initialized correctly.

Illuminates red to indicate that the numbered lane has failed to initialize.

---

### Note

When you first power on the HSSTP probe, the Lane LEDs might illuminate red. After a short amount of time, they change to green. If they remain red at connection time, this indicates that there is a problem. See [HSSTP probe LED errors on page 4-38](#) for further details.


---

## Chan Up (Channel)

Illuminates green to indicate that the channel has initialized correctly.

Illuminates red to indicate that the channel has failed to initialize.

### Tip

 The number of lanes available is target dependent. If one lane is available, the Channel LED illuminates green when the lane is ready for use. If more than one lane is available, the lanes have to be bonded first. The Channel LED illuminates green when the lanes are bonded and they are ready for use.

## RX Data

Flashes green when the HSSTP probe is successfully receiving data.

## Hard Error

Illuminates red to indicate that a high number of consecutive soft errors were detected. This usually indicates that there are signal-integrity issues, or that there are bad connections with the HSSTP signals.

Illuminates yellow to indicate that a hard error was detected, but is now resolved.

## Soft Error

Illuminates red to indicate that badly encoded data is being received which is causing disparity errors.

Illuminates yellow to indicate that disparity errors were detected, but are now resolved.

## Frame Error

Illuminates red to indicate that the received frames do not match the expected format. For example, Cyclic Redundancy Check (CRC) checking is enabled in the target device, but not in the debug configuration.

Illuminates yellow to indicate that incorrect frames were received, but are now correct.

## General Error

Illuminates red to indicate a miscellaneous error, such as CRC, End of Frame (EOF), or First in First out (FIFO), overrun errors. Further diagnostic information is available through the Debug Hardware log client, in Arm Development Studio: `<armds_installation_directory>/sw/debughw/tools2/dbghw_log_client`

Illuminates yellow to indicate that a miscellaneous error was detected, but is now resolved.

## GbD Link and GbD Data

These LEDs are currently reserved, and are not used by the HSSTP probe.

### *Related concepts*

[1.3 The DSTREAM-ST unit on page 1-16](#)

### *Related tasks*

[2.3 Connect and power up the DSTREAM-HT system on page 2-28](#)

### *Related references*

[Chapter 4 Troubleshooting on page 4-37](#)

### *Related information*

[DSTREAM-HT trace probe configuration](#)



## Chapter 2

# Set up your DSTREAM-HT

This chapter contains instructions about connecting the DSTREAM-HT system to your host PC and target system.

It contains the following sections:

- [2.1 Install the USB drivers for the DSTREAM-HT system on Windows](#) on page 2-26.
- [2.2 Install the USB drivers for the DSTREAM-HT system on Linux](#) on page 2-27.
- [2.3 Connect and power up the DSTREAM-HT system](#) on page 2-28.
- [2.4 DSTREAM-HT system boot sequence](#) on page 2-32.
- [2.5 Update the DSTREAM-HT system firmware](#) on page 2-33.

## 2.1 Install the USB drivers for the DSTREAM-HT system on Windows

To use the DSTREAM-HT system with a USB connection, install the USB device drivers for your operating system. The USB drivers for the DSTREAM-HT system are provided with Arm Development Studio.

The drivers for the DSTREAM-HT system are optionally installed as part of the installation process for Arm Development Studio. If you have skipped the driver install process in Arm Development Studio, follow these steps to install them.

### Prerequisites

Ensure you have:

- Installed Arm Development Studio. For more information, see the [Arm Development Studio Getting Started Guide](#).
- Administrative privileges on your PC.

### Procedure

1. Using administrative privileges, run the `driver_install.bat` batch file that is available in `<Arm_Development_Studio_install_directory>\sw\driver_files` directory.
2. In the **Arm Development Studio Driver Installation Wizard**, click **Next** and follow the steps.

#### Note

During installation, you might receive warnings such as **Windows can't verify the publisher of this driver software**. You can safely ignore these warnings and continue with the installation.

3. After the drivers are installed, click **Finish**.

The USB drivers are now installed on your PC.

### Related tasks

[2.3 Connect and power up the DSTREAM-HT system on page 2-28](#)

## 2.2 Install the USB drivers for the DSTREAM-HT system on Linux

To use the DSTREAM-HT system with a USB connection, install the USB device drivers for your operating system. The USB drivers for the DSTREAM-HT system are provided with Arm Development Studio.

