Hardware Appendix to the Software Guide to

UDE® Universal Debug Engine

Debugging, Trace and Test for Embedded Systems

Integrated Development Environment
for 64-, 32-, 16-bit Microcontrollers and Embedded Processors

AURIX, TriCore, Arm Cortex-M/R/A, Arm7/9/11, S32G/S/V,
Stellar G/P/E, RH850, R-Car, RISC-V, ARC, Power Architecture

pls
Development Tools

This manual contains 167 pages.

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Introduction

Overview

Thank you for choosing **UDE® Universal Debug Engine 2025**, one of the most powerful development workbenches available for the 64-bit architectures S32V234, the 32-bit architectures AURIX™, TriCore™, S32G, S32S, Power Architecture™, Cortex™-M/R/A, ARM™-7/9/11, RH850, R-Car, SuperH™ SH-2A, RISC-V, ARC and for the 16-bit architectures C166, ST10, XC166, XC2000, XE166, C166CBC, C166S V2 derivatives.

The **UDE® Universal Debug Engine** workbench lets you edit and organize your projects, supports you while building the applications and lets you run and test your software for example on a Starterkit board in a very convenient and cost-efficient way. The vast capability of the UDE® High-End Debugger enables you to develop fast and reliable software as well as to get short turn-around times for your microcontroller projects.

The software which you are about to install is the UDE® Standard License software. Included with the full licensed version comes a high-speed communication hardware which speeds up downloading your application into the target system. It offers a flexible way of communication via various communication channels to the supported microcontroller.

Special versions of UDE® like the **UDE® Memtool Flash/OTP Memory Programming Tool** are available on your request.

This **UDE Manual Appendix.pdf** describes the Hardware devices of **UDE® Universal Debug Engine**. It is an appendix of the **UDE Manual.pdf**. Please see the compatibility list in this manual below or the actual list on our Web site for supported MCUs.

Note: You are invited to browse to our Web site at **https://www.pls-mc.com/** to get the newest information or to download the latest version of **UDE® Universal Debug Engine**.

Feedback

PLS welcomes feedback on our products and documentation's. If you have any comments, suggestions or improvements about the products you are using, please use the Feedback Form from our Web Site **https://www.pls-mc.com/**, send an e-mail to **support@pls-mc.com** or call our Support Line.

Appendix A – Safety Instructions

Safety Instructions for Products and Equipment

Warning! It is critical that you read and follow this safety advice, the product description including technical data and the associated technical documentation. Do not use the product if you cannot read and/or understand the Information for safe operation. If you do have questions for safe operation, please contact the PLS support at **support@pls-mc.com**.

This PLS product enables users to control systems which accomplish safety functions (e.g., in electronic control systems), to change safety relevant data, or to allocate those for further processing. Hence, the application of this product can be hazardous. Improper use and unskilled application without adequate instruction and experience in handling of such products may cause threats to life and physical conditions as well as damages to property.

Our products have been developed and released exclusively for use in applications defined in the product description.

Fitness and suitability of the products for any intended use beyond the utilization for which the products have been released (e. g. other stresses/strains or technical conditions) need to be verified by the user on his own authority by taking appropriate actions and measures (e. g. by means of tests).

- PLS products made available as **beta versions** of firmware, hardware and software are to be used exclusively in testing and evaluation. These products may have not sufficient technical documentation and may not fulfill all requirements for quality and accuracy for market released series products. Therefore, product performance may differ from the product description and your expectations. The product should be used only in controlled test environments. Do not use data and results from **beta versions** without prior and separate verification and validation and do not pass them to third parties without prior examination.
- Do not use this product if you do not have proper experience and training in using the product.
- Data of any kind, which have been identified or collected by using PLS products, have to be verified with respect to reliability, quality and suitability prior to any use or dissemination.
- When using this product with systems which accomplish safety functions (e.g., in electronic control systems) that influence system behavior and can affect the safe operation of the system, you must ensure that the system can be transitioned to a safe condition (e.g. emergency shutdown or emergency operation mode) if a malfunction or hazardous incident should occur.
- All applicable regulations and statutes regarding operation must be strictly followed when using this product
- It is recommended to use the products only in closed and designated test environment.

Warning! If you fail to follow this safety advice, there might be a risk of death, serious injury or property damage. PLS and their representatives shall not be liable for any damage or injury caused by improper use of the product. PLS provides trainings regarding the proper and intended use of this product.

Regulatory Compliance and Compliance Statements

The UADx hardware is in conformity with the protection requirements of the EU Council Directive EMC 89/336/EWG, EMC 2004/108/EC, EMC 2014/30/EC. The UADx hardware has been tested and found to comply with the limits for Class B Information Technology Equipment according to the European Standard EN 55022, EN 55024.

The UADx hardware complies with the relevant provisions of the RoHS Directive for the European Union.

Software

- Install the software only on systems which fulfill the minimum requirements both in hard- and software.
- For installation of the software administrator rights are required to copy files in directories which are protected by the Windows OS, to install device drivers and modify the registry.
- The software enables the in-depth control of embedded systems. It should only be operated by persons who have the necessary expertise in the systems.
- Incorrect usage of the software can lead to irreparable destruction of components in the connected systems. This concerns in particular components whose integrated permanent memory (e.g. FLASH, PCM) is protected by special mechanisms.
- There is a particular danger if mechanical devices such as motors or actuators are controlled by the embedded systems. In this case, all necessary precautions must be taken to avoid accidents, e.g., emergency shutdown.
- There is also a particular danger if the embedded systems switch voltages that exceed the permissible contact voltages. In this case, all precautions must be taken to avoid accidents, e.g. insulation.

Electrical Safety Instructions

The UDE® Universal Debug Engine shall only be used according to the installing instruction of the **UDE Manual.pdf** and **UDE Manual Appendix.pdf**. Any external power supply used with the Universal Access Device (UAD2^{pro}, UAD2^{+}, UAD2^{next}, UAD3^{+} ...) and its components shall comply with the relevant regulations and standards applicable in the country of intended use.

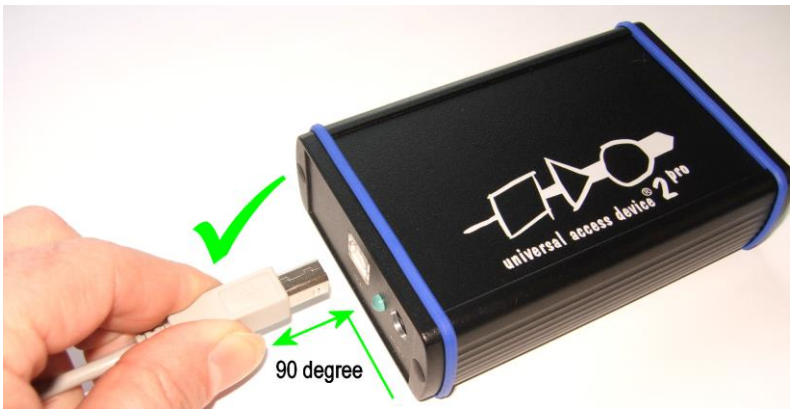
Please observe the following safety instructions when using the power supply:

- Always use the supplied power adapter, and connect it to an AC outlet of the rated voltage and frequency. If an AC adapter other than those specified by PLS is used, it may result in damage to the UADx and its accessories or AC adapter, fire or electric shock.
- Do not insert or disconnect the AC plug with wet hands. Doing so may cause electric shock.
- Insert the power plug fully and securely. Incomplete insertion may cause fire or electric shock.
- The power supply unit should be connected to an easily accessible socket outlet in the immediate vicinity of the unit.
- Always disconnect the power cord by holding the power plug. Pulling the power cord itself may damage it and cause fire or electric shock.

- Ensure that the device connections do not come into contact with liquids and do not touch them with wet or greasy hands or metal objects. If liquid gets into the device, stop using the device immediately and contact **support@pls-mc.com**.
- Do not store the devices in environments with high humidity or where the temperature may change suddenly. If condensation has formed, switch the devices off immediately and wait until all water drops have evaporated.
- Do not pour liquid substances over the UADx and its accessories or drop other objects on it, this could cause serious damage to the UADx and its components. If this should happen please stop all work with the UADx and its accessories immediately and contact **support@pls-mc.com**.
- Do not disassemble or attempt to repair the equipment. If a device is damaged, stop using the device immediately and contact **support@pls-mc.com**. Do not touch damaged areas. Avoid contact with eventually spilled liquids.
- If the UADx and its accessories is visibly damaged or its functionality is limited, it must not be used without prior instruction from support staff (**support@pls-mc.com**). Especially if components are damaged where voltage is flowing through them. These must be replaced by the manufacturer in order to avoid hazards.
- Unplug the power cord from the wall outlet during a thunderstorm or prolonged absence! Otherwise, damage to the unit could be caused by overvoltage.

Mechanical Safety Instructions

- Hold the head of the USB cable with your index finger and thumb on both sides and **insert** the cable straight into the USB port as shown in the illustration below. Make sure that you insert it straight and not at an angle.
- Hold both sides of the USB cable with your index finger and thumb at the point where it is connected to the computer and carefully **pull it out** horizontally to remove the cable from the USB port.



- Do not insert or remove a USB plug with excessive force.

- Do not plug in or pull out the USB plug upwards, downwards, left, right or forwards.
- Do not pull or tug on the USB cable when plugged into the port.

Safety Instructions

- Do not use the Universal Access Device (UAD2^{pro}, UAD2^{+}, UAD2^{next}, UAD3^{+} ...) and its accessories in places where flammable or combustible gases (gasoline etc.) are present. Doing so may cause a fire.
- The UADx and its components should be operated in a well-ventilated environment and should not be covered. The UADx and its accessories are only intended for use inside buildings.
- The UADx and its components should be placed on a stable, flat surface in use.
- Do not use excessive force when using the equipment. Do not pull on cables or bend them too much.
- Do not expose the devices to fire, microwaves or high temperatures.
- The UADx and its accessories must not be operated if it is damaged, or if smoke or odd smells occur. Doing so may result in a fire. In such situations, disconnect the power adapter from the AC outlet, and contact **support@pls-mc.com**.
- Make sure that the UADx and its accessories is stored at ground level and in a position that does not endanger persons and surrounding equipment.
- Do not place the UADx and its accessories on an unstable or sloping surface. Doing so may result in its dropping or overturning, causing injury. Be careful not to drop the UADx and its accessories when carrying it.
- Before cleaning, remove all connected cables to avoid the risk of electric shock. Clean the outside of the devices only, using a soft, damp cloth. Do not use chemicals or abrasives. Avoid under all circumstances the penetration of moisture into the device.
- The use of spare parts, accessories and special equipment which have not been tested and approved by PLS can have a negative influence on the function and properties of the UADx and its components. Therefore, PLS is not liable for any resulting damage.
- Improper operation of the UADx and its accessories may cause damage to the devices or other property. It may therefore only be used in technically perfect condition and for its intended purpose in accordance with the operating instructions given in the manual.
- Safe use of UADx and its accessories is only possible if the user manual is read completely and the instructions are followed completely. Non-observance of the instructions can lead to considerable damage or accidents.
- Anyone using UADx and its accessories must have access to the user manual. The user manual can be found here: in the delivery content of the UDE® as printed manual, UDE® Software installation as PDF.
- **Keep these operating instructions in a safe place for later use.**
- The product may only be used by persons instructed in the safe use of the product and understand the resulting dangers.
- Children should be supervised to ensure that they do not play with the UADx and its components.
- Keep the devices, all accessories and packaging materials out of reach of children and pets. Small objects such as the packaging materials could be accidentally swallowed. Cables could be tied around the neck.

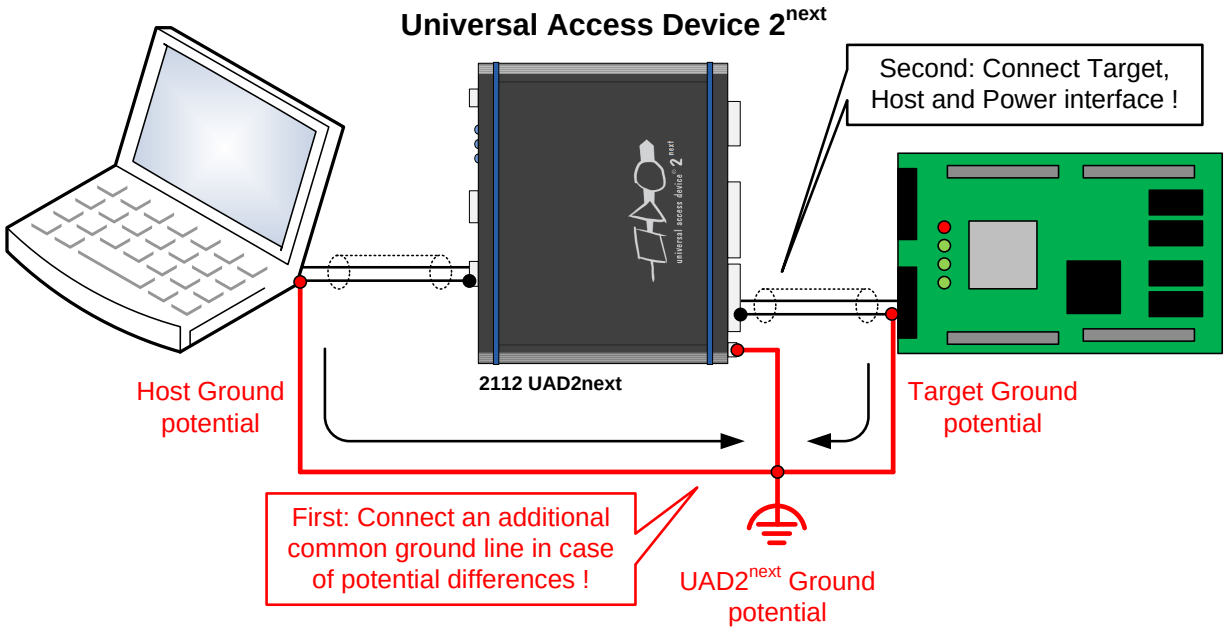
Static Electricity Precautions

Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **JTAG/DAP/SWD** connectors, these ports are endangered especially by electrostatic discharging. The maximum voltage on these pins must not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first. To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a **ground socket** on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.

Firmware updates

Attention! When a new version of UDE® is started the first time, a firmware update may be executed on the Universal Access Device (UAD2, UAD2^{pro}, UAD2^{next}, UAD3^{+}). This may take some more time than usual for the ‘target connect’ operation.
Please **DO NOT** power off or unplug the access device while this time!

Original Components of Delivery

A proper function of the UDE® Universal Debug Engine and its hardware devices is only guaranteed for working with the original components tested and delivered by PLS.

These parts can be identified by an inhered UDE® label:

The delivered components are verified by the recommends and standards of the chip manufactures. Please see the chapter **Delivery Contents** of the **UDE Manual.pdf** for further hints.

Appendix A.1 – Hardware Description UAD2 *)

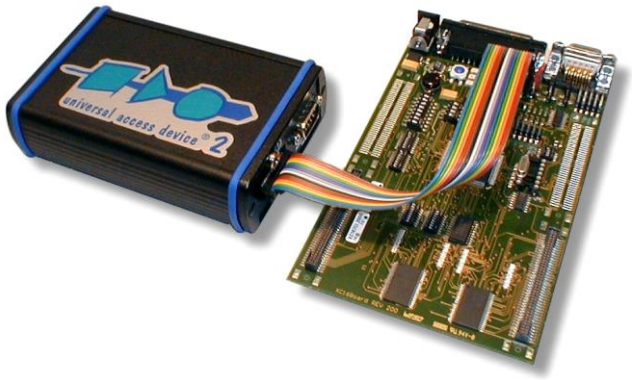
Description

Universal Access Device 2 as an add-on for the UDE® Development Environment for microcontrollers offers a flexible and fast solution for testing software applications on customer-specific target systems.

- Universal Access Device 2 offers high communication speed in conjunction with PC-based high-speed communication hardware that makes short turn-around cycles in software development possible.
- Universal Access Device 2 supports C16x / ST10, TriCore, XC166, XC2000, XE166, ARM7, ARM9, ARM11, Cortex-M3, Power Architecture, SuperH SH-2A and XScale derivatives with On-Chip Debug Support (OCDS)
- Supported communication channels are JTAG, DAP, SWD, ASC, SSC, CAN.

Universal Access Device 2 is a good solution for supporting target system communication channels beside ASC that are by default not available in the target system.

Accessing the target system is supported via DAP, JTAG, SWD, SSC, CAN as well as ASC and CAN bootstrap loader interfaces, maximum flexibility together with fast communication and minimum system resource consumption is achieved.



Note: A proper function of the UDE® Universal Debug Engine and its hardware devices is only guaranteed for working with the original components tested and delivered by PLS. The delivered components are verified with the recommends and standards of the chip manufactures.

*) Please note the UAD2^{pro} replaces the UAD2. For new projects, the UAD2 is no longer available. Of course, all existing UDE/UAD2 licenses will be maintained continuously for the next years without limitations.

Product Features

Universal Debug Interface for the UDE® Integrated Development Environment.

- DAP Interface via additional Debug Adapter (variable speed between 2 and 50 MHz) for debugging (supports TriCore AUDO Future and XC2000/XE166 with JTAG/OCDS)
- SWD Interface via additional Debug Adapter (variable speed between 2 and 25 MHz) for debugging (supports CoreSight and Cortex)
- Complete JTAG Interface via additional Debug Adapter (variable TCLK speed between 2 and 50 MHz) for JTAG/OCDS and JTAG/ARM debugging (supports all TriCore, C166CBC, XC166, XC2000, XE166, C166S V2, ARM7, ARM9, ARM11, Power Architecture OnCE and COP, SuperH SH-2A and XScale derivatives with JTAG/OCDS, JTAG/ARM, OnCE or COP module on-chip)
- ASC (RS232), SSC (RS485), CAN Interface
- USB 2.0 480 Mbps Host Interface available.

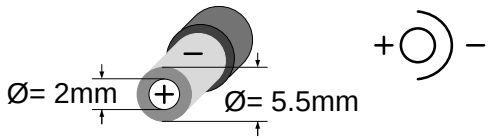
Precautions of Firmware updates

Attention! When a new version of UDE® is started the first time, a **firmware update** may be executed on the Universal Access Device (UAD2, UAD2^{pro}, UAD2^{next}, UAD3^{+}). This may take some more time than usual for the 'target connect' operation.
Please **DO NOT** power off or unplug the access device while this time!

Power Supply

For UAD2, the power is supplied by a main power supply unit (part of the delivery contents).

Attention! Do not use other main power supply units as they may damage Universal Access Device 2. Any damages or hazards arising from the use of unsuitable power supplies, over-voltage or wrong polarity are in the sole responsibility of the user and do not fall under warranty repair.

Universal Access Device 2 Power Supply connector	Input Voltage: 12V DC or 18V DC	Power Plug 

Driver Installation USB

Because of the Plug 'n Play-Capabilities of the UAD2, the USB driver installation is started automatically, when the UAD2 is connected to the host PC the first time.

Please follow the driver installation guide described in **UDE Manual.pdf**.

Interface and Connector Description

Overview

The Universal Access Device 2 features a number of interface connectors for the whole range of supported target interfaces. Via SUB-D9 connectors, serial connection between Universal Access Device 2 and the target as well as between Universal Access Device 2 and the external ASC / SSC / CAN hardware controlled by the target application is achieved. The JTAG / DAP / SWD interface is provided by a 10-pin, 16-pin or 20-pin header located on **an additional Debug Adapter**.

Universal Access Device 2

Label	Description	Connector
⏚	Ground potential of Universal Access Device 2	4 mm Round Connector
JTAG Target	JTAG / DAP Interface to the Target	16-pin Shroud Male Header (or via DAP / SWD / OnCE / COP / .. Adapter)
ASC / SSC / CAN Target	Combined ASC0, SSC, CAN0 Interface to the Target	SUB-D9 (Male)
Power	External Power Supply	Power Connector
Host/USB	Host Communication via USB 2.0	USB connector

Attention! The voltage on any pin of the ASC/SSC/CAN interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

Access Device Status Indication

The LED on the backside of the UAD2 indicates the device state and traffic on a specific host communication interface.

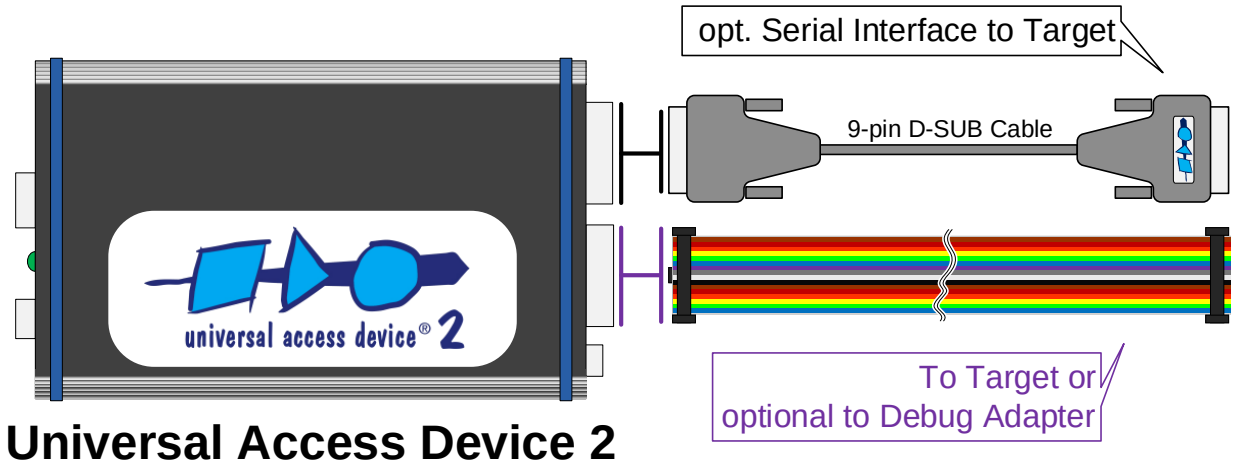
Comm (unication)	LED blink codes description
LED off	UAD2 not powered on (when powered on, the UAD2 or its power supply is defective)
LED blinking sporadically or continuously	UAD2 powered on, connection between UAD2 and Host interface established

Interface Details

USB 2.0 Host Interface

Universal Access Device 2 realizes the Host Communication via the USB 1.1 or USB 2.0 interface. If the PC is not equipped with an USB interface onboard, an USB host adapter must be installed. The USB port is labelled with Host/USB.

Connection Schema to the Target

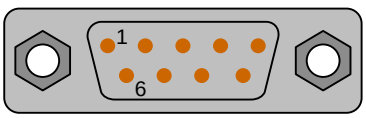


Asynchronous RS232-compatible Application Target Interface

The UAD2 provides a buffered asynchronous communication path between to the ASC0 of the target system controller.

ASC	ASC Communication Interface between UAD2 and the Target System	up to 1 Mbps

Connector Serial Target (**Male**) D-SUB9:



Pin 1	Reserved	Pin 2	**TxD** (Target Transmit)
Pin 3	**RxD** (Target Receive)	Pin 4	Reserved
Pin 5	**GND**	Pin 6	Reserved
Pin 7	Reserved	Pin 8	Reserved
Pin 9	Reserved		

Attention! The voltage on any pin of the ASC/SSC/CAN interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

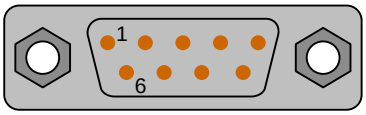
For connecting the target system with Universal Access Device 2, a standard 1-to-1 wired SUB-D9 cable is suitable.

Asynchronous RS485-compatible Target Interface (DIN 19245)

Transmission rates of up to 625 kBaud can be achieved with UAD2 via this serial interface. The definition of transmission protocol and pin assignment follows the German standard DIN 19245 for industrial networks called Profibus.

ASC	RS485-compatible asynchronous Communication Interface	up to 1 Mbps

Connector Serial Target (**Male**) D-SUB9:



Pin 1	Reserved	Pin 2	Reserved
Pin 3	**Data**	Pin 4	Reserved
Pin 5	**GND**	Pin 6	Reserved
Pin 7	Reserved	Pin 8	**/Data**
Pin 9	Reserved		

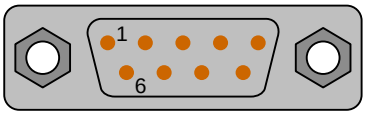
Attention! The voltage on any pin of the ASC/SSC/CAN interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

Synchronous RS485-compatible SSC Target Interface

Transmission rates up to 1 Mbps can be achieved with UAD2 via this serial interface. The transmission protocol uses the RS485 interface to reach the maximum data transmission rate for long cable distances.

SSC	RS485 -compatible synchronous Communication Interface based on the On-Chip SSC of the C16x, XC166, XC2000, XE166 and TriCore Controllers	up to 1 Mbps

Connector Serial Target (**Male**):



Pin 1	**RSTIN**	Pin 2	**MRST**
Pin 3	**MTSR**	Pin 4	**SCLK**
Pin 5	**GND**	Pin 6	**/RSTIN**
Pin 7	**/MRST**	Pin 8	**/MTSR**
Pin 9	**/SCLK**		

Attention! The voltage on any pin of the ASC/SSC/CAN interface must be between +12 Volts and -12 Volts. It must not exceed the absolute value of 12 Volts.

CAN Target Interface

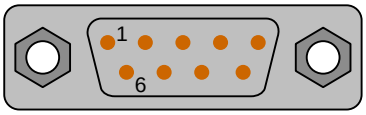
The Controller Area Network (CAN) bus and its associated protocol allow very efficient communication between a numbers of CAN nodes connected to the bus.

The Universal Access Device 2 may be connected therefore of the most standard evaluation boards with a CAN bus interface for the controller family. Note that the UAD2 does not contain the bus termination network. It must be added externally.

High-speed CAN networks based on ISO-DIS 11898 have a line topology and must be terminated with a 120 Ohm resistor between CAN_H and CAN_L lines at the last network node.

CAN	CAN Communication Interface	up to 1 Mbps

Connector Serial Target (**Male**) D-SUB9:



Pin 1	Reserved	Pin 2	**CAN_L**
Pin 3	**GND**	Pin 4	Reserved
Pin 5	Reserved	Pin 6	**GND**
Pin 7	**CAN_H**	Pin 8	Reserved
Pin 9	Reserved		

Attention! The voltage on any pin of the ASC/SSC/CAN interface must be between +12 Volts and -12 Volts, must not exceed the absolute value of 12 Volts.

DAP Target Interface

The debug interface DAP was established by Infineon for 16-bit and 32-bit-micro-controllers. For UAD2 an **additional DAP Debug Adapter** is required to support the 2-wire and the 3-wire DAP modes.

- I/O voltage range: 2.4 Volts – 5.0 Volts
- Power dissipation from target voltage: 100 mW (V_{REF} = 3.3 Volts)
- ESD Protection per signal: 15 kVolts, Capacity per signal: max 55 pF
- Resettable over-current protection for V_{IO}:10 A (max 0.2 s time to trip, resettable).

TriCore, XE166, XC2000 10-pin DAP

DAP	Debugging Channel for the DAP	up to 50 MHz

DAP Debug Adapter with 50 mil Samtec FTSH-105 connector:

Pin 1	**V_{REF}**	Pin 2	**DAP1**
Pin 3	GND	Pin 4	**DAP0**
Pin 5	GND	Pin 6	**DAP2_USER0**
Pin 7	KEY_GND	Pin 8	**DAPEN_USER1**
Pin 9	GND	Pin 10	**RESET#**

Product codes for ordering the adapter and matching cable

- 2000 - DAP 2-wire/3-wire communication adapter with one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)

Note: The DAP Debug Adapter must be powered from V_{REF} voltage. The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

JTAG Target Interface

TriCore, XC166, XC2000, XE166, Power Architecture, ARM7, ARM9, ARM11, XScale, SuperH SH-2A derivatives feature an on-chip IEEE1149.1-based interface for an external debugging unit.

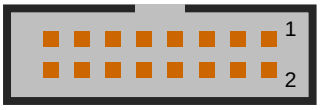
- I/O voltage range: 2.4 Volts – 5.0 Volts

Note: The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

TriCore, XE166, XC2000, XC166 Adapter 16-pin JTAG/OCDS

JTAG/OCDS	Debugging Channel for the IEEE1149.1-based JTAG	up to 50 MHz

JTAG Debug Adapter for 100 mil standard JTAG/OCDS:



Pin 1	**TMS**	Pin 2	**V_{REF}**
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

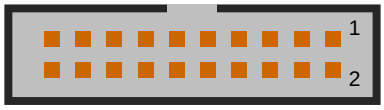
Product codes for ordering the matching cable

- 2018 - 16-pin flat ribbon JTAG/IFX communication cable with an Infineon defined 16-pin 100mil connector, 10" (25cm)

ARM7, ARM9, ARM11, XScale Adapter 20-pin JTAG

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	**V_{REF}**
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	n.c.	Pin 18	GND
Pin 19	n.c.	Pin 20	GND

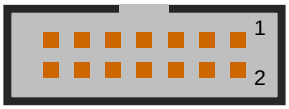
Product codes for ordering the matching cable

- 2020 - JTAG/ARM communication flat ribbon cable with an ARM defined 20-pin 100mil connector, 10" (25cm)

Power Architecture Adapter 14-pin JTAG/OnCE

JTAG/OnCE	Debugging Channel for the IEEE1149.1- and IEEE1149.7-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG OnCE:



Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK**	Pin 6	GND
Pin 7	n.c.	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	n.c.	Pin 14	**TRST#**

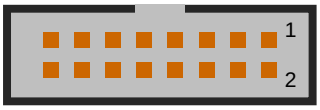
Product codes for ordering the adapter and matching cable

- 2023 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2018 - 16-pin flat ribbon JTAG/IFX communication cable with an Infineon defined 16-pin 100mil connector, 10" (25cm)

Power Architecture Adapter 16-pin JTAG/COP

JTAG/COP	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/COP:



Pin 1	**TDO**	Pin 2	QACK#
Pin 3	**TDI**	Pin 4	**TRST#**
Pin 5	HALTED	Pin 6	**V_{REF}**
Pin 7	**TCK**	Pin 8	n.c.
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	SRST#	Pin 12	GND
Pin 13	HRST#_**RESET#**	Pin 14	n.c.
Pin 15	CHKSTP	Pin 16	GND

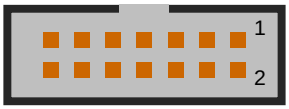
Product codes for ordering the adapter

- 2026 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector

SuperH SH-2A Adapter 14-pin JTAG/H-UDI

JTAG/H-UDI	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/H-UDI:



Pin 1	**TCK**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDO**	Pin 6	GND
Pin 7	n.c.	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	GND
Pin 11	**TDI**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GND

Product codes for ordering the adapter and cable

- 2050 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2018 - 16-pin flat ribbon JTAG/IFX communication cable with an Infineon defined 16-pin 100mil connector, 10" (25cm)

SWD Target Interface

The Serial Wire Debug (SWD) interface or Serial Wire Debug Port (SW-DP) is one of the features of the debug and trace technology ARM CoreSight™ and is supported via a Debug Adapter. The known JTAG Debug Port (JTAG-DP) is supported furthermore. Both debug ports, the SWD and the alternative JTAG debug port can be combined to the Serial Wire JTAG Debug Port (SWJ-DP), the CoreSight/Cortex standard port. For UAD2 an **additional SWD Debug Adapter** is required to support SWD.

- I/O voltage range: 2.4 Volts – 5.0 Volts.
- Power dissipation from target voltage: 100 mW (V_{REF} = 3.3 Volts)
- ESD Protection per signal: 15 kVolts
- Capacity per signal: max 55 pF, Pull Downs for TCK, SWDIO
- Resettable over-current protection for V_{IO}: 10 A (max 0.2 s time to trip, resettable).

Cortex Adapter 10-/20-pin Cortex

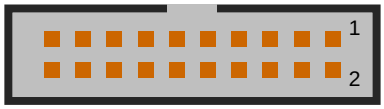
SWD	Debugging Channel for the SWD	up to 25 MHz

SWD Debug Adapter for 50 mil Samtec FTSH-105/FTSH-110 high density connector:

Pin 1	**V_{REF}**	Pin 2	**SWDIO**
Pin 3	GND	Pin 4	**SWDCLK**
Pin 5	GND	Pin 6	**SWO**
Pin 7	KEY_GND	Pin 8	n.c.
Pin 9	GND	Pin 10	**RESET#**
Pin 11*	n.c.	Pin 12*	n.c.
Pin 13*	n.c.	Pin 14*	n.c.
Pin 15*	GND	Pin 16*	n.c.
Pin 17*	GND	Pin 18*	n.c.
Pin 19*	GND	Pin 20*	n.c.

* Please note: These pins are only provided at the 20-pin micro connector.

SWD Debug Adapter for 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	n.c.
Pin 3	n.c.	Pin 4	GND
Pin 5	n.c.	Pin 6	GND
Pin 7	**SWDIO**	Pin 8	GND
Pin 9	**SWDCLK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**SWO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	n.c.	Pin 18	GND
Pin 19	n.c.	Pin 20	GND

Product codes for ordering the adapter and matching cables

- 2017 - SWD extender adapter with one CoreSight defined 10-pin 50mil Samtec FTSH-105 (CoreSight) connector, one 20-pin 50mil Samtec FTSH-110 (CoreSight) and one 20-pin 100mil (SWD) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2018 - 16-pin flat ribbon JTAG/IFX communication cable with an Infineon defined 16-pin 100mil connector, 10" (25cm)

Note: The SWD Debug Adapter must be powered from VREF voltage. The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

Special Target Interface for Automotive ECU

Note: The following non-standard interfaces for Automotive ECU are available as separate products from PLS. Please contact **sales@pls-mc.com** with the note **Automotive ECU** if the following Debug Adapters are required.

TriCore, XE166, XC2000, XC166 Adapter 10-pin MiniJTAG

JTAG/OCDS	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 Mbps

MiniJTAG/OCDS Adapter with 50 mil Samtec FTSH-105 connector:

Pin 1	**BRKIN#**	Pin 2	**TRST#**
Pin 3	GND	Pin 4	**TCLK**
Pin 5	**TMS**	Pin 6	**BRKOUT#**
Pin 7	**RESET#**	Pin 8	**TDI**
Pin 9	**V_{REF}**	Pin 10	**TDO**

Product codes for ordering the adapter and matching cables

- 2041 - JTAG/MiniJTAG communication adapter with one customer based 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)

Attention! The TriCore Adapter 10-pin MiniJTAG is not compatible with standard Infineon JTAG/OCDS/DAP adapter and should only be used for automotive ECUs.

MCU I/O resp. V_{REF} voltage

The Universal Access Device 2 detects the voltage on the I/O voltage pin and uses the external or the internal reference voltage automatically. The internal 3.3 Volts reference voltage is used for the internal level shifter only when the I/O voltage is higher than 4 Volts or lower than 2 Volts.

Note: With Universal Access Device 2, it is possible to debug cores with JTAG Support under different I/O voltages. The I/O voltage must be known as well as the target system's connections to MCU I/O voltage pin of the connector.

Resetting the Target Systems

For resetting the target system, at the connector JTAG / DAP Target the line RESET# (MCU I/O ring resp. V_{REF} voltage level) is provided. This reset line is active-low and may be connected to the corresponding lines on the target system to achieve an automatic and software-controlled target hardware reset.

The line RESET# can only be used in **Open-Drain** configuration. The level of this reset line is controlled by the MCU I/O voltage of the target or is selected for 3.3 Volts operation.

Static Electricity Precautions

Electrostatic Discharge (ESD) can damage a sensitive electronic component! Under several conditions static electricity and ground potential differences between the Access Device and the user's target hardware can build up high voltages - over 10000 Volts (10 kVolts) in some cases. The electrostatic discharge of this build-up voltage results in fast high current waveforms and fast magnetic (H-field) or electrostatic (E-field) disturbances. The discharge into the electronic components and circuitry can damage or destroy hardware components, resulting in failures and reduced reliability.

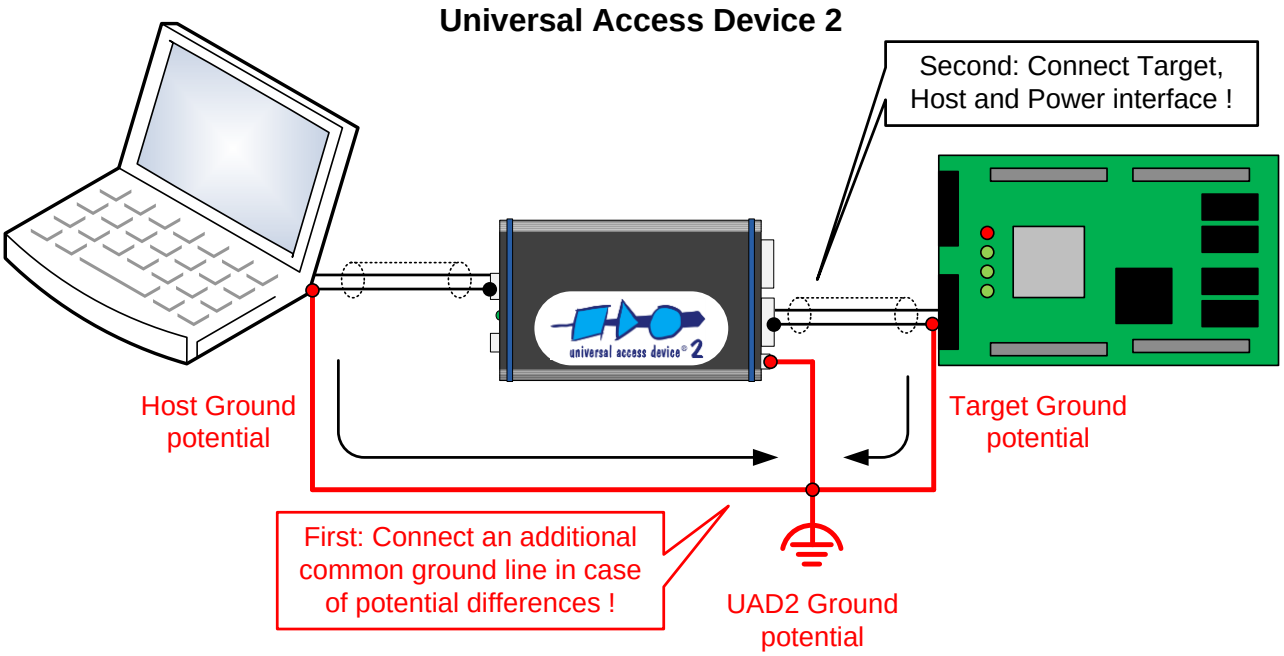
Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **JTAG/DAP/SWD** and the **3Pin/Serial** connectors, these ports are endangered especially. The maximum voltage on these pins may not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first.

To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Please ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a ground socket on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.
An additional protection for UAD2 can be achieved by using the JTAG Protector. Please note, that the JTAG Protector **DOES NOT** suspend the precautions described above.

