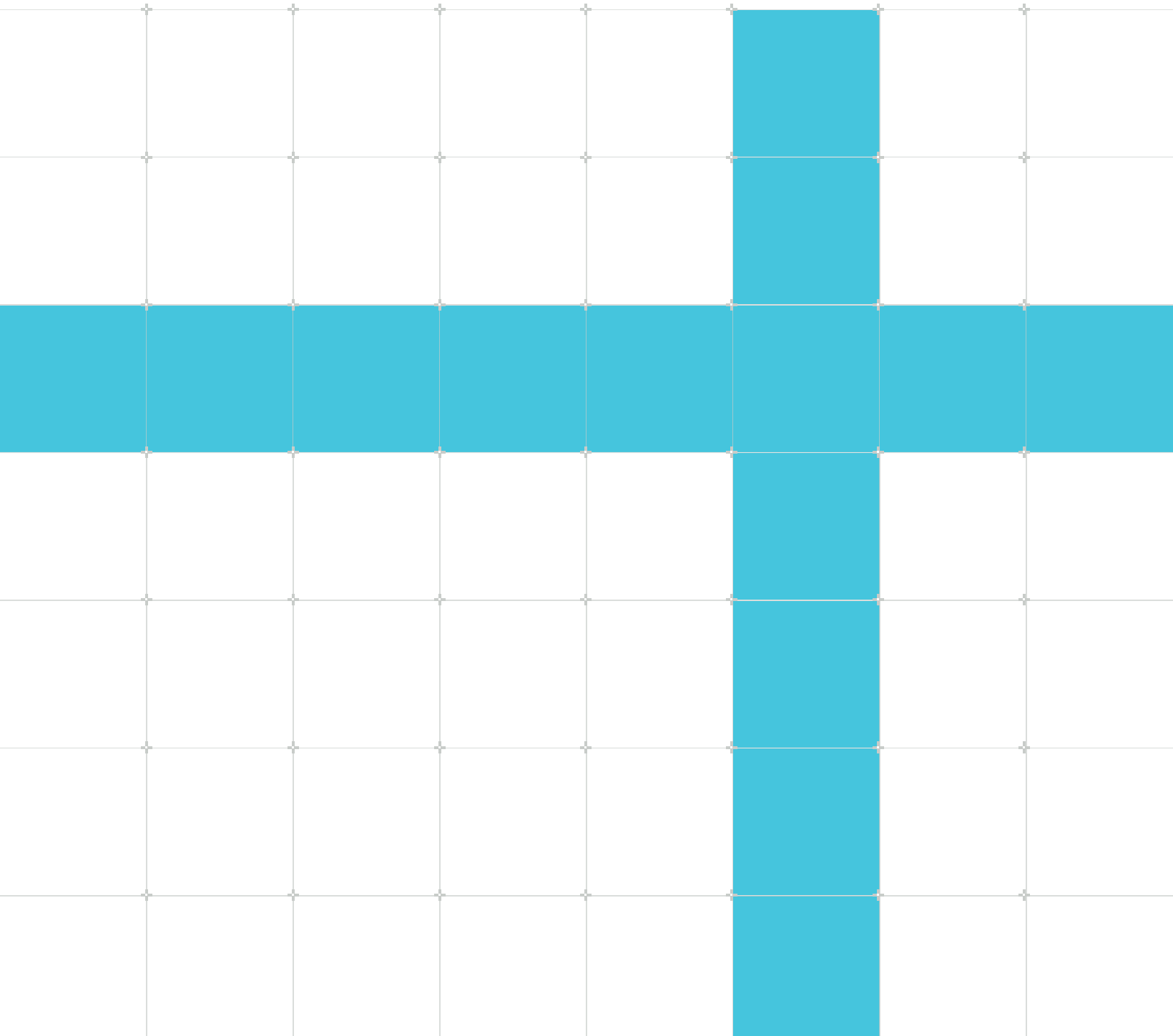
DSTREAM-ST

Version 1.0

Getting Started Guide

Issue 07
100892_1.0_07_en



DSTREAM-ST
Getting Started Guide

Release information

Document history

Issue	Date	Confidentiality	Change
0100-00	31 March 2017	Non-Confidential	First release
0100-01	24 November 2017	Non-Confidential	Documentation update for version 1.0 release
0100-02	22 June 2018	Non-Confidential	Documentation update for version 1.0 release
0100-03	5 April 2019	Non-Confidential	Documentation update for version 1.0 release
0100-04	18 April 2019	Non-Confidential	Documentation update to add the Conformance Notices
0100-05	30 April 2019	Non-Confidential	Documentation update for version 1.0 release
0100-06	13 December 2019	Non-Confidential	Documentation update for version 1.0 release
0100-07	10 October 2022	Non-Confidential	Documentation update for version 1.0 release

Proprietary Notice

Arm Limited. Company 02557590 registered in England.

110 Fulbourn Road, Cambridge, England CB1 9NJ.

(LES-PRE-20349|version 21.0)

Confidentiality Status

This document is Non-Confidential. The right to use, copy and disclose this document may be subject to license restrictions in accordance with the terms of the agreement entered into by Arm and the party that Arm delivered this document to.

Unrestricted Access is an Arm internal classification.

Product Status

The information in this document is Final, that is for a developed product.

Feedback

Arm® welcomes feedback on this product and its documentation. To provide feedback on the product, create a ticket on https://support.developer.arm.com

To provide feedback on the document, fill the following survey: https://developer.arm.com/documentation-feedback-survey.

Inclusive language commitment

Arm values inclusive communities. Arm recognizes that we and our industry have used language that can be offensive. Arm strives to lead the industry and create change.

Previous issues of this document included language that can be offensive. We have replaced this language.

To report offensive language in this document, email terms@arm.com.

Conformance Notices

This section contains conformance notices.

Federal Communications Commission Notice

This device is test equipment and consequently is exempt from part 15 of the FCC Rules under section 15.103 (c).

Class A

Important: This is a Class A device. In residential areas, this device may cause radio interference. The user should take the necessary precautions, if appropriate.

CE/UKCA Conformity