The drivers for the DSTREAM-HT system are optionally installed as part of the installation process for Arm Development Studio. If you have skipped the driver install process in Arm Development Studio, follow these steps to install them.

### Prerequisites

Ensure you have:

- Installed Arm Development Studio. For more information, see the [Arm Development Studio Getting Started Guide](#).
- Administrative privileges on your PC.

### Procedure

1. Using root privileges, run the `run_post_install_for_Arm_Development_Studio_vx.x.sh` script file that is available in the Arm Development Studio install directory. The `x.x` in the filename denotes the Arm Development Studio version that is installed on your PC.
2. To confirm the installation, enter `yes`.

The USB drivers are now installed on your PC.

### Related tasks

[2.3 Connect and power up the DSTREAM-HT system on page 2-28](#)

## 2.3 Connect and power up the DSTREAM-HT system

Describes how to connect your DSTREAM-HT system to your host PC and target hardware.

### Prerequisites

- You must [install Arm Development Studio](#) to access the software drivers and debug hardware configuration utilities.
- Your target hardware must have a debug connector supported by DSTREAM-HT. For a list of supported connectors, see [Target interface connectors](#) in the Arm DSTREAM-HT System and Interface Design Reference Guide.
- You must have the following items from the [Arm® DSTREAM-HT box contents on page 1-13](#):
  - The DSTREAM-ST unit.
  - The HSSTP probe, with the 60-way AUX cable.
  - The power supply unit, dual DC power cable, and the mains cable that is appropriate for your region.
  - To connect the DSTREAM-ST unit to the host PC or the network, you need either: \* The USB cable, to connect the DSTREAM-ST unit directly to the host PC using the USB 3.0 port. \* The Ethernet cable, to connect the DSTREAM-ST unit to the network.
  - To connect DSTREAM-HT to the target hardware, you need a target-compatible cable. For a list of supplied cables, see [Arm® DSTREAM-HT box contents on page 1-13](#).

---

### Warning

- If DSTREAM-HT or the target hardware are not earthed, potential differences can occur between them. During connection, potential differences cause unwanted pulses in the debug interface. This might also cause unwanted resets to occur.
  - Ensure the target connector has a compatible pinout before use. Incorrect connections might damage the debug or target hardware.
- 

### Procedure

1. Connect the DSTREAM-ST unit, the HSSTP probe, and the power supply unit:
  - a. Connect the DSTREAM-ST unit and the HSSTP probe using the 60-way AUX cable.
  - b. Attach the shorter 5V DC input end of the split power supply cable to the DSTREAM-ST unit, and attach the longer 5V DC input end to the HSSTP probe.

---

### Note

Depending on your device arrangement, the 5V DC inputs are identical and you can attach them to either the DSTREAM-ST unit or the HSSTP probe.

---

- c. Attach the Power Supply Unit (PSU) to the PSU-adaptor end of the split power supply cable.
2. Connect the DSTREAM-ST unit to the host PC:
    - If you are connecting using the USB port, connect the DSTREAM-ST unit to the host PC using the supplied USB 3.0 cable.

---

### Note

The USB drivers are provided with Arm Development Studio. For more information, see the USB driver installation topics: [Install the USB drivers for the DSTREAM-HT system on Windows on page 2-26](#) or [Install the USB drivers for the DSTREAM-HT system on Linux on page 2-27](#).

---

- If you are connecting across an Ethernet network, connect the DSTREAM-ST unit to the local network using the supplied Ethernet cable.
3. Power up the DSTREAM-HT system.

When you power up the DSTREAM-ST unit and HSSTP probe, both units follow a boot sequence. The LEDs identify the progress of the boot sequence. For more information, see [DSTREAM-HT system boot sequence on page 2-32](#).

---

**Note**

Arm recommends that both the DSTREAM-ST unit and HSSTP probe are powered-up simultaneously. Powering simultaneously ensures that the DSTREAM-ST unit correctly detects the HSSTP probe during its boot sequence.

If you need to reset the DSTREAM-HT system, press the reset button on the rear of the DSTREAM-ST unit. When a DSTREAM-ST unit is connected in a DSTREAM-HT system, the reset button on the DSTREAM-ST unit re-initializes both the DSTREAM-ST unit and the HSSTP probe.

- 
4. If you are connecting across an Ethernet network, configure the Ethernet and internet protocol settings for your DSTREAM-ST unit. To configure these settings, use the [Debug Hardware Configure IP view](#) in Arm Development Studio.