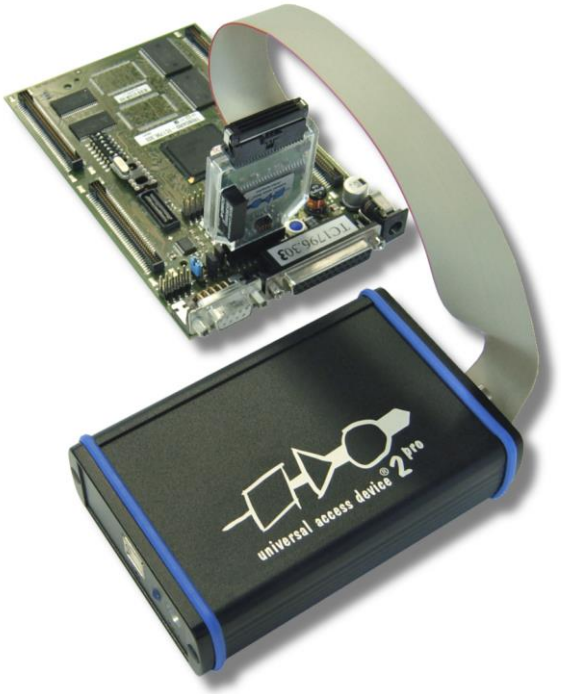
Appendix A.2 – Hardware Description UAD2pro

Description

Universal Access Device 2pro as a powerful add-on for the UDE® Development Environment for microcontrollers offers a flexible and fast solution for testing software applications on customer-specific target systems.

- Universal Access Device 2pro offers high communication speed in conjunction with PC-based high-speed communication hardware that makes short turn-around cycles in software development possible
- Universal Access Device 2pro supports C16x / ST10, TriCore, XE166, XC2000, ARM7, ARM9, ARM11, Cortex, Power Architecture, RH850, SuperH SH-2A and XScale derivatives with On-Chip Debug Support
- Supported communication channels are JTAG, cJTAG, H-UDI, DAP, SPD (Single Pin DAP) via CAN, SWD, ASC, CAN.

Universal Access Device 2pro is a good solution for supporting target of high-speed and flexible target access. Accessing the target system is supported via DAP, JTAG, cJTAG, SWD, H-UDI, CAN, SPD via CAN as well as ASC and CAN bootstrap loader interfaces, maximum flexibility together with fast communication and minimum system resource consumption is achieved.



The interface Debug Adapters to the target are used by the UAD2pro, UAD2next and the UAD3+ in the same way. Please note, that, because of the compatibility between UAD2pro, UAD2next and UAD3+ Debug Adapters, the adapters can be differ in the labels in detail.

Note: A proper function of the UDE® Universal Debug Engine and its hardware devices is only guaranteed for working with the original components tested and delivered by PLS. The delivered components are verified with the recommends and standards of the chip manufactures.

Product Features

Universal Debug Interface for the UDE® Integrated Development Environment.

- Separated target interface Debug Adapter
- 1.65 Volts – 5.5 Volts I/O ring voltage, no power consumption from target
- DAP and Single Pin DAP (via CAN) interface (variable up to 50 MHz)
- Support for DXCPL (DAP over CAN Physical Layer)
- SWD interface (variable speed up to 50 MHz)
- Complete JTAG, cJTAG, LPD interface (variable TCLK speed up to 50 MHz)
- ASC (RS232), CAN Interface
- USB 2.0 480 Mbps Host Interface available.

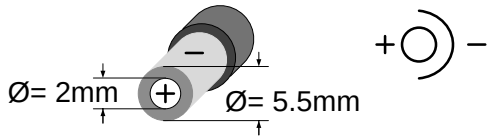
Precautions of Firmware updates

Attentions! When a new version of UDE® is started the first time, a **firmware update** may be executed on the Universal Access Device (UAD2, UAD2^{pro}, UAD2^{next}, UAD3^{+}). This may take some more time than usual for the 'target connect' operation.
Please **DO NOT** power off or unplug the access device while this time!

Power Supply

For Universal Access Device 2^{pro}, the power is supplied by a main power supply unit (part of the delivery contents).

Attention! Do not use other main power supply units as they may damage UAD2^{pro}. Any damages or hazards arising from the use of unsuitable power supplies, over-voltage or wrong polarity are in the sole responsibility of the user and do not fall under warranty repair.

Universal Access Device 2^{pro} Power Supply connector	Input Voltage: 12V DC or 18V DC	Power Plug 

Driver Installation USB

Because of the Plug 'n Play-Capabilities of the UAD2^{pro}, the USB driver installation is started automatically, when the UAD2^{pro} is connected to the host PC the first time.

Please follow the driver installation guide described in **UDE Manual.pdf**.

Interface and Connector Description

Overview

The Universal Access Device 2pro features a number of interface connectors for the whole range of supported target interfaces. Via SUB-D9 connectors, serial connection between UAD2pro and the target as well as between UAD2pro and the external ASC (RS232) / CAN hardware controlled by the target application is achieved. The JTAG / cJTAG / DAP / SWD / LPD interface is provided by a Debug Adapter.

Universal Access Device 2pro

Label	Description	Connector
⏚	Ground potential of Universal Access Device 2pro	4 mm Round Connector
Debug Target	Debug Interface to the Target	40-pin Shroud Male Header
ASC / CAN Target	Combined ASC0, CAN0 Interface to the Target	SUB-D9 (Male)
Power	External Power Supply	Power Connector
Host/USB	Host Communication via USB 2.0	USB connector

Attention! The voltage on any pin of the ASC/CAN interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

Access Device State Indication

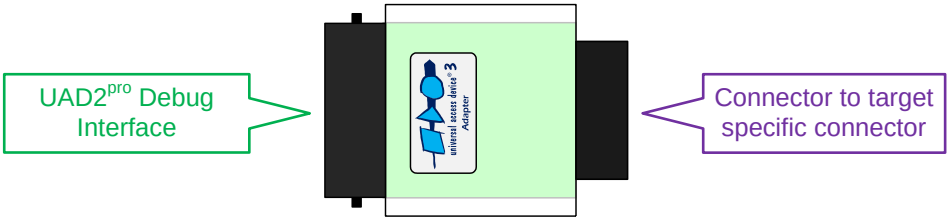
The LED on the backside of the UAD2pro indicates the device state and traffic on a specific host communication interface.

Comm (unication)	LED blink codes description
LED off	UAD2pro not powered on (when powered on, the UAD2pro or its power supply is defective)
LED blinking sporadically or continuously	UAD2pro powered on, connection between UAD2pro and Host interface established

Debug Adapter

The Debug Adapter is a part of the debug connection between the UAD2pro and the supported target PCB debug connector, e.g. connectors of JTAG, cJTAG, ARM, DAP/DAP2, SWD, OnCE, COP and further interfaces. The interface description below describes further details.

Target specific Debug Adapter



Product codes for ordering the adapters and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2010 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2035 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector
- 2052 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2031 - MiniDAP/cJTAG communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector
- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Description (combined)	Connector
Debug Interface to the UAD2next Debug Interface	40-pin Male Shrouded Header
Debug Connector to JTAG/DAP/DAP2 Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/DAP/DAP2 Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/OnCE and JTAG/cJTAG Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/COP Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/H-UDI Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/RH850 Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/ARM Target	20-pin Standard 100 mil Connector

Debug Connector to JTAG/SWD Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/SWD Target	20-pin Samtec FTSH Connector
Debug Connector to MiniDAP/cJTAG/SWD Target for Automotive ECU	10-pin Samtec TFM Connector
Debug Connector to MiniJTAG Target for Automotive ECU	10-pin Samtec FTSH Connector
Debug Connector to ETKS Target for Automotive ECU	16-pin Samtec FTSH Connector

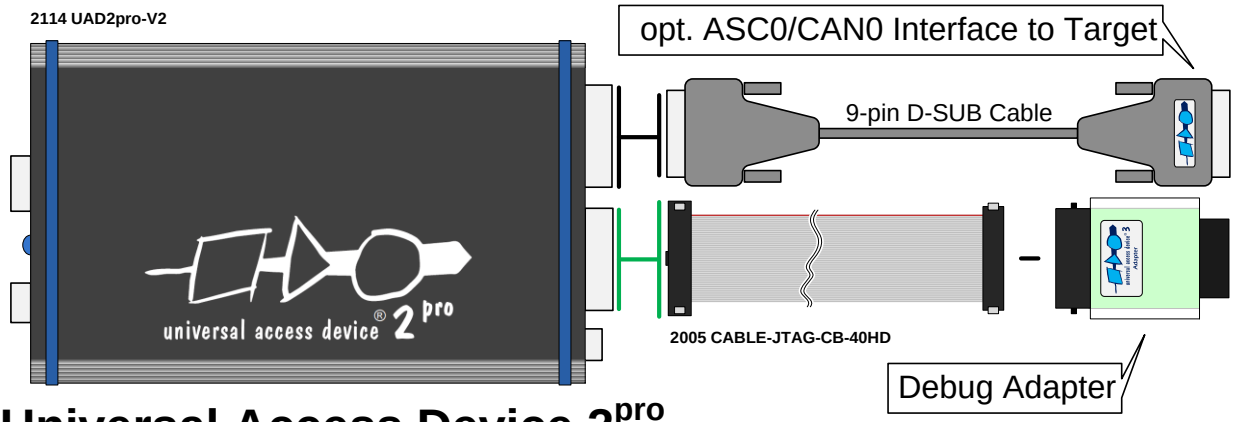
The interface description below describes further details.

Interface Details

USB 2.0 Host Interface

UAD2^{pro} realizes the Host Communication via the USB 1.1 or USB 2.0 interface. If the PC is not equipped with an USB interface onboard, an USB host adapter must be installed. The USB port is labelled with Host/USB.

Connection Schema to the Target



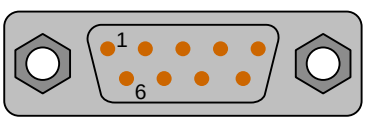
Universal Access Device 2^{pro}

Asynchronous RS232-compatible Application Target Interface

The UAD2^{pro} provides a buffered asynchronous communication path between to the ASC0 of the target system controller. This interface is combined with CAN0. The ASC0/CAN0 mode is selected by the UDE® target configuration.

ASC	ASC Communication Interface between UAD2^{pro} and the Target System	up to 1 Mbps

Connector Serial Target (**Male**) D-SUB9:



Pin 1	Reserved	Pin 2	**TxD** (Target Transmit)
Pin 3	**RxD** (Target Receive)	Pin 4	Reserved
Pin 5	**GND**	Pin 6	Reserved
Pin 7	**CTS** (Target Receive)	Pin 8	**RTS** (Target Transmit)
Pin 9	Reserved		

Attention! The voltage on any pin of the ASC/CAN interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

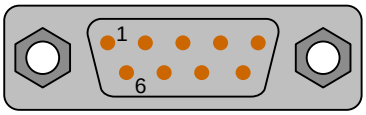
For connecting the target system with Universal Access Device 2pro, a standard 1-to-1 wired SUB-D9 cable is suitable.

CAN Target Interface

The Universal Access Device 2pro may be connected therefore of the most standard evaluation boards with a CAN bus interface for the controller family. Note that the UAD2pro does not contain the bus termination network. It must be added externally. High-speed CAN networks based on ISO-DIS 11898 have a line topology and must be terminated with a 120 Ohm resistor between CAN_H and CAN_L lines at the last network node.

CAN	CAN Communication Interface	up to 1 Mbps

Connector Serial Target (**Male**) D-SUB9:



Pin 1	Reserved	Pin 2	**CAN_L**
Pin 3	**GND**	Pin 4	Reserved
Pin 5	Reserved	Pin 6	**GND**
Pin 7	**CAN_H**	Pin 8	Reserved
Pin 9	Reserved		

Attention! The voltage on any pin of the ASC/CAN interface must be between +12 Volts and -12 Volts, must not exceed the absolute value of 12 Volts.

DAP Target Interface

The UAD2pro supports the 2-wire and the 3-wire DAP mode.

- I/O voltage range: 1.65 Volts – 5.5 Volts
- ESD Protection per signal: 15 kVolts, Capacity per signal: max 55 pF
- Resettable over-current protection for V_{IO}:10 A (max 0.2 s time to trip, resettable)

TriCore/AURIX, XE166, XC2000 Adapter 10-pin DAP

DAP	Debugging Channel for the DAP	up to 50 MHz

DAP Debug Adapter for 50 mil Samtec FTSH-105 DAP connector:

Pin 1	**V_{REF}**	Pin 2	**DAP1**
Pin 3	GND	Pin 4	**DAP0**
Pin 5	GND	Pin 6	**DAP2_USER0**
Pin 7	KEY_GND	Pin 8	**DAPEN_USER1**
Pin 9	GND	Pin 10	**RESET#**

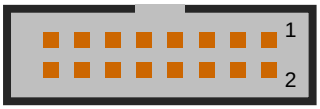
Product codes for ordering the adapter and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

TriCore/AURIX, XE166, XC2000 Adapter 16-pin DAP

DAP	Debugging Channel for the DAP	up to 50 MHz

DAP Debug Adapter for 100 mil standard JTAG/DAP connector:



Pin 1	**DAP1**	Pin 2	**V_{REF}**
Pin 3	**DAP2_USER0**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	Reserved (TDI)	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**DAP0**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**DAPEN_USER1**
Pin 15	Reserved	Pin 16	Reserved

Product codes for ordering the adapter and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Note: JTAG Debug Adapters are available as a standard and an isolated version. The Debug Adapter implements several interfaces on the same hardware: JTAG/DAP (XC2000/TriCore), JTAG/SWD (ARM, Cortex) are examples. Please see the detailed description about it.
The Debug Adapters to the target are used by the UAD2^{pro}, UAD2^{next} and the UAD3^{+} in the same way. Please note, that, because of the compatibility between UAD2^{pro}, UAD2^{next} and UAD3^{+} Debug Adapters, the adapters can be differ in the labels in detail.

JTAG Target Interface

TriCore, Power Architecture, ARM9, ARM11, Cortex, SuperH SH-2A derivatives feature an on-chip IEEE1149.1 and IEEE1149.7 based interface for an external debugging unit. This unit allows resource-saving target system access without additional software or hardware on the target system. Therefore, all controller serial interfaces remain available for the application without restrictions caused by the debugging interface.

TriCore, XC166, XC2000, XE166 derivatives are featured an on-chip IEEE1149.1-based interface for an external debugging unit. This unit allows resource-saving target system access without additional software or hardware on the target system. Therefore, all controller serial interfaces remain available for the application without restrictions caused by the debugging interface.

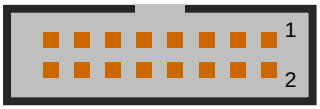
- I/O voltage range: 1.65 Volts – 5.5 Volts

Note: The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

TriCore/AURIX, XE166, XC2000, XC166 Adapter 16-pin JTAG/OCDS

JTAG/DAP	Debugging Channel for the IEEE1149.1-based JTAG	up to 50 MHz

JTAG Debug Adapter for 100 mil standard JTAG/OCDS connector:



Pin 1	**TMS**	Pin 2	**V_{REF}**
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

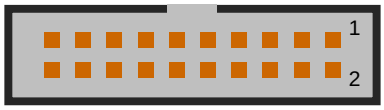
Product codes for ordering the adapter and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

ARM7, ARM9, ARM11, Cortex Adapter 20-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM for 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	RTCK	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	DBGREQ	Pin 18	GND
Pin 19	DBGACK	Pin 20	GND

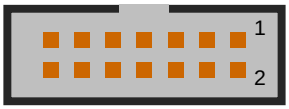
Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Power Architecture Adapter 14-pin JTAG/OnCE

JTAG/OnCE JTAG/cJTAG	Debugging Channel for the IEEE1149.1-and IEEE1149.7-based JTAG	up to 100 MHz

JTAG/cJTAG Debug Adapter for 100 mil standard OnCE connector:



Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK_TCKC**	Pin 6	GND
Pin 7	n.c.	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS_TMSC**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	n.c.	Pin 14	**TRST#**

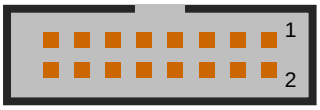
Product codes for ordering the adapter and matching cable

- 2010 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Power Architecture Adapter 16-pin JTAG/COP

JTAG/COP	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/COP connector:



Pin 1	**TDO**	Pin 2	QACK#
Pin 3	**TDI**	Pin 4	**TRST#**
Pin 5	HALTED	Pin 6	**V_{REF}**
Pin 7	**TCK**	Pin 8	n.c.
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	SRST#_HALT#	Pin 12	GND
Pin 13	HRST#_SRST#	Pin 14	n.c.
Pin 15	**RESET#**	Pin 16	GND

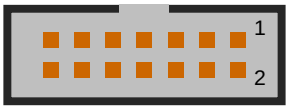
Product codes for ordering the adapter and matching cable

- 2035 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

SuperH SH-2A Adapter 14-pin JTAG/H-UDI

JTAG/H-UDI	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/H-UDI connector:



Pin 1	**TCK**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDO**	Pin 6	GND
Pin 7	**ASEBRK#_BRKACK**	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	GND
Pin 11	**TDI**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GND

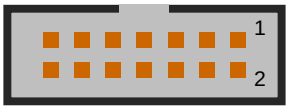
Product codes for ordering the adapter and matching cable

- 2052 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

RH850 Adapter 14-pin JTAG

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG RH850 connector:



Pin 1	**TCK_LDCLK**	Pin 2	GND
Pin 3	**TRST#**	Pin 4	**FLMD0**
Pin 5	**TDO_LPDO**	Pin 6	n.c.
Pin 7	**TDI_LPDIO**	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	**RDY_LPDCLKOUT**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GNDCHECK

Product codes for ordering the adapter and matching cable

- 2088 - JTAG communication adapter with one Renesas RH850 defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

SWD Target Interface

The Serial Wire Debug (SWD) interface or Serial Wire Debug Port (SW-DP) is one of the features of the debug and trace technology ARM CoreSight™. The known JTAG Debug Port (JTAG-DP) is supported furthermore. Both debug ports, the SWD and the alternative JTAG debug port can be combined to the Serial Wire JTAG Debug Port (SWJ-DP), the CoreSight/Cortex standard port.

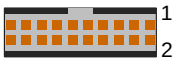
The JTAG/SWD ARM Adapter is equipped with 3 interface connectors: a 20-pin 100 mil legacy connector (female), a 10-pin 50 mil Cortex and a 20-pin 50 mil Cortex Connector.

- I/O voltage range: 1.65 Volts – 5.5 Volts

Cortex, ARM9, ARM11 Adapter 20-pin Cortex

JTAG/SWD	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM for 50 mil Samtec FTSH-110 Cortex connector:



Pin 1	V_{REF}	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**
Pin 11	GND_POWER1	Pin 12	**RTCK_TRACECLK**
Pin 13	GND_POWER2	Pin 14	**DBGREQ_TRACEDATA0**
Pin 15	GND	Pin 16	**DBGACK_TRACEDATA1**
Pin 17	GND	Pin 18	**TRACEDATA2**
Pin 19	GND	Pin 20	**TRACEDATA3**

Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM9, ARM11 Adapter 10-pin Cortex

JTAG/SWD	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM for 50 mil Samtec FTSH-105 Cortex connector:

Pin 1	V_{REF}	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**

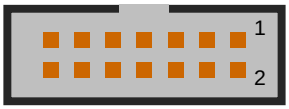
Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM, TI Adapter 14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter with 100 mil TI connector:



Pin 1	**TMS**	Pin 2	**TRST#**
Pin 3	**TDI**	Pin 4	GND
Pin 5	**V_{REF}**	Pin 6	n.c.
Pin 7	**TDO**	Pin 8	GND
Pin 9	**RTCK**	Pin 10	GND
Pin 11	**TCK**	Pin 12	GND
Pin 13	EMU0#	Pin 14	EMU1#

Product codes for ordering the adapter and matching cables

- 2027 - JTAG/ARM-TI communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one TexasInstruments defined 14-pin 100mil (JTAG) connector
- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

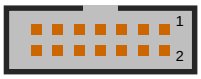
Cortex, ARM, XILINX Adapter 10-pin/14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-105 connector:

Pin 1	**V_{REF}**	Pin 2	**TMS**
Pin 3	GND	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TDO**
Pin 7	n.c.	Pin 8	**TDI**
Pin 9	GND	Pin 10	**RESET#**

JTAG Debug Adapter with 2 mm Xilinx connector:



Pin 1	n.c.	Pin 2	**V_{REF}**
Pin 3	GND	Pin 4	**TMS**
Pin 5	GND	Pin 6	**TCK**
Pin 7	GND	Pin 8	**TDO**
Pin 9	GND	Pin 10	**TDI**
Pin 11	GND	Pin 12	n.c.
Pin 13	GND	Pin 14	HALT

Product codes for ordering the adapter and matching cable

- 2079 - JTAG/ARM-XILINX communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one Xilinx defined 14-pin 2mm (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Special Target Interface for Automotive ECU

Attention! The following non-standard interfaces for Automotive ECU are available as separate products from PLS. Please contact **sales@pls-mc.com** with the note **Automotive ECU** if the following Debug Adapters are required.

TriCore/AURIX, Power Architecture, ARM/Cortex Adapter 10-pin MiniDAP/cJTAG/SWD

MiniDAP/SWD JTAG/cJTAG	Debugging Channel for the DAP, SWD and IEEE1149.7-based JTAG	up to 25 MHz

DAP/cJTAG/SWD Debug Adapter TriCore/Power Architecture/ARM for 50 mil Samtec TFM-105 connector:

Pin 1	GND	Pin 2	**TCK_DAP0_TCKC_SWCLK**
Pin 3	**TRST#_DAPEN_JCOMP**	Pin 4	**TDO_DAP2_SWO**
Pin 5	**TMS_DAP1_TMSC#_SWDIO**	Pin 6	**TDI**
Pin 7	**BRKIO#**	Pin 8	**V_{REF}**
Pin 9	n.c.	Pin 10	**RESET#**

Product codes for ordering the adapter and matching cables

- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

TriCore Adapter 10-pin MiniJTAG

MiniJTAG	Debugging Channel for the JTAG	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-105 JTAG connector:

Pin 1	**BRKIN#**	Pin 2	**TRST#**
Pin 3	GND	Pin 4	**TCK**
Pin 5	**TMS**	Pin 6	**BRKOUT#**
Pin 7	**RESET#**	Pin 8	**TDI**
Pin 9	**V_{REF}**	Pin 10	**TDO**

Product codes for ordering the adapter and matching cables

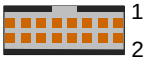
- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Attention! The TriCore Adapter 10-pin MiniJTAG is not compatible with standard Infineon JTAG/OCDS/DAP adapter and should only be used for automotive ECUs.

TriCore/AURIX, Power Architecture Adapter 16-pin ETKS

JTAG/ETKS DAP/ETKS	Debugging Channel for ETKS-arbitrated JTAG/DAP	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-108 ETKS connector:



Pin 1	**TMS_DAP1_TMSC#**	Pin 2	**V_{REF}**
Pin 3	**TDO_DAP2**	Pin 4	GND
Pin 5	GND	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#_DAPDIR_TMSCDIR**	Pin 10	**BRKOUT#_BRKIO#_RDY#**
Pin 11	**TCK_DAP0_TCKC**	Pin 12	GND
Pin 13	**BRKIN#_EVTI#**	Pin 14	**BREQ#**
Pin 15	**BGRANT#**	Pin 16	n.c.

Product codes for ordering the adapter and matching cables

- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

MCU I/O resp. V_{REF} voltage

The MCU I/O voltage is detected and used automatically from 1.65 Volts - 5.5 Volts.

Note: With Universal Access Device 2^{pro}, it is possible to debug cores with JTAG Support under different I/O voltages. The I/O voltage must be known as well as the target system's connections to V_{REF} voltage pin of the JTAG connector.

Resetting the Target Systems

For resetting the target system, at the connector JTAG / DAP Target the line RESET# (MCU I/O ring resp. V_{REF} voltage level) is provided. This reset line is active-low and may be connected to the corresponding lines on the target system to achieve an automatic and software-controlled target hardware reset.

The line RESET# can be used in **Open-Drain** and **PUSH-PULL** configuration, adjustable in UDE®. The level of this reset line is controlled by the MCU I/O voltage of the target or is selected for 3.3 Volts operation.

Static Electricity Precautions

Electrostatic Discharge (ESD) can damage a sensitive electronic component! Under several conditions static electricity and ground potential differences between the Access Device and the user's target hardware can build up high voltages - over 10000 Volts (10 kVolts) in some cases. The electrostatic discharge of this build-up voltage results in fast high current waveforms and fast magnetic (H-field) or electrostatic (E-field) disturbances. The discharge into the electronic components and circuitry can damage or destroy hardware components, resulting in failures and reduced reliability.

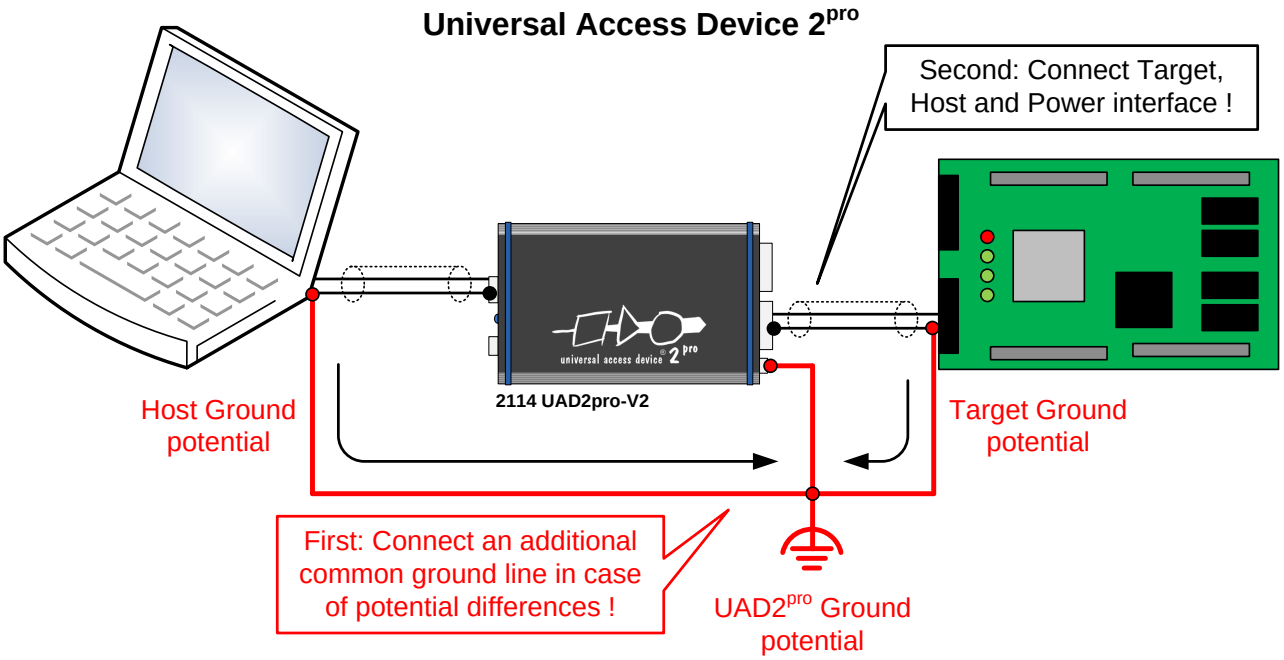
Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **JTAG/DAP/SWD** and the **3Pin/Serial** connectors, these ports are endangered especially. The maximum voltage on these pins may not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first.

To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Please ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a ground socket on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.

Appendix A.3 – Hardware Description UAD2+ *)

Description

Universal Access Device 2+ as an add-on for the UDE® Development Environment for microcontrollers offers a flexible and fast solution for testing software applications on customer-specific target systems.

- Universal Access Device 2+ offers high communication speed in conjunction with PC-based high-speed communication hardware that makes short turn-around cycles in software development possible.
- Universal Access Device 2+ supports C16x, ST10, TriCore, XC166, XC2000, XE166, ARM7, ARM9, ARM11, Cortex-M3, Power Architecture, SuperH SH-2A and XScale derivatives with JTAG On-Chip Debug Support (OCDS), DAP, SWD, JTAG/ARM, OnCE, COP or H-UDI interface.

Universal Access Device 2+ is a good solution for supporting target system communication channels beside ASC that are by default not available in the target system. Accessing the target system is supported via DAP, JTAG, SWD, SSC, CAN as well as ASC and CAN bootstrap loader interfaces, maximum flexibility together with fast communication and minimum system resource consumption is achieved.

It allows fast and reliable communication under Windows 10/11.

Note: A proper function of the UDE® Universal Debug Engine 2+ and its hardware devices is only guaranteed for working with the original components tested and delivered by PLS. The delivered components are verified with the recommends and standards of the chip manufactures.
*) Please note the UAD2next replaces the UAD2+. For new projects, the UAD2+ is no longer available. Of course, all existing UDE®/UAD2+ licenses will be maintained continuously for the next years without limitations.

Product Features

UAD2+ features flexible serial high-speed communication to a C16x, ST10, TriCore, XC166, XC2000, XE166, Power Architecture and ARM7, ARM9, ARM11, XScale target systems. It provides galvanic isolated interfaces that minimize the negative effects of

potential differences between UAD2+ and the target. The following serial modes are available:

1. DAP and JTAG debug interface (variable TCK speed between 2 and 50 MHz) via Debug Extender and **an additional Debug Adapter**
2. SWD debug interface (variable speed between 2 and 25 MHz) for debugging via **an additional Debug Adapter**
3. Asynchronous serial RS232 / RS485 interface
4. Synchronous / Asynchronous serial TTL / RS485 interface
5. CAN bus D-Sub male connector (CiA pin assignment) as debugging communication channel to target systems
6. 3Pin TTL interface
7. OCDS L2, NEXUS and ETM trace interface (optional via Trace Board).

For normal operation with UDE® Universal Debug Engine, no special communication setup is required. All settings are done automatically by UDE® Universal Debug Engine.

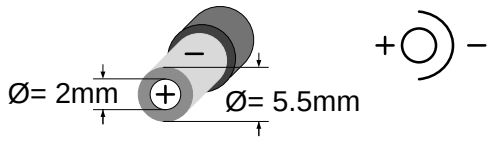
Precautions of Firmware updates

Attention! When a new version of UDE® is started the first time, a **firmware update** may be executed on the Universal Access Device (UAD2, UAD2pro, UAD2next, UAD3+). This may take some more time than usual for the 'target connect' operation.
Please **DO NOT** power off or unplug the access device while this time!

Power Supply

For Universal Access Device 2+, the power is supplied by a main power supply unit (part of the delivery contents).

Attention! Please do not use other mains power supply units as they may damage Universal Access Device 2+. Any damages or hazards arising from the use of unsuitable power supplies, over-voltage or wrong polarity are in the sole responsibility of the user and do not fall under warranty repair.

Universal Access Device 2+ Power Supply connector	Input Voltage: 12V DC or 18V DC	Power Plug 

Driver Installation IEEE1394

Because of the Plug 'n Play-Capabilities of the UAD2+, the IEEE1394 driver installation is started automatically, when the UAD2+ is connected to the host PC the first time.

Please follow the driver installation guide described in **UDE Manual.pdf**.

Driver Installation USB

Because of the Plug 'n Play-Capabilities of the Universal Access Device 2+, the USB driver installation is started automatically, when the Universal Access Device 2+ is connected to the host PC the first time.

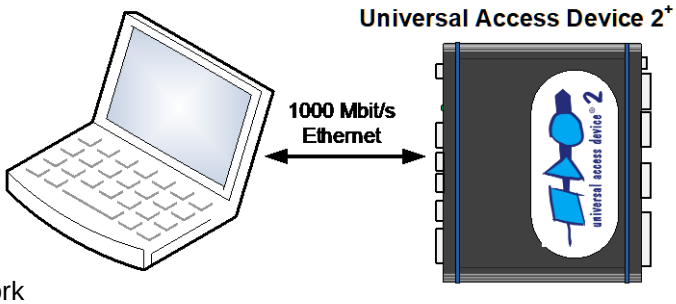
Please follow the driver installation guide described in **UDE Manual.pdf**.

Driver Installation Ethernet TCP/IP

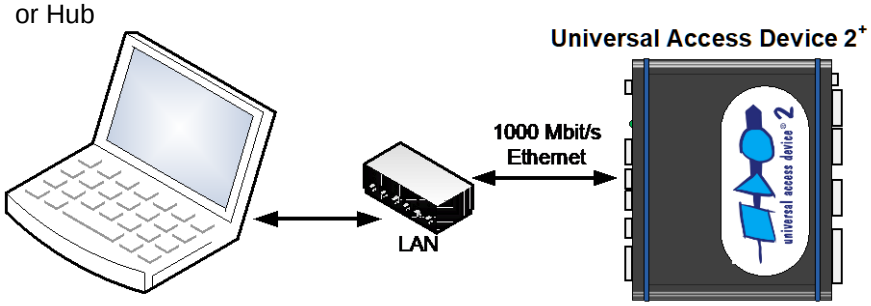
The UAD2⁺ is equipped with a 100 Mbit/s Fast Ethernet interface. It can be connected to a local PC or to a Local Network via Hubs or Switches and uses the TCP/IP.

Connection methods

UAD2⁺ connected direct to PC



UAD2⁺ connected to Local Network or Hub



DHCP or static IP addressing

The UAD2⁺ supports both, DHCP and static IP addressing. It can be configured with DHCP enabled. After power on it tries to get an IP address from a DHCP server. When there is no DHCP server answering, the UAD2⁺ will fall back to static IP after 60 seconds.

Connection methods

The UAD2⁺ can communicate to UDE® via the TCP/IP protocol, if a valid IP (Internet Protocol) address is configured by:

1. Using DHCP, this requires a DHCP server on your network, or

2. Using a static IP address, this requires knowledge about the network structure, e.g. knowledge of free IP addresses so that there is no IP used twice in the network.

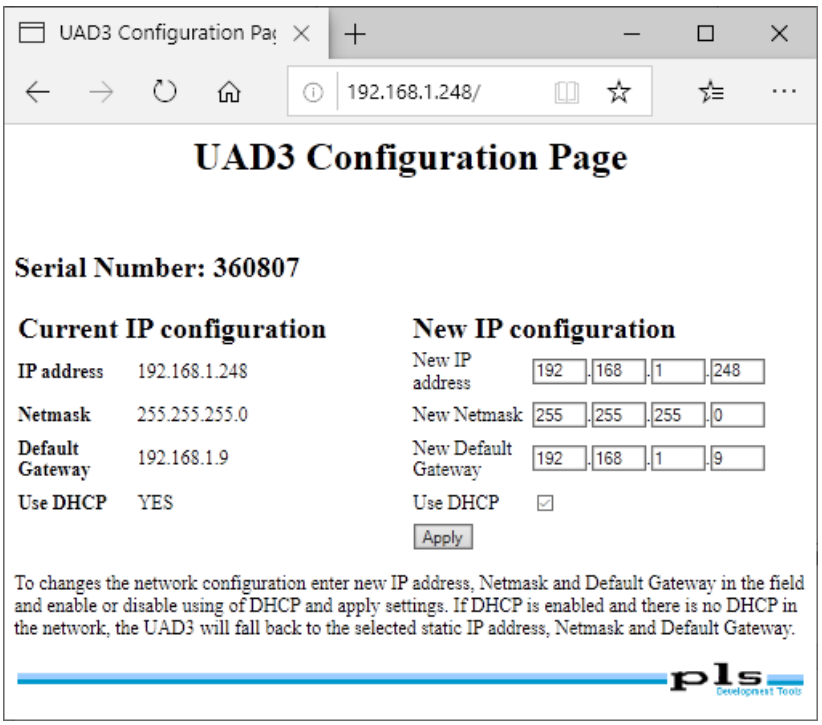
At factory settings, the UAD2⁺ is configured with DHCP enabled. After power ON the UAD2⁺ tries to receive an IP address from a DHCP server. If it receives no answer from a DHCP server, the UAD2⁺ will fall back to a static IP address after 60 seconds.
The static fall back IP address is `192.168.1.100`. The UAD2⁺ use the following TCP ports for communication: `43690` (`0xAAAA`) and `43691` (`0xAAAB`).

Configuration of the IP address via Ethernet

The configuration of the UAD2⁺, UAD2ⁿᵉˣᵗ or UAD3⁺ can be changed, using a web browser. After entering the current IP address, e.g.

```
http://192.168.1.114
```

the **UAD2 Configuration Page** appears as startup page. The configuration page contains the serial number of the UAD2⁺ and the current configuration at the left side of then page.



The example shows, that DHCP is enabled and the current IP address is 192.168.1.114.

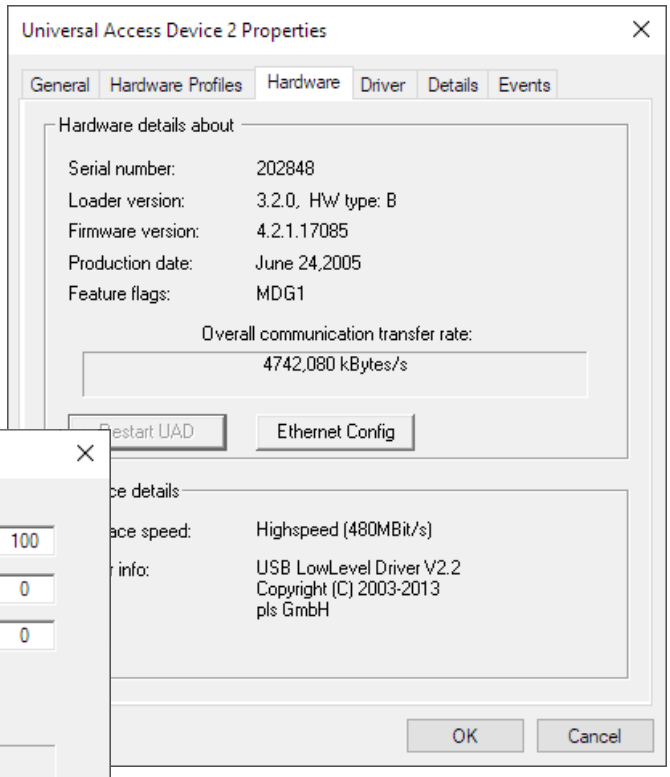
On the right of the form, new settings can be entered. The configured IP address will also be used as fallback, when DHCP is enabled but no DHCP answer is received. After clicking **Apply,** the new settings are stored. To apply the new settings immediately, power the UAD2⁺ OFF and ON again. Otherwise, they are applied after the next power ON event.