These marks indicate that this product meets all essential health, safety and environmental requirements. The CE mark indicates conformity within EU member states and the UKCA mark indicates conformity within the UK.

The Declarations of Conformity are available on request.

The *Waste Electrical and Electronic Equipment* (WEEE) marking, that is, the crossed out wheelie-bin figure, indicates that this product must not be disposed of with general waste within the European Union. To prevent possible harm to the environment from uncontrolled waste disposal, the user is required to recycle the product responsibly to promote reuse of material resources. To comply with EU law, you must dispose of the product in one of the following ways:

- Return it to the distributor where it was purchased. The distributor is required to arrange free collection when requested.
- 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 for instructions.
- End-of-Life products can be disposed of safely using an *Approved Authorized Treatment Facility* (AATF). To support safe disposal, Arm has partnered with B2B Compliance. B2B can be contacted at the following weblink: https://b2bcompliance.org.uk

During the lifetime of the product, you are advised to:

- Inspect the product regularly to ensure that it is in good working order.
- Ensure that the product is free from dust and debris that might cause damage.
- Clean the product with an air duster when necessary.
- Power down the system when not in use.
- Observe ESD precautions when handling the product.

The product can radiate Radio Frequency Interference (RFI) or Electromagnetic Interference (EMI) and might cause harmful interference to radio communications. There is no guarantee that interference cannot occur in a particular installation. If you suspect that this equipment is causing interference to other equipment, you are encouraged to try to correct the interference by one or more of the following measures:

- Ensure attached cables do not lie across any sensitive equipment.
- Increase the distance between the product and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the product is connected.
- Consult Arm for help.

The product can be sensitive to Radio Frequency Interference (RFI) or Electromagnetic Interference (EMI) which might cause incorrect operation of the product:

- Avoid using the product near sources of EMI.
- Never use the product in *Safety-Critical-Systems* (SCS), or *Life-Critical-Systems* (LCS).


Note

Arm recommends that, wherever possible, shielded interface cables be used.