You can also use the **Debug Hardware Configure IP** view to assign a name for the DSTREAM-ST unit.

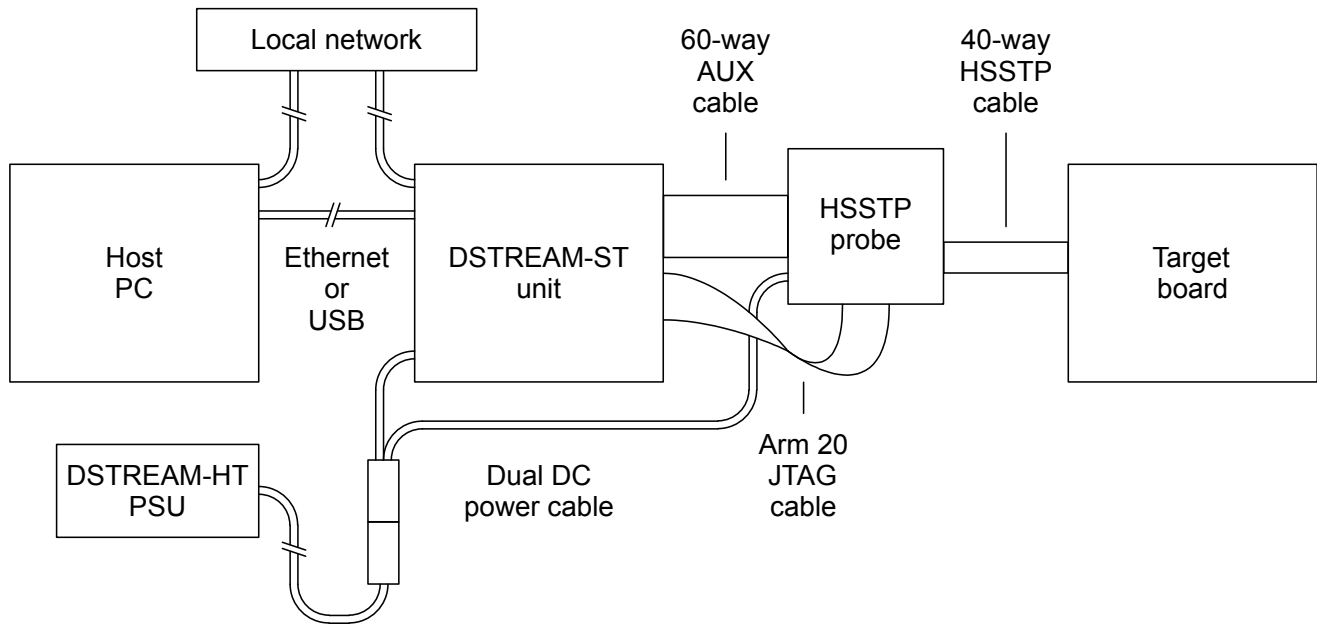
5. Connect the DSTREAM-HT system to the target hardware. Use the appropriate cables and adapters for the target debug and trace connector (or connectors). Some targets have debug and trace on a single connector, and some targets split them between two connectors. Each connector, and the appropriate cable to use for that connector, is described in [Target interface connectors](#) in the Arm DSTREAM-HT System and Interface Design Reference Guide.