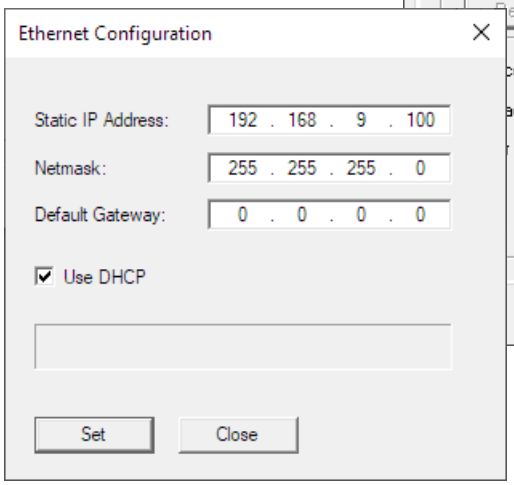
Configuration of the IP address via USB/IEEE1394

If the IP address of the UAD2⁺ is unknown, it can be configured using the USB or FireWire connection:

Connect the UAD2⁺ via USB or Firewire to a PC. Open the device manager's property page of the UAD2⁺ and select **Ethernet Config**.

The **Ethernet Configuration** dialog appears where the same settings can be made.





Once the UAD2+ was configured, a connection via UAD2+ can be established: Create a new workspace and select your target configuration. If **default** is set as communication device and there is no other UAD2+ connected, the Ethernet device is found automatically.

If no UAD was found, open the menu entry **Config – Target interface...** in UDE® or menu entry **Target – Setup** in UDE® Memtool. In the **Target Interface Setup,** dialog click on the **Setup** button.

For using the TCP/IP communication, the **Select Communication Device** dialog is opened. You can select the specific access device that you want to use. These settings are stored in the target configuration `*.cfg` file format.

For Ethernet connections select **UAD2 device, attached to Ethernet port**. A specific IP address to connect can be entered or an UAD2+ can be selected from the list after retrieving available devices. Pressing **OK** stores the settings. A connection is established now.

If multiple UAD2+, UAD2next or UAD3+ are used at the same time (e.g. for automated FLASH programming), then every UAD2+, UAD2next or UAD3+ have its own target configuration with either unique IP or unique serial number.

Determining the MAC address

The MAC address of the UAD2+/UAD3+ device is defined as

```
00:79:92:<SN2>:<SN1>:<SN0>
```

where `<SN2>..<SN0>` are parts of the hexadecimal value of the serial number of the device, e.g: for serial number `123456` (`== 0x1E240h`) the MAC address would be `00:79:92:01:E2:40`.

Application hints

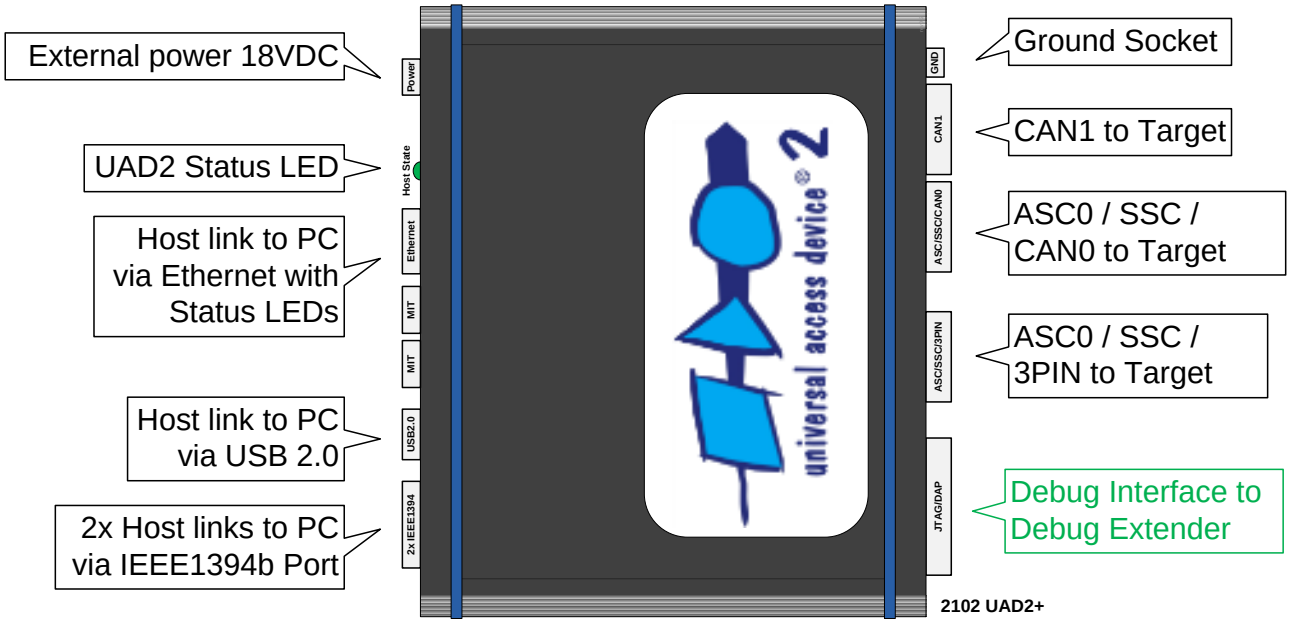
The following options are available for Ethernet configuration in the target configuration files:

PortType:	Must be set to ‘Ethernet’ for Ethernet connection
UseFixedIp:	Set to ‘`1`’ if connection to a specific IP address should be made, otherwise ‘`0`’
FixedIp:	Specific IP address of the access device in text form
DeviceNumber:	Serial number of the access device, if no specific IP is used

Interface and Connector Description

Overview

The Universal Access Device 2⁺ features a number of interface connectors for host and target connections.



Universal Access Device 2⁺

Label	Description	Connector
⏚	Ground potential of Universal Access Device 2⁺	4 mm Round Connector
JTAG Target	Debug Interface to the JTAG / DAP / SWD / OnCE Debug Extender	40-pin Shroud Male Header
Trace Target	Trace Interface to the Target Pod (optional)	80-pin Shroud Male Header
ASC/SSC/3PIN Target	ASC0, SSC, 3PIN TTL Interface to the Target	10-pin Shroud Male Header
ASC/SSC/CAN0 Target	ASC0, SSC RS232/RS485 and CAN0 Interface to the Target	SUB-D9 (Male)
CAN1 Target	CAN1 Interface to the Target	SUB-D9 (Male)
Power	External Power Supply	Power Connector
ASC Application	ASC Interface to the application-specific RS232 device of the target	SUB-D9 (Female)
Ethernet	Host Communication via Ethernet TCP/IP	RJ-45
USB 2.0	Host Communication via USB 2.0	USB connector
IEEE1394	Host Communication via IEEE1394	2 x IEEE1394 connector

Access Device Status Indication

The LED on the backside of the UAD2+ indicates the device state and traffic on a specific host communication interface.

Comm (unication)	LED blink codes description
LED off	UAD2+ not powered on (when powered on, the UAD2+ or its power supply is defective)
LED blinking sporadically or continuously	UAD2+ powered on, connection between UAD2+ and Host interface established

Ethernet Socket	LED blink codes description
Green LED on	Connection between UAD2+ and Host interface established
Yellow LED on	UAD2+ is communicating with Host interface

Debug Adapter

The Debug Adapter is a part of the debug connection between the UAD2+ and the supported target PCB debug connector, e.g. connectors of JTAG, cJTAG, ARM, DAP/DAP2, SWD, OnCE, COP and further interfaces. The interface description below describes further details.

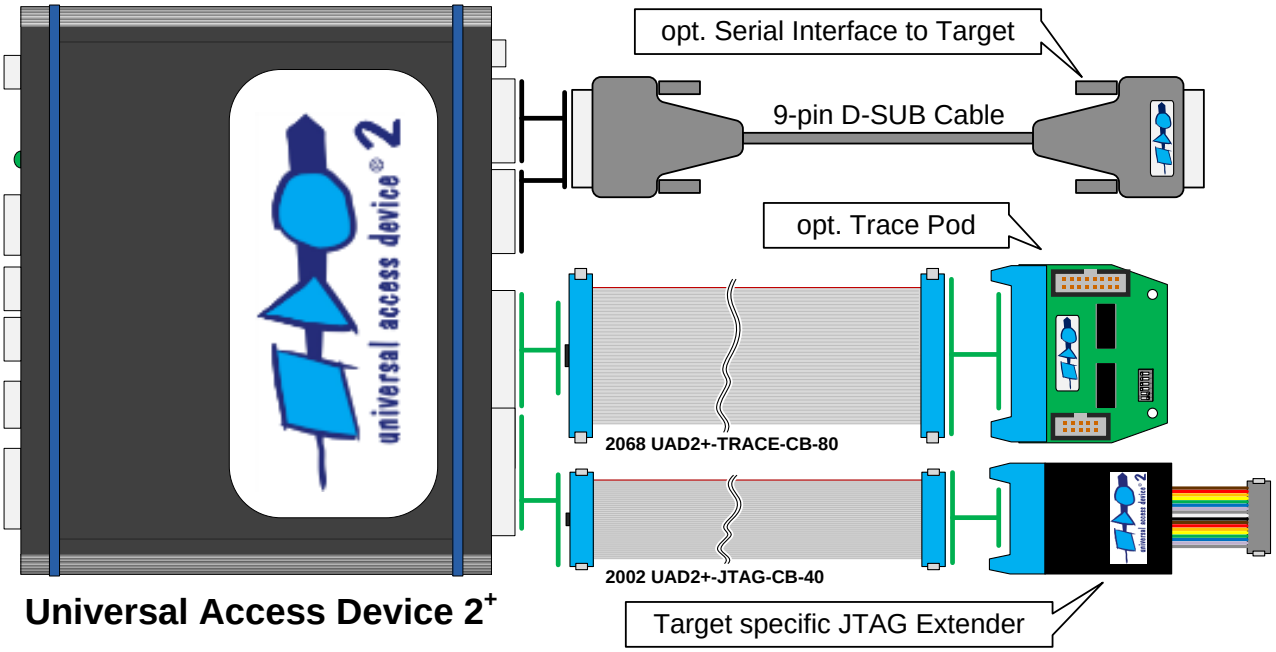
Description (combined)	Connector
Debug Interface to the UAD2+ Debug Interface	40-pin Male Shrouded Header
Debug Connector to JTAG/DAP/DAP2 Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/DAP/DAP2 Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/OnCE and JTAG/cJTAG Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/COP Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/H-UDI Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/RH850 Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/ARM Target	20-pin Standard 100 mil Connector
Debug Connector to JTAG/SWD Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/SWD Target	20-pin Samtec FTSH Connector
Debug Connector to MiniDAP/cJTAG/SWD Target for Automotive ECU	10-pin Samtec TFM Connector
Debug Connector to MiniJTAG Target for Automotive ECU	10-pin Samtec FTSH Connector
Debug Connector to ETKS Target for Automotive ECU	16-pin Samtec FTSH Connector

Interface Details

Host Interfaces

Universal Access Device 2⁺ can realize the Host Communication via the USB 1.1 or USB 2.0 interface, via the IEEE1394 bus, also known as Firewire™ or i.Link™ and via Ethernet TCP/IP 100 Mbit/s.

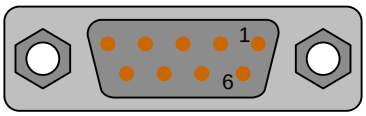
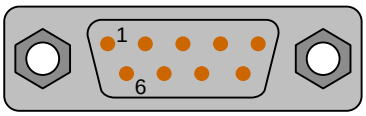
Connection Schema to the Target



Asynchronous RS232-compatible Application Target Interface

The UAD2⁺ provides a buffered asynchronous communication path between to the ASC0 of the target system controller.

ASC	RS232-compatible asynchronous Communication Interface between UAD2⁺, the Target System and external target system application devices	up to 1 Mbps

ASC Application (**Female**) D-SUB9: (RS232 from/to external device)		ASC0/SSC/CAN0 Target (**Male**) D-SUB9: (RS232 from/to target)	
			
Pin 1	Pin 1 of ASC0 Target	Pin 1	Pin 1 of ASC0 Application
Pin 2	**RxD** (Application Receive)	Pin 2	**TxD** (Target Transmit)
Pin 3	**TxD** (Application Transmit)	Pin 3	**RxD** (Target Receive)
Pin 4	Pin 4 of ASC0 Target	Pin 4	Pin 4 of ASC0 Application
Pin 5	**GND**	Pin 5	**GND**
Pin 6	Pin 6 of ASC0 Target	Pin 6	Pin 6 of ASC0 Application
Pin 7	Pin 7 of ASC0 Target	Pin 7	Pin 7 of ASC0 Application
Pin 8	Pin 8 of ASC0 Target	Pin 8	Pin 8 of ASC0 Application
Pin 9	Pin 9 of ASC0 Target	Pin 9	Pin 9 of ASC0 Application

Attention! The voltage on any pin of the ASC/SSC/CAN0 interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

For connecting the target system with Universal Access Device 2+, a standard 1-to-1 wired SUB-D9 cable is suitable.

Asynchronous Unbuffered TTL-compatible Target Interface

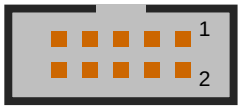
Additionally to the buffered ASC0 via RS232, an unbuffered TTL-level ASC0 is available. For this, no additional hardware (RS232 driver) at the target system is required - the signal lines TxD and RxD are directly connected to the corresponding controller pins.

The maximum cable length between Universal Access Device and the target system using the unbuffered ASC0 must not exceed about 25 cm (10“).

As described with the buffered ASC0 interface, the unbuffered ASC features the same functionality including a bootstrap loader/3Pin debug communication solution. For connecting the target system, the delivered 10-pin flat ribbon cable and a matching header at the target system are required.

ASC	TTL-compatible asynchronous Communication Interface between UAD2+ and the Target System	up to 1 Mbps

Adapter for 100 mil standard ASC/SSC/3PIN Target:



Pin 1	**GND**	Pin 2	**GND**
Pin 3	Reserved	Pin 4	**PER_RESET**
Pin 5	Reserved	Pin 6	**RxD** (Target Receive)
Pin 7	Reserved	Pin 8	**TxD** (Target Transmit)
Pin 9	VCC[1]	Pin 10	VCC[1]

Product codes for ordering the cable

- 2065 - Adapter cable for combined ASC, SSC, 3Pin usage between UAD2+ and target microcontroller with 10-pin connector, 10-pin flat ribbon cable with two 10-pin female headers, 10" (25cm)

[1] VCC means 5.0 Volts driven by the UAD2+, max. 100 mA. Do not connect the VCC with the target’s power supply!

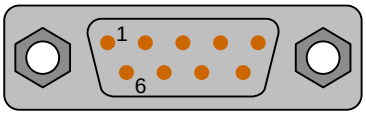
Name-matching pins of the connector and the target system controller (RxD, TxD and GND) must be connected as shown in the following drawing. PER_RESET serves as an active-low reset line and may be implemented as an automatic target system reset optionally.

Asynchronous RS485-compatible Target Interface (DIN 19245)

Transmission rates of up to 625 kbps can be achieved with UAD2⁺ via this serial interface. The definition of transmission protocol and pin assignment follows the German standard DIN 19245 for industrial networks called Profibus.

ASC	RS485-compatible asynchronous Communication Interface	up to 1 Mbps

Connector ASC/SSC/CAN0 Target (**Male**) D-SUB9:



Pin 1	Reserved	Pin 2	Reserved
Pin 3	**Data**	Pin 4	Reserved
Pin 5	**GND**	Pin 6	Reserved
Pin 7	Reserved	Pin 8	**/Data**
Pin 9	Reserved		

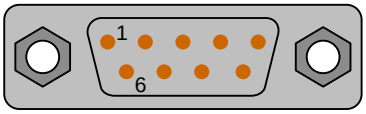
Attention! The voltage on any pin of the ASC/SSC/CAN0 interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

Synchronous RS485-compatible SSC Target Interface

Transmission rates up to 1 Mbps can be achieved with UAD2⁺ via this serial interface. The transmission protocol uses the RS485 interface to reach the maximum data transmission rate for long cable distances.

SSC	RS485 -compatible synchronous Communication Interface based on the On-Chip SSC	up to 1 Mbps

Connector ASC/SSC/CAN0 Target (**Male**) D-SUB9:



Pin 1	**RSTIN**	Pin 2	**MRST**
Pin 3	**MTSR**	Pin 4	**SCLK**
Pin 5	**GND**	Pin 6	**/RSTIN**
Pin 7	**/MRST**	Pin 8	**/MTSR**
Pin 9	**/SCLK**		

Attention! The voltage on any pin of the ASC/SSC/CAN0 interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

Synchronous TTL-compatible SSC Target Interface

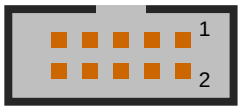
The SSC debug communication channel is based on the C16x controller's on-chip SSC. As no additional hardware is required, the maximum transmission speed of up to 5 Mbps can be achieved. For reliable results, the maximum cable length between Universal Access Device 2+ and the target system must not exceed about 25 cm (10“).

For using the SSC debug communication channel, an SSC-supporting monitor in the target system is required, which may be either implemented in ROM or uploaded via the bootstrap loader/ASC communication into the target system's RAM. After downloading the monitor, the ASC can be used for application purposes.

For connecting the target system, the delivered 10-pin flat ribbon cable and a matching header at the target system are required.

SSC	TTL-compatible synchronous Communication Interface based on the On-Chip SSC	up to 5 Mbps

Adapter for 100 mil ASC/SSC/CAN0 Target:



Pin 1	**GND**	Pin 2	**GND**
Pin 3	**SCLK**	Pin 4	**PER_RESET**
Pin 5	**MTSR**	Pin 6	Reserved
Pin 7	**MRST**	Pin 8	Reserved
Pin 9	VCC[1]	Pin 10	VCC[1]

Product codes for ordering the cable

- 2065 - Adapter cable for combined ASC, SSC, 3Pin usage between UAD2+ and target microcontroller with 10-pin connector, 10-pin flat ribbon cable with two 10-pin female headers, 10" (25cm)

[1] VCC means 5.0 Volts driven by the UAD2+, max. 100 mA. Do not connect the VCC with the target’s power supply!

Name-matching pins of the connector and the target system controller (SCLK, MTSR, MRST and GND) must be connected as shown in the following drawing. PER_RESET serves as an active-low reset line and may be implemented as an automatic target system reset optionally.

3Pin Target Interface

The 3Pin interface is a high-speed debug port based on 3 port pins of the target system controller. The optimized protocol is event driven and allows fast data transfer via a software-controlled interface.

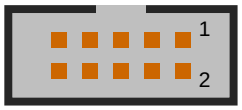
The maximum cable length between Universal Access Device 2+ and the target system must not exceed about 25 cm (10“).

For working with the 3Pin interface, a monitor with 3Pin communication kernel at the target is required. This monitor may either be implemented in the target system's ROM or downloaded into the target system via bootstrap loader/RS232. After starting the monitor and switching to the 3Pin interface the RS232 is available again for the application without limitation.

C166, ST10, XC166 Support

3Pin	TTL-compatible High-Speed Communication Interface based on 3 Port Pins	up to 2 Mbps

Adapter for 100 mil 3Pin/Serial Target:



Pin 1	**GND**	Pin 2	**GND**
Pin 3	**CLOCK**	Pin 4	**PER_RESET**
Pin 5	**DATA**	Pin 6	Reserved
Pin 7	**MODE**	Pin 8	Reserved
Pin 9	VCC[1]	Pin 10	VCC[1]

Product codes for ordering the adapter and cable

- 2065 - Adapter cable for combined ASC, SSC, 3Pin usage between UAD2+ and target microcontroller with 10-pin connector, 10-pin flat ribbon cable with two 10-pin female headers, 10" (25cm)

[1] VCC means 5.0 Volts driven by the UAD2+, max. 100 mA. Do not connect the VCC with the target's power supply!

Important: For a correct function of the 3Pin interface, the pin **MODE** is not allowed to be connected with a pull-down resistor less than 100 kOhm !

Name-matching pins of the connector and the target system controller (CLOCK, DATA, MODE and GND) must be connected as shown in the following drawing. PER_RESET serves as an active-low reset line and may be implemented as an automatic target system reset optionally.

3Pin Interface Hardware Description

The target controller's pins MODE, DATA and CLOCK may be assigned to any port pin of the controller with the following limitations:

Pin Name	Direction	Description
MODE	I/O	Direction control of the data transfer / external interrupt for halting the customer's application **Important**: For a correct function of the 3Pin interface, the pin MODE is not allowed to be connected with a pull-down resistor less than 100 kOhm !
CLOCK	O	Clock signal for synch transmission
DATA	I/O	Data upstream/downstream

3Pin Software Description

For debugging via the 3Pin interface, a dedicated target monitor according to the target system topography is required. This monitor can be set up with the 3Pin Monitor Wizard software.

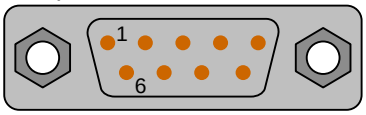
CAN Target Interface

The Controller Area Network (CAN) bus and its associated protocol allow very efficient communication between a numbers of CAN nodes connected to the bus.

The pin assignment is compatible with the CiA CAN bus pin assignment for 9-pin D-Sub male connectors. The Universal Access Device 2⁺ may be connected therefore of the most standard evaluation boards with a CAN bus interface for the controller family. Note that the UAD2⁺ does not contain the bus termination network. It must be added externally. High-speed CAN networks based on ISO-DIS 11898 have a line topology and must be terminated with a 120 Ohm resistor between CAN_H and CAN_L lines at the last network node.

CAN Interface	CAN Communication Interface	up to 1 Mbps

Connector CAN1 Target (**Male**) D-SUB9: (CiA pin assignment)



Pin 1	n.c.	Pin 2	**CAN_L**
Pin 3	**GND**	Pin 4	n.c.
Pin 5	n.c.	Pin 6	**GND**
Pin 7	**CAN_H**	Pin 8	n.c.
Pin 9	n.c.		

DAP Target Interface

The debug interface DAP was established by Infineon for the AUDO Future devices and other upcoming 16-bit and 32-bit-microcontrollers. The new board connector is a 50 mil Samtec FTSH-105 double row 10-pins micro-terminal with keying shroud, which saves board space on targets system side.

- I/O voltage range: 2.4 - 5.0 Volts, Capacity per signal: max 55 pF
- Power dissipation from target voltage: 100 mW (V_{IO} = 3.3 Volts)
- ESD Protection per signal: 15 kVolts
- Resettable over-current protection for V_{IO}:10 A (max 0.2 s time to trip, resettable)

For UAD2⁺ an **additional DAP Debug Adapter** is required to support the 2-wire and the 3-wire DAP modes.

TriCore, XE166, XC2000 Adapter 10-pin DAP

DAP	Debugging Channel for the via DAP	up to 50 MHz

DAP Debug Adapter for 50 mil Samtec FTSH-105 connector:

Pin 1	**V_{REF}**	Pin 2	**DAP1**
Pin 3	GND	Pin 4	**DAP0**
Pin 5	GND	Pin 6	**DAP2_USER0**
Pin 7	KEY_GND	Pin 8	**DAPEN_USER1**
Pin 9	GND	Pin 10	**RESET#**

Product codes for ordering the adapter and matching cable

- 2000 - DAP 2-wire/3-wire communication adapter with one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)

Note: The DAP Debug Adapter must be powered from V_{REF} voltage. The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

JTAG Target Interface

TriCore, XC166, XC2000, XE166, Power Architecture, ARM7, ARM9, ARM11, XScale, SuperH SH-2A derivatives feature an on-chip IEEE1149.1-based interface for an external debugging unit. This unit allows resource-saving target system access without additional software or hardware on the target system. Therefore, all controller serial interfaces remain available for the application without restrictions caused by the debugging interface.

Universal Access Device 2⁺ is delivered with a Debug Extender. The Debug Extender as add-on to UAD2⁺ implements a galvanic isolation barrier for JTAG signals.

This galvanic isolated target interface minimizes the negative effects of potential differences between UAD2⁺ and the target.

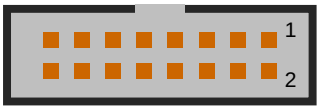
- I/O voltage range: 2.4 Volts – 5.0 Volts

For UAD2+ an **additional SWD / OnCE Debug Adapter** is required to support all JTAG features.

TriCore/AURIX, XE166, XC2000, XC166 Adapter 16-pin JTAG/OCDS

JTAG/OCDS	Debugging Channel for the IEEE1149.1-based JTAG	up to 50 MHz

JTAG Debug Adapter for 100 mil standard JTAG/OCDS connector:



Pin 1	**TMS**	Pin 2	**V_{REF}**
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

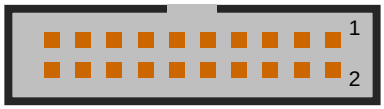
Product codes for ordering the extender and cables

- 2044 - JTAG/IFX extender adapter with one 16-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 16-pin flat ribbon cable with 16-pin interface, 2" (5cm)
- 2018 - 16-pin flat ribbon JTAG/IFX communication cable with an Infineon defined 16-pin 100mil connector, 10" (25cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

ARM7, ARM9, ARM11, XScale Adapter 20-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	**V_{REF}**
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	n.c.	Pin 18	GND
Pin 19	n.c.	Pin 20	GND

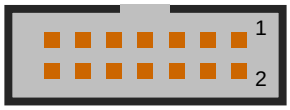
Product codes for ordering the extender and cables

- 2021 - JTAG/ARM extender adapter with one ARM defined 20-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 20-pin flat ribbon cable, 5" (10cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

Power Architecture Adapter 14-pin JTAG/OnCE

JTAG/OnCE	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG OnCE connector:



Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK**	Pin 6	GND
Pin 7	n.c.	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	n.c.	Pin 14	**TRST#**

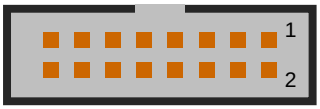
Product codes for ordering the extender and cables

- 2019 - JTAG/IFX extender adapter with one 16-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 16-pin flat ribbon cable, 5" (10cm)
- 2023 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

Power Architecture Adapter 16-pin JTAG/COP

JTAG/COP	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/COP connector:



Pin 1	**TDO**	Pin 2	QACK#
Pin 3	**TDI**	Pin 4	**TRST#**
Pin 5	HALTED	Pin 6	**V_{REF}**
Pin 7	**TCK**	Pin 8	n.c.
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	SRST#_HALT#	Pin 12	GND
Pin 13	HRST#_SRST#	Pin 14	n.c.
Pin 15	**RESET#**	Pin 16	GND

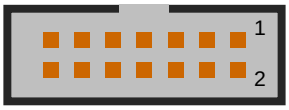
Product codes for ordering the extender and cable

- 2050 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2019 - JTAG/IFX extender adapter with one 16-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 16-pin flat ribbon cable, 5" (10cm)

SuperH SH-2A Adapter 14-pin JTAG/H-UDI

JTAG/H-UDI	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/H-UDI connector:



Pin 1	**TCK**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDO**	Pin 6	GND
Pin 7	n.c.	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	GND
Pin 11	**TDI**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GND

Product codes for ordering the adapter, cable and extender

- 2050 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2019 - JTAG/IFX extender adapter with one 16-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 16-pin flat ribbon cable, 5" (10cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

SWD Target Interface

The Serial Wire Debug (SWD) interface or Serial Wire Debug Port (SW-DP) is one of the features of the debug and trace technology ARM CoreSight™. The known JTAG Debug Port (JTAG-DP) is supported furthermore. Both debug ports, the SWD and the alternative JTAG debug port can be combined to the Serial Wire JTAG Debug Port (SWJ-DP), the CoreSight standard port.

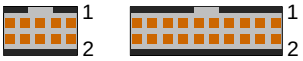
- I/O voltage range: 2.4 Volts – 5.0 Volts.
- Power dissipation from target voltage: 100 mW (V_{REF} = 3.3 Volts)
- ESD Protection per signal: 15 kVolts
- Capacity per signal: max 55 pF, Pull Downs for TCK, SWDIO
- Resettable over-current protection for V_{IO}:10 A (max 0.2 s time to trip, resettable)

For UAD2+ an **additional SWD Debug Adapter** is required to support all SWD features.

Cortex, ARM9, ARM11 Adapter 20-pin Cortex

SWD	Debugging Channel for the SWD	up to 25 MHz

SWD Debug Adapter for 50 mil Samtec FTSH-105/FTSH-110 connector:



Pin 1	**V_{REF}**	Pin 2	**SWDIO**
Pin 3	GND	Pin 4	**SWDCLK**
Pin 5	GND	Pin 6	**SWO**
Pin 7	KEY_GND	Pin 8	n.c.
Pin 9	GND	Pin 10	**RESET#**
Pin 11	n.c.	Pin 12	n.c.
Pin 13	n.c.	Pin 14	n.c.
Pin 15	GND	Pin 16	n.c.
Pin 17	GND	Pin 18	n.c.
Pin 19	GND	Pin 20	n.c.

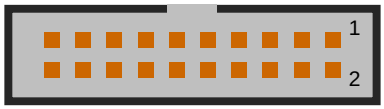
Product codes for ordering the extender and cable

- 2019 - JTAG/IFX extender adapter with one 16-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 16-pin flat ribbon cable, 5" (10cm)
- 2017 - SWD extender adapter with one CoreSight defined 10-pin 50mil Samtec FTSH-105 (CoreSight) connector, one 20-pin 50mil Samtec FTSH-110 (CoreSight) and one 20-pin 100mil (SWD) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

Cortex, ARM9, ARM11 Adapter 20-pin Cortex

SWD	Debugging Channel for the SWD	up to 25 MHz

SWD Debug Adapter for 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	n.c.
Pin 3	n.c.	Pin 4	GND
Pin 5	n.c.	Pin 6	GND
Pin 7	**SWDIO**	Pin 8	GND
Pin 9	**SWDCLK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**SWO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	n.c.	Pin 18	GND
Pin 19	n.c.	Pin 20	GND

Product codes for ordering the extender and cable

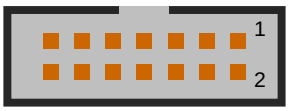
- 2019 - JTAG/IFX extender adapter with one 16-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 16-pin flat ribbon cable, 5" (10cm)
- 2017 - SWD extender adapter with one CoreSight defined 10-pin 50mil Samtec FTSH-105 (CoreSight) connector, one 20-pin 50mil Samtec FTSH-110 (CoreSight) and one 20-pin 100mil (SWD) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

Note: The SWD Debug Adapter must be powered from V_{REF} voltage. The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

Cortex, ARM, TI Adapter 14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter with 100 mil TI connector:



Pin 1	**TMS**	Pin 2	**TRST#**
Pin 3	**TDI**	Pin 4	GND
Pin 5	**V_{REF}**	Pin 6	n.c.
Pin 7	**TDO**	Pin 8	GND
Pin 9	**RTCK**	Pin 10	GND
Pin 11	**TCK**	Pin 12	GND
Pin 13	EMU0#	Pin 14	EMU1#

Product codes for ordering the adapter and cable

- 2027 - JTAG/ARM-TI communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one TexasInstruments defined 14-pin 100mil (JTAG) connector
- 2021 - JTAG/ARM extender adapter with one ARM defined 20-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 20-pin flat ribbon cable, 5" (10cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

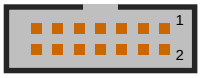
Cortex, ARM, XILINX Adapter 10-pin/14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-105 connector:

Pin 1	**V_{REF}**	Pin 2	**TMS**
Pin 3	GND	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TDO**
Pin 7	n.c.	Pin 8	**TDI**
Pin 9	GND	Pin 10	**RESET#**

JTAG Debug Adapter with 2 mm Xilinx connector:



Pin 1	n.c.	Pin 2	**V_{REF}**
Pin 3	GND	Pin 4	TMS
Pin 5	GND	Pin 6	TCK
Pin 7	GND	Pin 8	TDO
Pin 9	GND	Pin 10	TDI
Pin 11	GND	Pin 12	n.c.
Pin 13	GND	Pin 14	HALT

Product codes for ordering the adapter and cables

- 2079 - JTAG/ARM-XILINX communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one Xilinx defined 14-pin 2mm (JTAG) connector
- 2021 - JTAG/ARM extender adapter with one ARM defined 20-pin 100mil (JTAG) connector. Galvanic isolated target interfaces. 20-pin flat ribbon cable, 5" (10cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

Special Target Interface for Automotive ECU

Note: The following non-standard interfaces for Automotive ECU are available as separate products from PLS. Please contact **sales@pls-mc.com** with the note **Automotive ECU** if the following Debug Adapters are required.

TriCore/AURIX, Power Architecture, ARM/Cortex Adapter 10-pin MiniDAP/cJTAG/SWD

MiniDAP/SWD JTAG/cJTAG	Debugging Channel for the DAP, SWD and IEEE1149.7-based JTAG	up to 25 MHz

DAP/cJTAG/SWD Debug Adapter TriCore/Power Architecture/ARM for 50 mil Samtec TFM-105 connector:

Pin 1	GND	Pin 2	**TCK_DAP0_TCKC_SWCLK**
Pin 3	**TRST#_DAPEN_JCOMP**	Pin 4	**TDO_DAP2_SWO**
Pin 5	**TMS_DAP1_TMSC#_SWDIO**	Pin 6	**TDI**
Pin 7	**BRKIO#**	Pin 8	**V_{REF}**
Pin 9	n.c.	Pin 10	**RESET#**

Product codes for ordering the adapter and cables

- 2038 - MiniDAP/cJTAG/MiniJTAG/ETKS extender adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector, one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21/4.1) connector. Galvanic isolated target interfaces. ESD/overvoltage protection.

▪ 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm) ▪ 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm) ▪ 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm) ▪ 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

TriCore Adapter 10-pin MiniJTAG

MiniJTAG	Debugging Channel for the JTAG	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-105 JTAG connector:

Pin 1	**BRKIN#**	Pin 2	**TRST#**
Pin 3	GND	Pin 4	**TCK**
Pin 5	**TMS**	Pin 6	**BRKOUT#**
Pin 7	**RESET#**	Pin 8	**TDI**
Pin 9	**V_{REF}**	Pin 10	**TDO**

Product codes for ordering the adapter and cables

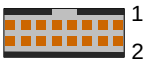
- 2041 - JTAG/MiniJTAG communication adapter with one customer based 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)

Attention! The TriCore Adapter 10-pin MiniJTAG is not compatible with standard Infineon JTAG/OCDS/DAP adapter and should only be used for automotive ECUs.

TriCore/AURIX, Power Architecture Adapter 16-pin ETKS

JTAG/ETKS DAP/ETKS	Debugging Channel for ETKS-arbitrated JTAG/DAP	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-108 ETKS connector:



Pin 1	**TMS_DAP1_TMSC#**	Pin 2	**V_{REF}**
Pin 3	**TDO_DAP2**	Pin 4	GND
Pin 5	GND	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#_DAPDIR_TMSCDIR**	Pin 10	**BRKOUT#_BRKIO#_RDY#**
Pin 11	**TCK_DAP0_TCKC**	Pin 12	GND
Pin 13	**BRKIN#_EVTI#**	Pin 14	**BREQ#**
Pin 15	**BGRANT#**	Pin 16	n.c.

Product codes for ordering the adapter and cables

- 2038 - MiniDAP/cJTAG/MiniJTAG/ETKS extender adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector, one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21/4.1) connector. Galvanic isolated target interfaces. ESD/overvoltage protection.
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2002 - 40-pin HD flat ribbon cable between UAD2+ and JTAG extender, 16" (40cm)

MCU I/O resp. V_{REF} voltage

The MCU I/O voltage is detected and adjusted automatically from 2.4 Volts - 5.0 Volts.

The Universal Access Device 2+ detects the voltage on the I/O voltage pin and uses the external or the internal reference voltage automatically. The internal 3.3 Volts reference voltage is used for the internal level shifter only when the I/O voltage is higher than 4 Volts or lower than 2.4 Volts.

Resetting the Target Systems

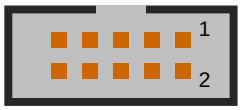
For resetting the target system, at the connectors 3Pin/Serial Target and JTAG/OCDS Target the lines PER_RESET (3.3 Volts LVTTL-compatible) and RESET# (MCU I/O resp. V_{REF} voltage levels) are provided. These reset lines are active-low and may be connected to the corresponding lines on the target system to achieve an automatic and software-controlled target hardware reset.

Push-Pull Configuration

For the signal PER_RESET, two modes realize a flexible access to various target hardware types. Therefore, in the **Push-Pull** mode the reset line of the target system may be driven directly by Universal Access Device without any additional hardware. In this configuration, no other active drivers or RC combinations must be attached to the PER_RESET line.

PER_RESET	**3.3 Volts** LVTTL-level Reset line in **Push/Pull** or **Open-Drain** Configuration	

Adapter for 100 mil 3Pin/Serial Target:



Pin 1	GND	Pin 2	**GND**
Pin 3	Reserved	Pin 4	**PER_RESET**
Pin 5	Reserved	Pin 6	Reserved
Pin 7	Reserved	Pin 8	Reserved
Pin 9	VCC[1]	Pin 10	VCC[1]

[1] VCC means 5.0 Volts driven by the UAD2+, max. 100 mA. Do not connect the VCC with the target's power supply!

Open-Drain Configuration

Configuring the PER_RESET line in **Open-Drain** mode or using the RESET# line allows a wired-AND reset line. In this mode, more than one source can reset the target system's controller without interferences. Please note the limited current sinking capability of the PER_RESET / RESET# line of 16 mA (standard TTL) when using RC combinations.

The line RESET# can only be used in **Open-Drain** configuration. The level of this reset line is controlled by the MCU I/O voltage of the target or is selected for 3.3 Volts operation.

Static Electricity Precautions

Electrostatic Discharge (ESD) can damage a sensitive electronic component! Under several conditions static electricity and ground potential differences between the Access Device and the user's target hardware can build up high voltages - over 10000 Volts (10 kVolts) in some cases. The electrostatic discharge of this build-up voltage results in fast high current waveforms and fast magnetic (H-field) or electrostatic (E-field) disturbances. The discharge into the electronic components and circuitry can damage or destroy hardware components, resulting in failures and reduced reliability.