Contents

List of Figures

List of Tables

1. Introduction

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

1.1 Conventions

The following subsections describe conventions used in Arm documents.

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: developer.arm.com/glossary.

Typographic conventions

Arm documentation uses typographical conventions to convey specific meaning.

Convention	Use
italic	Citations.
bold	Interface elements, such as menu names. Terms in descriptive lists, where appropriate.
`monospace`	Text that you can enter at the keyboard, such as commands, file and program names, and source code.
`monospace underline`	A permitted abbreviation for a command or option. You can enter the underlined text instead of the full command or option name.
`<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	Terms that have specific technical meanings as defined in the *Arm® Glossary*. For example, **IMPLEMENTATION DEFINED**, **IMPLEMENTATION SPECIFIC**, **UNKNOWN**, and **UNPREDICTABLE**.
	Recommendations. Not following these recommendations might lead to system failure or damage.
	Requirements for the system. Not following these requirements might result in system failure or damage.
	Requirements for the system. Not following these requirements will result in system failure or damage.

Convention	Use
 Note	An important piece of information that needs your attention.
 Tip	A useful tip that might make it easier, better or faster to perform a task.
 Remember	A reminder of something important that relates to the information you are reading.

1.2 Useful resources

This document contains information that is specific to this product. See the following resources for other useful information.

Access to Arm documents depends on their confidentiality:

- Non-Confidential documents are available at developer.arm.com/documentation. Each document link in the following tables goes to the online version of the document.
- Confidential documents are available to licensees only through the product package.

Arm product resources	Document ID	Confidentiality
Arm Development Studio Getting Started Guide	101469	Non-Confidential
Arm Development Studio Heterogeneous system debug with Arm Development Studio	102021	Non-Confidential
Arm Development Studio User Guide	101470	Non-Confidential
Arm DSTREAM-HT Getting Started Guide	101760	Non-Confidential
Arm DSTREAM-HT System and Interface Design Reference Guide	101761	Non-Confidential
Arm DSTREAM-PT Getting Started Guide	101713	Non-Confidential
Arm DSTREAM-PT System and Interface Design Reference Guide	101714	Non-Confidential
Arm DSTREAM-ST System and Interface Design Reference Guide	100893	Non-Confidential
Arm DSTREAM-XT Getting Started Guide	102443	Non-Confidential
Arm DSTREAM-XT System and Interface Design Reference Guide	102444	Non-Confidential
CoreSight Access Tool (CSAT) User Guide	epm051792	Non-Confidential

1.3 Other information

See the Arm website for other relevant information.

- Arm® Developer.
- Arm® Documentation.
- Technical Support.
- Arm® Glossary.

2. The DSTREAM-ST system

DSTREAM-ST is a debug and trace hardware unit that enables software debug and optimization on Arm® processor-based targets.

DSTREAM-ST 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). It also enables the collection of narrow-port (4-pin) parallel streaming trace from the device for non-intrusive debug and code optimization.

This chapter describes the DSTREAM-ST hardware.

2.1 Buy Arm DSTREAM-ST

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

You can contact them to buy DSTREAM-ST.

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.

2.2 Arm DSTREAM-ST box contents

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

The items are:

- DSTREAM-ST unit.
- Power supply unit and associated cables.
- Ethernet cable.
- USB 3.0 cable.
- CoreSight™ 10/20-way 0.05" pitch ribbon cable.
- CoreSight Short 20-way 0.05" pitch ribbon cable.
- JTAG 20-way 0.1" pitch ribbon cable.
- JTAG 14-way Texas Instruments adapter.
- MICTOR 38-way adapter.