---

**Warning**

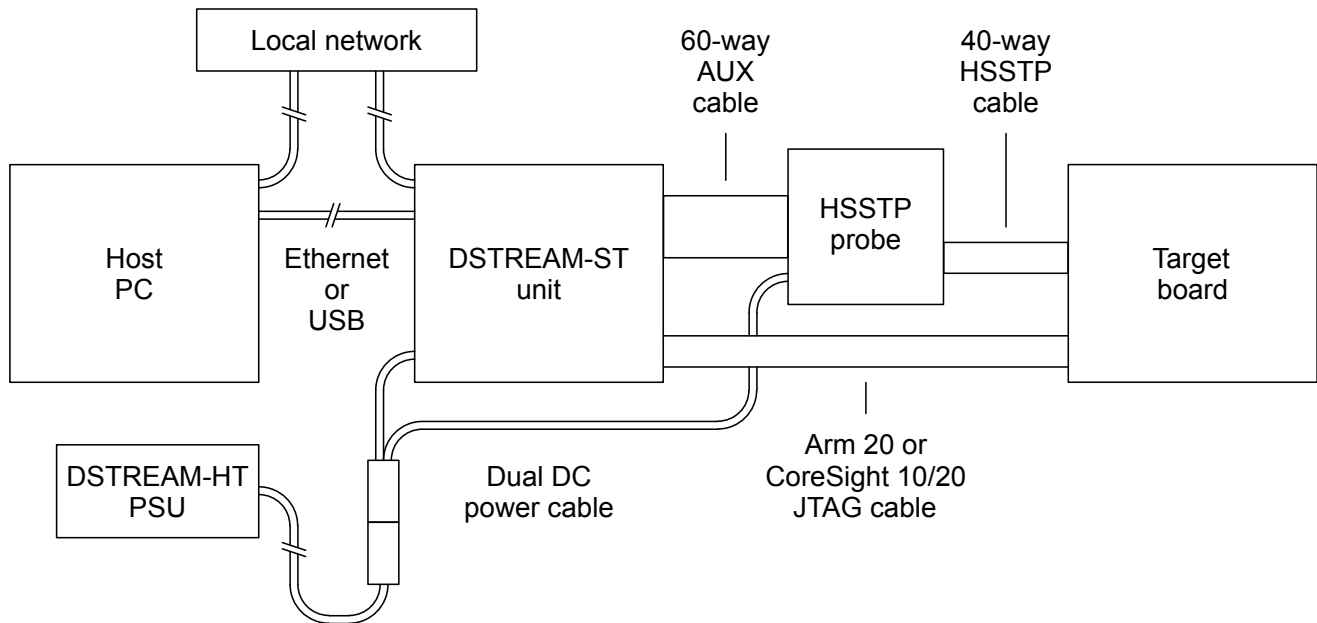
When connecting the DSTREAM-HT system to target hardware, to avoid damaging the target or debug hardware, ensure that the debug and trace connector (or connectors) on the target use pinouts supported by DSTREAM-HT. For supported pinout information, see the [Arm DSTREAM-HT System and Interface Design Reference Guide](#).

- 
- If your target has debug and trace on a single connector, connect the HSSTP probe to the target using the 40-way HSSTP cable:



**Figure 2-1 DSTREAM-HT connection.**

- If your target has separate debug and trace connectors, connect the DSTREAM-HT system with the debug cable bypassing the HSSTP probe:
  1. Connect the HSSTP probe to the target using the 40-way HSSTP cable.
  2. Connect the DSTREAM-ST unit to the target using the appropriate JTAG or CoreSight ribbon cable.



**Figure 2-2 DSTREAM-HT debug bypass connection.**

6. Power up the target hardware.

**Note**

When the DSTREAM-HT system is powered-up, ensure that the air intakes on the top of each unit, are not blocked.

- If the DSTREAM-ST unit overheats, it shuts down, all the LEDs turn off, and it remains in a safe state.
- If the HSSTP probe overheats, it enters a low-power mode and all of its LEDs flash red.

To re-initialize the DSTREAM-HT system, press the reset button on the rear of the DSTREAM-ST unit.

---

### Next Steps

- The first time you connect and power-up your DSTREAM-HT system you must [Update the DSTREAM-HT system firmware](#) on page 2-33.
- [Work with your DSTREAM-HT](#) on page 3-34

### Related concepts

[1.2 Arm® DSTREAM-HT box contents](#) on page 1-13

[2.4 DSTREAM-HT system boot sequence](#) on page 2-32

## 2.4 DSTREAM-HT system boot sequence

When you power up the DSTREAM-HT system, it goes through a boot sequence. The LEDs identify the progress of the boot sequence.

The boot sequence is:

1. To indicate that both units are powered, the DSTREAM logo of the DSTREAM-ST unit illuminates blue and the **STATUS** LED of the HSSTP probe illuminates RED.
2. The **FLASH** LED of the DSTREAM-ST unit flashes as it loads its firmware.
3. The **STATUS** LED of the HSSTP probe illuminates green, indicating that its FPGA has successfully loaded.
4. The **STATUS** LED of the DSTREAM-ST unit flashes green, and then stays illuminated, indicating that it has successfully booted.
5. The **Host Link** LED of the HSSTP probe flashes blue, and then illuminates green to indicate that the units have successfully linked.
6. If the target is connected to the DSTREAM-HT system and powered, the **TARGET** LED on the DSTREAM-ST unit and the **VTREF** LED on the HSSTP probe illuminate green.