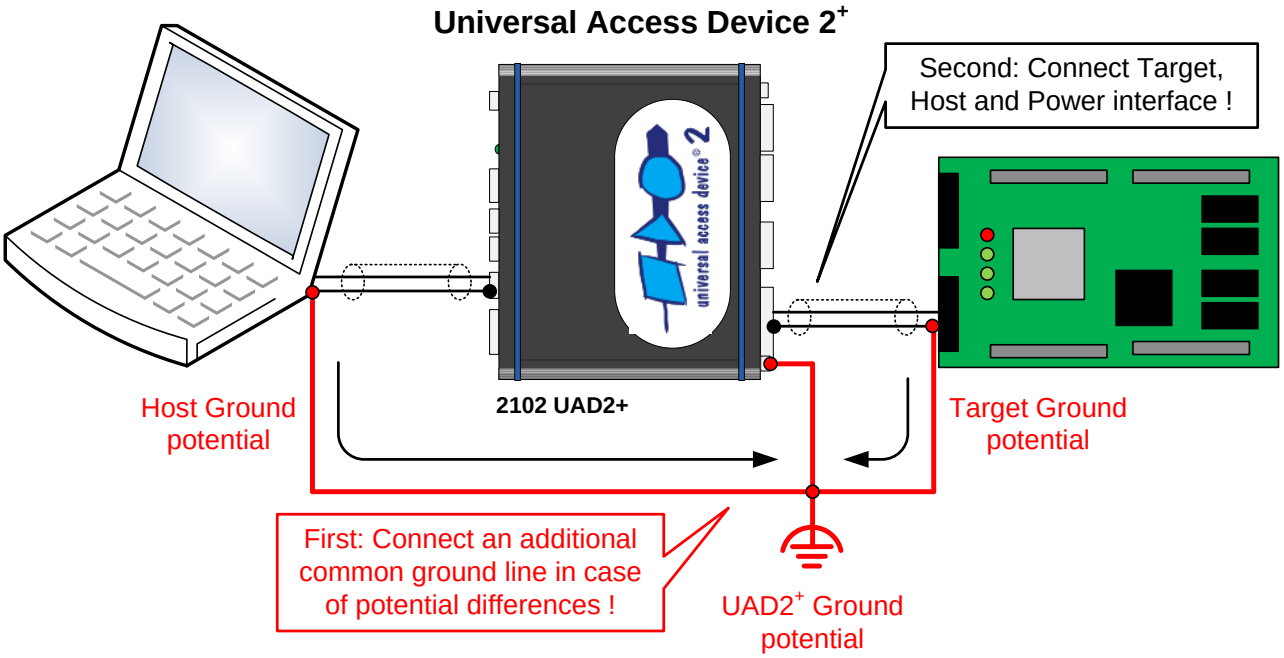
Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **JTAG/DAP/SWD** and the **3Pin/Serial** connectors, these ports are endangered especially. The maximum voltage on these pins may not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first.

To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Please ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a ground socket on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.

Note: The UAD2^{next} replaces the UAD2^{+}. For new projects, the UAD2^{+} is no longer available. Of course, all existing UDE®/UAD2^{+} licenses will be maintained continuously for the next years without limitations.

Appendix A.4 – Hardware Description UAD2+ Trace Board *)

Description

Hard real-time debugging requires close interaction with the processor. Tracing shall provide a chronological picture of a system's inner workings up to, starting from or in the vicinity an event, mainly to guide a human in understanding a faulty program.

The **OCDS L2** was defined for this purpose and it is available on the TriCore derivatives. The OCDS L2 unit of the TriCore derivatives supports the recording of a running program's trace. In combination with the JTAG/OCDS unit, a comfortable watching of the program flow in real-time is possible.

The ARM architecture defines the **Embedded Trace Macrocell ETM**, which provides the possibility of an instruction trace, too.

In the same way, the Power Architecture **NEXUS** Trace is supported.

UDE® supports the OCDS, NEXUS and ETM by the Universal Access Device Trace Board add-on. The PLS solution consists of the Trace Board, built in the Universal Access Device or Universal Access Device 2+, and a standalone Trace Pod connected via a flat ribbon cable with the Trace Board.

***) Note:** The UAD2next replaces the UAD2+. For new projects, the UAD2+ and its Trace Board is no longer available. Of course, all existing UDE®/UAD2+ licenses will be maintained continuously for the next years without limitations.

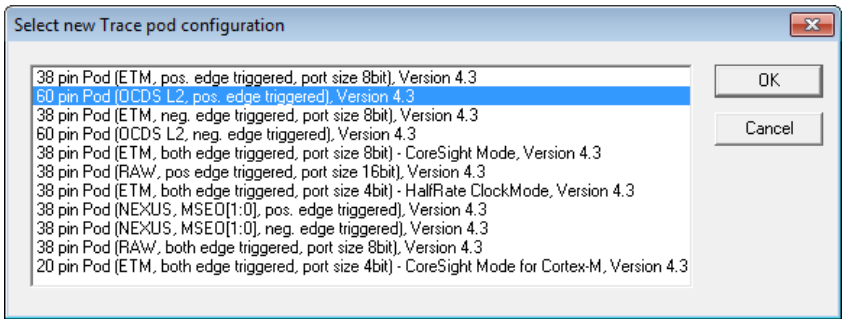
Product Features

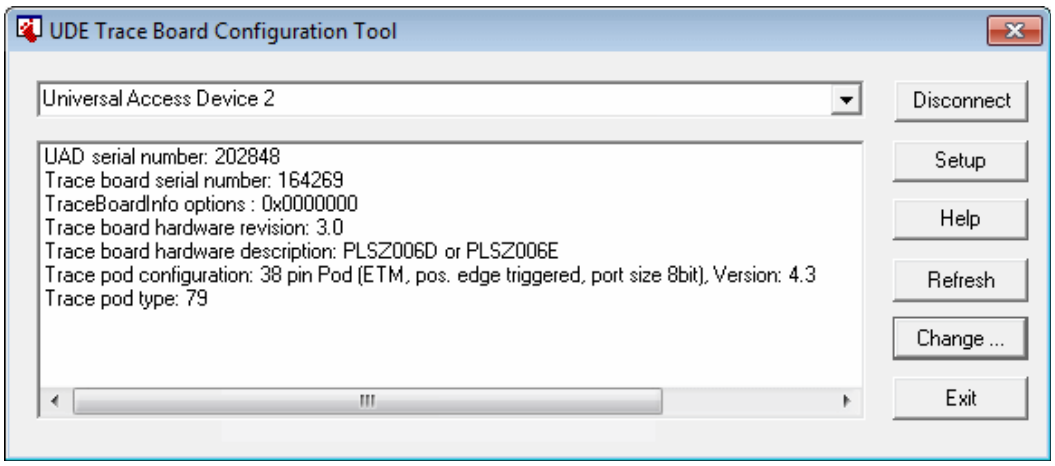
- Trace ports supported up to 100 MHz and up to 150 MHz
- OCDS L2 trace with Infineon TriCore/PCP
- ETM trace with ARM7, ARM9, Cortex-M (CoreSight)
- NEXUS trace with Power Architecture MPC55xx and SPC56x
- 1M Sample trace depth
- 40-bit time stamp range, Timestamp resolution 1/ f_{MCU} (i.e. 10 ns at f_{MCU}=100 MHz)
- Intelligent trace filter for optimal trace utilization
- Additional 8 external trace lines to observe external signals (XPORT)
- Some series are equipped with an on-board PLL
- LVDS interface to external Trace Pod supports interfaces for 40-pin, 60-pin OCDS L2 and 20-pin, 38-pin ETM and NEXUS connectors.

Trace Pod Calibration

To connect the Trace Board with the target hardware a set of Interface Trace Pods is available. Currently a 40-pin Low Speed Pod, a 60-pin High-Speed Pod and a 38-pin Pod are available. Before using the trace add-in, the Trace Board must be calibrated for using the correct Trace Pod.

Use the tool `TraceBoardCfg.exe` from the UDE® directory to select or change the correct Trace Pod and calibrate the Trace Board. Select first the UAD2 family and push Connect. The actual Trace Pod calibration is displayed. Push **Change..** to change the calibration if necessary.





The Trace Pod can be calibrated to sample the positive or the negative signal edge. By default, the positive signal edge sampling is the appropriate setting for the most targets.

Connect / Disconnect
Connects or disconnects to a Universal Access Device with the Trace Board Add-On. You can specify the UAD2 family via the selection box on the left hand.

Setup
The Setup allows the selection of a specific UAD2 on the help of the connection port and the serial number of the UAD.

Refresh
Refreshes the information about the Trace Boards.

Change..
Opens a selection dialog for the choice of an appropriate Trace Board configuration.

Exit
Closes the Trace Board Configuration tool.

The following target architectures and calibration settings are supported:

Target	Connector	Recommend Calibration
TriBoard TC11xx, TC17xx, TC19xx	60-pin Samtec QSH-030-01-F-D-A	60-pin Trace Pod (OCDS L2, pos. edge triggered)
TriBoard TC1766.102 only!	60-pin Samtec QSH-030-01-F-D-A	60-pin Trace Pod (OCDS L2, pos. edge triggered - TC1766.102)
ARM LPC2xxx, STR91x	38-pin AMP-MICTOR	38-pin Trace Pod (ETM, pos. edge triggered, port size 8bit)
ARM AT91RM9200, 4bit Halfrate ClockMode	38-pin AMP-MICTOR	38-pin Trace Pod (ETM, both. edge triggered, port size 8bit) - Halfrate ClockMode
Power Architecture NEXUS	38-pin AMP-MICTOR	38-pin Trace Pod (NEXUS, MSEO[1:0], pos. edge triggered)
Cortex-M ETM CoreSight Mode	20-pin Samtec FTSH-110-01	20-pin Trace Pod (ETM, both edges triggered, port size 4bit) – CoreSight Mode for Cortex-M

Technical details

Note: The setup time of the trace signal must be greater than 3ns relatively to the clock edge, a hold time of greater 0ns must be held. If this requirement is violated, the sampling point at the negative edge can be used. Use the appropriate calibration setting in this case.

Trace Pod Setup

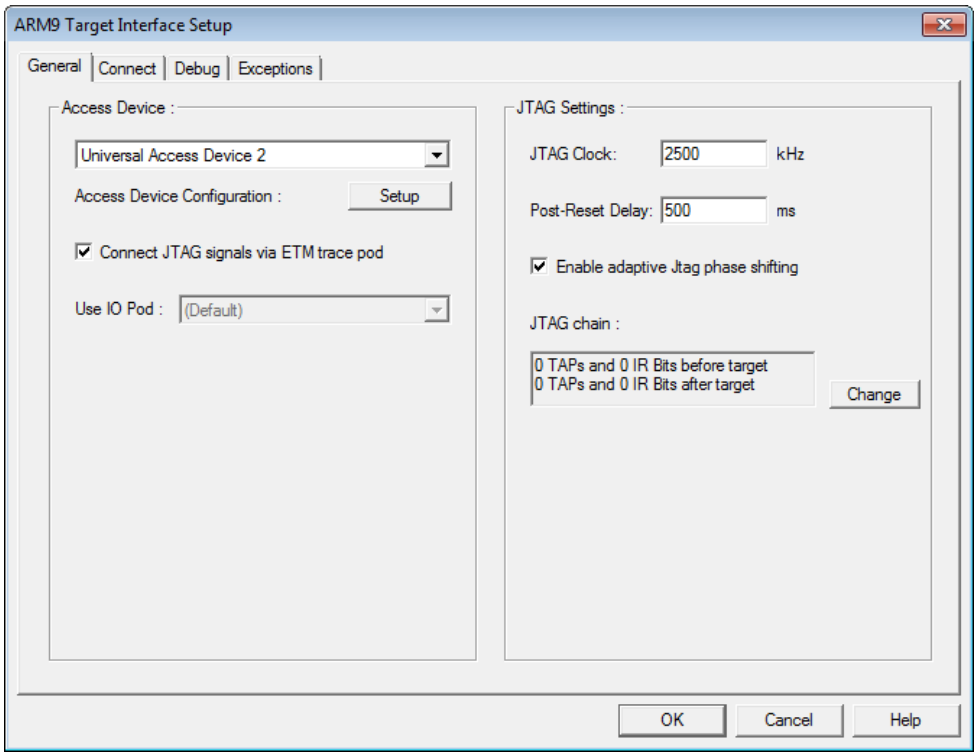
The Trace Pods are being able to provide the full JTAG signal set to the target. In combination with the UAD, you have the choice:

1. JTAG debug communication via the Debug Adapter,
2. JTAG debug communication via the Trace Pod,
3. JTAG debug communication via the Trace Pod directly through the trace connector (currently only possible with 38-pin and 60-pin High Speed Trace Pod).

You have to setup the used constellation within the UAD2 setup via the menu **Config** - **Target Interface..** - **General**

Connect JTAG signals via Trace Pod deselected
Communication via the UAD's JTAG connector (default variant 1)

Connect JTAG signals via Trace Pod selected
Communication via the Trace Pod (via additional cable or directly - variant 2, 3)



Please see the chapter **JTAG Target Interface** for further hints below.

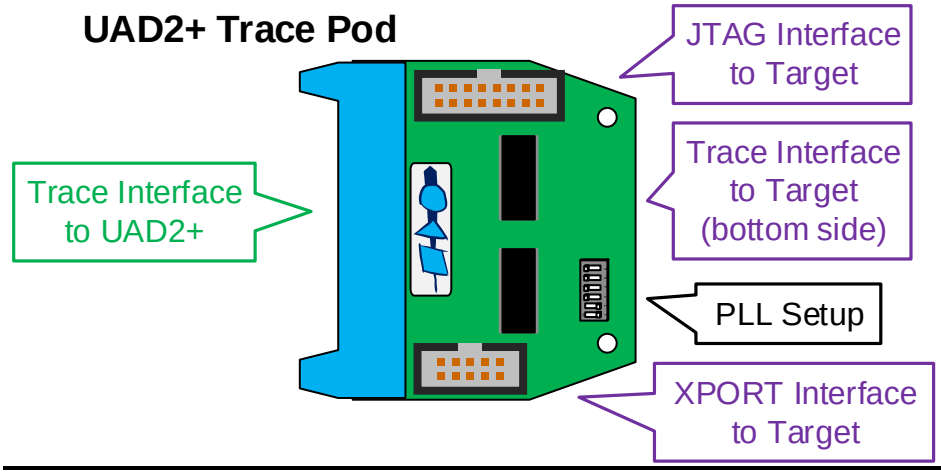
Interface and Connector Description

Overview

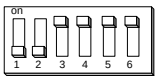
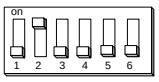
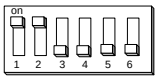
The Trace Board is built in the Universal Access Device and will be delivered assembled completely. For adapting the Trace Board with the target hardware, a Trace Pod is used. This Trace Pod is connected with the Trace Board via a flat ribbon cable.

The Trace Pod provides the interfaces to JTAG and OCDS L2 or ETM. Additionally, the XPORT interface with an 8-bit wide trace bus is available.

Note: Some Trace Pod series are equipped with an on-board PLL. The setup of the PLL is done via a mini DIP switch on the backside of the Trace Pod.



Description	Connector
Trace Interface to the UAD2+	80-pin Male HD-Header
Trace Interface to the Target	38-pin, 40-pin, 60-pin Female Header
JTAG Interface to the Target	16-pin or 20-pin Shroud Male Header
XPORT Interface to the Target	10-pin Shroud Male Header

Description	Mini DIP Switch
Programming Mode	
Normal Mode, PLL Profile 0	
Normal Mode, PLL Profile 1	
Normal Mode, PLL Profile 2	
Normal Mode, PLL Profile 3	

Interface Details

Interface to Host

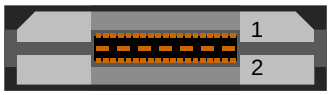
The Trace Pods are connected to the Universal Access Device's Trace Board via the host interface consisting of a double-40-wire or 80-wire HD flat ribbon parallel cable. Corresponding to your target trace connector, an appropriate Trace Pod is used.

Currently a 38-pin Trace Pod for ARM ETM and a 38-pin Trace Pod for NEXUS, a 40-pin Low Speed Trace Pod for TriBoard TC10GP, TriBoard TC1775 and a 60-pin High Speed Trace Pod for TriBoard TC11IB, TriBoard TC1130, and TriBoard TC1796 are available.

JTAG Target Adapter 38-pin ETM (Trace Pod)

ETM - 38	38-pin Trace Port	up to 150 MHz

ETM Trace Adapter with 38-pin AMP Mictor connector:



Pin 1	n.c.	Pin 2	n.c.
Pin 3	n.c.	Pin 4	n.c.
Pin 5	**GND**	Pin 6	**TRACECLK**
Pin 7	n.c.	Pin 8	n.c.
Pin 9	**SRST#**	Pin 10	**EXTTRIG**
Pin 11	**TDO**	Pin 12	n.c.
Pin 13	**RTCK**	Pin 14	n.c.
Pin 15	**TCK**	Pin 16	**TRACEPKT[7]**
Pin 17	**TMS**	Pin 18	**TRACEPKT[6]**
Pin 19	**TDI**	Pin 20	**TRACEPKT[5]**
Pin 21	**TRST#**	Pin 22	**TRACEPKT[4]**
Pin 23	n.c.	Pin 24	**TRACEPKT[3]**
Pin 25	n.c.	Pin 26	**TRACEPKT[2]**
Pin 27	n.c.	Pin 28	**TRACEPKT[1]**
Pin 29	n.c.	Pin 30	**TRACEPKT[0]**
Pin 31	n.c.	Pin 32	**TRACESYNC**
Pin 33	n.c.	Pin 34	**PIPESTAT[2]**
Pin 35	n.c.	Pin 36	**PIPESTAT[1]**
Pin 37	n.c.	Pin 38	**PIPESTAT[0]**

Product codes for ordering the adapter and cables

- 2053 - Trace/JTAG adapter with one ARM defined 38-pin trace MICTOR38 (ETM) connector, 38-pin trace pod to ARM ETM targets
- 2068 - Trace cable between UAD2+ and an trace pod. 80-pin HD flat ribbon cable, 5" (10cm)

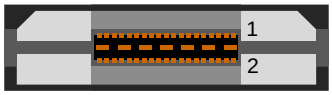
Note: The 38-pin connector provides the full JTAG signal set. You **must** use the direct JTAG interface via the 38-pin target trace connector. No additional connection is required.

Setup the Target Configuration to use the JTAG interface via the Trace Pod as described in the chapter **JTAG Trace Pod Setup**.

JTAG Target Adapter 38-pin NEXUS (Trace Pod)

NEXUS - 38	38-pin Trace Port	up to 150 MHz

NEXUS Trace Adapter with 38-pin AMP Mictor connector:



Pin 1	n.c.	Pin 2	n.c.
Pin 3	n.c.	Pin 4	n.c.
Pin 5	**MDO[9]**	Pin 6	**CLKOUT**
Pin 7	**VEND_IO2**	Pin 8	**MDO[8]**
Pin 9	**RESET**	Pin 10	**EVTI**
Pin 11	**TDO**	Pin 12	**VREF**
Pin 13	**MDO[10]**	Pin 14	**TOOL_IO2**
Pin 15	**TCK**	Pin 16	**MDO[7]**
Pin 17	**TMS**	Pin 18	**MDO[6]**
Pin 19	**TDI**	Pin 20	**MDO[5]**
Pin 21	**TRST#**	Pin 22	**MDO[4]**
Pin 23	**MDO[11]**	Pin 24	**MDO[3]**
Pin 25	n.c.	Pin 26	**MDO[2]**
Pin 27	n.c.	Pin 28	**MDO[1]**
Pin 29	n.c.	Pin 30	**MDO[0]**
Pin 31	n.c.	Pin 32	**EVTO**
Pin 33	n.c.	Pin 34	**MCKO**
Pin 35	n.c.	Pin 36	**MSEO[1]**
Pin 37	n.c.	Pin 38	**MSEO [0]**

Product codes for ordering the adapter and cables

- 2055 - Trace/JTAG adapter with Nexus defined 38-pin trace MICTOR38 (Nexus) connector, 38-pin trace pod to Nexus trace targets
- 2068 - Trace cable between UAD2+ and an trace pod. 80-pin HD flat ribbon cable, 5" (10cm)

Alternative adapter

- 2056 - Trace/JTAG adapter with Nexus defined 38-pin trace MICTOR38 (Nexus) connector (extended height), 38-pin trace pod to Nexus trace targets

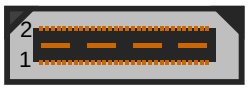
Note: The 38-pin connector provides the full JTAG signal set. You **must** use the direct JTAG interface via the 38-pin target trace connector. No additional connection is required.

Setup the Target Configuration to use the JTAG interface via the Trace Pod as described in the chapter **JTAG Trace Pod Setup**.

JTAG Target Adapter 60-pin OCDS Level 2 (High Speed Trace Pod)

OCDS L2 - 60	60-pin Trace Port (Variant 1)	up to 100 MHz

OCDS L2 Trace Adapter with 60-pin Samtec QSH-030:

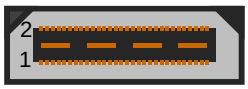


Pin 1	**RESET#**	Pin 2	**EMUBREAK[2]**
Pin 3	**BRKIN#**	Pin 4	**EMUBREAK[1]**
Pin 5	**TRST#**	Pin 6	n.c.
Pin 7	n.c.	Pin 8	n.c.
Pin 9	n.c.	Pin 10	**EMUBREAK[0]**
Pin 11	**OCDS_E#**	Pin 12	**EMUSTAT[4]**
Pin 13	**TDI**	Pin 14	**EMUSTAT[3]**
Pin 15	**TCLK**	Pin 16	**EMUSTAT[2]**
Pin 17	n.c.	Pin 18	**EMUSTAT[1]**
Pin 19	n.c.	Pin 20	**EMUSTAT[0]**
Pin 21	n.c.	Pin 22	n.c.
Pin 23	n.c.	Pin 24	n.c.
Pin 25	n.c.	Pin 26	n.c.
Pin 27	**BRKOUT#**	Pin 28	**TDO**
Pin 29	n.c.	Pin 30	n.c.
Pin 31	**PCP_BRKOUT#**	Pin 32	n.c.
Pin 33	**BRKIN#**	Pin 34	n.c.
Pin 35	**BRKOUT#**	Pin 36	**EMUPC[7]**
Pin 37	n.c.	Pin 38	**EMUPC[6]**
Pin 39	n.c.	Pin 40	**EMUPC[5]**
Pin 41	n.c.	Pin 42	**EMUPC[4]**
Pin 43	n.c.	Pin 44	**TMS**
Pin 45	n.c.	Pin 46	n.c.
Pin 47	n.c.	Pin 48	**EMUPC[3]**
Pin 49	n.c.	Pin 50	**EMUPC[2]**
Pin 51	n.c.	Pin 52	**EMUPC[1]**
Pin 53	n.c.	Pin 54	**EMUPC[0]**
Pin 55	n.c.	Pin 56	n.c.
Pin 57	n.c.	Pin 58	**OCDS_L2_E#**
Pin 59	n.c.	Pin 60	**CPU_CLOCK**

Note: The High Speed 60-pin connector provides the full JTAG/OCDS signal set. If the TriCore target board supports a JTAG/OCDS interface via this connector (i.e. the TriBoard TC1920B.201), you **must** use the direct JTAG/OCDS interface via the 60-pin target trace connector. No additional connection is required.
Setup the Target Configuration to use the JTAG/OCDS interface via the Trace Pod as described in the chapter **JTAG/OCDS Trace Pod Setup**.

OCDS L2 - 60	60-pin Trace Port (Variant 2)	up to 150 MHz

OCDS L2 Trace Adapter with 60-pin Samtec QSH-030:



Pin 1	**RESET#**	Pin 2	**EMUBREAK[2]**
Pin 3	**BRKIN#**	Pin 4	**EMUBREAK[1]**
Pin 5	**TRST#**	Pin 6	n.c.
Pin 7	n.c.	Pin 8	n.c.
Pin 9	n.c.	Pin 10	**EMUBREAK[0]**
Pin 11	**OCDS_E#**	Pin 12	**EMUSTAT[4]**
Pin 13	**TDI**	Pin 14	**EMUSTAT[3]**
Pin 15	**TCLK**	Pin 16	**EMUSTAT[2]**
Pin 17	n.c.	Pin 18	**EMUSTAT[1]**
Pin 19	n.c.	Pin 20	**EMUSTAT[0]**
Pin 21	n.c.	Pin 22	n.c.
Pin 23	n.c.	Pin 24	n.c.
Pin 25	n.c.	Pin 26	n.c.
Pin 27	**BRKOUT#**	Pin 28	**TDO**
Pin 29	n.c.	Pin 30	n.c.
Pin 31	**PCP_BRKOUT#**	Pin 32	n.c.
Pin 33	**Reserved**	Pin 34	n.c.
Pin 35	**Reserved**	Pin 36	**EMUPC[7]**
Pin 37	n.c.	Pin 38	**EMUPC[6]**
Pin 39	n.c.	Pin 40	**EMUPC[5]**
Pin 41	n.c.	Pin 42	**EMUPC[4]**
Pin 43	n.c.	Pin 44	**TMS**
Pin 45	n.c.	Pin 46	n.c.
Pin 47	n.c.	Pin 48	**EMUPC[3]**
Pin 49	n.c.	Pin 50	**EMUPC[2]**
Pin 51	n.c.	Pin 52	**EMUPC[1]**
Pin 53	n.c.	Pin 54	**EMUPC[0]**
Pin 55	n.c.	Pin 56	n.c.
Pin 57	n.c.	Pin 58	**OCDS_L2_E#**
Pin 59	n.c.	Pin 60	**CPU_CLOCK**

Product codes for ordering the adapter and cables

- 2080 - Trace/JTAG adapter with one Infineon defined 60-pin trace QTH-030-04 (OCDS-L2) connector, 60-pin trace pod to Infineon OCDS L2 targets
- 2068 - Trace cable between UAD2+ and an trace pod. 80-pin HD flat ribbon cable, 5" (10cm)

Note: The High Speed 60-pin connector provides the full JTAG/OCDS signal set. If the TriCore target board supports a JTAG/OCDS interface via this connector (i.e. the TriBoard TC1920B.201), you **must** use the direct JTAG/OCDS interface via the 60-pin target trace connector. No additional connection is required.
Setup the Target Configuration to use the JTAG/OCDS interface via the Trace Pod as described in the chapter **JTAG/OCDS Trace Pod Setup**.

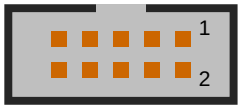
XPort Target Interface

The XPort interface allows observing additional 8 external trace lines. This interface is LVTTL compatible with 5.0 Volts tolerance. The sample frequency is half of the CPU_CLOCK and the sample point is the rising edge of CPU_CLOCK. The results are visible in the trace list within the OCDS L2 Window beside the OCDS L2 trace entries.

UAD2+ XPort Adapter 10-pin

XPort Interface	Additional 8-bit wide Trace Port	

Adapter for 100 mil XPort:



Pin 1	**XPORT[1]**	Pin 2	**XPORT[0]**
Pin 3	**XPORT[3]**	Pin 4	**XPORT[2]**
Pin 5	**XPORT[5]**	Pin 6	**XPORT[4]**
Pin 7	**XPORT[7]**	Pin 8	**XPORT[6]**
Pin 9	**LVDD (3.3 Volts)**	Pin 10	**GND**

JTAG Target Interface for OCDS

The usage of the JTAG connector installed on the Trace Pod is recommended:

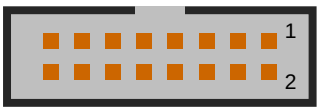
- when using the 40-pin Low Speed Trace Pod or
- when using the 60-pin High Speed Trace Pod and the target trace connector does not implement the JTAG/OCDS interface via the trace connector.

Use the JTAG/OCDS interface on the Trace Pod always alternatively to the UAD's JTAG/OCDS interface and setup your target configuration according.

UAD2+ TraceBoard Adapter 16-pin JTAG/OCDS

JTAG/OCDS	Debugging Channel for the IEEE1149.1-based OCDS-JTAG	up to 10 MHz

JTAG Debug Adapter for 100 mil standard JTAG/OCDS:



Pin 1	**TMS**	Pin 2	n.c.
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

Product codes for ordering the matching cable

- 2018 - 16-pin flat ribbon JTAG/IFX communication cable with an Infineon defined 16-pin 100mil connector, 10" (25cm)

A 16-pin flat ribbon cable is delivered with the Universal Access Device. As the cable is wired according to the OCDS recommendation for the JTAG Connector V1.6 (Infineon Technologies), existing OCDS headers in the target system can be used.

JTAG/OCDS – MCU or V_{REF} I/O voltage

Note: The Trace Pod is LVTTL compatible. It supports 3.3 Volts I/O voltage and is 5.0 Volts tolerant.

JTAG Target Interface for ETM

The usage of the JTAG connector installed on the Trace Pod is recommended:

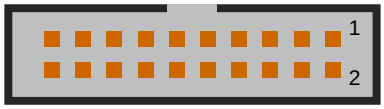
- when the target trace connector does not implement the JTAG interface via the trace connector.

Use the JTAG interface on the Trace Pod always alternatively to the UAD's JTAG interface and setup your target configuration according.

UAD2+ TraceBoard JTAG/ARM Adapter 20-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 10 MHz

JTAG Debug Adapter for 100 mil standard JTAG/ARM:



Pin 1	**V_{REF}**	Pin 2	**V_{REF}**
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	n.c.	Pin 18	GND
Pin 19	n.c.	Pin 20	GND

JTAG - MCU I/O resp. V_{REF} voltage

Note: The Trace Pod is LVTTL compatible. It supports 3.3 Volts I/O voltage and is 5.0 Volts tolerant.

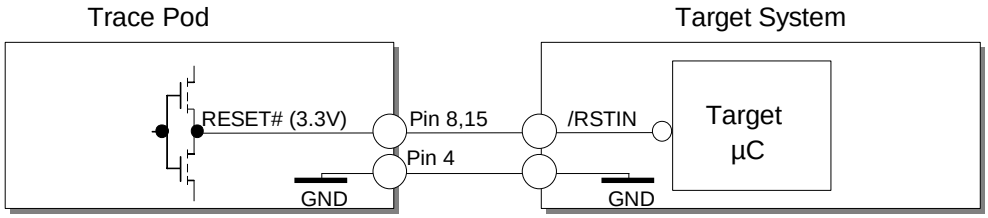
Resetting the Target Systems

For resetting the target system, at the connector JTAG the line RESET# is provided. These reset line is active-low and must be connected to the corresponding line on the target system to achieve an automatic and software-controlled target hardware reset.

The line RESET# can be used in Push-Pull and Open-Drain configuration depending from the used Trace Pod variant.

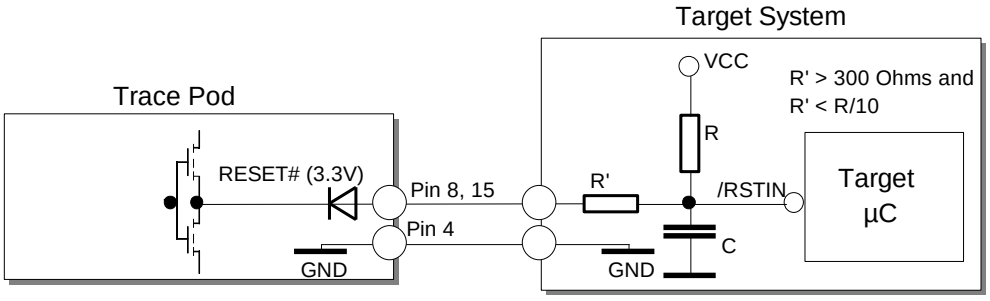
Push-Pull Configuration (Pod Variant 1)

In push-pull configuration, the Reset signal allows the direct control of the Reset inputs of the target hardware. For that, the RESET# line of the target interface has to be connected with the active-low reset input /RSTIN of the target system controller. In this configuration, no other active drivers or RC combinations must be attached to the RESET# line.



Open-Drain Configuration (Pod Variant 2)

Configuring the RESET# line in open-drain mode allows a wired-AND reset line. In this mode, more than one source can reset the target system's controller without interferences.



Static Electricity Precautions

Electrostatic Discharge (ESD) can damage a sensitive electronic component! Under several conditions static electricity and ground potential differences between the Access Device and the user's target hardware can build up high voltages - over 10000 Volts (10 kVolts) in some cases. The electrostatic discharge of this build-up voltage results in fast high current waveforms and fast magnetic (H-field) or electrostatic (E-field) disturbances. The discharge into the electronic components and circuitry can damage or destroy hardware components, resulting in failures and reduced reliability.

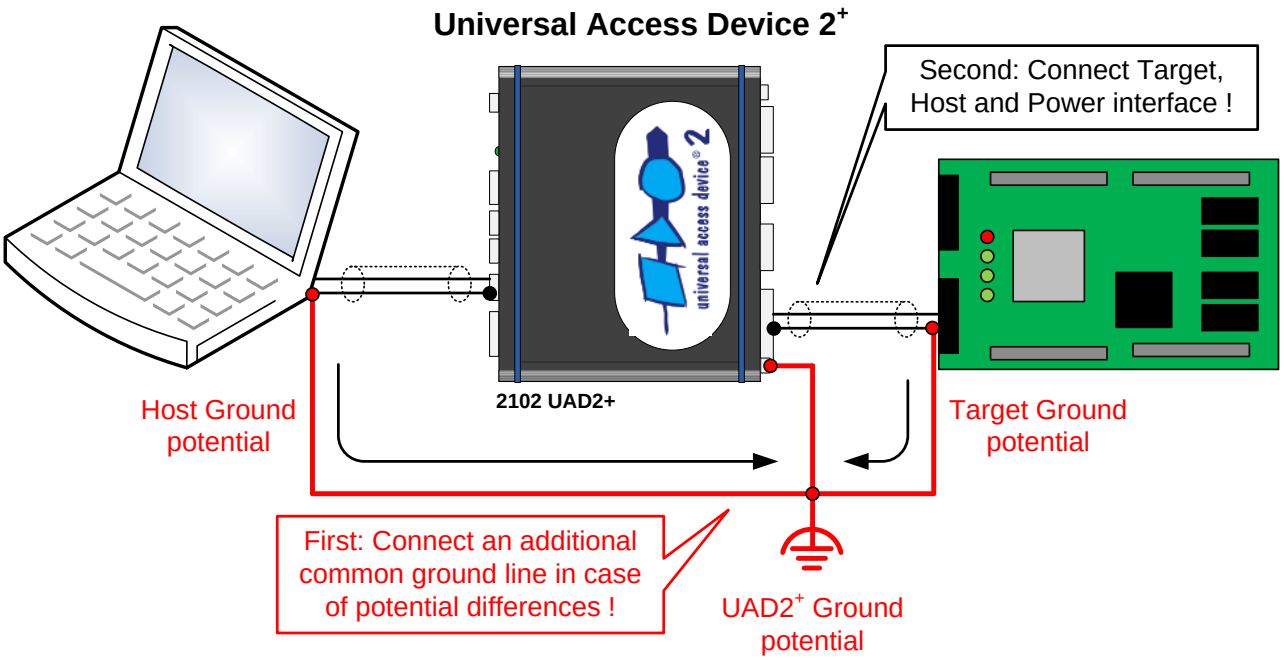
Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **JTAG/DAP/SWD** and the **3Pin/Serial** connectors, these ports are endangered especially. The maximum voltage on these pins may not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first.

To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Please ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a ground socket on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.

Appendix A.5 – Hardware Description UAD2^{next}

Description

The Universal Access Device 2^{next} (UAD2^{next}) is the new all-in-one device in PLS's UDE® target access device family. It combines the state-of-the-art debugging features of the UAD2^{pro} with trace capabilities, which makes it ideal for efficient debugging, test and system-level analysis. Together with the UDE® Universal Debug Engine the UAD2^{next} provides a comprehensive and powerful support even for the latest heterogeneous multi-core SoC's.

- Fast and reliable access to AURIX, TriCore, PowerArchitecture, Cortex-R, Cortex-M, Cortex-A, XC2000, XE166, XMC1000, XMC4000, ARM7/9/11, SuperH SH-2A and RH850
- Proven and robust aluminium housing 17.0 x 14.5 x 5.5 cm
- Passive Cooling.

Product Features

The UAD2^{next} is optimized for high-speed debug communication between UDE® running on the host PC and the target system.

- Proven Debug Adapter solution already used for UAD2^{pro} and UAD3^{+} offers fastest and reliable target access for state-of-the art debug interfaces DAP, DXCPL, SWD, JTAG, cJTAG, LPD
- Ready for upcoming debug interfaces without replacing the base UAD2^{next} device
- High-speed debug access with up to 160 MHz shift clock and 1.65 Volts – 5.5 Volts I/O ring voltage
- Galvanic isolated Debug Adapters (RF coupler technology with 1,000 V_{RMS} isolation) available
- Longer distances between UAD2^{next} and target system. Up to 0.5 m possible
- USB 3.0 or Gigabit Ethernet for connecting UAD2^{next} to UDE® running on the PC

- Connectors for ASC and CAN/CAN FD (CAN FD available upon request) with galvanic signal isolation up to 1,000 V_{RMS}
- Support for DXCPL (DAP over CAN Physical Layer)

For trace-based debugging, measurement and system-level analysis the UAD2next can be extended with target specific trace interfaces.

- Ready for ARM Cortex ETM, STM, ITM, PTM, Xilinx FTM, for NEXUS class 3 parallel / serial Aurora trace (AGBT) and for Infineon MCDS
- ETM Mictor, Cortex ETM, MIPI Trace connector supported
- NEXUS class 3 Mictor, NEXUS, NEXUS HP50 connector supported
- Aurora Trace HS22, HS34, HS40 (ARM HSSTP) connector supported
- Easy mounting and robust plug-in Trace Modules for a wide range of trace interfaces
- Up to 12-bit parallel trace
- 2 Lane serial trace for up to 1.25 Gbps
- 512 MByte internal trace memory.

The UAD2next allows fast and reliable communication under Windows 10/11.

Note: A proper function of the UDE® Universal Debug Engine 2next and its hardware devices is only guaranteed for working with the original components tested and delivered by PLS. The delivered components are verified with the recommends and standards of the chip manufactures.

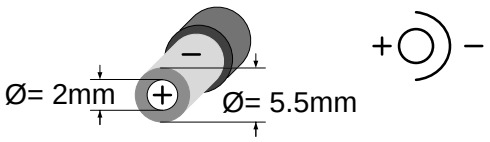
Precautions of Firmware updates

Attention! When a new version of UDE® is started the first time, a **firmware update** may be executed on the Universal Access Device (UAD2, UAD2pro, UAD2next, UAD3+). This may take some more time than usual for the 'target connect' operation.
Please **DO NOT** power off or unplug the access device while this time!

Power Supply

For UAD2next the power is supplied by a main power supply unit (part of the delivery contents).

Attention! Please do not use other mains power supply units as they may damage UAD2next. Any damages or hazards arising from the use of unsuitable power supplies, over-voltage or wrong polarity are in the sole responsibility of the user and do not fall under warranty repair.

Universal Access Device 2next Power Supply connector	Input Voltage: 12V DC	Power Plug 

Driver Installation USB

Because of the Plug 'n Play-Capabilities of the UAD2next, the USB driver installation is started automatically, when the UAD2next is connected to the host PC the first time.

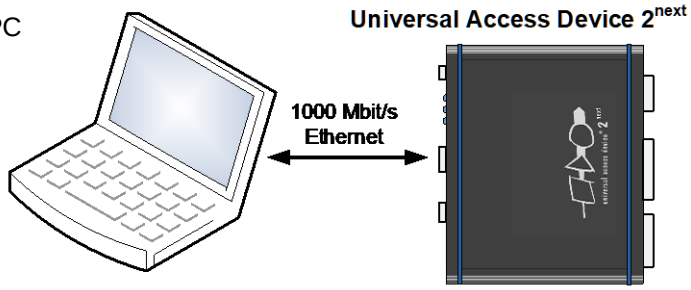
Please follow the driver installation guide described in **UDE Manual.pdf**.