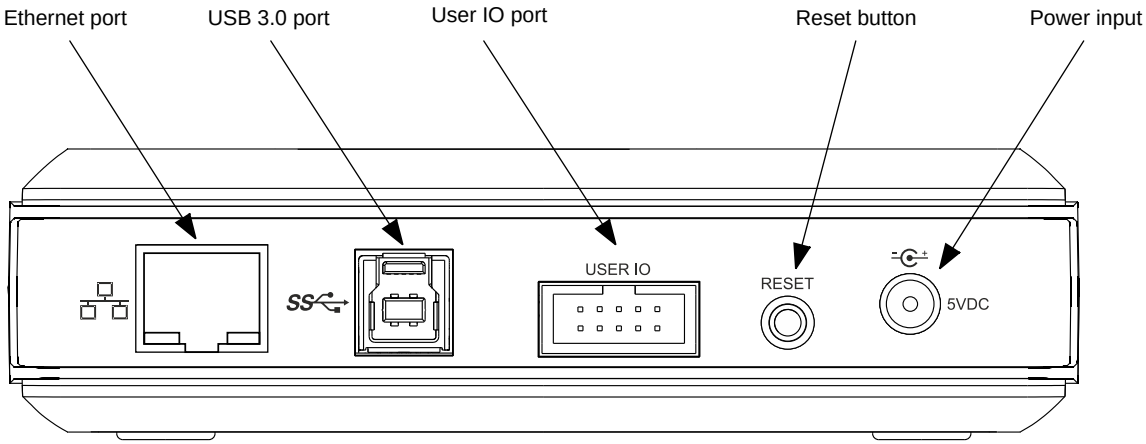
2.3 The DSTREAM-ST unit

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 2-1: 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-ST System and Interface Design Reference Guide for more details.

RESET Button

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

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.

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. To update the firmware of your DSTREAM-ST unit, use the Debug Hardware Firmware Installer view in Arm® Development Studio.

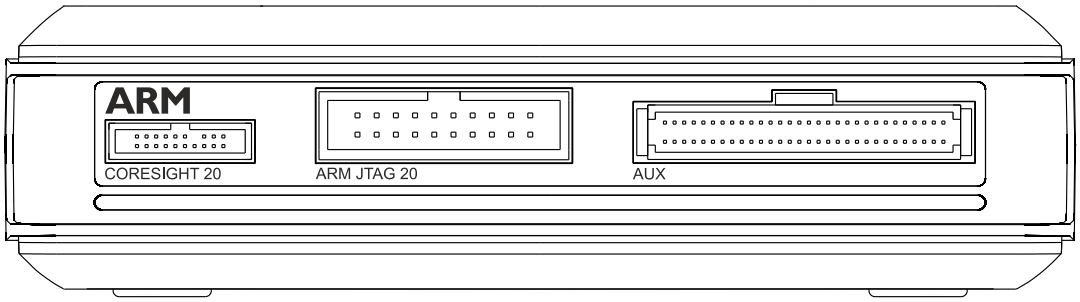
Power input

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

Front

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

Figure 2-2: 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 for any potential future enhancement of DSTREAM-ST.

Other connectors

Included with DSTREAM-ST are:

- **Texas Instruments 14-way adapter** - Used together with the Arm JTAG 20 cable, provides debug access to any target with a TI JTAG 14 header.
- **MICTOR adapter** - Used together 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 allow the use of separate debug and trace power domains.