The DSTREAM-HT system is now ready for use.

---

### Note

If your DSTREAM-HT system boot sequence does not follow this sequence, see [Troubleshooting on page 4-37](#).

---

### Related tasks

[2.3 Connect and power up the DSTREAM-HT system on page 2-28](#)

[4.5 Restore a DSTREAM-HT system on page 4-43](#)



## 2.5 Update the DSTREAM-HT system firmware

The DSTREAM-HT system firmware contains:

- The operating system that runs on the DSTREAM-ST unit.
- Templates that define how the debug hardware communicates with different target devices.
- Configuration files to load into any add-on probe units, such as the HSSTP probe.

Firmware updates are supplied with Arm Development Studio.

### Prerequisites

- Ensure you connect and power-up the DSTREAM-HT system so the firmware on both the DSTREAM-ST unit and HSSTP probe is updated simultaneously. For more information, see [Connect and power up the DSTREAM-HT system on page 2-28](#).
- You must ensure that the current DSTREAM-HT system firmware is at least the minimum version required by Arm Development Studio.
- You must ensure that Arm Development Studio is installed on the host PC.

#### Note

In Arm Development Studio, the latest firmware files are available at:  
`<Arm_Development_Studio_install_directory>/sw/debughw/firmware/.`

#### Warning

You must have firmware version 5.4 or later, installed for the HSSTP probe to be detected.

If earlier firmware is installed, the DSTREAM-ST unit does not function as part of a DSTREAM-HT system. Instead, the DSTREAM-ST unit functions only as a DSTREAM-ST unit and is limited to 4-bit streaming trace.

### Procedure

1. Open the [Debug Hardware Firmware Installer view](#): from the main menu in Arm Development Studio, select **Window > Show View > Debug Hardware Firmware Installer**.
2. For the **Debug Hardware** field, click **Browse...** and **Select** your debug unit, then click **Connect**.  
Result: You can view the currently installed firmware version, the auto-selected new firmware file, and the new firmware details.
3. Either accept the auto-selected firmware update file, or browse and select a different firmware update file:
  - To accept the auto-selected firmware update file, click **Install**.
  - To select a different firmware update file, in **Select Firmware Update File**, click **Browse**, select your firmware update file, and click **Open**. Click **Install**.

The firmware is now updated on both the DSTREAM-ST unit and HSSTP probe.

### Related tasks

[2.3 Connect and power up the DSTREAM-HT system on page 2-28](#)

## Chapter 3

# Work with your DSTREAM-HT

Arm DSTREAM-HT is a comprehensive solution for the development and debug of complex Arm-based devices. This chapter explains some of the ways you can use DSTREAM-HT to work with your targets.

It contains the following sections:

- [3.1 Debug software for DSTREAM-HT on page 3-35.](#)
- [3.2 Hot-plug the debug cable on page 3-36.](#)

## 3.1 Debug software for DSTREAM-HT

The development software on your host PC provides the interface between your debugger and the DSTREAM-HT hardware that controls the target devices. The host software translates debugger commands, such as `start`, `stop`, and `download`, into control sequences for a particular processor.

Depending on your needs, there are several options:

### Arm Development Studio

Arm Development Studio is a suite of tools for embedded C/C++ software development on any Arm-based device. It features an editor, compilers, debugger, and a system profiler. Combined with DSTREAM-HT, you get a comprehensive solution for developing and debugging complex systems.

For more information on debugging using Arm Development Studio, see the [documentation](#).

You can download the latest version of Arm Development Studio from the [Arm Development Studio downloads page](#).

### Remote Device Debug Interface (RDDI)

Third-party debuggers, both for Arm and other processors, can connect to DSTREAM-HT using the RDDI interface.

You can use the RDDI interface to:

- Address each target device individually, without affecting other devices on the board. It uses this ability to create virtual connections for each of the JTAG devices on the board. Your debugger can attach to one of these virtual connections, and perform debugging operations with no knowledge of the other devices on the board.
- Enable multiple concurrent connections to debug multiprocessor systems. Depending on the system, you can also perform a synchronized start or stop of processors for debugging multiprocessor systems where the processors interact with each other.
- Perform simple tasks. For example, for production testing, a low-level RDDI connection to DSTREAM-HT can be used to gain access to the JTAG scan-chains inside the target device.