Driver Installation Ethernet TCP/IP

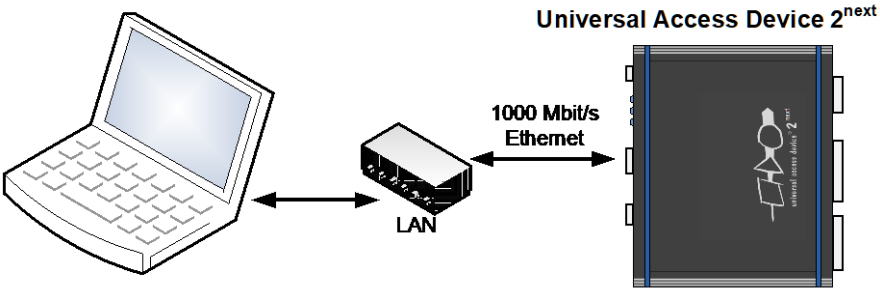
The UAD2next is equipped with a 1000 Mbit/s Gigabit Ethernet interface. It can be connected to a local PC or to a Local Network via Hubs or Switches and uses TCP/IP.

Connection methods

UAD2next connected direct to PC



UAD2next connected to Local Network or Hub



DHCP or static IP addressing

The UAD2next supports both, DHCP and static IP addressing. It can be configured with DHCP enabled. After power on it tries to get an IP address from a DHCP server. When there is no DHCP server answering, the UAD2next will fall back to static IP after 60 seconds.

Connection methods

The UAD2next can communicate to UDE® via the TCP/IP protocol, if a valid IP (Internet Protocol) address is configured by:

1. Using DHCP, this requires a DHCP server on your network, or

2. Using a static IP address, this requires knowledge about the network structure, e.g. knowledge of free IP addresses so that there is no IP used twice in the network.

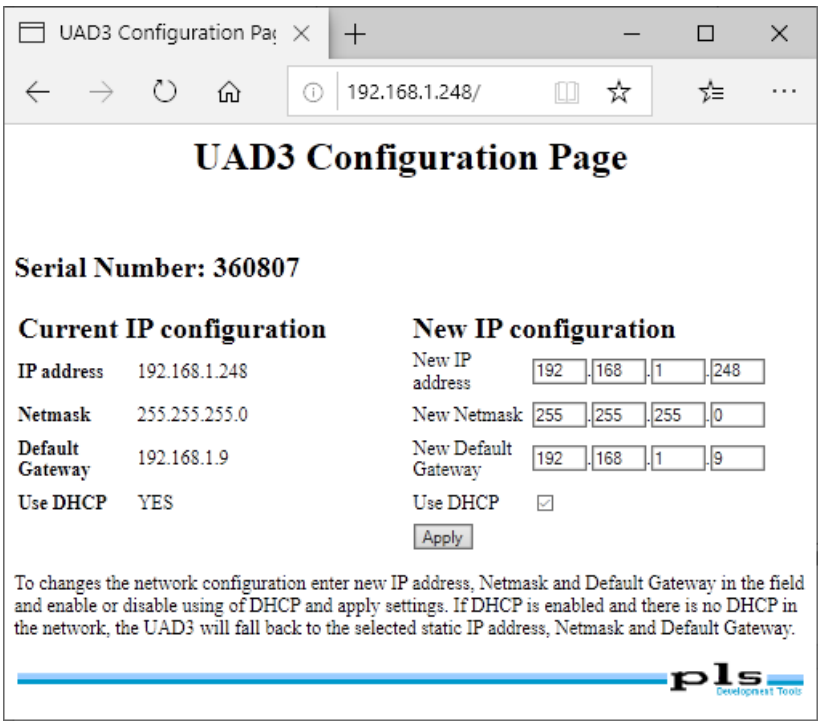
At factory settings, the UAD2next is configured with DHCP enabled. After power ON the UAD2next tries to receive an IP address from a DHCP server. If it receives no answer from a DHCP server, the UAD2next will fall back to a static IP address after 60 seconds. The static fall back IP address is `192.168.1.100`. The UAD2next use the following TCP ports for communication: `43690 (0xAAAA)` and `43691 (0xAAAB)`.

Configuration of the IP address via Ethernet

The configuration of the UAD2next can be changed, using a web browser. After entering the current IP address, e.g.

```
http://192.168.1.152
```

the **UAD2 Configuration Page** appears as startup page. The configuration page contains the serial number of the UAD2next and the current configuration at the left side of then page.



The example shows, that DHCP is enabled and the current IP address is 192.168.1.152.

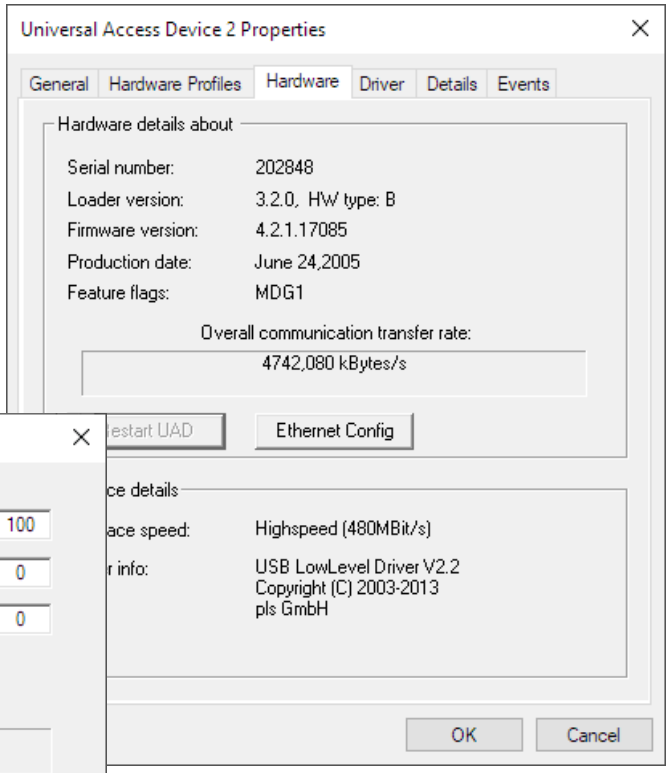
On the right of the form, new settings can be entered. The configured IP address will also be used as fallback, when DHCP is enabled but no DHCP answer is received. After clicking **Apply,** the new settings are stored. To apply the new settings immediately, power the UAD2^{next} OFF and ON again. Otherwise, they are applied after the next power ON event.

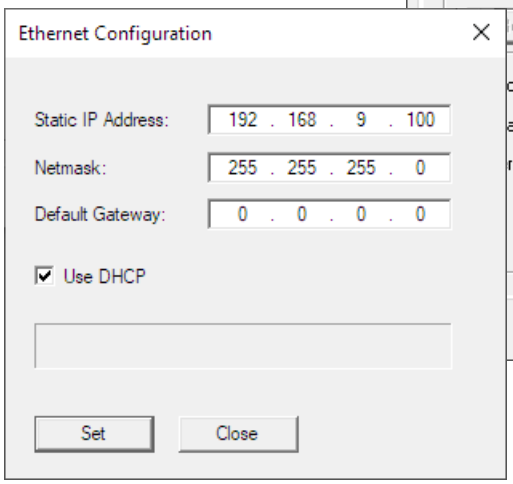
Configuration of the IP address via USB/IEEE1394

If the IP address of the UAD2^{next} is unknown, it can be configured using the USB or FireWire connection:

Connect the UAD2^{next} via USB to a PC. Open the device manager's property page of the UAD2^{next} and select **Ethernet Config**.

The **Ethernet Configuration** dialog appears where the same settings can be made.





Once the UAD2next was configured, a connection via UAD2next can be established: Create a new workspace and select your target configuration. If **default** is set as communication device and there is no other UAD2next connected, the Ethernet device is found automatically.

If no UAD was found, open the menu entry **Config – Target interface...** in UDE® or menu entry **Target – Setup** in UDE® Memtool. In the **Target Interface Setup,** dialog click on the **Setup** button.

For using the TCP/IP communication, the **Select Communication Device** dialog is opened. You can select the specific access device that you want to use. These settings are stored in the target configuration `*.cfg` file format.

For Ethernet connections select **UAD2 device, attached to Ethernet port**. A specific IP address to connect can be entered or an UAD2+ can be selected from the list after retrieving available devices. Pressing **OK** stores the settings. A connection is established now.

If multiple UAD2+, UAD2next or UAD3+ are used at the same time (e.g. for automated FLASH programming), then every UAD2+, UAD2next or UAD3+ have its own target configuration with either unique IP or unique serial number.

Determining the MAC address

The MAC address of the UAD2next device is defined as

```
00:79:92:<SN2>:<SN1>:<SN0>
```

where `<SN2>..<SN0>` are parts of the hexadecimal value of the serial number of the device, e.g: for serial number `123456 (== 0x1E240h)` the MAC address would be `00:79:92:01:E2:40`.

Application hints

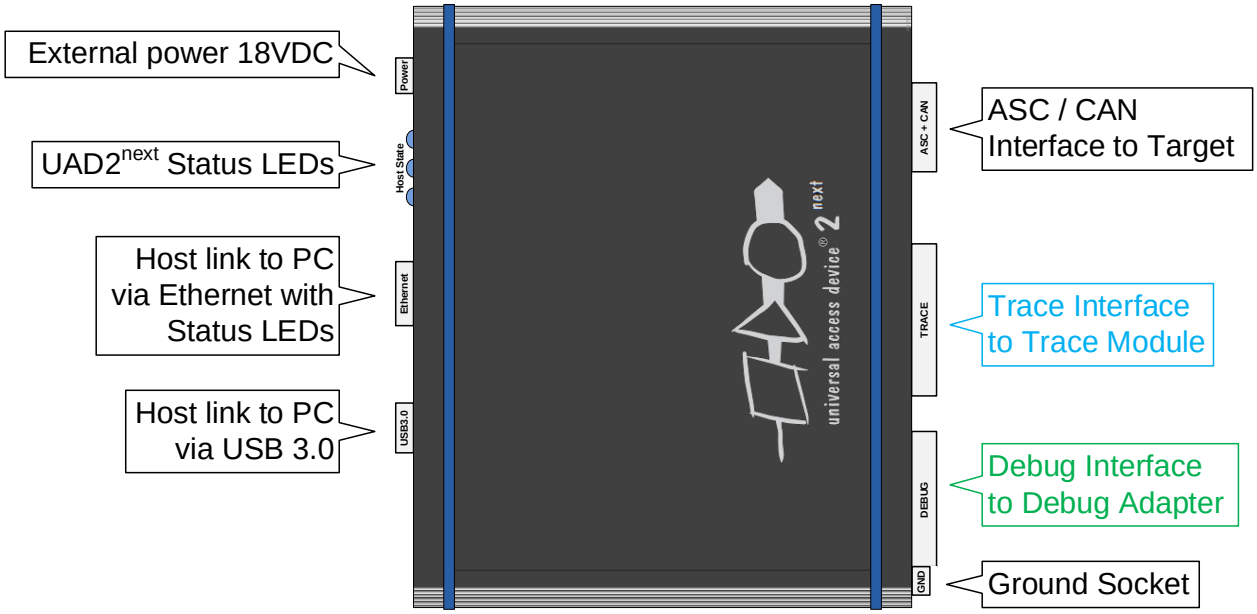
The following options are available for Ethernet configuration in the target configuration files:

PortType:	Must be set to ‘Ethernet’ for Ethernet connection
UseFixedIp:	Set to ‘`1`’ if connection to a specific IP address should be made, otherwise ‘`0`’
FixedIp:	Specific IP address of the access device in text form
DeviceNumber:	Serial number of the access device, if no specific IP is used

Interface and Connector Description

Overview

The Universal Access Device 2next features a number of interface connectors for host and target connections.



Universal Access Device 2next

Label	Description	Connector
⏚	Ground potential of Universal Access Device 2next	4 mm Round Connector
Debug Target	Debug Interface to the Debug Adapter	40-pin Shroud Male Header
Trace Target	Trace Interface to the UAD2next Trace Module	100-pin Female Header
ASC Target	ASC Interface to the Target	SUB-D9 (Male)
CAN Target	CAN Interface to the Target	SUB-D9 (Male)
Power	External Power Supply	Connector
Ethernet	Host Communication via Ethernet TCP/IP	RJ-45
USB	Host Communication via USB 3.0	USB connector

Access Device State Indication

The LEDs on the backside of the UAD2next indicate the device state and traffic on a specific host communication interface.

Status (left)	LED blink codes description
LED off	UAD2next not powered on (when powered on, the UAD2next or its power supply could be defective)
LED blinking sporadically or continuously	UAD2next powered on, connection between UAD2next and Host interface established

USB (middle)	LED blink codes description
LED off	No Host interface detected
LED on	Connection between UAD2next and Host interface established
LED blinking sporadically	UAD2next is communicating with Host interface

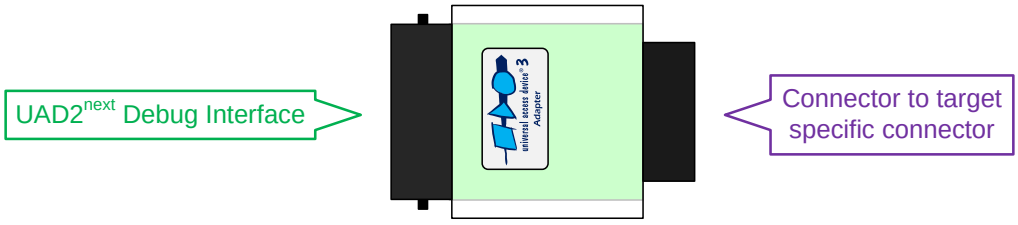
The **LED (right)** has no function.

Ethernet Socket		LED blink codes description
Green LED	(left)	Link between UAD2next and Network established
Yellow LED	(right)	UAD2next is communicating with Network

Debug Adapter

The Debug Adapter is a part of the debug connection between the UAD2next and the supported target PCB debug connector, e.g. connectors of JTAG, cJTAG, ARM, DAP/DAP2, SWD, OnCE, COP and further interfaces.

Target specific Debug Adapter



Product codes for ordering the adapters and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2010 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2035 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector
- 2052 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2031 - MiniDAP/cJTAG communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector
- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector

- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

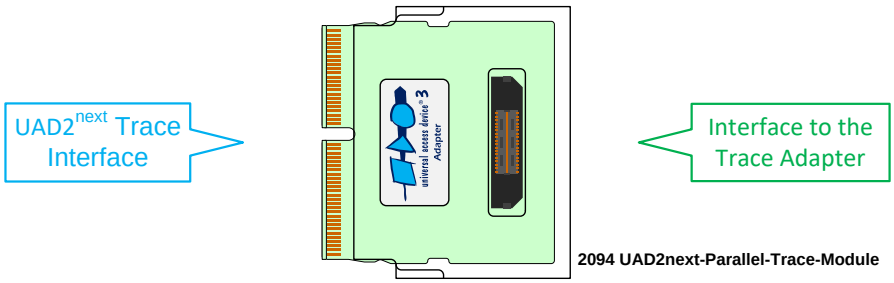
The interface description below describes further details.

Description (combined)	Connector
Debug Interface to the UAD2next Debug Interface	40-pin Male Shrouded Header
Debug Connector to JTAG/DAP/DAP2 Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/DAP/DAP2 Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/OnCE and JTAG/cJTAG Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/COP Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/H-UDI Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/RH850 Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/ARM Target	20-pin Standard 100 mil Connector
Debug Connector to JTAG/SWD Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/SWD Target	20-pin Samtec FTSH Connector
Debug Connector to MiniDAP/cJTAG/SWD Target for Automotive ECU	10-pin Samtec TFM Connector
Debug Connector to MiniJTAG Target for Automotive ECU	10-pin Samtec FTSH Connector
Debug Connector to ETKS Target for Automotive ECU	16-pin Samtec FTSH Connector

UAD2next Trace Modules

The Trace Modules and its Trace Adapters provide interfaces for sampling of trace data. The connection between the Debug Interface, the Trace Module, the Trace Adapters and the target is done via an additional adapter cable set.

UAD2next Parallel Trace Module

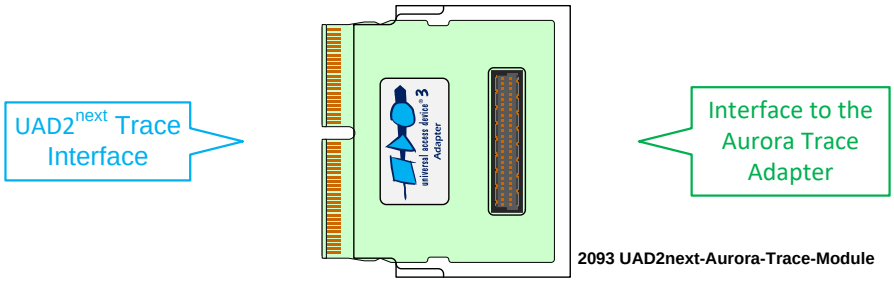


2094 UAD2next-Parallel-Trace-Module

Product codes for ordering the adapter

- 2094 - Parallel Trace module for UAD2next, size 5.2 x 4.1 x 0.8 cm, up to 12 bit parallel trace, one connector for trace adapter cable, UAD2next trace module connector, 512 MByte Trace memory enabled

UAD2next Aurora Trace Module



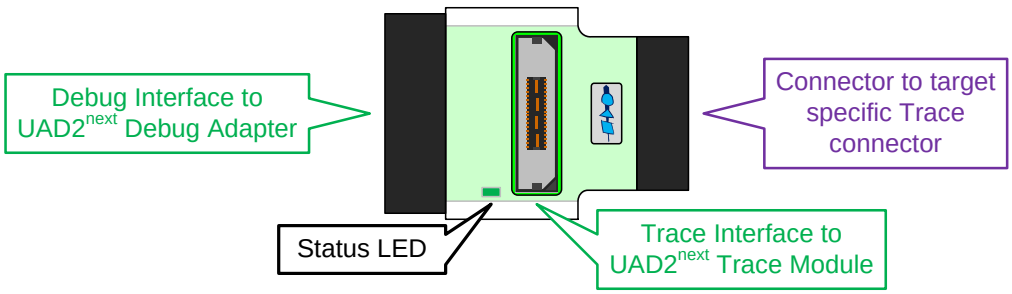
2093 UAD2next-Aurora-Trace-Module

Product codes for ordering the adapter

- 2093 - Aurora Trace module for UAD2next, size 5.2 x 4.1 x 0.8 cm, up to 1.25 GBit/s, up to 2 lanes, one connector for flex cable, UAD2next trace module connector, 512 MByte Trace memory enabled

UAD2next Parallel Trace Adapter

The Trace Adapter provides the target adaptation of the debug and trace signals. It has connectors for the Debug Interface, the Trace Module and the target specific connector.



Product codes for ordering the adapters

- 2022 - 38-pin Trace adapter to ARM ETM and CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2058 - 20-pin Trace adapter to ARM Cortex-M CoreSight trace targets with 4-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, target connector
- 2061 - 60-pin Trace adapter to CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, Samtec QTH-030 target connector
- 2076 - 50-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, HP50 target connector

Description ETM	Connector
Debug Interface to the UAD2next Debug Adapter (ARM)	20-pin Standard 100 mil Connector
Trace Interface to the UAD2next Trace Module	38-pin Connector
Trace Interface to the Target (ETM)	38-pin AMP Mictor Connector

Description Cortex ETM	Connector
Debug Interface to the UAD2next Debug Adapter (ARM)	20-pin Standard 100 mil Connector
Trace Interface to the UAD2next Trace Module	38-pin Connector
Trace Interface to the Target (Cortex ETM)	20-pin Samtec FTSH Connector

Description ETM MIPI	Connector
Debug Interface to the UAD2next Debug Adapter (ARM)	20-pin Standard 100 mil Connector
Trace Interface to the UAD2next Trace Module	38-pin Connector
Trace Interface to the Target (MIPI)	60-pin Samtec QSH Connector

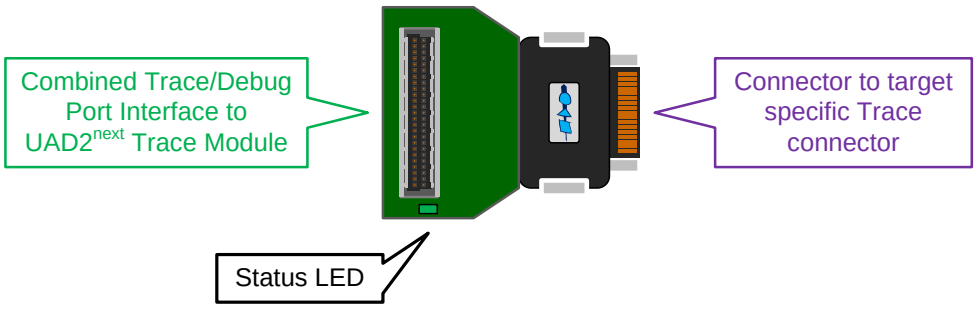
Description Cortex NEXUS	Connector
Debug Interface to the UAD2next Debug Adapter (NEXUS)	14-pin Standard 100 mil Connector
Trace Interface to the UAD2next Trace Module	38-pin Connector
Trace Interface to the Target (NEXUS)	38-pin AMP Mictor Connector

Description Cortex NEXUS HP50	Connector
Debug Interface to the UAD2next Debug Adapter (NEXUS)	14-pin Standard 100 mil Connector
Trace Interface to the UAD2next Trace Module	38-pin Connector
Trace Interface to the Target (NEXUS HP50)	50-pin Samtec ERF8 Connector

The interface description below describes further details.

UAD2^{next} Aurora Trace Adapter

The Trace Adapter provides the target adaptation of the debug and trace signals. It has connectors for the Trace Module and the target specific connector.



Product codes for ordering the adapters

- 2064 - Aurora Trace adapter (HS22) to Infineon Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137969-01 target connector
- 2063 - Aurora Trace adapter (HS34) to Nexus Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137973-01 target connector
- 2045 - Aurora Trace adapter (HS40) to ARM Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-130367-01 target connector

Description Aurora HS22	**Connector**
Trace Interface to the UAD2^{next} Trace Module	50-pin Connector
Trace Connector to Target	22-pin HS22 Connector

Description Aurora HS34	**Connector**
Trace Interface to the UAD2^{next} Trace Module	50-pin Connector
Trace Connector to Target	34-pin HS34 Connector

Description Aurora HS40	**Connector**
Trace Interface to the UAD2^{next} Trace Module	50-pin Connector
Trace Connector to Target	40-pin HS40 Connector

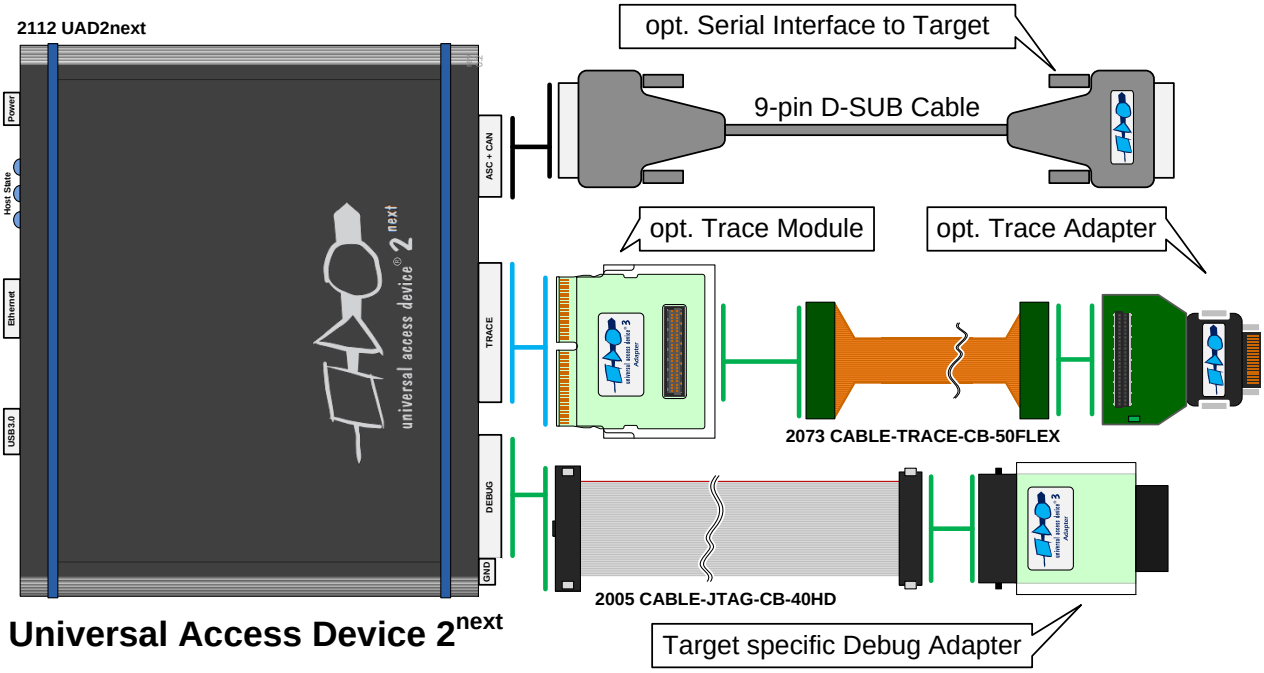
The interface description below describes further details.

Interface Details

Host Interfaces

Universal Access Device 2next can realize the Host Communication via the USB 1.1, USB 2.0 or USB 3.0 interface as well as via Gigabit Ethernet TCP/IP.

Connection Schema to the Target

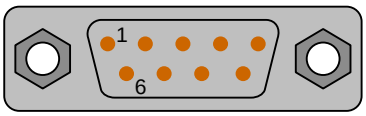


Asynchronous RS232-compatible Application Target Interface

The UAD2next provides a buffered asynchronous communication path between to the ASC0 of the target system controller.

ASC	RS232-compatible asynchronous Communication Interface between UAD2next and external target system application devices	up to 1 Mbps

ASC0 Target (**Male**) D-SUB9:



Pin 1	n.c.	Pin 2	**TxD*** (Target Transmit)
Pin 3	**RxD*** (Target Receive)	Pin 4	n.c.
Pin 5	**GND***	Pin 6	n.c.
Pin 7	**CTS*** (Target Receive)	Pin 8	**RTS*** (Target Transmit)
Pin 9	n.c.	Shield	Chassis GND

* All signal lines are galvanic isolated pins.

Attention! The voltage on any pin of the ASC interface must be between +12 Volts and -12 Volts and must not exceed the absolute value of 12 Volts.

For connecting the target system with UAD2next, a standard 1-to-1 wired SUB-D9 cable is suitable.

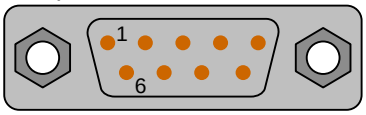
CAN Target Interface

The Controller Area Network (CAN) bus and its associated protocol allow very efficient communication between a numbers of CAN nodes connected to the bus.

The pin assignment is compatible with the CiA CAN bus pin assignment for 9-pin D-Sub male connectors. The UAD2^{next} may be connected therefore of the most standard evaluation boards with a CAN bus interface for the controller family. Note that the UAD2^{next} does not contain the bus termination network. It must be added externally. High-speed CAN networks based on ISO-DIS 11898 have a line topology and must be terminated with a 120 Ohm resistor between CAN_H and CAN_L lines at the last network node.

CAN Interface	CAN Communication Interface	up to 1 Mbps

Connector CAN0 Target (**Male**) D-SUB9: (CiA pin assignment)



Pin 1	n.c.	Pin 2	**CAN_L***
Pin 3	**GND***	Pin 4	n.c.
Pin 5	n.c.	Pin 6	**GND***
Pin 7	**CAN_H***	Pin 8	n.c.
Pin 9	n.c.	Shield	Chassis GND

* All signal lines are galvanic isolated pins.

DAP/DAP2 Target Interface

The debug interface JTAG/DAP/DAP2 was established by Infineon for the AUDO Future devices and other upcoming 16-bit and 32-bit-microcontrollers. The new board connector is a 50 mil Samtec FTSH-105 double row 10-pins micro-terminal with keying shroud, which saves board space on targets system side.

The UAD2^{next} supports the 2-wire and the 3-wire DAP mode.

- I/O voltage range: 1.65 Volts – 5.5 Volts, Capacity per signal: max 55 pF
- ESD Protection per signal: 15 kVolts
- Resettable over-current protection for V_{IO}: 10 A (max 0.2 s time to trip, resettable).

TriCore/AURIX, XE166, XC2000 Adapter 10-pin DAP/DAP2

DAP/DAP2	Debugging Channel for the JTAG/DAP/DAP2	up to 100 MHz

DAP Debug Adapter for 50 mil Samtec FTSH-105 DAP connector:

Pin 1	**V_{REF}**	Pin 2	**DAP1**
Pin 3	GND	Pin 4	**DAP0**
Pin 5	GND	Pin 6	**DAP2_USER0**
Pin 7	KEY_GND	Pin 8	**DAPEN_USER1**
Pin 9	GND	Pin 10	**RESET#**

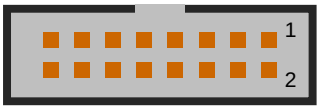
Product codes for ordering the adapter and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

TriCore/AURIX, XE166, XC2000 Adapter 16-pin DAP/DAP2

DAP	Debugging Channel for the DAP	up to 50 MHz

DAP Debug Adapter for 100 mil standard JTAG/DAP connector:



Pin 1	**DAP1**	Pin 2	**V_{REF}**
Pin 3	**DAP2_USER0**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	Reserved (TDI)	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**DAP0**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**DAPEN_USER1**
Pin 15	Reserved	Pin 16	Reserved

Product codes for ordering the adapter and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

JTAG Target Interface

TriCore, XC166, XC2000, XE166 Power Architecture, ARM9, ARM11, Cortex derivatives feature an on-chip IEEE1149.1- and IEEE1149.7-based interface for an external debugging unit. This unit allows resource-saving target system access without additional software or hardware on the target system. Therefore, all controller serial interfaces remain available for the application without restrictions caused by the debugging interface.

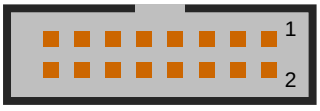
- I/O voltage range: 1.65 Volts – 5.5 Volts

Note: The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

TriCore/AURIX, XE166, XC2000, XC166 Adapter 16-pin JTAG/OCDS

JTAG/OCDS	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/OCDS:



Pin 1	**TMS**	Pin 2	**V_{REF}**
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

Product codes for ordering the adapter and matching cables

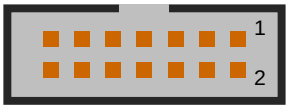
- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector

▪ 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm) ▪ 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Power Architecture Adapter 14-pin JTAG/OnCE

JTAG/OnCE JTAG/cJTAG	Debugging Channel for the IEEE1149.1- and IEEE1149.7-based JTAG	up to 100 MHz

JTAG/cJTAG Debug Adapter for 100 mil standard OnCE connector:



Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK_TCKC**	Pin 6	GND
Pin 7	n.c.	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS_TMSC**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	n.c.	Pin 14	**TRST#**

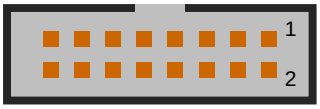
Product codes for ordering the adapter and matching cable

- 2010 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Power Architecture Adapter 16-pin JTAG/COP

JTAG/COP	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/COP connector:



Pin 1	**TDO**	Pin 2	QACK#
Pin 3	**TDI**	Pin 4	**TRST#**
Pin 5	HALTED	Pin 6	**V_{REF}**
Pin 7	**TCK**	Pin 8	n.c.
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	SRST#_HALT#	Pin 12	GND
Pin 13	HRST#_SRST#	Pin 14	n.c.
Pin 15	**RESET#**	Pin 16	GND

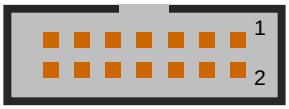
Product codes for ordering the adapter and matching cable

- 2035 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

SuperH SH-2A Adapter 14-pin JTAG/H-UDI

JTAG/H-UDI	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/H-UDI connector:



Pin 1	**TCK**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDO**	Pin 6	GND
Pin 7	n.c.	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	GND
Pin 11	**TDI**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GND

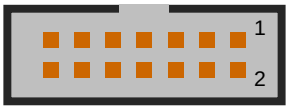
Product codes for ordering the adapter and matching cable

- 2052 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

RH850 Adapter 14-pin JTAG

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG RH850 connector:



Pin 1	**TCK_LDCLK**	Pin 2	GND
Pin 3	**TRST#**	Pin 4	**FLMD0**
Pin 5	**TDO_LPDO**	Pin 6	n.c.
Pin 7	**TDI_LPDIO**	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	**RDY_LPDCLKOUT**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GNDCHECK

Product codes for ordering the adapter and matching cable

- 2088 - JTAG communication adapter with one Renesas RH850 defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

SWD Target Interface

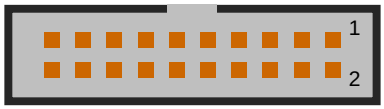
The Serial Wire Debug (SWD) interface or Serial Wire Debug Port (SW-DP) is one of the features of the debug and trace technology ARM CoreSight™. The known JTAG Debug Port (JTAG-DP) is supported furthermore. Both debug ports, the SWD and the alternative JTAG debug port can be combined to the Serial Wire JTAG Debug Port (SWJ-DP), the CoreSight standard port. The JTAG/SWD ARM Adapter is equipped with 3 interface connectors: a 20-pin 100 mil legacy connector (female), a 10-pin 50 mil CoreSight/Cortex and a 20-pin 50 mil CoreSight/Cortex Connector.

- I/O voltage range: 1.65 Volts – 5.5 Volts.

Cortex, ARM7, ARM9, ARM11 Adapter 20-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	RTCK	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	DBGREQ	Pin 18	GND
Pin 19	DBGACK	Pin 20	GND

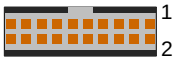
Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM9, ARM11 Adapter 20-pin Cortex

JTAG/SWD	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-110 Cortex connector:



Pin 1	**V_{REF}**	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**
Pin 11	GND_POWER1	Pin 12	**RTCK**_TRACECLK
Pin 13	GND_POWER2	Pin 14	**DBGREQ**_TRACEDATA0
Pin 15	GND	Pin 16	**DBGACK**_TRACEDATA1
Pin 17	GND	Pin 18	TRACEDATA2
Pin 19	GND	Pin 20	TRACEDATA3

Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM9, ARM11 Adapter 10-pin Cortex

JTAG/SWD	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-105 Cortex connector:

Pin 1	**V_{REF}**	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**

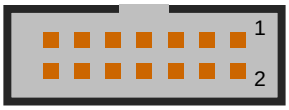
Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM, TI Adapter 14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter with 100 mil TI connector:



Pin 1	**TMS**	Pin 2	**TRST#**
Pin 3	**TDI**	Pin 4	GND
Pin 5	**V_{REF}**	Pin 6	n.c.
Pin 7	**TDO**	Pin 8	GND
Pin 9	**RTCK**	Pin 10	GND
Pin 11	**TCK**	Pin 12	GND
Pin 13	EMU0#	Pin 14	EMU1#

Product codes for ordering the adapters and matching cable

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2027 - JTAG/ARM-TI communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one TexasInstruments defined 14-pin 100mil (JTAG) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)

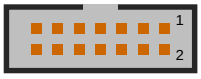
Cortex, ARM, XILINX Adapter 10-pin/14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-105 connector:

Pin 1	**V_{REF}**	Pin 2	**TMS**
Pin 3	GND	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TDO**
Pin 7	n.c.	Pin 8	**TDI**
Pin 9	GND	Pin 10	**RESET#**

JTAG Debug Adapter with 2 mm Xilinx connector:



Pin 1	n.c.	Pin 2	**V_{REF}**
Pin 3	GND	Pin 4	**TMS**
Pin 5	GND	Pin 6	**TCK**
Pin 7	GND	Pin 8	**TDO**
Pin 9	GND	Pin 10	**TDI**
Pin 11	GND	Pin 12	n.c.
Pin 13	GND	Pin 14	HALT

Product codes for ordering the adapter and matching cable (optional)

- 2079 - JTAG/ARM-XILINX communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one Xilinx defined 14-pin 2mm (JTAG) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)

MCU I/O resp. VREF voltage

The MCU I/O voltage is detected and used automatically from 1.65 Volts - 5.5 Volts.

The I/O voltage must be known as well as the target system's connections to VREF voltage pin of the JTAG connector.

Special Target Interface for Automotive ECU

Note: The following non-standard interfaces for Automotive ECU are available as separate products from PLS. Please contact **sales@pls-mc.com** with the note **Automotive ECU** if the following Debug Adapters are required.

TriCore/AURIX, Power Architecture, ARM/Cortex Adapter 10-pin MiniDAP/cJTAG/SWD

MiniDAP/SWD JTAG/cJTAG	Debugging Channel for the DAP, SWD and IEEE1149.7-based JTAG	up to 25 MHz

DAP/cJTAG/SWD Debug Adapter TriCore/Power Architecture/ARM for 50 mil Samtec TFM-105 connector:

Pin 1	GND	Pin 2	**TCK_DAP0_TCKC_SWCLK**
Pin 3	**TRST#_DAPEN_JCOMP**	Pin 4	**TDO_DAP2_SWO**
Pin 5	**TMS_DAP1_TMSC#_SWDIO**	Pin 6	**TDI**
Pin 7	**BRKIO#**	Pin 8	**V_{REF}**
Pin 9	n.c.	Pin 10	**RESET#**

Product codes for ordering the adapter and matching cables

- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

TriCore Adapter 10-pin MiniJTAG

MiniJTAG	Debugging Channel for the JTAG	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-105 JTAG connector:

Pin 1	**BRKIN#**	Pin 2	**TRST#**
Pin 3	GND	Pin 4	**TCK**
Pin 5	**TMS**	Pin 6	**BRKOUT#**
Pin 7	**RESET#**	Pin 8	**TDI**
Pin 9	**V_{REF}**	Pin 10	**TDO**

Product codes for ordering the adapter and matching cables

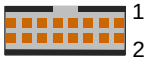
- 2031 - MiniDAP/cJTAG communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Attention: The TriCore Adapter 10-pin MiniJTAG is not compatible with standard Infineon JTAG/OCDS/DAP adapter and should only be used for automotive ECUs.

TriCore/AURIX, Power Architecture Adapter 16-pin ETKS

JTAG/ETKS DAP/ETKS	Debugging Channel for ETKS-arbitrated JTAG/DAP	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-108 ETKS connector:



Pin 1	**TMS_DAP1_TMSC#**	Pin 2	**V_{REF}**
Pin 3	**TDO_DAP2**	Pin 4	GND
Pin 5	GND	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#_DAPDIR_TMSCDIR**	Pin 10	**BRKOUT#_BRKIO#_RDY#**
Pin 11	**TCK_DAP0_TCKC**	Pin 12	GND
Pin 13	**BRKIN#_EVTI#**	Pin 14	**BREQ#**
Pin 15	**BGRANT#**	Pin 16	n.c.