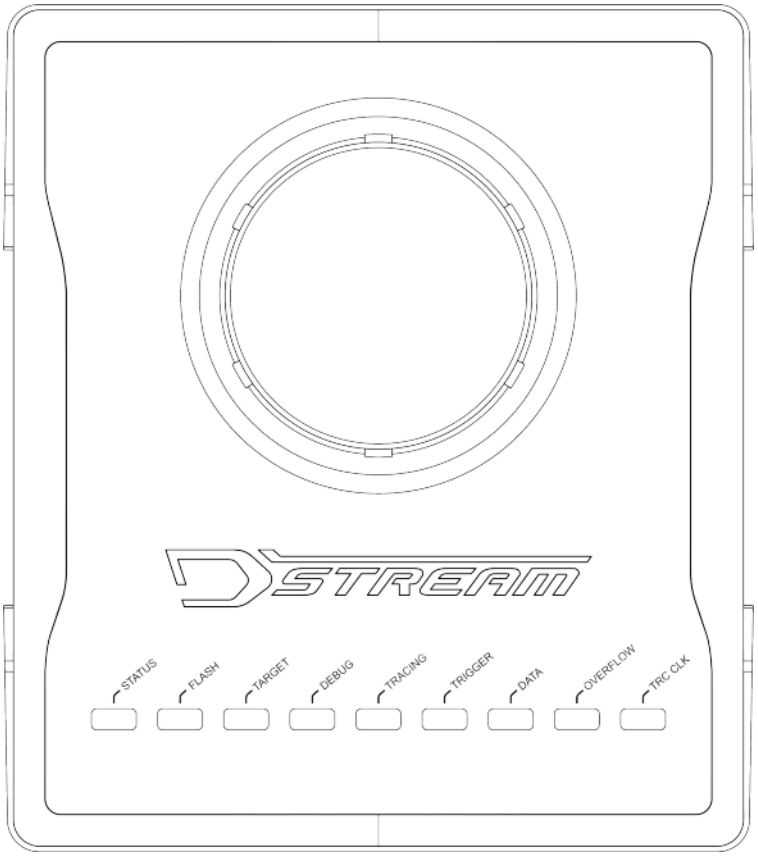
- **MIPI-34 adapter** - This adapter connects directly to the front panel of DSTREAM-ST and is supplied with a MIPI-34 ribbon cable to provide debug and trace access to any target with a MIPI-34 header.
- **MIPI-60 adapter** - This adapter plugs into a target's MIPI-60 socket and converts it to a MICTOR 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 2-3: 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-ST unit.

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 aligns with the trace data stream on detection of a full synchronization packet.

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

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 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 information

Connect and power up the DSTREAM-ST unit on page 20

3. Set up your DSTREAM-ST

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

3.1 Install the USB drivers for the DSTREAM-ST unit on Windows

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

Before you begin

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.

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**.

Results

The USB drivers are now installed on your PC.

Related information

Connect and power up the DSTREAM-ST unit on page 20

3.2 Install the USB drivers for the DSTREAM-ST unit on Linux

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

Before you begin

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`.

Results

The USB drivers are now installed on your PC.

Related information

Connect and power up the DSTREAM-ST unit on page 20

3.3 Connect and power up the DSTREAM-ST unit

This topic describes how to connect your DSTREAM-ST unit to your host PC and target hardware.

Before you begin

- You must have installed Arm Development Studio to access the software drivers and debug hardware configuration utilities.
- Your target hardware must contain a debug interface supported by DSTREAM-ST. For a list of supported connectors, see Target interface connectors in the Arm® DSTREAM-ST System and Interface Design Reference Guide.
- To connect the DSTREAM-ST unit between your PC and the target hardware, you need:
  - The DSTREAM-ST unit.
  - The power adapter for the DSTREAM-ST unit and the mains cable for the power adapter that is appropriate for your region.
  - To connect the DSTREAM-ST unit to the PC or the network, you need either:
    - The USB cable, to connect the DSTREAM-ST unit directly to the PC using the USB 3.0 port.

    - The RJ-45 Ethernet cable, to connect the DSTREAM-ST unit to the network.
  - To connect the DSTREAM-ST unit to the target hardware, you need a target-compatible cable. For a list of provided cables, see Arm DSTREAM-ST box contents.

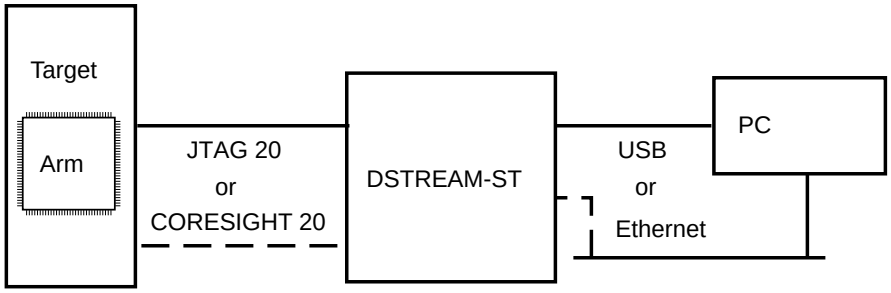
Caution

- If the DSTREAM-ST unit or the target hardware are not properly earthed, potential differences can occur between them, causing unwanted pulses in the debug interface during connection. This can cause unwanted resets to occur.
- When connecting the DSTREAM-ST unit 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 the DSTREAM-ST unit. For supported pinout information, see the Arm DSTREAM-ST System and Interface Design Reference Guide.