RDDI is freely available from within the Arm Development Studio installation. It is located `<install_directory>/Arm/Development Studio <version>/sw/debugger/RDDI`.

### CoreSight Access Tool (CSAT)

The CoreSight Access Tool (CSAT) provides a scriptable low-level interface to the CoreSight Debug Access Port (DAP) on a target. CSAT is useful to perform initial bring-up tests before a debugger connection to the target is available.

CSAT provides low-level, command-line manipulation of devices connected to a DAP, for example, custom instrumentation hardware, at the memory or register level. CSAT removes the complexity, complication, or overhead of a debugger. CSAT can be used while a debugger is connected to an Arm processor. This enables the debugging of complex hardware-related problems.

For more information, see the [CoreSight Access Tool \(CSAT\) User Guide](#). In your Arm Development Studio installation, CSAT is located in `<install_directory>/Arm/Development Studio <version>/bin/csat.exe`.

### Related tasks

[2.2 Install the USB drivers for the DSTREAM-HT system on Linux on page 2-27](#)

[2.1 Install the USB drivers for the DSTREAM-HT system on Windows on page 2-26](#)

## 3.2 Hot-plug the debug cable

At times, you might want to connect or disconnect the debug cable between the DSTREAM-HT system and the target hardware, without powering off the target. This process is known as *hot-plugging*.

Arm recommends you avoid hot-plugging the debug cable. However, you can hot-plug without affecting operation of the target, if:

- The DSTREAM-HT system is powered by its original power supply (which has an earthed-output).
- The target hardware is earthed, either through its power supply, or a separate earth connection.

---

### Note

If the DSTREAM-HT system or the target hardware are not properly earthed, potential differences can occur between them. During connection, potential differences can cause unwanted pulses in the debug interface. Pulses in the debug interface can cause unwanted resets to occur.

---

### Hot-plugging: connecting

To connect a DSTREAM-HT system to a target without affecting its current state, you must:

1. Power up the DSTREAM-HT system. Allow the DSTREAM-ST and HSSTP probe to boot up.
2. Connect the HSSTP trace cable to the target.
3. Connect the debug cable to the target.

---

### Warning

When connecting the debug cable to the target system, to guard against ground-loop noise, ensure that one of the GND pins of the debug connector makes contact first. This contact ensures that the current target state is not affected. For pin details, see [Target interface connections](#) in the Arm DSTREAM-HT System and Interface Design Reference Guide.

---

### Hot-plugging: disconnecting

When unplugging the debug connector, you must be aware that:

- If you are using a Return Test Clock (RTCK) system, make sure that no communication is taking place between the system and the DSTREAM-HT system. Otherwise, if the DSTREAM-HT system is waiting for a return clock, it might lock up.
- If you are not using an RTCK system, the debug software can handle this situation. However, you must perform a Test Access Port (TAP) reset using the debugger when you next connect the DSTREAM-HT system to a target. For more information on TAP resets, see [Reset signals](#).

### Related tasks

[2.3 Connect and power up the DSTREAM-HT system on page 2-28](#)

# Chapter 4

## Troubleshooting

This chapter describes the steps that you need to take when your DSTREAM-HT system does not function as expected.

For more information about troubleshooting and support for your DSTREAM-HT system, see the [Arm DSTREAM-HT web page](#) on the Arm Developer web site.

It contains the following sections:

- [4.1 HSSTP probe LED errors on page 4-38.](#)
- [4.2 Host Link issues on page 4-40.](#)
- [4.3 DSTREAM-HT overheats on page 4-41.](#)
- [4.4 Arm® Development Studio invalid trace on page 4-42.](#)
- [4.5 Restore a DSTREAM-HT system on page 4-43.](#)
- [4.6 Remotely restart a DSTREAM-HT system on page 4-44.](#)

## 4.1 HSSTP probe LED errors

Lists the LED combinations that indicate HSSTP probe errors, and how to resolve them.

If your HSSTP probe detects bad signal integrity or an error state, the **Chan up** or one or more of the **Errors** section LEDs on the probe illuminates red.

### Bad signal integrity

Bad signal integrity on any of the HSSTP lanes causes one or more of the lanes to fail link training. This causes the HSSTP probe to reach an error state.

Indicated by: A red LED for the affected lane, in the **Lanes** LED section on the probe.