Product codes for ordering the adapter and matching cables

- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

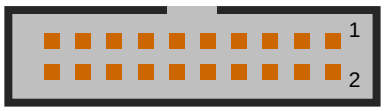
ETM Parallel Trace Interface

The JTAG debug interface to the target is provided by the UAD2^{next} via Debug Adapter and Parallel Trace Adapter.

UAD2^{next} Parallel Trace Adapter 20-pin ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/ARM:



Pin 1	**V_{REF}**	Pin 2	**V_{REF}**
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	**DBGRQ**	Pin 18	GND
Pin 19	**DBGACK**	Pin 20	GND

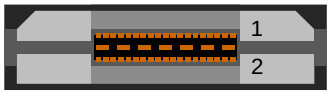
Product codes for ordering the adapter and matching cable

- 2058 - 20-pin Trace adapter to ARM Cortex-M CoreSight trace targets with 4-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, target connector
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD2next Parallel Trace Adapter 38-pin ETM (ETMv3 Mictor 38-pin support)

ETMv3 - 38	38-pin Mictor Trace Port	up to 250 Mbps

ETMv3 Trace Adapter with 38-pin AMP Mictor connector:



Pin 1	n.c.	Pin 2	n.c.
Pin 3	n.c.	Pin 4	n.c.
Pin 5	Reserved	Pin 6	**TRACECLK**
Pin 7	**DBGRQ**	Pin 8	**DBGACK**
Pin 9	**RESET#**	Pin 10	**EXTTRIG**
Pin 11	**TDO**	Pin 12	**VT_{REF}**
Pin 13	**RTCK**	Pin 14	**V_{REF}**
Pin 15	**TCK**	Pin 16	**TRACEDATA[7]**
Pin 17	**TMS**	Pin 18	**TRACEDATA[6]**
Pin 19	**TDI**	Pin 20	**TRACEDATA[5]**
Pin 21	**TRST#**	Pin 22	**TRACEDATA[4]**
Pin 23	Reserved	Pin 24	**TRACEDATA[3]**
Pin 25	Reserved	Pin 26	**TRACEDATA[2]**
Pin 27	Reserved	Pin 28	**TRACEDATA[1]**
Pin 29	Reserved	Pin 30	Reserved
Pin 31	**TRACEDATA[11]**	Pin 32	Reserved
Pin 33	**TRACEDATA[10]**	Pin 34	Reserved
Pin 35	**TRACEDATA[9]**	Pin 36	**TRACECTL**
Pin 37	**TRACEDATA[8]**	Pin 38	**TRACEDATA[0]**

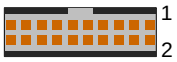
Product codes for ordering the adapter and matching cable

- 2022 - 38-pin Trace adapter to ARM ETM and CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD2next Parallel Trace Adapter 20-pin Cortex ETM

Cortex ETM	20-pin Cortex ETM Trace Port	up to 100 MHz

Cortex ETM Trace Adapter with 50 mil Samtec FTSH-110 connector:



Pin 1	**VT_{REF}**	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**
Pin 11	GND_POWER1	Pin 12	**RTCK_TRACECLK**
Pin 13	GND_POWER2	Pin 14	**DBGREQ_TRACEDATA0**
Pin 15	GND	Pin 16	**DBGACK_TRACEDATA1**
Pin 17	GND	Pin 18	**TRACEDATA2**
Pin 19	GND	Pin 20	**TRACEDATA3**

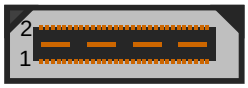
Product codes for ordering the adapter and matching cables

- 2058 - 20-pin Trace adapter to ARM Cortex-M CoreSight trace targets with 4-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, target connector
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD2next Parallel Trace Adapter 60-pin ETM MIPI

MIPI	60-pin MIPI Trace Port	up to 250 Mbps

ETMv3 Trace Adapter with 60-pin Samtec QSH-030 connector:



Pin 1	**VSUPPLY**	Pin 2	**TMS**
Pin 3	**TCK**	Pin 4	**TDO**
Pin 5	**TDI**	Pin 6	**RESET#**
Pin 7	**RTCK**	Pin 8	**TRST#**
Pin 9	n.c.	Pin 10	**DBGRQ**
Pin 11	**DBACK**	Pin 12	**VT_{REF}**
Pin 13	**TRC_CLK[0]**	Pin 14	n.c.
Pin 15	n.c.	Pin 16	GND
Pin 17	**TRC_DATA[0][0]**	Pin 18	n.c.
Pin 19	**TRC_DATA[0][1]**	Pin 20	n.c.
Pin 21	**TRC_DATA[0][2]**	Pin 22	n.c.
Pin 23	**TRC_DATA[0][3]**	Pin 24	n.c.
Pin 25	**TRC_DATA[0][4]**	Pin 26	n.c.
Pin 27	**TRC_DATA[0][5]**	Pin 28	n.c.
Pin 29	**TRC_DATA[0][6]**	Pin 30	n.c.
Pin 31	**TRC_DATA[0][7]**	Pin 32	n.c.
Pin 33	**TRC_DATA[0][8]**	Pin 34	n.c.
Pin 35	**TRC_DATA[0][9]**	Pin 36	n.c.
Pin 37	**TRC_DATA[0][10]**	Pin 38	n.c.
Pin 39	**TRC_DATA[0][11]**	Pin 40	n.c.
Pin 41	Reserved	Pin 42	n.c.
Pin 43	Reserved	Pin 44	n.c.
Pin 45	Reserved	Pin 46	n.c.
Pin 47	Reserved	Pin 48	n.c.
Pin 49	Reserved	Pin 50	n.c.
Pin 51	Reserved	Pin 52	n.c.
Pin 53	Reserved	Pin 54	n.c.
Pin 55	Reserved	Pin 56	n.c.
Pin 57	GND	Pin 58	GND
Pin 59	**TRC_CLK[1]**	Pin 60	n.c.

Product codes for ordering the adapter and matching cable

- 2061 - 60-pin Trace adapter to CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, Samtec QTH-030 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

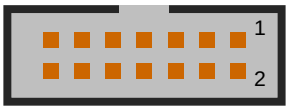
NEXUS Parallel Trace Interface

The JTAG debug interface to the target is provided by the UAD2next via Debug Adapter and Parallel Trace Adapter.

UAD2next Parallel Trace Adapter 14-pin NEXUS

JTAG/OnCE JTAG/cJTAG	Debugging Channel for the IEEE1149.1- and IEEE1149.7-based JTAG	up to 100 MHz

JTAG/cJTAG Debug Adapter for 100 mil standard OnCE connector:

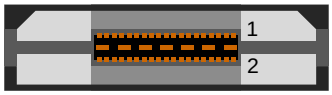


Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK_TCKC**	Pin 6	GND
Pin 7	**EVTI#**	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS_TMSC**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	**RDY#**	Pin 14	**TRST#**

UAD2next Parallel Trace Adapter 38-pin NEXUS

ETMv3 - 38	38-pin Mictor NEXUS Trace Port	up to 250 Mbps

NEXUS Trace Adapter with 38-pin AMP Mictor connector:



Pin 1	Reserved	Pin 2	Reserved
Pin 3	Reserved	Pin 4	Reserved
Pin 5	**MDO9**	Pin 6	**CLKOUT**
Pin 7	**VEND_IO2**	Pin 8	**MDO8**
Pin 9	**RESET#**	Pin 10	**EVTI#**
Pin 11	**TDO**	Pin 12	**V_{REF}**
Pin 13	**MDO10**	Pin 14	**RDY#**
Pin 15	**TCK**	Pin 16	**MDO7**
Pin 17	**TMS**	Pin 18	**MDO6**
Pin 19	**TDI**	Pin 20	**MDO5**
Pin 21	**TRST#**	Pin 22	**MDO4**
Pin 23	**MDO11**	Pin 24	**MDO3**
Pin 25	n.c.	Pin 26	**MDO2**
Pin 27	n.c.	Pin 28	**MDO1**
Pin 29	n.c.	Pin 30	**MDO0**
Pin 31	n.c.	Pin 32	**EVTO#**
Pin 33	n.c.	Pin 34	**MCKO**
Pin 35	n.c.	Pin 36	**MSEO1#**
Pin 37	n.c.	Pin 38	**MSEO0#**

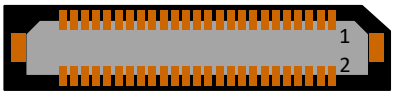
Product codes for ordering the adapter and matching cable

- 2059 - 38-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD2^{next} Parallel Trace Adapter 50-pin NEXUS HP50

HP50	50-pin NEXUS Trace Port	up to 250 Mbps

NEXUS HP50 Trace Adapter with 50-pin Samtec ERF8 ASP-148422-01 connector:



Pin 1	**MSEO0#**	Pin 2	**VT_{REF}**
Pin 3	**MSEO1#**	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TMS**
Pin 7	**MDO0**	Pin 8	**TDI**
Pin 9	**MDO1**	Pin 10	**TDO**
Pin 11	GND	Pin 12	**TRST#**
Pin 13	**MDO2**	Pin 14	**RDY#**
Pin 15	**MDO3**	Pin 16	**EVTI#**
Pin 17	GND	Pin 18	**EVTO#**
Pin 19	**MCK0**	Pin 20	**RESET#**
Pin 21	**MDO4**	Pin 22	GEN_IO0
Pin 23	GND	Pin 24	GND
Pin 25	**MDO5**	Pin 26	**CLKOUT**
Pin 27	**MDO6**	Pin 28	GEN_IO1
Pin 29	GND	Pin 30	GND
Pin 31	**MDO7**	Pin 32	GEN_IO2
Pin 33	**MDO8**	Pin 34	GEN_IO3
Pin 35	GND	Pin 36	GND
Pin 37	**MDO9**	Pin 38	GEN_IO4
Pin 39	**MDO10**	Pin 40	GEN_IO5
Pin 41	GND	Pin 42	GND
Pin 43	**MDO11**	Pin 44	Reserved
Pin 45	Reserved	Pin 46	Reserved
Pin 47	GND	Pin 48	GND
Pin 49	Reserved	Pin 50	n.c.

Product codes for ordering the adapter and matching cable

- 2076 - 50-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, HP50 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

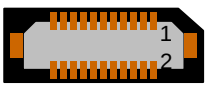
MCDS Serial Trace Interface

The JTAG interface is provided by the UAD2^{next} via Aurora Trace Module.

UAD2^{next} Serial Trace Adapter 22-pin Aurora MCDS

ERF8 HS22 AGBT/MCDS	22-pin Aurora Port (AGBT)	up to 1.25 Gbps

Aurora Trace Adapter with 22-pin Samtec ERF8 HS22 ASP-137969-01 connector:



Latch: GND			
Pin 1	**Aurora Lane0+**	Pin 2	**VT_{REF}**
Pin 3	**Aurora Lane0-**	Pin 4	**TCK_DAP0**
Pin 5	GND	Pin 6	**TMS_DAP1**
Pin 7	**Aurora Lane1+**	Pin 8	**TDI**
Pin 9	**Aurora Lane1-**	Pin 10	**TDO_DAP2**
Pin 11	GND	Pin 12	**TRST#**

Pin 13	**Aurora Lane2+**	Pin 14	**Aurora AGBT_CLK+**
Pin 15	**Aurora Lane2-**	Pin 16	**Aurora AGBT_CLK-**
Pin 17	GND	Pin 18	**BRKOUT#_TGIOx#**
Pin 19	**Aurora Lane3+**	Pin 20	**Aurora AGBT_ERR**
Pin 21	**Aurora Lane3-**	Pin 22	**RESET#**
Latch: GND			
Product codes for ordering the adapter and matching cable ▪ 2064 - Aurora Trace adapter (HS22) to Infineon Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137969-01 target connector ▪ 2073 - Trace cable between Aurora Trace Pod and the Aurora Target Adapter. Flex cable with two 50-pin connectors, 10" (24cm)			

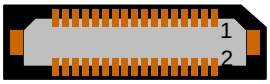
NEXUS Serial Trace Interface

The JTAG interface is provided by the UAD2^{next} via Aurora Trace Module.

UAD2^{next} Serial Trace Adapter 34-pin Aurora NEXUS

ERF8 HS34 NEXUS	34-pin Aurora Port	up to 1.25 Gbps

Aurora Trace Adapter with 34-pin Samtec ERF8 HS34 ASP-137973-01 connector:



Latch: GND			
Pin 1	**Aurora Lane0+**	Pin 2	**VT_{REF}**
Pin 3	**Aurora Lane0-**	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TMS_TMSC**
Pin 7	**Aurora Lane1+**	Pin 8	**TDI**
Pin 9	**Aurora Lane1-**	Pin 10	**TDO**
Pin 11	GND	Pin 12	**TRST#_JCOMP**
Pin 13	**Aurora Lane2+**	Pin 14	n.c.
Pin 15	**Aurora Lane2-**	Pin 16	n.c.
Pin 17	GND	Pin 18	**BRKOUT#_EVTO#**
Pin 19	**Aurora Lane3+**	Pin 20	Reserved
Pin 21	**Aurora Lane3-**	Pin 22	**RESET#**
Pin 23	GND	Pin 24	GND
Pin 25	n.c.	Pin 26	**Aurora AGBT_CLK+**
Pin 27	n.c.	Pin 28	**Aurora AGBT_CLK-**
Pin 29	GND	Pin 30	GND
Pin 31	n.c.	Pin 32	n.c.
Pin 33	n.c.	Pin 34	Reserved
Latch: GND			
Product codes for ordering the adapter and matching cable ▪ 2063 - Aurora Trace adapter (HS34) to Nexus Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137973-01 target connector ▪ 2073 - Trace cable between Aurora Trace Pod and the Aurora Target Adapter. Flex cable with two 50-pin connectors, 10" (24cm)			

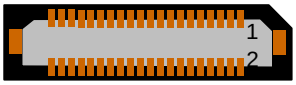
ARM HSSTP Serial Trace Interface

The JTAG interface is provided by the UAD2^{next} via Aurora Trace Module.

UAD2^{next} Serial Trace Adapter 40-pin Aurora ARM HSSTP

ERF8 HS40 ARM HSSTP	40-pin Aurora Port (ARM HSSTP)	up to 1.25 Gbps

Aurora Trace Adapter with 40-pin Samtec ERF8 HS40 ASP-130367-01 connector:



Latch: GND			
Pin 1	Reserved	Pin 2	**VT_{REF}**
Pin 3	Reserved	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	GND
Pin 7	**Aurora Lane2+**	Pin 8	**TMS_SWDIO**
Pin 9	**Aurora Lane2-**	Pin 10	**TRST#**
Pin 11	GND	Pin 12	GND
Pin 13	**Aurora Lane0+**	Pin 14	**TDI**
Pin 15	**Aurora Lane0-**	Pin 16	**TDO**
Pin 17	GND	Pin 18	GND
Pin 19	**Aurora CLK+**	Pin 20	**RESET#**
Pin 21	**Aurora CLK-**	Pin 22	Reserved
Pin 23	GND	Pin 24	GND
Pin 25	**Aurora Lane1+**	Pin 26	Reserved
Pin 27	**Aurora Lane1-**	Pin 28	Reserved
Pin 29	GND	Pin 30	GND
Pin 31	**Aurora Lane3+**	Pin 32	Reserved
Pin 33	**Aurora Lane3-**	Pin 34	**TRGOUT**
Pin 35	GND	Pin 36	Reserved
Pin 37	Reserved	Pin 38	Reserved
Pin 39	Reserved	Pin 40	Reserved
Latch: GND			

Product codes for ordering the adapter and matching cable

- 2045 - Aurora Trace adapter (HS40) to ARM Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-130367-01 target connector
- 2073 - Trace cable between Aurora Trace Pod and the Aurora Target Adapter. Flex cable with two 50-pin connectors, 10" (24cm)

Trace VT_{REF} Voltage

The Trace Adapter interface is voltage compatible to the VT_{REF} voltage from 1.6 Volts – 5.5 Volts.

Resetting the Target Systems

For resetting the target system, at the JTAG Target the line RESET# (MCU I/O voltage levels) is provided. These reset lines are active-low and may be connected to the corresponding lines on the target system to achieve an automatic and software-controlled target hardware reset.

The line RESET# can be used in **Open-Drain** and **PUSH-PULL** configuration, adjustable in UDE®. The level of this reset line is controlled by the MCU I/O voltage of the target.

Static Electricity Precautions

Electrostatic Discharge (ESD) can damage a sensitive electronic component! Under several conditions static electricity and ground potential differences between the Access Device and the user's target hardware can build up high voltages - over 10000 Volts (10 kVolts) in some cases. The electrostatic discharge of this build-up voltage results in fast high current waveforms and fast magnetic (H-field) or electrostatic (E-field) disturbances. The discharge into the electronic components and circuitry can damage or destroy hardware components, resulting in failures and reduced reliability.

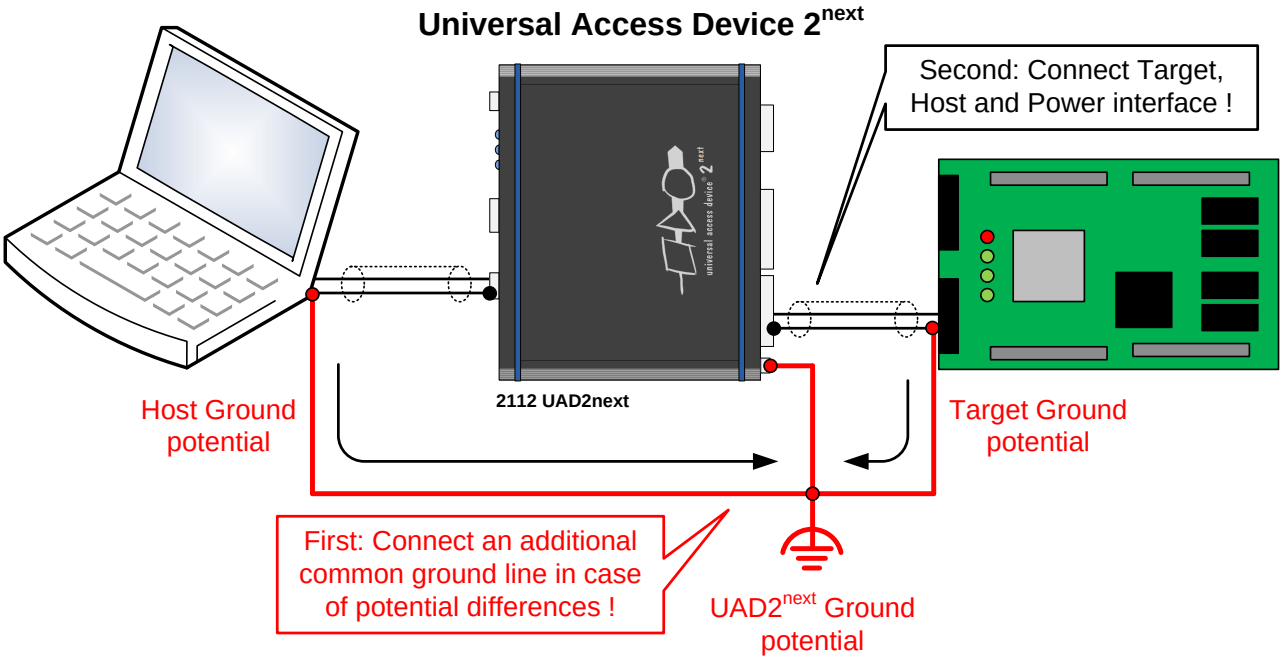
Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **debug** connectors, these ports are endangered especially. The maximum voltage on these pins may not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first.

To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Please ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a **ground socket** on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.

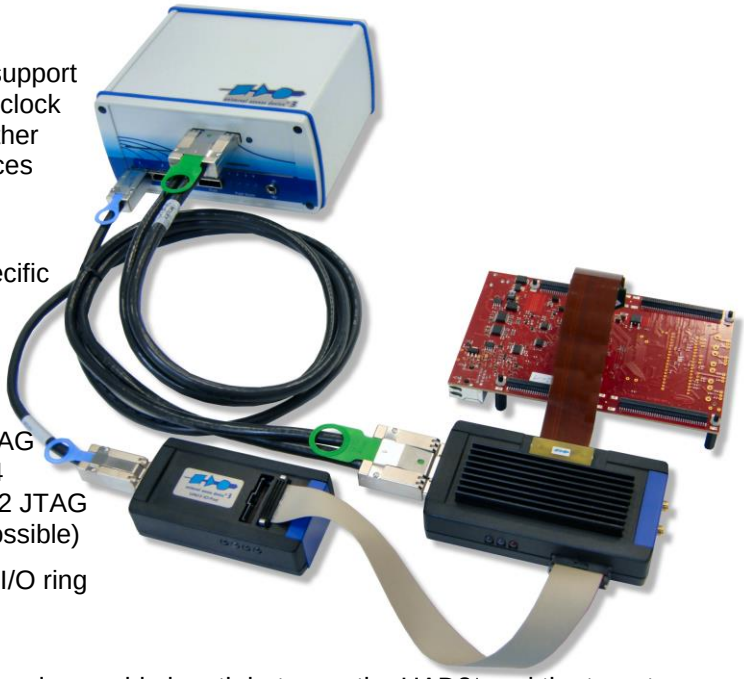
Appendix A.6 – Hardware Description UAD3+

Description

The Universal Access Device 3+ (UAD3+) is the consequent advancement of the established UAD2 family in an optimized manner. Application fields are debugging / trace / profiling / calibration for the development, integration and system level test of modern microcontroller systems with high clock frequencies and multi-core targets.

The UAD3+ is a modular concept and offers the high-speed debug access to high-speed TriCore, Power Architecture, ARM9, ARM11, Cortex-A8, Cortex-A9, RH850, SuperH SH-2A, XScale and further microcontrollers MCU architectures as a modular concept. Multiple Debug/Trace Pods can be connected via a long line cable to ensure a flexible adaptation with the target connector. The UAD3+ is oriented to enables first class performance. UAD3+ supports the Cortex ETM Trace, NEXUS Trace, Aurora and further Trace definitions.

Product Features



- High speed debug channel support with up to 100 MHz channel clock for JTAG/cJTAG based or other serial debug channel interfaces (DAP/DAP2, SWD, NEXUS, DXCPL, LPD, CoreSight, ...)
- Supports all architecture-specific JTAG- and other debug bus interfaces by an appropriate interface Debug Adapter
- Multi Target / Multi System Access - Up to 8 multiple JTAG interfaces supported (up to 4 Debug Pods possible, up to 2 JTAG interfaces per Debug Pod possible)
- JTAG connectors with MCU I/O ring voltage 0.8 Volts - 5.5 Volts supported
- Separated Debug Pods feature long cable length between the UAD3+ and the target, cable length up to 5 meters –
  1 meter default, longer cable length on request
- Wide range of host interfaces, USB2.0, Gigabit-Ethernet (10/100/1000 MBit/s), IEEE1394b (FireWire-800).

The Universal Access Device 3+ allows the recording of trace information of a running program on the microcontroller in real-time.

- ETM Mictor, Cortex ETM, MIPI Trace connector supported
- NEXUS class 3 Mictor, NEXUS, NEXUS HP50 connector supported
- Aurora Trace HS22 (AGBT), HS34, HS40 (ARM HSSTP) connector supported
- Maximum trace frontend bandwidth 800 MByte/s
- Trace support up to 500 Mbps in parallel or 3.125 Gbps in serial (Aurora)
- Trace memory extendable up to 4 GByte
- Time-endless trace for a continuous tracing and observation
- Trace stream width up to 32-bit, Half Rate clock mode up to 250 MHz supported
- Reference voltage 0.8 Volts - 3.3 Volts supported
- Variable time stamps possible, inserted by the trace board frontend
- Intelligent trace filters for optimal trace utilization, Automatic edge detection, External Trigger Pins.

The UAD3⁺ allows fast and reliable communication under Windows 10/11.

Note: A proper function of the UDE® Universal Debug Engine 3⁺ and its hardware devices is only guaranteed for working with the original components tested and delivered by PLS. The delivered components are verified with the recommends and standards of the chip manufactures.

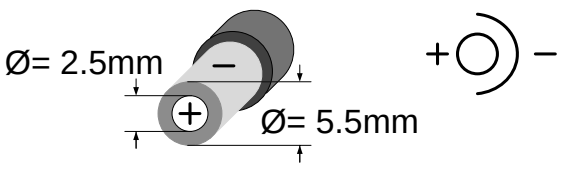
Precautions of Firmware updates

Attention! When a new version of UDE® is started the first time, a **firmware update** may be executed on the Universal Access Device (UAD2, UAD2^{pro}, UAD2^{next}, UAD3⁺). This may take some more time than usual for the 'target connect' operation.
Please **DO NOT** power off or unplug the access device while this time!

Power Supply

For UAD3⁺, the power is supplied by a main power supply unit (part of the delivery contents).

Attention! Please do not use other mains power supply units as they may damage UAD3⁺. Any damages or hazards arising from the use of unsuitable power supplies, over-voltage or wrong polarity are in the sole responsibility of the user and do not fall under warranty repair.

Universal Access Device 3⁺ Power Supply	Input Voltage: 18V DC	Power Plug 

Driver Installation IEEE1394b

Because of the Plug 'n Play-Capabilities of the UAD3+, the IEEE1394 driver installation is started automatically, when the UAD3+ is connected to the host PC the first time.

Please follow the driver installation guide described in **UDE Manual.pdf**.

Driver Installation USB

Because of the Plug 'n Play-Capabilities of the UAD3+, the USB driver installation is started automatically, when the UAD3+ is connected to the host PC the first time.

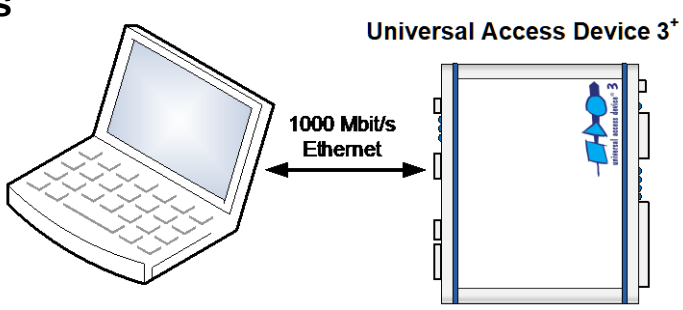
Please follow the driver installation guide described in **UDE Manual.pdf**.

Driver Installation Ethernet TCP/IP

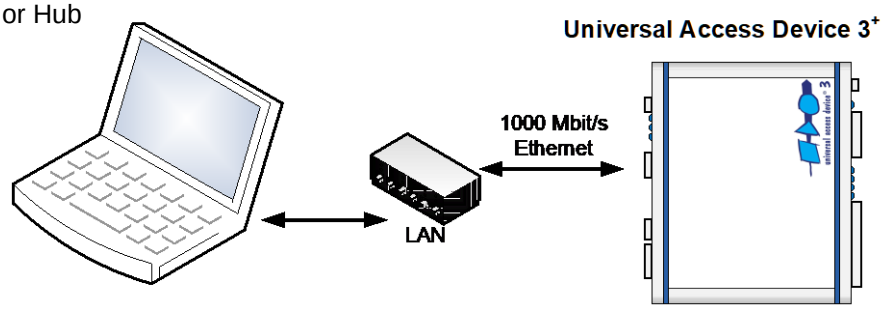
The UAD3+ is equipped with a 1000 Mbit/s Gigabit Ethernet interface. It can be connected to a local PC or to a Local Network via Hubs or Switches and uses TCP/IP.

Connection methods

UAD3+ connected direct to PC



UAD3+ connected to Local Network or Hub



DHCP or static IP addressing

The UAD3+ supports both, DHCP and static IP addressing. It can be configured with DHCP enabled. After power on it tries to get an IP address from a DHCP server. When there is no DHCP server answering, the UAD3+ will fall back to static IP after 60 seconds.

Connection methods

The UAD3+ can communicate to UDE® via the TCP/IP protocol, if a valid IP (Internet Protocol) address is configured by:

1. Using DHCP, this requires a DHCP server on your network, or

2. Using a static IP address, this requires knowledge about the network structure, e.g. knowledge of free IP addresses so that there is no IP used twice in the network.

At factory settings, the UAD3+ is configured with DHCP enabled. After power ON the UAD3+ tries to receive an IP address from a DHCP server. If it receives no answer from a DHCP server, the UAD3+ will fall back to a static IP address after 60 seconds.

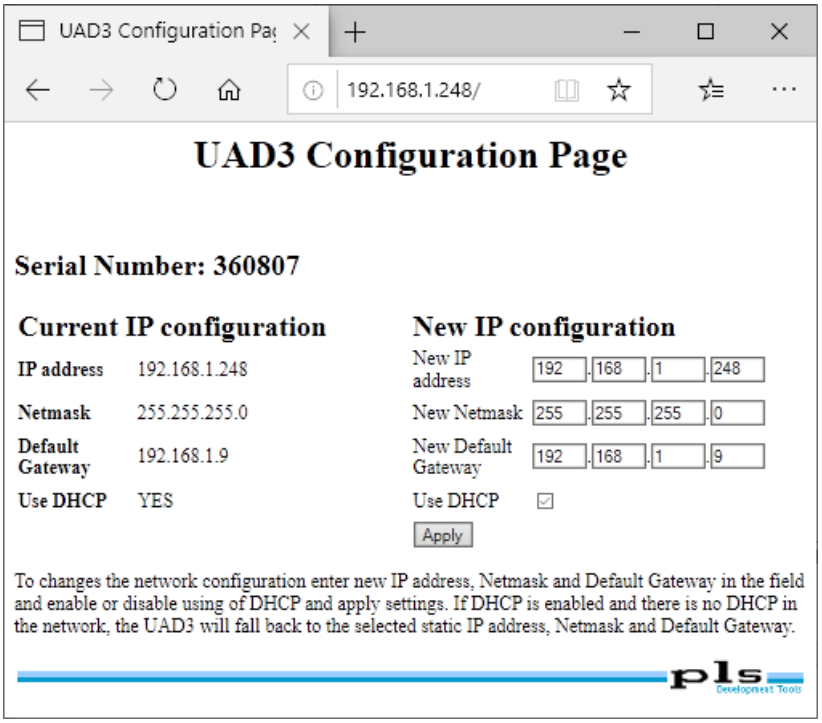
The static fall back IP address is `192.168.1.100`. The UAD3+ use the following TCP ports for communication: `43690` (`0xAAAA`) and `43691` (`0xAAAB`).

Configuration of the IP address via Ethernet

The configuration of the UAD3+ can be changed, using a web browser. After entering the current IP address, e.g.

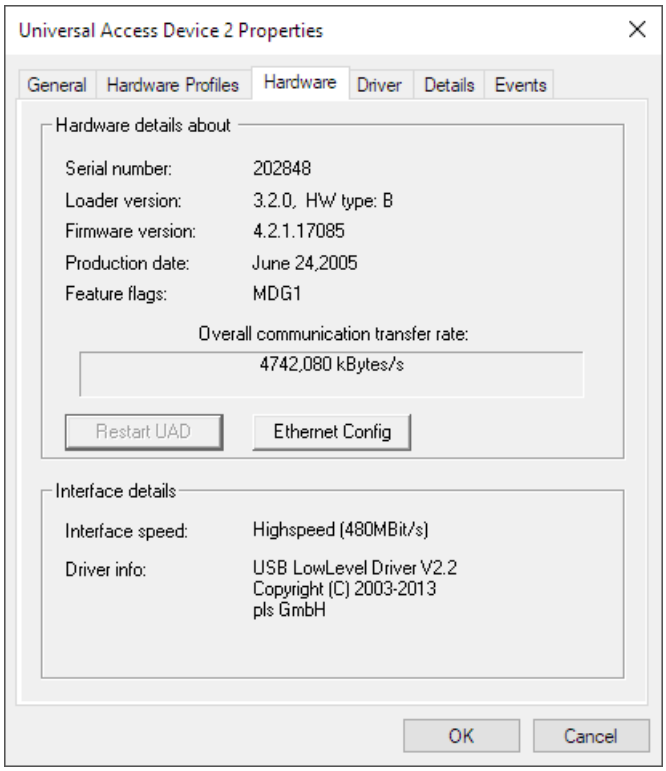
`http://192.168.1.152`

the **UAD3 Configuration Page** appears as startup page. The configuration page contains the serial number of the UAD3+ and the current configuration at the left side of then page.



The example shows, that DHCP is enabled and the current IP address is 192.168.1.152.

On the right of the form, new settings can be entered. The configured IP address will also be used as fallback, when DHCP is enabled but no DHCP answer is received. After clicking **Apply,** the new settings are stored. To apply the new settings immediately, power the UAD3+ OFF and ON again. Otherwise, they are applied after the next power ON event.



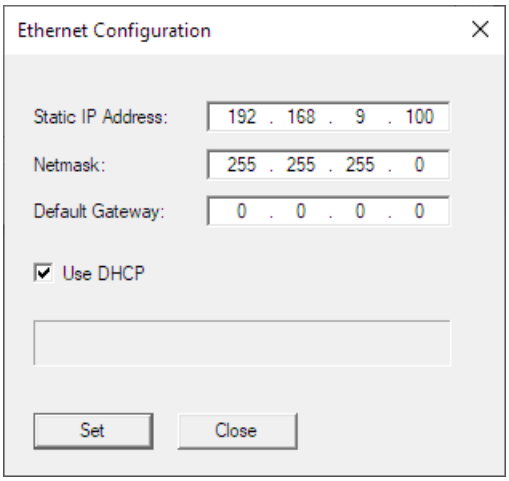
Configuration of the IP address via USB/IEEE1394

If the IP address of the UAD3+ is unknown, it can be configured using the USB connection:

Connect the UAD3+ via USB to a PC. Open the device manager's property page of the

UAD3+ and select **Ethernet Config**.

The **Ethernet Configuration** dialog appears where the same settings can be made.



Once the UAD3+ was configured, a connection via UAD3+ can be established: Create a new workspace and select your target configuration. If **default** is set as communication device and there is no other UAD3+ connected, the Ethernet device is found automatically.

If no UAD3+ was found, open the menu entry **Config – Target interface...** in UDE® or menu entry **Target – Setup** in UDE® Memtool. In the **Target Interface Setup,** dialog click on the **Setup** button.

For using the TCP/IP communication, the **Select Communication Device** dialog is opened. You can select the specific access device that you want to use. These settings are stored in the target configuration `*.cfg` file format.

For Ethernet connections select **UAD3+ device, attached to Ethernet port**. A specific IP address to connect can be entered or an UAD2+ can be selected from the list after retrieving available devices. Pressing **OK** stores the settings. A connection is established now.

If multiple UAD2+, UAD2next or UAD3+ are used at the same time (e.g. for automated FLASH programming), then every UAD2+, UAD2next or UAD3+ have its own target configuration with either unique IP or unique serial number.

Determining the MAC address

The MAC address of the UAD3+ device is defined as

```
00:79:92:<SN2>:<SN1>:<SN0>
```

where `<SN2>..<SN0>` are parts of the hexadecimal value of the serial number of the device, e.g: for serial number `123456` (`== 0x1E240h`) the MAC address would be `00:79:92:01:E2:40`.

Application hints

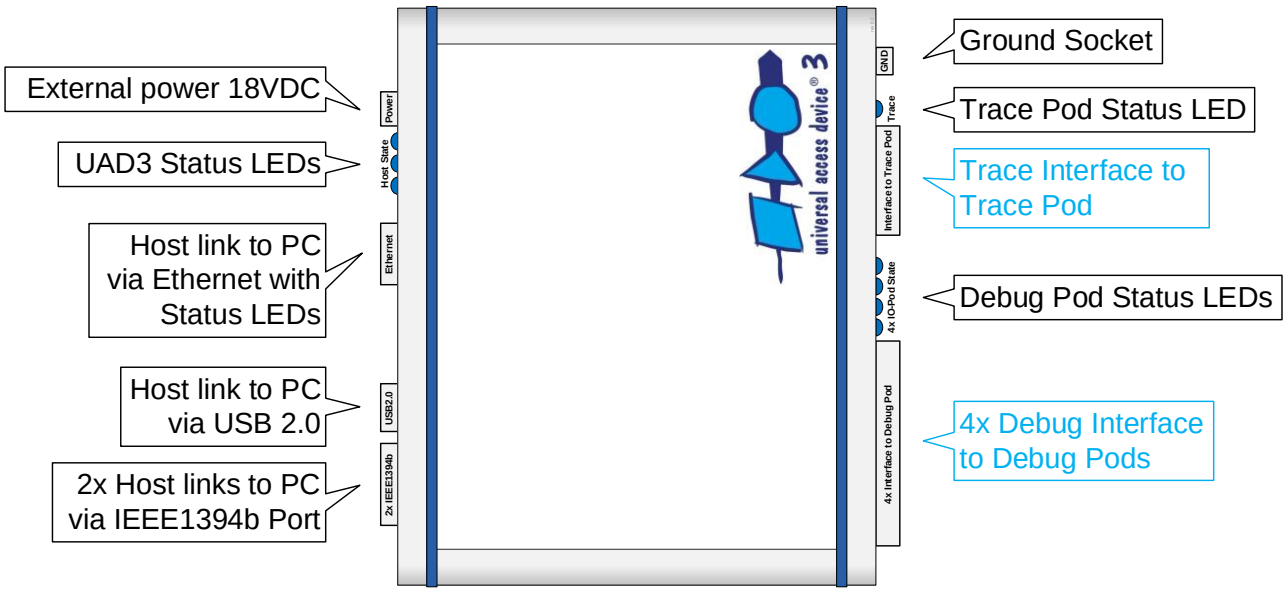
The following options are available for Ethernet configuration in the target configuration files:

PortType:	Must be set to ‘Ethernet’ for Ethernet connection
UseFixedIp:	Set to ‘`1`’ if connection to a specific IP address should be made, otherwise ‘`0`’
FixedIp:	Specific IP address of the access device in text form
DeviceNumber:	Serial number of the access device, if no specific IP is used

Interface and Connector Description

Overview

The Universal Access Device 3⁺ features a number of interface connectors for host and target connections.



Universal Access Device 3+

Label	Description	Connector
⏚	Ground potential of Universal Access Device 3⁺	4 mm Round Connector
Pod 1 – Pod 4	4x Debug Interfaces to the UAD3⁺ Debug Pods	26-pin Female Header
Trace Pod	1x Trace Interface to the UAD3⁺ Trace Pod	68-pin Female Header
Power	External Power Supply	Connector
Ethernet	Host Communication via Ethernet TCP/IP	RJ-45
USB 2.0	Host Communication via USB 2.0	USB connector
IEEE1394b	Host Communication via IEEE1394b	2 x IEEE1394b connector

Access Device Status Indication

The LEDs on the backside of the UAD3+ indicate the device state and traffic on a specific host communication interface. See the following LED description from left to right.