Procedure

1. Connect the host PC to the DSTREAM-ST unit as shown in the following figure. Use either the USB port or a TCP/IP network connection, as required:

   Figure 3-1: Connecting the host PC to the DSTREAM-ST unit.



   - 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-ST unit on Windows or Install the USB drivers for the DSTREAM-ST unit on Linux.
     - The DSTREAM-ST unit uses the Remote Network Driver Interface Specification (RNDIS) to provide a virtual Ethernet link over USB. To ensure your DSTREAM-ST unit is discoverable, enable the RNDIS protocol in your network and firewall settings.

   - If you are connecting across an Ethernet network, connect the DSTREAM-ST unit to the local network using the supplied RJ-45 Ethernet cable.
2. Power up the DSTREAM-ST unit.

When you power up the DSTREAM-ST unit, it follows a boot sequence. The LEDs identify the progress of the boot sequence. For more information, see DSTREAM-ST unit boot sequence.


Note

If you need to reset the DSTREAM-ST unit, press the reset button on the rear of the DSTREAM-ST unit.

3. 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.


Note

You can also use the **Debug Hardware Configure IP** view to assign a name for the DSTREAM-ST unit. For more information, see the Arm Development Studio documentation for Debug Hardware Configure IP view.

4. Connect the DSTREAM-ST unit to the target hardware. Use the appropriate cables and connector. Each connector, and the appropriate cable to use for that connector, is described in Target interface connectors in the Arm DSTREAM-ST System and Interface Design Reference Guide.
5. Power up the target hardware.


Note

- When the DSTREAM-ST unit is powered-up, ensure that the air intake, on the top of the unit, is not blocked.
- If the DSTREAM-ST unit overheats, it shuts down, all the LEDs turn off, and it remains in a safe state.
- To re-initialize the DSTREAM-ST unit, press the reset button on the rear of the DSTREAM-ST unit.

Next steps

- Work with your DSTREAM-ST.

Related information

DSTREAM-ST unit boot sequence on page 22

3.4 DSTREAM-ST unit boot sequence

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

The DSTREAM-ST unit follows this boot sequence:

1. The DSTREAM logo illuminates blue.

2. The **FLASH** LED flashes as the flash memory is accessed.
3. The **STATUS** LED flashes green and then stays illuminated.
4. If the target is connected to the DSTREAM-ST unit and powered, the **TARGET** LED illuminates green.

The DSTREAM-ST unit is now ready for use.

3.5 Update the DSTREAM-ST firmware

The DSTREAM-ST system firmware provided with Arm® Development Studio contains the DSTREAM-ST operating system, templates that define how the debug hardware communicates with target devices, and configuration files for add-on probes (such as the Parallel Trace probe).

Before you begin

- You must ensure that Arm Development Studio is installed on the host PC.

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

- You must also ensure that the current DSTREAM-ST firmware is at least the minimum version required by Arm Development Studio.

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. Accept the auto-selected firmware update file, or browse and select a different firmware update file. Either:
   - 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**.

Results

The firmware is now updated on the DSTREAM-ST unit.

Related information

Connect and power up the DSTREAM-ST unit on page 20

4. Work with your DSTREAM-ST

Arm® DSTREAM-ST 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-ST to work with your targets.

4.1 Debug software for DSTREAM-ST

The development software on your host PC provides the interface between your debugger and the DSTREAM-ST 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-ST, 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-ST 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-ST 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 `<Arm_Development_Studio_install_directory>/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 `<Arm_Development_Studio_install_directory>/bin/csat`.

Related information

Install the USB drivers for the DSTREAM-ST unit on Linux on page 19
Install the USB drivers for the DSTREAM-ST unit on Windows on page 19

4.2 Hot-plug the debug cable

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

If the DSTREAM-ST unit 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.

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

- The DSTREAM-ST unit 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.