### Solution

Using Arm Development Studio, open the configuration file for your target and check that:

1. The lane speed option, HSSTP\_SPEED, is configured correctly.
2. The lane width option, HSSTP\_LANES, is configured correctly.
3. The equalization mode option, HSSTP\_RX\_EQUALIZATION, is configured correctly.

If these steps do not resolve the issue, [contact Arm support](#).

### Disparity error

A disparity error is when there is a bit error on the link.

Indicated as follows:

- A single disparity error is indicated by a red **Soft** LED in the **Errors** LED section on the probe.
- Multiple disparity errors are indicated by red **Soft** and **Hard** LEDs in the **Errors** LED section on the probe.

### Solution

1. Check all the cables are correctly connected on the HSSTP probe and target.
2. On your target, check the transmitter amplitude and pre-emphasis settings.
3. Use Arm Development Studio to reconnect to the target device.

If the above steps do not resolve the issue, [contact Arm support](#).

### Cyclic Redundancy Check (CRC) error

CRC errors occur if there is a mismatch between the CRC configuration, which is enabled or disabled in Arm Development Studio, and the generated CRC output from the target.

Indicated by: A red **Frame** and **General** LEDs in the **Errors** LED section on the probe.

### Solution

To check that your debug configuration and target configurations match, use the DSTREAM-ST log client:

- If CRC is enabled in the target device, ensure that CRC is enabled in the debug configuration (HSSTP\_CRC option).
- If CRC is not enabled in the target device, ensure that CRC is not enabled in the debug configuration (HSSTP\_CRC option).

If this solution does not resolve the issue, [contact Arm support](#).

### End of Frame (EOF) or First in First out (FIFO) overrun errors

EOF or FIFO overrun errors are indicated in the DSTREAM-ST log client.

Indicated by: A red **General** LED in the **Errors** LED section on the probe.

## Solution

*Contact Arm support.*

## Bonding sequence transmission error

Bonding sequence transmission errors occur when the bonding sequence transmission length is incorrectly set.

Indicated by: A green **Lanes** LEDs and a red **Chan up** LED on the probe.

## Solution

In Arm Development Studio, check the bonding sequence transmission length that is set in the python script for your target.

If the bonding sequence transmission length is set correctly, *contact Arm support.*

### *Related tasks*

*4.5 Restore a DSTREAM-HT system on page 4-43*

### *Related references*

*4.2 Host Link issues on page 4-40*

## 4.2 Host Link issues

During the DSTREAM-HT system boot sequence, the LEDs identify the progress of the boot sequence. On the HSSTP probe, to indicate that the units are successfully linked, the **Host Link** LED briefly flashes blue, then illuminates green.

If the **Host Link** LED does not flash, or continues to only flash blue and not illuminate green, the link connection is not established.

### Host Link LED does not flash or illuminate

If the **Host Link** LED does not flash or illuminate, the link connection is incomplete, because:

- The HSSTP probe factory firmware version requires updating.
- The flash memory on the HSSTP probe is corrupt. If the flash memory is the cause, the **STATUS** LED illuminates red.
- The connection with the AUX 60-way ribbon cable is not complete.

### Solution

1. Disconnect the AUX 60-way ribbon cable.
2. Ensure the connector pins on the DSTREAM-ST unit and HSSTP probe are not damaged.
3. Ensure the 60-way ribbon cable is not damaged.
4. Reconnect the 60-way ribbon cable. Ensure both ends of the cable are securely connected.
5. Reset the DSTREAM-HT system. Use the reset button on the rear of the DSTREAM-ST unit.
6. If a reset does not fix the **Host Link** connection, restore the DSTREAM-HT system. For more information, see [Restore a DSTREAM-HT system on page 4-43](#).

### Host Link LED only flashes blue

If the **Host Link** LED continues to flash blue, the link connection is incomplete.

### Solution

1. Disconnect the AUX 60-way ribbon cable.
2. Ensure the connector pins on the DSTREAM-ST unit and HSSTP probe are not damaged.
3. Ensure the 60-way ribbon cable is not damaged.
4. Reconnect the 60-way ribbon cable. Ensure both ends of the cable are securely connected.
5. Reset the DSTREAM-HT system. Use the reset button on the rear of the DSTREAM-ST unit.
6. If a reset does not fix the **Host Link** connection, restore the DSTREAM-HT system. For more information, see [Restore a DSTREAM-HT system on page 4-43](#).