Comm (unication) (left)	**LED blink codes description**
LED off	UAD3+ not powered on (when powered on, the UAD3+ or its power supply could be defective)
LED blinking sporadically or continuously	UAD3+ powered on, connection between UAD3+ and Host interface established

USB 2.0	**LED blink codes description**
LED off	No Host interface detected
LED on	Connection between UAD3+ and Host interface established

IEEE1394b (right)	**LED blink codes description**
LED off	No Host interface detected
LED on	Connection between UAD3+ and Host interface established

Ethernet Socket		**LED blink codes description**
Green LED	(left)	Link between UAD3+ and Network established
Yellow LED	(right)	UAD3+ is communicating with Network

UAD3+ Debug Pod State Indication

The LEDs on the frontside of the UAD3+ indicate the Debug Pod state and traffic. See the following LED description from left to right.

1 (left)	**LED blink codes description**
LED off	No Debug Pod 1 detected
LED on	Connection established between UAD3+ and Debug Pod 1
LED blinking	Interface error

2	**LED blink codes description**
LED off	No Debug Pod 2 detected
LED on	Connection established between UAD3+ and Debug Pod 2
LED blinking	Interface error

3	LED blink codes description
LED off	No Debug Pod 3 detected
LED on	Connection established between UAD3+ and Debug Pod 3
LED blinking	Interface error

4 (right)	LED blink codes description
LED off	No Debug Pod 4 detected
LED on	Connection established between UAD3+ and Debug Pod 4
LED blinking	Interface error

UAD3+ Trace Pod State Indication

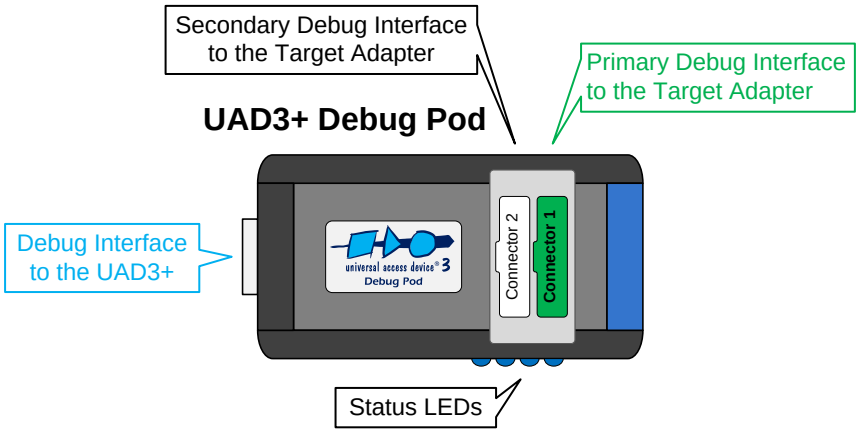
The LED on the frontside of the UAD3+ indicate the Trace Pod state and traffic.

Trace Pod State	LED blink codes description
LED off	No Trace Pod detected
LED on	Connection established between UAD3+ and Trace Pod
LED blinking	Interface error

UAD3+ Debug Pod

The UAD3+ Debug Pod features the communication protocol to the target system. Currently, the JTAG, DAP/DAP2, SWD interface is implemented for different target architectures.

The connection between the Debug Pod and the target is done via an additional adapter cable set, which consists of a Debug Adapter and a Debug Adapter cable.



Product codes for ordering the debug pod

- 2009 - Communication device for JTAG, SWD, DAP communication, size 11 x 6 x 3 cm, up to 100MHz JTAG clock, two generic connectors, one connector to UAD3+
- 2051 - Communication device for JTAG, SWD, DAP communication, size 11 x 6 x 3 cm, up to 100MHz JTAG clock, two generic connectors, one connector to UAD3+

The Status LEDs on the side of the Debug Pod indicates the device state of the Pod.

Pod Power State (left)	LED blink codes description
LED off	Debug Pod not powered from UAD3+
LED on	Debug Pod powered on from UAD3+

Debug Pod State	LED blink codes description
LED off	No Debug Pod detected
LED on	Connection established between UAD3+ and Debug Pod
LED blinking	Interface error

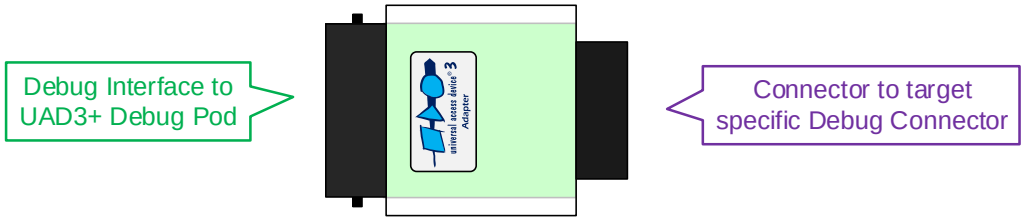
Port State (Secondary Interface)	LED blink codes description
LED off	No Debug Adapter detected
LED flashing	Connection established between Debug Pod and Debug Adapter on Secondary Debug Interface

Port State (right) (Primary Interface)	LED blink codes description
LED off	No Debug Adapter detected
LED flashing	Connection established between Debug Pod and Debug Adapter on Primary Debug Interface

Debug Adapter

The Debug Adapter is a part of the debug connection between the UAD3+ Debug Pod and the supported target PCB debug connector, e.g. connectors of JTAG, cJTAG, ARM, DAP/DAP2, SWD, OnCE, COP and further interfaces.

Target specific Debug Adapter



Product codes for ordering the adapters and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2010 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2035 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector
- 2052 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2031 - MiniDAP/cJTAG communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector
- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Description (combined)	Connector
Debug Interface to the UAD3+ Debug Interface	40-pin Male Shrouded Header
Debug Connector to JTAG/DAP/DAP2 Target	10-pin Samtec FTSH Connector
Debug Connector to JTAG/DAP/DAP2 Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/OnCE and JTAG/cJTAG Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/COP Target	16-pin Standard 100 mil Connector
Debug Connector to JTAG/H-UDI Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/RH850 Target	14-pin Standard 100 mil Connector
Debug Connector to JTAG/ARM Target	20-pin Standard 100 mil Connector
Debug Connector to JTAG/SWD Target	10-pin Samtec FTSH Connector

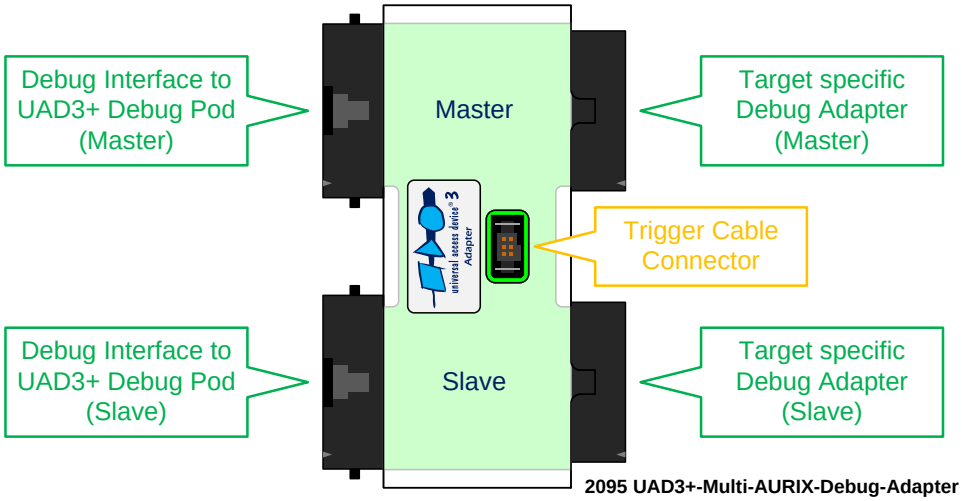
Debug Connector to JTAG/SWD Target	20-pin Samtec FTSH Connector
Debug Connector to MiniDAP/cJTAG/SWD Target for Automotive ECU	10-pin Samtec TFM Connector
Debug Connector to MiniJTAG Target for Automotive ECU	10-pin Samtec FTSH Connector
Debug Connector to ETKS Target for Automotive ECU	16-pin Samtec FTSH Connector

The interface description below describes further details.

UAD3+ Multi AURIX Adapter

The Multi AURIX Debug Adapter is an extension for the UAD3+ that enables synchronized debugging of AURIX multi-chip systems in one single debug session.

A standard Debug Adapter is connected to the Multi AURIX Debug Adapter and the debug interfaces of each controller. Synchronization is achieved by using additional trigger pins, which are also wired to the Multi AURIX Debug Adapter.



2095 UAD3+-Multi-AURIX-Debug-Adapter

Product codes for ordering the adapter and matching cable

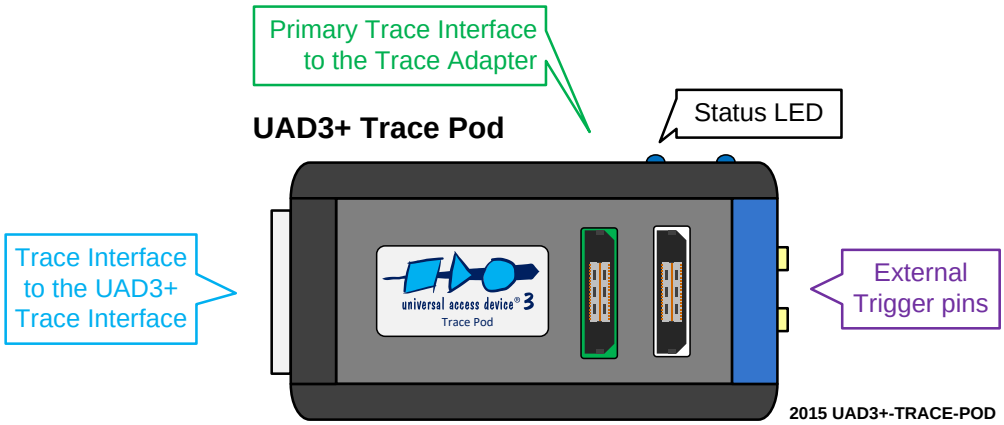
- 2095 - Adapter with two 40-pin UAD3+ Debug Pod connectors, two 40-pin UAD3+ Adapter connectors and one 6-pin TFM-103 trigger connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Description (combined)	Connector
Debug Interface to the UAD3+ Debug Pod	40-pin Male Shrouded Header Connected via Cable
Target specific Debug Adapter	40-pin Female Header Connected directly to Adapter
Trigger Cable Connector	6-pin Samtec TFM Connector

Note: Ask the PLS Support Team at **support@pls-mc.com** for detailed information and further hints about Multi AURIX debugging.

UAD3+ Trace Pod

The Trace Pod provides an interface for sampling of trace data. The connection between the Debug Pod, the Trace Pod and the target is done via an additional adapter cable set.



Product codes for ordering the trace pod

- 2015 - Trace pod device, size 13 x 7 x 3 cm, up to 500MHz trace clock, up to 32bit trace width, two generic connectors to Trace Adapter, one connector to UAD3+

Note: The debug interface is provided by the UAD3+ Debug Pod only. This means, that the Debug Pod must be connected to the debug interface of the Trace Adapter.

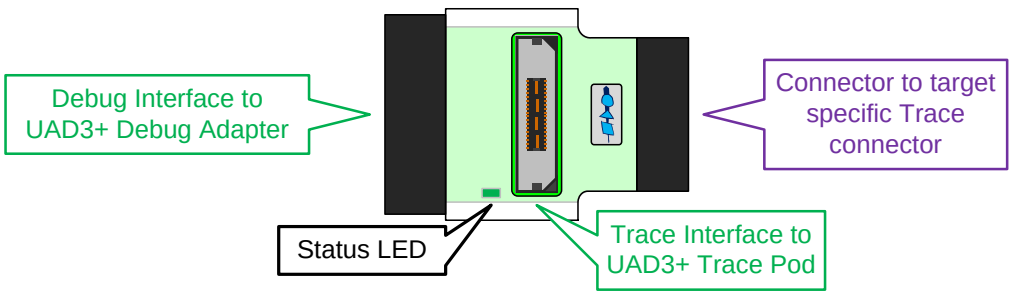
UAD3+ Trace Pod State Indication

The LED on the side of the Trace Pod indicates the state of the connection and traffic.

Pod State	LED blink codes description
LED off	Trace Pod not powered from UAD3+
LED flashing	Update in progress **Do not remove the power of UAD3+ !**
LED on	Connection between UAD3+ and Trace Pod established

UAD3+ Parallel Trace Adapter

The Trace Adapter provides the target adaptation of the debug and trace signals. It consists of a PCB with connectors for the Debug Pod, the Trace Pod and the target specific Trace connector.



Product codes for ordering the adapters

- 2022 - 38-pin Trace adapter to ARM ETM and CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2058 - 20-pin Trace adapter to ARM Cortex-M CoreSight trace targets with 4-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, target connector

- 2059 - 38-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2076 - 50-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, HP50 target connector
- 2061 - 60-pin Trace adapter to CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, Samtec QTH-030 target connector

Description ETM	Connector
Debug Interface to the UAD3+ Debug Adapter (ARM)	20-pin Standard 100 mil Connector
Trace Interface to the UAD3+ Trace Pod	38-pin Connector
Trace Interface to the Target (ETM)	38-pin AMP Mictor Connector

Description Cortex ETM	Connector
Debug Interface to the UAD3+ Debug Adapter (ARM)	20-pin Standard 100 mil Connector
Trace Interface to the UAD3+ Trace Pod	38-pin Connector
Trace Interface to the Target (Cortex ETM)	20-pin Samtec FTSH Connector

Description ETM MIPI	Connector
Debug Interface to the UAD3+ Debug Adapter (ARM)	20-pin Standard 100 mil Connector
Trace Interface to the UAD3+ Trace Pod	38-pin Connector
Trace Interface to the Target (MIPI)	60-pin Samtec QSH Connector

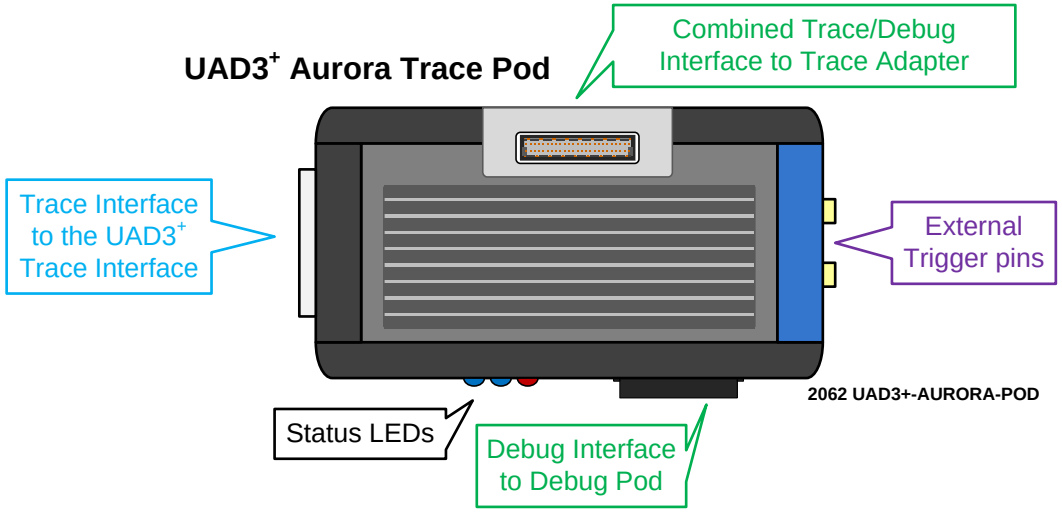
Description Cortex NEXUS	Connector
Debug Interface to the UAD3+ Debug Adapter (NEXUS)	14-pin Standard 100 mil Connector
Trace Interface to the UAD3+ Trace Pod	38-pin Connector
Trace Interface to the Target (NEXUS)	38-pin AMP Mictor Connector

Description Cortex NEXUS HP50	Connector
Debug Interface to the UAD3+ Debug Adapter (NEXUS)	14-pin Standard 100 mil Connector
Trace Interface to the UAD3+ Trace Pod	38-pin Connector
Trace Interface to the Target (NEXUS HP50)	50-pin Samtec ERF8 Connector

UAD3+ Aurora Trace Pod

The connection between the Debug Pod, the Aurora Trace Pod and the target is done via an additional adapter cable set, the Trace Adapter.

Note: Ask the PLS Support Team at **support@pls-mc.com** for detailed information and further hints about using Aurora Trace.



Product codes for ordering the trace pod

- 2062 - Aurora Trace pod device, size 13 x 7 x 3 cm, up to 3.125Gbps, up to 4 lanes, one connector for flex cable, one connector to UAD3+

Note: The debug interface is provided by the UAD3+ Debug Pod only. This means, that the Debug Pod must be connected to the Debug Pod interface of the Aurora Trace Pod.

UAD3+ Aurora Trace Pod State Indication

The LED on the side of the Trace Pod indicates the state of the connection and traffic between UAD3+ and Trace Pod.

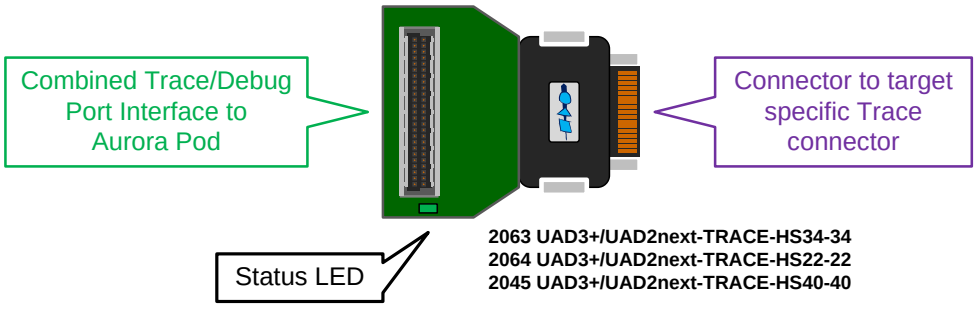
Target Link State (left)	LED blink codes description
LED off or blinking	No Link to Target detected
LED on	Aurora Link between Trace Pod and Target established

UAD3+ Link State (middle)	LED blink codes description
LED off	Trace Pod not powered from UAD3+
LED flashing	Update in progress **Do not remove the power of UAD3+ !**
LED blinking	Link Interface error to UAD3+
LED on	Link between UAD3+ and Trace Pod established

Boot / Error State (right)	LED blink codes description
LED off	No error
LED on	Interface or Aurora Trace Pod error

UAD3⁺ Aurora Trace Adapter

The Aurora Trace Adapter provides the target adaptation of the debug and trace signals. It consists of a PCB with connectors for the combined Trace/Debug Port of the Aurora Pod and one of the target Trace connectors.



Product codes for ordering the trace adapters

- 2064 - Aurora Trace adapter (HS22) to Infineon Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137969-01 target connector
- 2063 - Aurora Trace adapter (HS34) to Nexus Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137973-01 target connector
- 2045 - Aurora Trace adapter (HS40) to ARM Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-130367-01 target connector

Description Aurora HS22	Connector
Trace Interface to Aurora Pod	50-pin Connector
Trace Connector to Target	22-pin HS22 Connector

Description Aurora HS34	Connector
Trace Interface to Aurora Pod	50-pin Connector
Trace Connector to Target	34-pin HS34 Connector

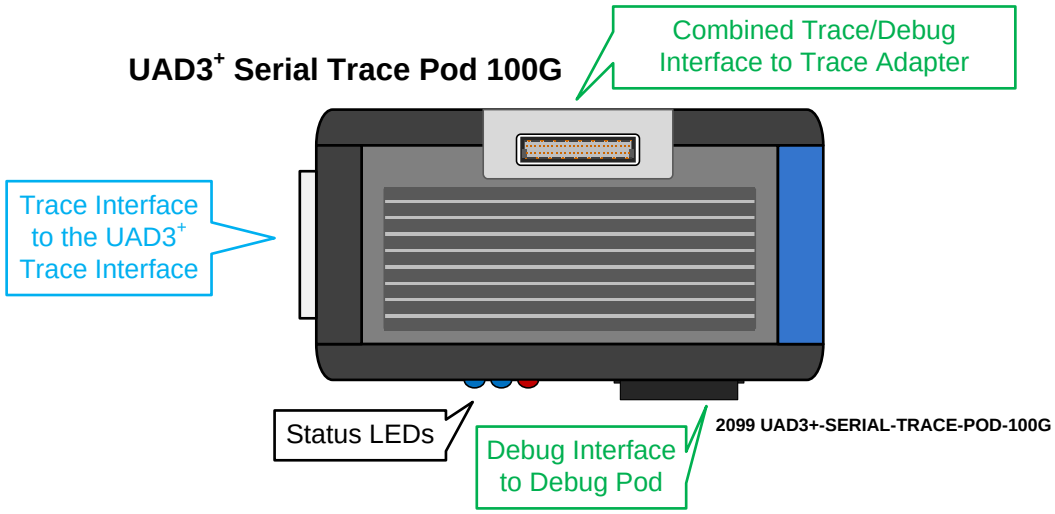
Description Aurora HS40	Connector
Trace Interface to Aurora Pod	50-pin Connector
Trace Connector to Target	40-pin HS40 Connector

The interface description below describes further details.

UAD3+ Serial Trace Pod 100G

The connection between the Debug Pod, the Serial Trace Pod 100G and the target is done via an additional adapter cable set, the Trace Adapter.

Note: Ask the PLS Support Team at **support@pls-mc.com** for detailed information and further hints about using Serial Trace.



Product codes for ordering the trace pod

- 2099 - Serial Trace pod device 100G, size 13 x 7,5 x 4 cm, up to 12.5Gbps, up to 8 lanes, one connector for flex cable, one connector to UAD3+

Note: The debug interface is provided by the UAD3+ Debug Pod only. This means, that the Debug Pod must be connected to the Debug Pod interface of the Serial Trace Pod 100G.

UAD3+ Serial Trace Pod 100G State Indication

The LED on the side of the Serial Trace Pod 100G indicates the state of the connection and traffic between UAD3+ and Trace Pod.

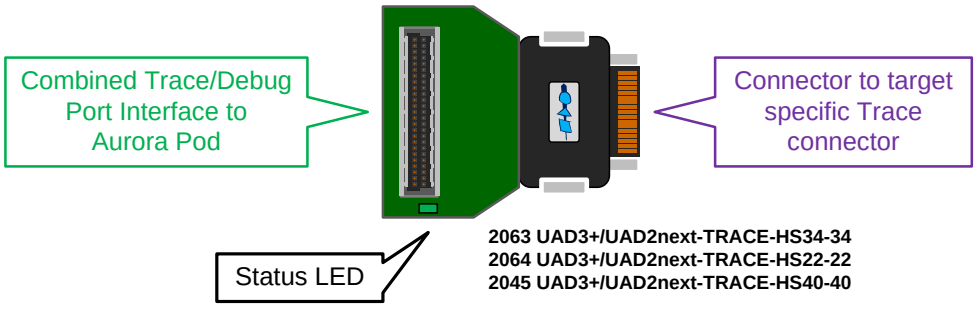
Pod State (left)	**LED blink codes description**
LED blinking	Serial Trace Pod 100G ready
LED flashing	Communication between Pod and UAD3+

UAD3+ Link State (middle)	**LED blink codes description**
LED flashing	Update in progress **Do not remove the power of UAD3+ !**
LED blinking	Link Interface error or Update error
LED on	Link between UAD3+ and Serial Trace Pod 100G established

Boot / Error State (right)	LED blink codes description
LED off	No error
LED on	Interface or Serial Trace Pod 100G error

UAD3+ Serial Trace Adapter

The Serial Trace Adapter provides the target adaptation of the debug and trace signals. It consists of a PCB with connectors for the combined Trace/Debug Port of the Aurora Pod and one of the target Trace connectors.



Product codes for ordering the trace adapters

- 2063 - Aurora Trace adapter (HS34) to Nexus Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137973-01 target connector
- 2064 - Aurora Trace adapter (HS22) to Infineon Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137969-01 target connector
- 2045 - Aurora Trace adapter (HS40) to ARM Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-130367-01 target connector

Description Serial Trace HS22	Connector
Trace Interface to Serial Trace Pod	50-pin Connector
Trace Connector to Target	22-pin HS22 Connector

Description Serial Trace HS34	Connector
Trace Interface to Serial Trace Pod	50-pin Connector
Trace Connector to Target	34-pin HS34 Connector

Description Serial Trace HS40	Connector
Trace Interface to Serial Trace Pod	50-pin Connector
Trace Connector to Target	40-pin HS40 Connector

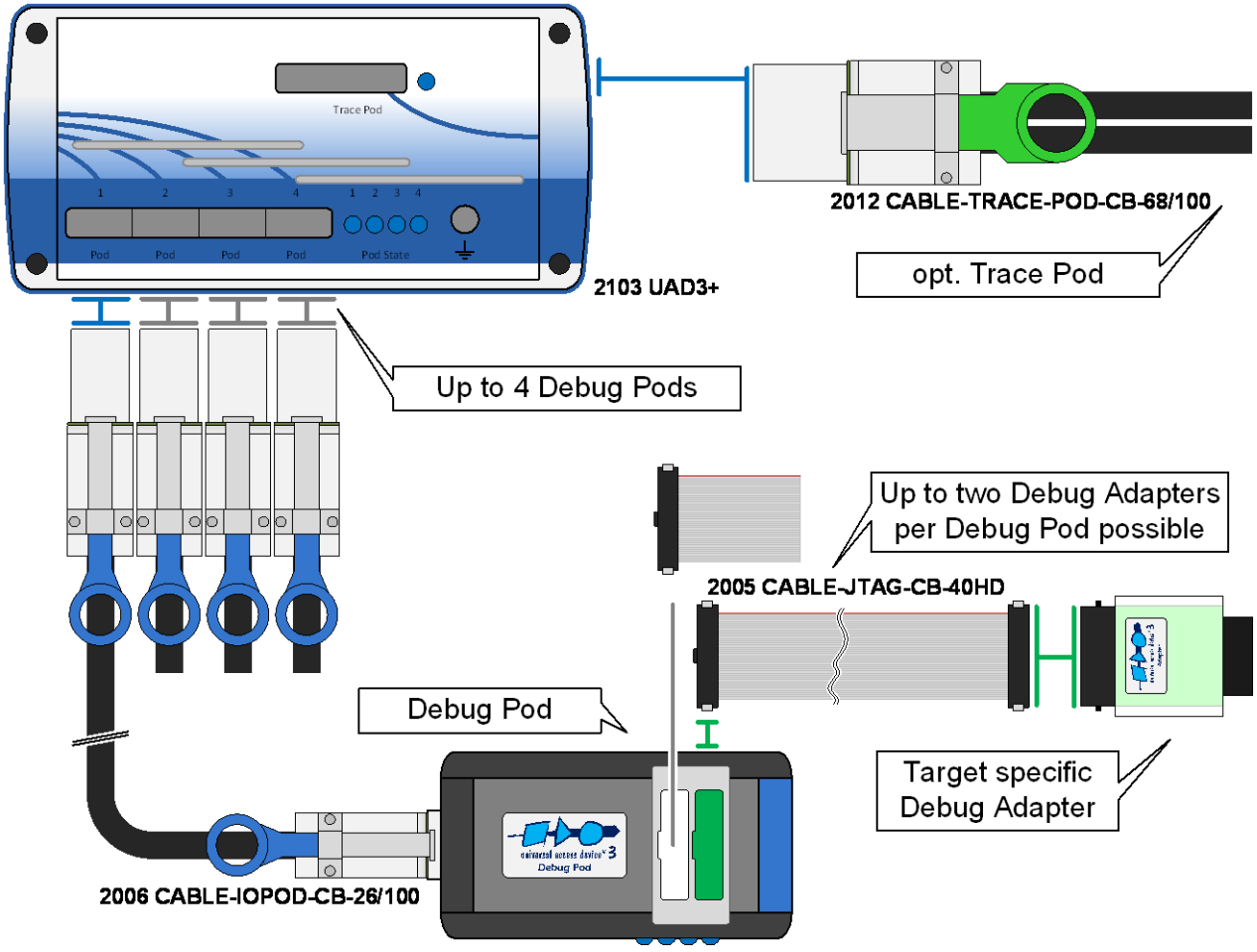
The interface description below describes further details.

Interface Details

Host Interfaces

Universal Access Device 3⁺ can realize the Host Communication via the USB 1.1 or USB 2.0 interface, via the IEEE1394b bus, also known as Firewire™-800 or i.Link™ and via Gigabit Ethernet TCP/IP.

Connection Schema to the Target



DAP/DAP2 Target Interface

The debug interface JTAG/DAP/DAP2 was established by Infineon for the AUDO Future devices and other upcoming 16-bit and 32-bit-microcontrollers. The new board connector is a 50 mil Samtec FTSH-105 double row 10-pins micro-terminal with keying shroud, which saves board space on targets system side.

The UAD3⁺ supports the 2-wire and the 3-wire DAP mode.

- I/O voltage range: 1.65 Volts – 5.5 Volts
- ESD Protection per signal: 15 kVolts
- Capacity per signal: max 55 pF
- Resettable over-current protection for V_{IO}: 10 A (max 0.2 s time to trip, resettable).

TriCore/AURIX, XE166, XC2000 Adapter 10-pin DAP/DAP2

DAP/DAP2	Debugging Channel for the JTAG/DAP/DAP2	up to 100 MHz

DAP Debug Adapter for 50 mil Samtec FTSH-105 DAP connector:

Pin 1	**V_{REF}**	Pin 2	**DAP1**
Pin 3	GND	Pin 4	**DAP0**
Pin 5	GND	Pin 6	**DAP2_USER0**
Pin 7	KEY_GND	Pin 8	**DAPEN_USER1**
Pin 9	GND	Pin 10	**RESET#**

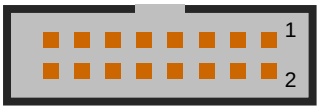
Product codes for ordering the adapter and matching cables

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

TriCore/AURIX, XE166, XC2000 Adapter 16-pin DAP/DAP2

DAP	Debugging Channel for the DAP	up to 50 MHz

DAP Debug Adapter for 100 mil standard JTAG/DAP connector:



Pin 1	**DAP1**	Pin 2	**V_{REF}**
Pin 3	**DAP2_USER0**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	Reserved (TDI)	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**DAP0**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**DAPEN_USER1**
Pin 15	Reserved	Pin 16	Reserved

Product codes for ordering the adapter and matching cable

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

JTAG Target Interface

TriCore, XC166, XC2000, XE166 Power Architecture, ARM9, ARM11, Cortex derivatives feature an on-chip IEEE1149.1- and IEEE1149.7-based interface for an external debugging unit. This unit allows resource-saving target system access without additional software or hardware on the target system. Therefore, all controller serial interfaces remain available for the application without restrictions caused by the debugging interface.

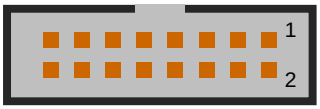
- I/O voltage range: 1.65 Volts – 5.5 Volts

Note: The maximum cable length between Universal Access Device and the target system must not exceed about 25 cm (10“).

TriCore/AURIX, XE166, XC2000, XC166 Adapter 16-pin JTAG/OCDS

JTAG/OCDS	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/OCDS:



Pin 1	**TMS**	Pin 2	**V_{REF}**
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	GND
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

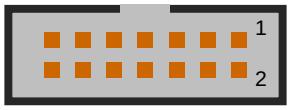
Product codes for ordering the adapter and matching cable

- 2004 - JTAG/DAP communication adapter with one Infineon defined 16-pin 100mil (JTAG) connector and one 10-pin 50mil Samtec FTSH-105 (DAP) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Power Architecture Adapter 14-pin JTAG/OnCE

JTAG/OnCE JTAG/cJTAG	Debugging Channel for the IEEE1149.1- and IEEE1149.7-based JTAG	up to 100 MHz

JTAG/cJTAG Debug Adapter for 100 mil standard OnCE connector:



Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK_TCKC**	Pin 6	GND
Pin 7	n.c.	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS_TMSC**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	n.c.	Pin 14	**TRST#**

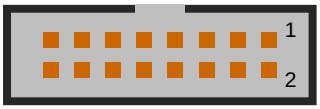
Product codes for ordering the adapter and matching cable

- 2010 - JTAG/OnCE communication adapter with one OnCE defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Power Architecture Adapter 16-pin JTAG/COP

JTAG/COP	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/COP connector:



Pin 1	**TDO**	Pin 2	QACK#
Pin 3	**TDI**	Pin 4	**TRST#**
Pin 5	HALTED	Pin 6	**V_{REF}**
Pin 7	**TCK**	Pin 8	n.c.
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	SRST#_HALT#	Pin 12	GND
Pin 13	HRST#_SRST#	Pin 14	n.c.
Pin 15	**RESET#**	Pin 16	GND

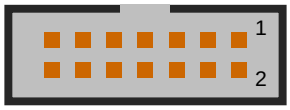
Product codes for ordering the adapter and matching cable

- 2035 - JTAG/COP communication adapter with one COP defined 16-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

SuperH SH-2A Adapter 14-pin JTAG/H-UDI

JTAG/H-UDI	Debugging Channel for the IEEE1149.1-based JTAG	up to 30 MHz

JTAG Debug Adapter for 100 mil standard JTAG/H-UDI connector:



Pin 1	**TCK**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDO**	Pin 6	GND
Pin 7	n.c.	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	GND
Pin 11	**TDI**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GND

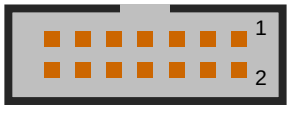
Product codes for ordering the adapter and matching cable

- 2052 - JTAG/SuperH communication adapter with one Renesas SuperH defined 14-pin 100mil (H-UDI) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

RH850 Adapter 14-pin JTAG

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG RH850 connector:



Pin 1	**TCK_LDCLK**	Pin 2	GND
Pin 3	**TRST#**	Pin 4	**FLMD0**
Pin 5	**TDO_LPDO**	Pin 6	n.c.

Pin 7	**TDI_LPDIO**	Pin 8	**V_{REF}**
Pin 9	**TMS**	Pin 10	n.c.
Pin 11	**RDY_LPDCLKOUT**	Pin 12	GND
Pin 13	**RESET#**	Pin 14	GNDCHECK

Product codes for ordering the adapter and matching cable

- 2088 - JTAG communication adapter with one Renesas RH850 defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

SWD Target Interface

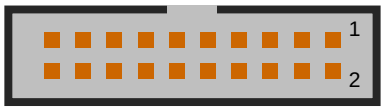
The Serial Wire Debug (SWD) interface or Serial Wire Debug Port (SW-DP) is one of the features of the debug and trace technology ARM CoreSight™. The known JTAG Debug Port (JTAG-DP) is supported. Both debug ports, the SWD and the alternative JTAG debug port can be combined to the Serial Wire JTAG Debug Port (SWJ-DP), the CoreSight standard port.

- I/O voltage range: 1.65 Volts – 5.5 Volts

Cortex, ARM7, ARM9, ARM11 Adapter 20-pin ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 100 mil standard ARM connector:



Pin 1	**V_{REF}**	Pin 2	n.c.
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	RTCK	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	DBGREQ	Pin 18	GND
Pin 19	DBGACK	Pin 20	GND

Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM9, ARM11 Adapter 10-pin Cortex

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-105 Cortex connector:

Pin 1	V_{REF}	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**

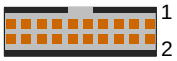
Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM9, ARM11 Adapter 20-pin Cortex

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-110 Cortex connector:



Pin 1	V_{REF}	Pin 2	**TMS_SWDIO**
Pin 3	GND	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	**TDO_SWO**
Pin 7	KEY	Pin 8	**TDI_EXTB**
Pin 9	GND	Pin 10	**RESET#**
Pin 11	GND_POWER1	Pin 12	**RTCK**_TRACECLK
Pin 13	GND_POWER2	Pin 14	**DBGREQ**_TRACEDATA0
Pin 15	GND	Pin 16	**DBGACK**_TRACEDATA1
Pin 17	GND	Pin 18	TRACEDATA2
Pin 19	GND	Pin 20	TRACEDATA3

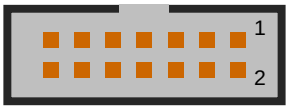
Product codes for ordering the adapter and matching cables

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Cortex, ARM, TI Adapter 14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter with 100 mil TI connector:



Pin 1	**TMS**	Pin 2	**TRST#**
Pin 3	**TDI**	Pin 4	GND
Pin 5	**V_{REF}**	Pin 6	n.c.
Pin 7	**TDO**	Pin 8	GND
Pin 9	**RTCK**	Pin 10	GND
Pin 11	**TCK**	Pin 12	GND
Pin 13	EMU0#	Pin 14	EMU1#

Product codes for ordering the adapters and matching cable

- 2016 - JTAG/ARM/SWD communication adapter with one ARM defined 20-pin 100mil (ARM) connector, one 10-pin 50mil Samtec FTSH-105 (CoreSight) connector and one 20-pin 50mil Samtec FTSH-110 (CoreSight) connector
- 2027 - JTAG/ARM-TI communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one TexasInstruments defined 14-pin 100mil (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

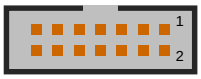
Cortex, ARM, XILINX Adapter 10-pin/14-pin JTAG/ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter ARM with 50 mil Samtec FTSH-105 connector:

Pin 1	**V_{REF}**	Pin 2	**TMS**
Pin 3	GND	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TDO**
Pin 7	n.c.	Pin 8	**TDI**
Pin 9	GND	Pin 10	**RESET#**

JTAG Debug Adapter with 2 mm Xilinx connector:



Pin 1	n.c.	Pin 2	**V_{REF}**
Pin 3	GND	Pin 4	TMS
Pin 5	GND	Pin 6	TCK
Pin 7	GND	Pin 8	TDO
Pin 9	GND	Pin 10	TDI
Pin 11	GND	Pin 12	n.c.
Pin 13	GND	Pin 14	HALT

Product codes for ordering the adapter and matching cable

- 2079 - JTAG/ARM-XILINX communication adapter for adaption between UAD2+/UAD2pro/UAD2next/UAD3+ with one 20-pin 100mil (ARM) adapter and one Xilinx defined 14-pin 2mm (JTAG) connector
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

MCU I/O resp. VREF voltage

The MCU I/O voltage is detected and used automatically from 1.65 Volts - 5.5 Volts. The I/O voltage must be known as well as the target system's connections to VREF voltage pin of the JTAG connector.

Special Target Interface for Automotive ECU

Note: The following non-standard interfaces for Automotive ECU are available as separate products from PLS. Please contact **sales@pls-mc.com** with the note **Automotive ECU** if the following Debug Adapters are required.