Hot-plugging: connecting

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-ST System and Interface Design Reference Guide.

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

1. Power up the DSTREAM-ST unit. Allow the DSTREAM-ST unit to power up.
2. Connect the debug cable to the target.

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-ST unit. Otherwise, if the DSTREAM-ST unit 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-ST unit into a target. For more information on TAP resets, see Reset signals.

Related information

Connect and power up the DSTREAM-ST unit on page 20

5. Troubleshooting

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

5.1 DSTREAM-ST overheats

In a powered-up state, the air intake on the top of the DSTREAM-ST unit must remain clear.

Air intake is 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.

Solution

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

5.2 Restore a DSTREAM-ST unit

If there are any problems with the DSTREAM-ST unit, you can restore it back to its factory settings using the recovery mode for the unit.

Before you begin

Debug hardware drivers are provided with Arm® Development Studio. You must have Arm Development Studio installed on your PC to access the drivers.

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.
   DSTREAM-ST erases the existing firmware within its internal flash, and replaces it with the original factory installed version.

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

Results

After the recovery process is complete, DSTREAM-ST 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-ST firmware.

5.3 Remotely restart a DSTREAM-ST unit

Describes how to remotely restart a DSTREAM-ST unit.

Remote restart is not supported by Arm Development Studio
Arm® Development Studio does not currently have a feature to remotely restart a DSTREAM-ST unit, however, a workaround is available.

Workaround
To restart your DSTREAM-ST unit, update the firmware. At the end of a firmware update, the DSTREAM-ST unit restarts.

To update the firmware of a DSTREAM-ST unit, either use:

- The Arm Development Studio GUI. For instructions, see Update the DSTREAM-ST firmware.
- 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.

5.4 Troubleshoot target connections

Your DSTREAM-ST unit is built for robust performance, but problems can arise when:

- Incompatible hardware is used with software.
- Hardware is not configured or connected correctly.
- Other hardware-related issues.

Table 5-1: Target connection troubleshooting

Check List	Things to check
Are you using the latest version of Arm® Development Studio?	Download and install the latest version of Arm Development Studio. New functionality, bug-fixes, and support for new targets are provided with every release of Arm Development Studio.
Are you using the latest firmware for your DSTREAM-ST unit.	Use the Debug Hardware Firmware Installer view in Arm Development Studio to update the firmware for your DSTREAM-ST unit.
Are all the cables connected and seated properly in the correct orientation.	• Make sure all the cables are connected and seated properly. • Check that the stripe on the debug cable matches up with pin-1 of the debug connector.
Does the pin-out of the target's debug connector match the pin-out of your DSTREAM-ST unit?	Check the connection pin-out details of your connector.