### Related concepts

[1.4 The HSSTP probe on page 1-21](#)

[1.2 Arm® DSTREAM-HT box contents on page 1-13](#)

[2.4 DSTREAM-HT system boot sequence on page 2-32](#)



## 4.3 DSTREAM-HT overheats

The air intakes on the top of both the DSTREAM-ST unit and HSSTP probe, in a powered-up DSTREAM-HT system, must remain clear.

### Air intakes are blocked

If the air intake on the top of the DSTREAM-ST unit becomes blocked and the DSTREAM-ST unit overheats, it shuts down, all the LEDs turn off, and it remains in a safe state.

If the air intake on the top of the HSSTP probe becomes blocked and the HSSTP probe overheats, it enters a low-power mode and all of its LEDs flash red.

### Solution

Check that the air intake is clear, and then press **Reset** on the rear of the DSTREAM-ST unit to reinitialize the DSTREAM-HT system.

## 4.4 Arm® Development Studio invalid trace

Invalid trace errors for Arm Development Studio might not cause a red LED error on the HSSTP probe.

### Badly ordered data

If Arm Development Studio receives data in an incorrect order, it reports an `Invalid trace` error.

Indicated by: Arm Development Studio warning only.

### Solution

Enable the HSSTP probe to reorder the data using the `HSSTP_NDALT` debug configuration setting in Arm Development Studio.

If this does not resolve the issue, [contact Arm support](#).

### Related tasks

[4.5 Restore a DSTREAM-HT system on page 4-43](#)

### Related references

[4.1 HSSTP probe LED errors on page 4-38](#)

[4.2 Host Link issues on page 4-40](#)

## 4.5 Restore a DSTREAM-HT system

If there are any problems with the DSTREAM-HT system, and the other troubleshooting sections did not help or do not apply, you can restore your DSTREAM-HT system back to its factory settings using the recovery mode for the DSTREAM-ST unit.

### Prerequisites

- Connect and power-up the DSTREAM-HT system. For more information on how to connect and power-up the DSTREAM-HT system, see [Connect and power up the DSTREAM-HT system on page 2-28](#)
- Attempt a soft reset of your DSTREAM-HT system, by pressing the **Reset** button on the rear of the DSTREAM-ST unit, before running a full restore of the system.
- Debug hardware drivers are provided with Arm Development Studio. You must have Arm Development Studio installed on your PC to access the drivers. For more information on installing Arm Development Studio, see the [Arm Development Studio Getting Started Guide](#).

### Procedure

1. Press and hold the reset button on the DSTREAM-ST unit for approximately 10 seconds.
2. When the **STATUS** LED flashes red, release the button.

Both the DSTREAM-ST unit and the HSSTP probe erase their existing firmware within their internal flash, and replaces it with the original factory-installed version.

————— **Note** —————

When in recovery mode, debug and trace operations are not enabled.

After the recovery process is complete, the DSTREAM-ST unit automatically reboots with its factory settings.

If a restore fails, [contact Arm support](#).

### Next Steps

- You must perform a firmware update to restore full functionality.

To update the firmware to the latest version, see [Update the DSTREAM-HT system firmware on page 2-33](#).

————— **Note** —————

To use the HSSTP probe, your DSTREAM-ST must have firmware version 5.4 or later, installed.

- [Connect and power up the DSTREAM-HT system on page 2-28](#)
- [Work with your DSTREAM-HT on page 3-34](#)

### Related tasks

[2.5 Update the DSTREAM-HT system firmware on page 2-33](#)

## 4.6 Remotely restart a DSTREAM-HT system

Describes how to remotely restart a DSTREAM-HT system.

### Remote restart is not supported by Arm® Development Studio

Arm Development Studio does not currently have a feature to remotely restart a DSTREAM-HT system, however, a workaround is available.

### Workaround

To restart your DSTREAM-HT system, update the firmware. At the end of a firmware update, the DSTREAM-HT system restarts.

To update the firmware of a DSTREAM-HT system, either use:

- The Arm Development Studio IDE. For instructions, see [Update the DSTREAM-HT system firmware on page 2-33](#).
- The `dbghw_batchupdater` utility on the command line. For instructions, see the [Updating multiple debug hardware units](#) topic in the Arm Development Studio User Guide.

### Related tasks

[2.5 Update the DSTREAM-HT system firmware on page 2-33](#)

### Related information

[Updating multiple debug hardware units](#)