

Selecting a debug header for Arm Cortex-M devices

By Andy Davison

Introduction

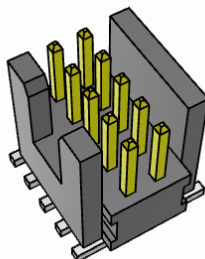
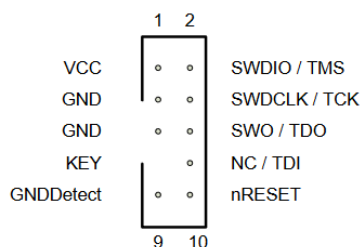
Debug headers are critical for development of embedded systems, here we provide a reference for the widely popular Arm Cortex-M devices.

Connection is keyed

Whatever your system does, you'll need to connect to the microcontroller to develop and debug your software. Although not essential to have a keyed connector, it is worth the extra cost to avoid the debugger connection being misaligned. It is also worth trying to keep the connector relatively close to the micro to maintain good signal integrity.

Cortex Debug Connector

A simple 10 pin header supports legacy JTAG, Arm CoreSight Serial Wire Debug (SWD) and Serial Wire Viewer (via SWO when SWD is used) operations.



Reference part number from Samtec FTSH-105-01-F-DV-K

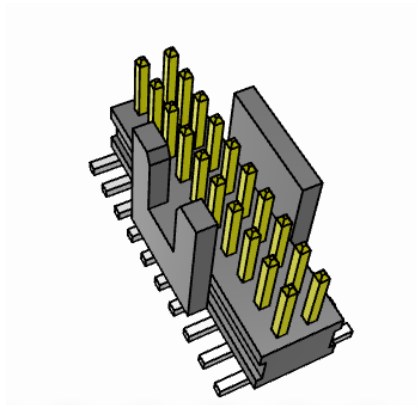
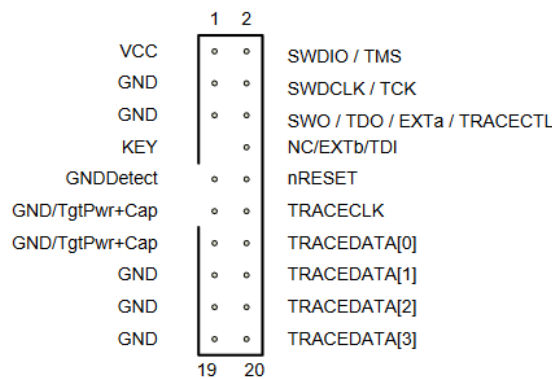
<https://www.samtec.com/products/ftsh-105-01-f-dv-k>

Note: The VCC is a reference not a supply.

Note: The nRESET signal is open drain, and consideration should be taken where multiple sources may drive it.

Cortex Debug+ ETM Connector

In addition to legacy JTAG and SWD, the extended 20 pin connector supports the Embedded Trace Macrocell (ETM) which provides Instruction Trace and Code coverage operations (where available).



Reference part number from Samtec FTSH-110-01-F-DV-K

<https://www.samtec.com/products/ftsh-110-01-l-dv-k>

The first 10 pins match the smaller connector, so the footprint could be used for either should that be useful.

<https://www.samtec.com/standards/jtag>

Provides a landing page for a range of debug connectors available from Samtec including variants with pin 7 removed. This provides additional polarisation but is not critical to operation.

Which should you choose?

This depends on the micro you're using and the toolchain, as well as space considerations.

The Cortex Debug + ETM should provide coverage for all requirements but may not be supported by all hardware. It is supported by ULINK-Pro and some 3rd party debuggers. This should be checked in the relevant user manuals and datasheets.

The 10-pin Cortex Debug connector has a small footprint and is supported by Keil's ULINK2, ULINK-Pro and the majority of 3rd party debuggers.

Some tools may support legacy JTAG connectors, however for new designs the miniature CoreSight debug connectors should be the preference.

Further Information

For more information visit our website: www.hitex.co.uk or get in touch: info@hitex.co.uk. You can also connect with us: [LinkedIn](#)