Check List	Things to check
Have the target and the DSTREAM-ST unit power cycled to ensure normal operating conditions?	To restore normal operating conditions, power-cycle the target and your DSTREAM-ST unit.
Has the DSTREAM-ST unit booted successfully?	Observe the progress of the boot sequence to confirm that your DSTREAM-ST unit is booting properly. See DSTREAM-ST unit boot sequence for more information. Check that the **STATUS** LED is glowing steady green. If the **STATUS** LED flashes red, a boot failure has occured. See Restore a DSTREAM-ST unit for more information.
Is the target system fully powered-up?	• Check that you have followed the power up sequence specified by the target's documentation correctly. Illuminated LEDs on the target do not necessarily mean that the SoC and debug interface are powered. • Check if there are any buttons or switches on the target which must be operated to enable the SoC and debug interface. • Check your target's documentation or support channels for more information.
Does the target SoC have security features that must be disabled or unlocked during connection?	Check the documentation of the SoC for details about security features.
Are there any switches or jumper links to set on the target?	On some target boards, solder-links, jumper-links, or DIP switches must be configured to enable debug. Check target board documentation or support channels for more information.
Is the correct debug connector used on the target board?	Some target boards use separate debug connectors for SoCs, FPGAs, and processor core supervisors. Check if you are using the correct debug connector.
Is debugging disabled in the target SoC?	Some targets disable debugging for security purposes. Check if debugging is enabled on your target.
Is the target's operating system disabling the debug interface during the boot process?	• Try connecting and stopping the target immediately after power up. • Try postponing the boot process using a serial connection to the target.
Is the connection attempting to load an image into the target SoC while the cores are running?	Try halting the cores through a bare-metal connection first.
Does the **DEBUG** LED flash when trying to initiate the target connection?	Check if the host software is communicating with the correct debug unit. If using Arm Development Studio, to identify and ensure you are using the correct debug unit, click the **Identify** button in either the Debug Hardware Firmware Installer view or the Debug Hardware Configure IP view.
Is the connection a simple **Connect Only** connection in the Arm Development Studio debug configuration for your target?	A simple **Connect Only** connection is useful to verify the connection to the hardware. This type of connection usually does not run any scripts or load any images on the target. To start debugging, set the connection as either **Debug from entry point** or **Debug from symbol** in the debug configuration.
Is the **Clock Speed (Hz)** in the platform configuration set correctly?	Problems might occur if the clock speed is set too high. Set the clock speed to lower frequencies in adaptive and non-adaptive clocking modes.
Are the `nTRST` and `nSRST` signals linked on the target?	Enable **Linked_SRST_TRST** in the **Probe Configuration** tab in the **Platform Configuration Editor** in Arm Development Studio.
Are initialization resets putting the target into an unwanted state?	Disable **TResetOnInitConnect** and **AllowICETAPreset** in the **Probe Configuration** tab in the **Platform Configuration Editor** in Arm Development Studio.

Check List	Things to check
In the Arm Development Studio debug configuration for the target, does the **Target Connection option** match the debug unit?	Check if you have selected the DSTREAM-ST unit as the **Target Connection** option in the **Connection** tab of the debug configuration for your target.
Does the platform configuration settings for your target specify the correct debug interface mode?	Check if the **LVDS Debug Interface mode** is set correctly in the platform configuration settings for your target.
Is an SWD connection being attempted with hardware which only supports JTAG?	Check and correct the connection setting. Even if the SoC supports SWD, there might be buffers on the target board which prevent bi-directional data on the TMS signal. Check and correct the connection setting.
Are trace capture options correctly set?	Check that the trace capture settings used for the debug configuration are set correctly.
Are core trace options correctly set with the appropriate cores enabled?	Check that the core trace options used for the debug configuration are set correctly.
Is the **TRACING** LED lit but the **DATA** LED unlit?	This indicates failure to synchronize with the trace data stream. Check if the target SoC's TPIU or I/O pins are configured correctly.

Check List	Things to check

Are you having USB connectivity issues?	The DSTREAM-ST unit uses Ethernet over USB to connect to your Host PC. On Windows 7 and Windows 10 hosts, the DSTREAM-ST unit is automatically detected as a DSTREAM-ST Network Adapter and you can view it in the **Device Manager** as a network adapter. On Linux hosts, the DSTREAM-ST unit is detected as a USB network device. The DHCP server running on your DSTREAM-ST unit assigns an IP address in the link local address range to the USB interface connected to your unit. You can use the `ifconfig` utility to view the IP address that your DSTREAM-ST unit has assigned to the connected USB interface on your workstation. If you have issues with connectivity on Linux hosts, you might need to enable your USB interface in the **Network Manager**, or enable it in the relevant configuration files for your Linux distribution.
	
	Note:
	The following instructions use `usb0` as the USB interface which is connected to your DSTREAM-ST unit. If your setup differs, change it accordingly. You can use the output of the `dmesg` utility to view the USB interface number.
	
	On Ubuntu hosts:
	1. Add the following text to `etc/network/interfaces`:
	`allow-hotplug usb0`
	`iface usb0 inet dhcp`
	2. Restart your network service or workstation.
	
	On Red Hat hosts:
	1. Create the following file:
	`/etc/sysconfig/network-scripts/ifcfg-usb0`
	2. Add the following text to the file:
	`DEVICE=usb0`
	`BOOTPROTO=dhcp`
	`ONBOOT=yes`
	3. Restart your network service or workstation.