TriCore/AURIX, Power Architecture, ARM/Cortex Adapter 10-pin MiniDAP/cJTAG/SWD

MiniDAP/SWD JTAG/cJTAG	Debugging Channel for the DAP, SWD and IEEE1149.7-based JTAG	up to 25 MHz

DAP/cJTAG/SWD Debug Adapter TriCore/Power Architecture/ARM for 50 mil Samtec TFM-105 connector:

Pin 1	GND	Pin 2	**TCK_DAP0_TCKC_SWCLK**
Pin 3	**TRST#_DAPEN_JCOMP**	Pin 4	**TDO_DAP2_SWO**
Pin 5	**TMS_DAP1_TMSC#_SWDIO**	Pin 6	**TDI**
Pin 7	**BRKIO#**	Pin 8	**V_{REF}**
Pin 9	n.c.	Pin 10	**RESET#**

Product codes for ordering the adapter and matching cables

- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

TriCore Adapter 10-pin MiniJTAG

MiniJTAG	Debugging Channel for the JTAG	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-105 JTAG connector:

Pin 1	**BRKIN#**	Pin 2	**TRST#**
Pin 3	GND	Pin 4	**TCK**
Pin 5	**TMS**	Pin 6	**BRKOUT#**
Pin 7	**RESET#**	Pin 8	**TDI**
Pin 9	**V_{REF}**	Pin 10	**TDO**

Product codes for ordering the adapter and matching cables

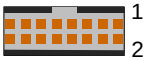
- 2031 - MiniDAP/cJTAG communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP/cJTAG) connector
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

Attention! The TriCore Adapter 10-pin MiniJTAG is not compatible with standard Infineon JTAG/OCDS/DAP adapter and should only be used for automotive ECUs.

TriCore/AURIX, Power Architecture Adapter 16-pin ETKS

JTAG/ETKS DAP/ETKS	Debugging Channel for ETKS-arbitrated JTAG/DAP	up to 50 MHz

JTAG Debug Adapter for 50 mil Samtec FTSH-108 ETKS connector:



Pin 1	**TMS_DAP1_TMSC#**	Pin 2	**V_{REF}**
Pin 3	**TDO_DAP2**	Pin 4	GND
Pin 5	GND	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#_DAPDIR_TMSCDIR**	Pin 10	**BRKOUT#_BRKIO#_RDY#**
Pin 11	**TCK_DAP0_TCKC**	Pin 12	GND
Pin 13	**BRKIN#_EVTI#**	Pin 14	**BREQ#**
Pin 15	**BGRANT#**	Pin 16	n.c.

Product codes for ordering the adapter and matching cable

- 2034 - MiniDAP/cJTAG/MiniJTAG/ETKS communication adapter with one customer defined 10-pin 50mil Samtec TFM-105 (MiniDAP), one 10-pin 50mil Samtec FTSH-105 (MiniJTAG) connector and one 16-pin 50mil Samtec FTSH-108 (ETKS20/21) connector
- 2003 - 10-pin HD flat ribbon FTSH/FFSD cable with two 10-pin female target headers, 10" (25cm)
- 2028 - 16-pin HD flat ribbon FTSH/FFSD cable with two 16-pin female target headers, 10" (25cm)
- 2037 - 10-pin TFM/SFSD cable with two 10-pin female target headers, 10" (25cm)
- 2005 - 40-pin HD flat ribbon Adapter cable between UAD2pro, UAD2next or UAD3+ IO Pod and JTAG Adapter, 10" (25cm)

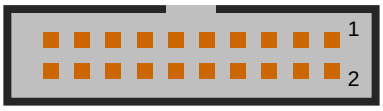
ETM Parallel Trace Interface

The JTAG interface is provided by UAD3⁺ via Debug Pod and Parallel Trace Adapter.

UAD3⁺ Parallel Trace Adapter 20-pin ARM

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 100 MHz

JTAG Debug Adapter for 100 mil standard JTAG/ARM:



Pin 1	**V_{REF}**	Pin 2	**V_{REF}**
Pin 3	**TRST#**	Pin 4	GND
Pin 5	**TDI**	Pin 6	GND
Pin 7	**TMS**	Pin 8	GND
Pin 9	**TCK**	Pin 10	GND
Pin 11	n.c.	Pin 12	GND
Pin 13	**TDO**	Pin 14	GND
Pin 15	**RESET#**	Pin 16	GND
Pin 17	**DBGRQ**	Pin 18	GND
Pin 19	**DBGACK**	Pin 20	GND

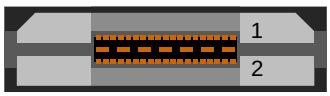
Product codes for ordering the adapter and matching cables

- 2058 - 20-pin Trace adapter to ARM Cortex-M CoreSight trace targets with 4-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, target connector
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD3+ Parallel Trace Adapter 38-pin ETM (ETMv3 Mictor 38-pin support)

ETMv3 - 38	38-pin Mictor Trace Port	up to 500 Mbps

Trace ETMv3 with 38-pin AMP Mictor connector:



Pin 1	n.c.	Pin 2	n.c.
Pin 3	n.c.	Pin 4	n.c.
Pin 5	Reserved	Pin 6	**TRACECLK**
Pin 7	**DBGRQ**	Pin 8	**DBGACK**
Pin 9	**RESET#**	Pin 10	**EXTTRIG**
Pin 11	**TDO**	Pin 12	**VT_{REF}**
Pin 13	**RTCK**	Pin 14	**V_{REF}**
Pin 15	**TCK**	Pin 16	**TRACEDATA[7]**
Pin 17	**TMS**	Pin 18	**TRACEDATA[6]**
Pin 19	**TDI**	Pin 20	**TRACEDATA[5]**
Pin 21	**TRST#**	Pin 22	**TRACEDATA[4]**
Pin 23	**TRACEDATA[15]**	Pin 24	**TRACEDATA[3]**
Pin 25	**TRACEDATA[14]**	Pin 26	**TRACEDATA[2]**
Pin 27	**TRACEDATA[13]**	Pin 28	**TRACEDATA[1]**
Pin 29	**TRACEDATA[12]**	Pin 30	Reserved
Pin 31	**TRACEDATA[11]**	Pin 32	Reserved
Pin 33	**TRACEDATA[10]**	Pin 34	Reserved
Pin 35	**TRACEDATA[9]**	Pin 36	**TRACECTL**
Pin 37	**TRACEDATA[8]**	Pin 38	**TRACEDATA[0]**

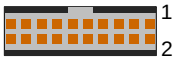
Product codes for ordering the adapter and matching cable

- 2022 - 38-pin Trace adapter to ARM ETM and CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD3+ Parallel Trace Adapter 20-pin Cortex

Cortex ETM	20-pin Cortex ETM Trace Port	up to 100 MHz

Cortex ETM Trace Adapter with 50 mil Samtec FTSH-110 connector:



Pin 1	**VT_{REF}**	Pin 2	TMS_SWDIO
Pin 3	GND	Pin 4	TCK_SWCLK
Pin 5	GND	Pin 6	TDO_SWO
Pin 7	KEY	Pin 8	TDI_EXTB
Pin 9	GND	Pin 10	RESET#
Pin 11	GND_POWER1	Pin 12	RTCK_**TRACECLK**
Pin 13	GND_POWER2	Pin 14	DBGREQ_**TRACEDATA0**
Pin 15	GND	Pin 16	DBGACK_**TRACEDATA1**
Pin 17	GND	Pin 18	**TRACEDATA2**
Pin 19	GND	Pin 20	**TRACEDATA3**

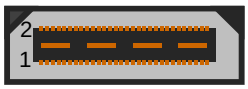
Product codes for ordering the adapter and matching cables

- 2058 - 20-pin Trace adapter to ARM Cortex-M CoreSight trace targets with 4-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, target connector
- 2029 - 20-pin HD flat ribbon FTSH/FFSD cable with two 20-pin female target headers, 5" (12,5cm)
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD3+ Parallel Trace Adapter 60-pin ETM MIPI

MIPI	60-pin MIPI Trace Port	up to 500 Mbps

ETMv3 Trace Adapter with 60-pin Samtec QSH-030 connector:



Pin 1	**VSUPPLY**	Pin 2	**TMS**
Pin 3	**TCK**	Pin 4	**TDO**
Pin 5	**TDI**	Pin 6	**RESET#**
Pin 7	**RTCK**	Pin 8	**TRST#**
Pin 9	n.c.	Pin 10	**DBGRQ**
Pin 11	**DBACK**	Pin 12	**VT_{REF}**
Pin 13	**TRC_CLK[0]**	Pin 14	n.c.
Pin 15	n.c.	Pin 16	GND
Pin 17	**TRC_DATA[0][0]**	Pin 18	n.c.
Pin 19	**TRC_DATA[0][1]**	Pin 20	n.c.
Pin 21	**TRC_DATA[0][2]**	Pin 22	n.c.
Pin 23	**TRC_DATA[0][3]**	Pin 24	n.c.
Pin 25	**TRC_DATA[0][4]**	Pin 26	n.c.
Pin 27	**TRC_DATA[0][5]**	Pin 28	n.c.
Pin 29	**TRC_DATA[0][6]**	Pin 30	n.c.
Pin 31	**TRC_DATA[0][7]**	Pin 32	n.c.
Pin 33	**TRC_DATA[0][8]**	Pin 34	n.c.
Pin 35	**TRC_DATA[0][9]**	Pin 36	n.c.
Pin 37	**TRC_DATA[0][10]**	Pin 38	n.c.
Pin 39	**TRC_DATA[0][11]**	Pin 40	n.c.
Pin 41	**TRC_DATA[0][12]**	Pin 42	n.c.
Pin 43	**TRC_DATA[0][13]**	Pin 44	n.c.
Pin 45	**TRC_DATA[0][14]**	Pin 46	n.c.
Pin 47	**TRC_DATA[0][15]**	Pin 48	n.c.
Pin 49	**TRC_DATA[0][16]**	Pin 50	n.c.
Pin 51	**TRC_DATA[0][17]**	Pin 52	n.c.
Pin 53	**TRC_DATA[0][18]**	Pin 54	n.c.
Pin 55	**TRC_DATA[0][19]**	Pin 56	n.c.
Pin 57	GND	Pin 58	GND
Pin 59	**TRC_CLK[1]**	Pin 60	n.c.

Product codes for ordering the adapter and matching cable

- 2061 - 60-pin Trace adapter to CoreSight trace targets with 16-pin trace width, 20-pin JTAG connector to UAD3+, Trace Pod connector, Samtec QTH-030 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

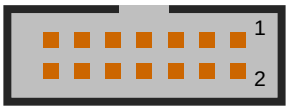
NEXUS Parallel Trace Interface

The JTAG debug interface to the target is provided by UAD3⁺ via Debug Pod and Parallel Trace Adapter.

UAD3⁺ Parallel Trace Adapter 14-pin NEXUS

JTAG/OnCE JTAG/cJTAG	Debugging Channel for the IEEE1149.1- and IEEE1149.7-based JTAG	up to 100 MHz

JTAG/cJTAG Debug Adapter for 100 mil standard OnCE connector:

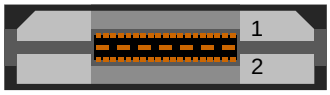


Pin 1	**TDI**	Pin 2	GND
Pin 3	**TDO**	Pin 4	GND
Pin 5	**TCK_TCKC**	Pin 6	GND
Pin 7	**EVTI#**	Pin 8	n.c.
Pin 9	**RESET#**	Pin 10	**TMS_TMSC**
Pin 11	**V_{REF}**	Pin 12	n.c.
Pin 13	**RDY#**	Pin 14	**TRST#**

UAD3⁺ Parallel Trace Adapter 38-pin NEXUS

ETMv3 - 38	38-pin Mictor NEXUS Trace Port	up to 500 Mbps

NEXUS Trace Adapter with 38-pin AMP Mictor connector:



Pin 1	**MDO12**	Pin 2	**MDO13**
Pin 3	**MDO14**	Pin 4	**MDO15**
Pin 5	**MDO9**	Pin 6	**CLKOUT**
Pin 7	**VEND_IO2**	Pin 8	**MDO8**
Pin 9	**RESET#**	Pin 10	**EVTI#**
Pin 11	**TDO**	Pin 12	**V_{REF}**
Pin 13	**MDO10**	Pin 14	**RDY#**
Pin 15	**TCK**	Pin 16	**MDO7**
Pin 17	**TMS**	Pin 18	**MDO6**
Pin 19	**TDI**	Pin 20	**MDO5**
Pin 21	**TRST#**	Pin 22	**MDO4**
Pin 23	**MDO11**	Pin 24	**MDO3**
Pin 25	n.c.	Pin 26	**MDO2**
Pin 27	n.c.	Pin 28	**MDO1**
Pin 29	n.c.	Pin 30	**MDO0**
Pin 31	n.c.	Pin 32	**EVTO#**
Pin 33	n.c.	Pin 34	**MCKO**
Pin 35	n.c.	Pin 36	**MSEO1#**
Pin 37	n.c.	Pin 38	**MSEO0#**

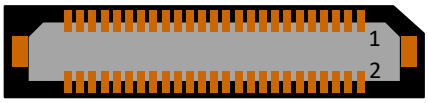
Product codes for ordering the adapter and matching cable

- 2059 - 38-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, MICTOR-38 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

UAD3+ Parallel Trace Adapter 50-pin NEXUS HP50

HP50	50-pin NEXUS Trace Port	up to 500 Mbps

NEXUS HP50 Trace Adapter with 50-pin Samtec ERF8 ASP-148422-01 connector:



Pin 1	**MSEO0#**	Pin 2	**VT_{REF}**
Pin 3	**MSEO1#**	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TMS**
Pin 7	**MDO0**	Pin 8	**TDI**
Pin 9	**MDO1**	Pin 10	**TDO**
Pin 11	GND	Pin 12	**TRST#**
Pin 13	**MDO2**	Pin 14	**RDY#**
Pin 15	**MDO3**	Pin 16	**EVTI#**
Pin 17	GND	Pin 18	**EVTO#**
Pin 19	**MCK0**	Pin 20	**RESET#**
Pin 21	**MDO4**	Pin 22	GEN_IO0
Pin 23	GND	Pin 24	GND
Pin 25	**MDO5**	Pin 26	**CLKOUT**
Pin 27	**MDO6**	Pin 28	GEN_IO1
Pin 29	GND	Pin 30	GND
Pin 31	**MDO7**	Pin 32	GEN_IO2
Pin 33	**MDO8**	Pin 34	GEN_IO3
Pin 35	GND	Pin 36	GND
Pin 37	**MDO9**	Pin 38	GEN_IO4
Pin 39	**MDO10**	Pin 40	GEN_IO5
Pin 41	GND	Pin 42	GND
Pin 43	**MDO11**	Pin 44	**MDO13**
Pin 45	**MDO12**	Pin 46	**MDO14**
Pin 47	GND	Pin 48	GND
Pin 49	**MDO15**	Pin 50	n.c.

Product codes for ordering the adapter and matching cable

- 2076 - 50-pin Trace adapter to PowerPC Nexus trace targets with 16-pin trace width, 14-pin JTAG connector to UAD3+, Trace Pod connector, HP50 target connector
- 2011 - Trace cable between Trace Pod and the Trace Adapter. 38-pin HD flat ribbon cable, 8" (20cm)

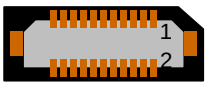
MCDS Serial Trace Interface

The JTAG interface to the target is provided via Debug Pod and Aurora Trace Pod.

UAD3+ Serial Trace Adapter 22-pin Aurora MCDS

ERF8 HS22 AGBT/MCDS	22-pin Aurora Port (AGBT)	up to 3.125 Gbps

Aurora Trace Adapter with 22-pin Samtec ERF8 HS22 ASP-137969-01 connector:



Latch: GND			
Pin 1	**Aurora Lane0+**	Pin 2	**VT_{REF}**
Pin 3	**Aurora Lane0-**	Pin 4	**TCK_DAP0**
Pin 5	GND	Pin 6	**TMS_DAP1**
Pin 7	**Aurora Lane1+**	Pin 8	**TDI**
Pin 9	**Aurora Lane1-**	Pin 10	**TDO_DAP2**
Pin 11	GND	Pin 12	**TRST#**
Pin 13	**Aurora Lane2+**	Pin 14	**Aurora AGBT_CLK+**
Pin 15	**Aurora Lane2-**	Pin 16	**Aurora AGBT_CLK-**
Pin 17	GND	Pin 18	**BRKOUT#**
Pin 19	**Aurora Lane3+**	Pin 20	**Aurora AGBT_ERR**
Pin 21	**Aurora Lane3-**	Pin 22	**RESET#**
Latch: GND			

Product codes for ordering the adapter and matching cable

- 2064 - Aurora Trace adapter (HS22) to Infineon Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137969-01 target connector
- 2073 - Trace cable between Aurora Trace Pod and the Aurora Target Adapter. Flex cable with two 50-pin connectors, 10" (24cm)

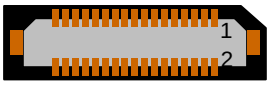
NEXUS Serial Trace Interface

The JTAG interface to the target is provided via Debug Pod and Aurora Trace Pod.

UAD3+ Serial Trace Adapter 34-pin Aurora NEXUS

ERF8 HS34 NEXUS	34-pin Aurora Port	up to 3.125 Gbps

Aurora Trace Adapter with 34-pin Samtec ERF8 HS34 ASP-137973-01 connector:



Latch: GND			
Pin 1	**Aurora Lane0+**	Pin 2	**VT_{REF}**
Pin 3	**Aurora Lane0-**	Pin 4	**TCK**
Pin 5	GND	Pin 6	**TMS**
Pin 7	**Aurora Lane1+**	Pin 8	**TDI**
Pin 9	**Aurora Lane1-**	Pin 10	**TDO**
Pin 11	GND	Pin 12	**TRST#_JCOMP**
Pin 13	**Aurora Lane2+**	Pin 14	n.c.
Pin 15	**Aurora Lane2-**	Pin 16	n.c.
Pin 17	GND	Pin 18	**BRKOUT#_EVTO#**
Pin 19	**Aurora Lane3+**	Pin 20	Reserved
Pin 21	**Aurora Lane3-**	Pin 22	**RESET#**
Pin 23	GND	Pin 24	GND
Pin 25	n.c.	Pin 26	**Aurora AGBT_CLK+**
Pin 27	n.c.	Pin 28	**Aurora AGBT_CLK-**
Pin 29	GND	Pin 30	GND

Pin 31	n.c.	Pin 32	n.c.
Pin 33	n.c.	Pin 34	Reserved
Latch: GND			
Product codes for ordering the adapter and matching cable ▪ 2063 - Aurora Trace adapter (HS34) to Nexus Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-137973-01 target connector ▪ 2073 - Trace cable between Aurora Trace Pod and the Aurora Target Adapter. Flex cable with two 50-pin connectors, 10" (24cm)			

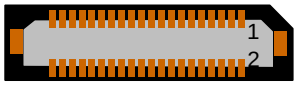
ARM HSSTP Serial Trace Interface

The JTAG interface to the target is provided via Debug Pod and Aurora Trace Pod.

UAD3+ Serial Trace Adapter 40-pin Aurora ARM HSSTP

ERF8 HS40 ARM HSSTP	40-pin Aurora Port (ARM HSSTP)	up to 3.125 Gbps

Aurora Trace Adapter with 40-pin Samtec ERF8 HS40 ASP-130367-01 connector:



Latch: GND			
Pin 1	Reserved	Pin 2	**VT_{REF}**
Pin 3	Reserved	Pin 4	**TCK_SWCLK**
Pin 5	GND	Pin 6	GND
Pin 7	**Aurora Lane2+**	Pin 8	**TMS_SWDIO**
Pin 9	**Aurora Lane2-**	Pin 10	**TRST#**
Pin 11	GND	Pin 12	GND
Pin 13	**Aurora Lane0+**	Pin 14	**TDI**
Pin 15	**Aurora Lane0-**	Pin 16	**TDO**
Pin 17	GND	Pin 18	GND
Pin 19	**Aurora CLK+**	Pin 20	**RESET#**
Pin 21	**Aurora CLK-**	Pin 22	Reserved
Pin 23	GND	Pin 24	GND
Pin 25	**Aurora Lane1+**	Pin 26	Reserved
Pin 27	**Aurora Lane1-**	Pin 28	Reserved
Pin 29	GND	Pin 30	GND
Pin 31	**Aurora Lane3+**	Pin 32	Reserved
Pin 33	**Aurora Lane3-**	Pin 34	**TRGOUT**
Pin 35	GND	Pin 36	Reserved
Pin 37	Reserved	Pin 38	Reserved
Pin 39	Reserved	Pin 40	Reserved
Latch: GND			
Product codes for ordering the adapter and matching cable ▪ 2045 - Aurora Trace adapter (HS40) to ARM Aurora trace targets with up to 4 lanes, 50-pin connector for flex cable, Samtec ASP-130367-01 target connector ▪ 2073 - Trace cable between Aurora Trace Pod and the Aurora Target Adapter. Flex cable with two 50-pin connectors, 10" (24cm)			

Trace VT_{REF} Voltage

The Trace Adapter interface is voltage compatible to the VT_{REF} voltage from 0.8 Volts – 3.3 Volts.

Resetting the Target Systems

For resetting the target system, at the JTAG Target the line RESET# (MCU I/O voltage levels) is provided. These reset lines are active-low and may be connected to the corresponding lines on the target system to achieve an automatic and software-controlled target hardware reset.

The line RESET# can only be used in **Open-Drain** configuration. The level of this reset line is controlled by the MCU I/O voltage of the target.

Debug/Trace Pod Configuration for UAD3+

The **UAD3+ Debug Pods** and **UAD3+ Trace Pods** are optimized for highest communication speed. They are adapted to a specific target access by a specific firmware, which supports exactly one of the specific target accesses (JTAG, DAP, SWD, ...). To switch between the different target access configurations, it is required to re-configure the Debug/Trace Pod firmware manually.

If an unsuitable **UAD3+ Debug/Trace Pod** firmware is used anyway, UDE® shows the following message in the UDE® log window and disallows the connection to the target:

```
Error, Wrong type of JTAG engine or JTAG engine too old!
Error, Use UAD Configurator to update Pod to latest version!
Error, Can't connect target!
```

In this case, the firmware on the Debug/Trace Pod must be re-configured by the UDE® Access Device Configurator. Close UDE® and follow the procedure described in the chapter below.

UDE® Access Device Configurator

The **UDE® Access Device Configurator** supports the re-configuring of the Debug/Trace Pods of **UAD3+**. Open from Windows' menu **Start – All Programs – Universal Debug Engine 2025 – UDE Administration Tool**, open from the menu **Tools** – **UDE Access Device Configurator**.

Alternatively, start the `<UDE_DIRECTORY>/UADConfig.exe`.

Debug Pod Configuration

Choose the requested **UAD3+** from the identified **Access Device** via the shown serial number.

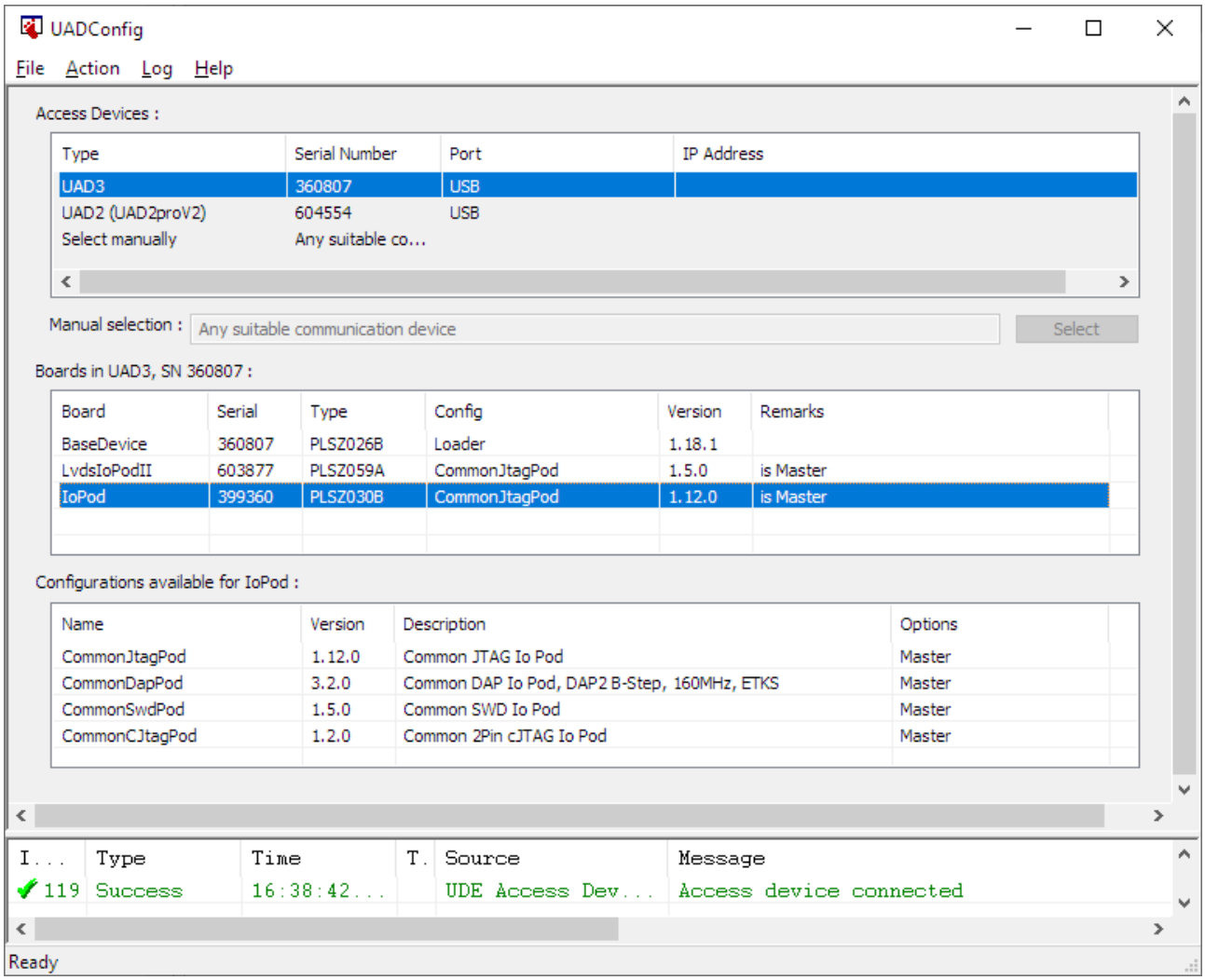
Note: If the required **UAD3+** is not visible, check the power line, the USB/Ethernet/Firewire communication line of the UAD3+ and the line to the Debug Pod. The **UAD3+** must be running (backside Power LED is blinking) and the Debug Pod must be connected to the UAD3+ (Power LED is on). For further details see the following chapter **Interface and Connector description**.

Select and double-click the line that shows the required UAD3+ device. In field **Boards** the installed Trace Boards and Trace Pods within the UAD3+ are shown. At least two boards are shown: one **BaseDevice** and one of the **IoPod** or **LvdsIoPodII**.

The BaseDevice is configured automatically and won't be described further.

The Debug/Trace Pod is described in the line via **SerialNumber**, **Type**, **Configuration** and **Version**. The item in **Configuration** is used as synonym for the Debug Pod firmware and describes kind of access. Some of the firmware are special versions and must be used only when required.

Select and double-click in the line that shows the requested **IOPod** or **LvdsIoPodII**.



Select and double-click a new firmware version from the **Configurations available for IoPod** for re-configuring, which supports the requested kind of target access. The Debug Pod will be re-configured.

Target access	Recommend Configuration
Infineon TriCore/XC2000/XE166 JTAG-based	CommonJtagPod
ARM7, ARM9, ARM11 JTAG-based	CommonJtagPod
Power Architecture OnCE-based	CommonJtagPod

Cont'd.

Target	Recommend Configuration
Power Architecture COP-based	CommonJtagPod
Renesas Super-H H-UDI-based	CommonJtagPod
Renesas RH850 JTAG-based	CommonJtagPod
Infineon TriCore AURIX DAP-, DAP2- and DAP-Wide-Mode-based	CommonDapPod
Infineon TriCore AURIX DAP- and DAP2-based (TC2xx-A-Step only !)	CommonDapPod_2_3
Infineon XC2000/XE166 DAP- and DAP2-based	CommonDapPod
Cortex/CoreSight SWD-based	CommonSwdPod
Power Architecture, Cortex/CoreSight IEEE1149.7-compactJTAG-based	CommonCJTagPod

After that, please check the correct kind of firmware in the field **Boards**. Close the UAD Access Device Configurator and re-start the UDE® session.

Trace Pod Configuration

Use the **UDE® Access Device Configurator** or respectively the tool `<UDE_DIRECTORY>/UADConfig.exe` from the UDE® directory to select or change the correct Trace Pod firmware configuration.

Select the **UAD3+** by double-click on the entry in the field **Access Device**.

The field **Boards** shows the installed hardware components of the **UAD3+**. Select the **TracePodII** entry. The field **Configurations** shows the installed firmware. By double-click to an entry, a new Trace Pod firmware can be selected and configured.

Target	Recommend calibration
Aurora-based Trace	AuroraTracePod
Parallel-based Trace	CombinedTracePod

Note: Ask the PLS Support Team at **support@pls-mc.com** for detailed information and further hints about using Trace.

Static Electricity Precautions

Electrostatic Discharge (ESD) can damage a sensitive electronic component! Under several conditions static electricity and ground potential differences between the Access Device and the user's target hardware can build up high voltages - over 10000 Volts (10 kVolts) in some cases. The electrostatic discharge of this build-up voltage results in fast high current waveforms and fast magnetic (H-field) or electrostatic (E-field) disturbances. The discharge into the electronic components and circuitry can damage or destroy hardware components, resulting in failures and reduced reliability.

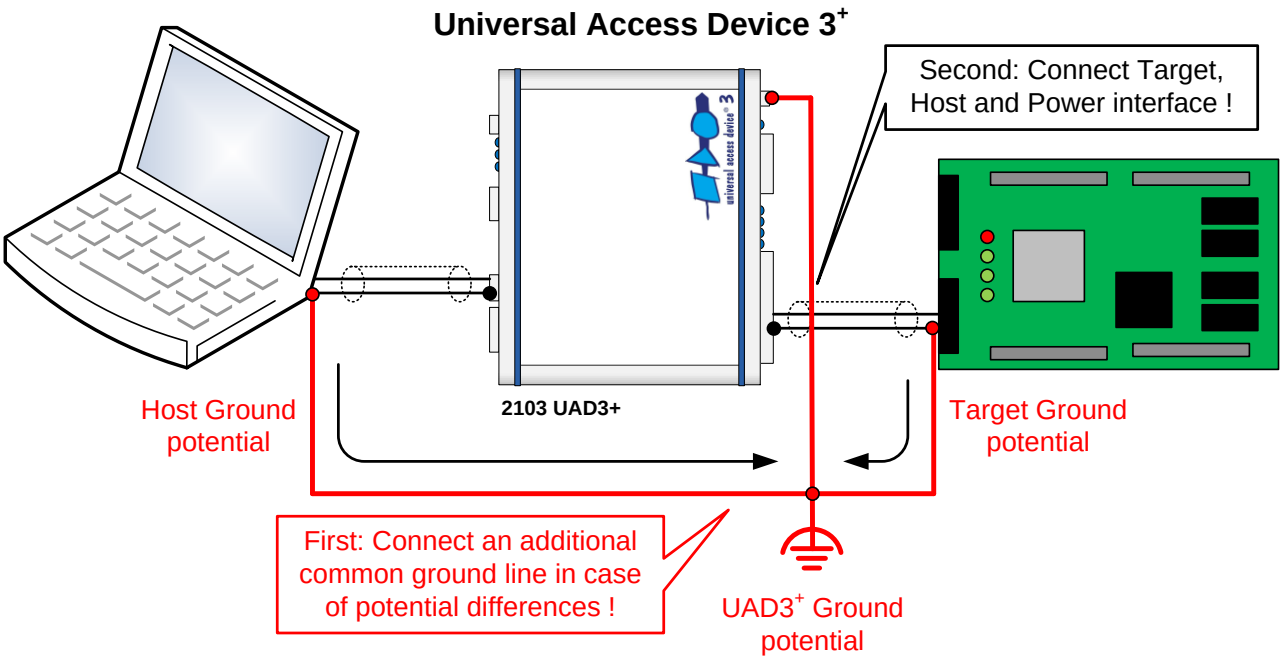
Because of the **non-hot-pluggable** 1.65 Volts / 5.0 Volts properties of the **JTAG/DAP/SWD** connectors, these ports are endangered especially. The maximum voltage on these pins may not exceeded 5.5 Volts against the UAD's ground, especially in the case that the ground planes are not connected first.

To protect your hardware against damage from static electricity and ground potential discharge, you have to follow some basic precautions:

1. Before you change any cable connections from the Access Device, please **remove the power** from the Access Device and your target system.

2. Please ensure that the **static electricity** and **ground potentials** between the Access Device, the host PC and the target hardware are **balanced**. If there is a danger of high potential differences, you must connect the Access Device, the host PC and the target hardware to the same ground domain **via a low resistance connection**.

3. Establish the target connection and **power on** the systems.



Attention! All Universal Access Devices are equipped with a **ground socket** on the front side. Please use this ground socket for discharging the static electricity and balancing ground potentials between the Universal Access Device, the host PC and the target hardware **BEFORE** you connect the target hardware to the Access Device.

Appendix A.7 – Hardware Description JTAG-Protector 2

Description

The UAD-JTAG-Protector 2 is an add-on hardware for Universal Access Device and other JTAG-based communication devices and is optimized for the communication between the UDE® Universal Debug Engine on the host PC and target microcontroller system equipped with JTAG interface.

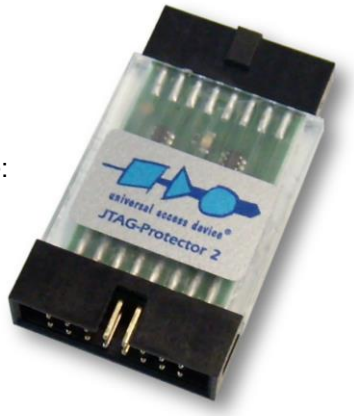
It is recommended for the protection of JTAG interfaces from the danger of over-voltage and ESD in hard production environments.

Product Features

The JTAG-Protector 2 is available for the access devices UAD2 using the JTAG interface for XC166, XC2000, TriCore, Power Architecture, ARM, XScale.

The protection function bases on series resistors, over-voltage clipping diodes and varistors for all signals.

Electrical properties



- Series resistor per signal: 27 Ohms
- Capacity per signal: 100 pF max
- ESD Protection per signal: 15 kVolts.

From Q2/2008, the improved JTAG-Protector 2 is available:

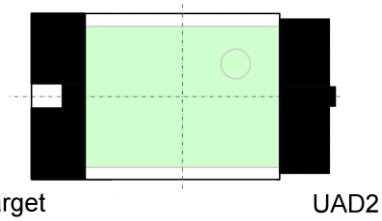
- Series resistor per signal: 27 Ohms
- Capacity per signal: 55 pF max
- Enhanced ESD Protection per signal: 15 kVolts
- Resettable over-current protection: 10 A
  (max 0.2s time to trip, resettable)
- Power dissipation from target voltage: 10 mW (V_{IO} = 3.3 Volts).

Note: When using **needle adaptors** that the function of the JTAG protections can be ensured only, when the ground and target power connections (MCU I/O voltage) are established first. After that, the signal pins have to be connected.

Installation

Please insert the female connector of the JTAG-Protector (the right side in the drawing) into the shrouded male header of the JTAG connector of the UAD2.

The usage with UAD2⁺ is possible, when using an UAD2 Debug Extender equipped with a male shrouded header.



Note: Please contact the Support at **support@pls-mc.com** in case of any doubt.

Interface and Connector Description

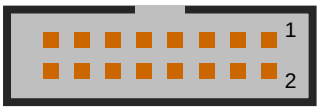
Interface Details

JTAG Target Interface

UAD/UAD2 JTAG Debug Adapter (XC2000, TriCore, Power Architecture, ARM, XScale Support)

JTAG	Debugging Channel for the IEEE1149.1-based JTAG	up to 20 MHz

JTAG Debug Adapter for 100 mil standard JTAG:



Pin 1	**TMS**	Pin 2	**MCU I/O voltage**
Pin 3	**TDO**	Pin 4	GND
Pin 5	Reserved	Pin 6	GND
Pin 7	**TDI**	Pin 8	**RESET#**
Pin 9	**TRST#**	Pin 10	**BRKOUT#**
Pin 11	**TCLK**	Pin 12	**GND**
Pin 13	**BRKIN#**	Pin 14	**OCDS_E#**
Pin 15	Reserved	Pin 16	Reserved

Product codes for ordering the adapter

- 2001 - JTAG protector for Universal Access Device JTAG adapter with ESD / overvoltage protection

Please note that from Q2/2008 a new Version of the JTAG protector will be delivered. These protectors are not target controller specifically, but are connected directly to the UAD2. They extend the JTAG port of the UAD2 by a protection.

MCU I/O resp. V_{REF} voltage

Note: For the full protection function of the JTAG protector, the MCU I/O voltage must be connected to the protector, too.

The Universal Access Device 2 detects the voltage on the I/O voltage pin and uses the external or the internal reference voltage automatically. The internal 3.3 Volts reference voltage is used for the internal level shifter only when the I/O voltage is higher than 4 Volts or lower than 2 Volts.

Appendix B – Compatibility List

The following list gives an overview about compatibility between the UDE® Universal Debug Engine and products from third-party partners. In case of trouble with UDE®, please ensure the compatibility of the parts in the debug environment. For latest developments, which are not described below, visit our web site **https://www.pls-mc.com/**.

***) Note:** So-marked products are discontinued or replaced by a newer hardware. For new projects, these products are no longer available.

UDE® Universal Debug Engine

	Windows 10 x64	Windows 11 x64
UDE® Universal Debug Engine	✓	✓
Universal Access Device 2 (UAD2) via USB 2.0	✓	✓
Universal Access Device 2^{pro} ($UAD2^{pro}$) via USB 2.0	✓	✓
Universal Access Device 2^{+} ($UAD2^{+}$) via USB 2.0, IEEE1394, Ethernet TCP/IP	✓	✓
Universal Access Device 2^{next} ($UAD2^{next}$) via USB 2.0, Ethernet TCP/IP	✓	✓
Universal Access Device 3^{+} ($UAD3^{+}$) via USB 2.0, IEEE1394, Ethernet TCP/IP	✓	✓

Microcontrollers

32-Bit TriCore™ Derivatives (Infineon Technologies)

- Infineon AUDO-NextGeneration, AUDO-NG, AUDO-Future, AUDO-MAX
- Infineon AURIX TC4x (MCA)
- Infineon AURIX TC32x, TC33x, TC33xED, TC35x, TC35xED, TC36x,
- Infineon AURIX TC37x, TC37xED, TC38x, TC39x, TC39xED (MCA)
- Infineon AURIX TC21x, TC22x, TC23x, TC23xED, TC24x, TC24xED (MCA)
- Infineon AURIX TC26x, TC26xED, TC27xx, TC27xxED, TC29x, TC29xED (MCA)
- Infineon TC1161, TC1162, TC1163, TC1164, TC1165, TC1166, TC1167, TC1197
- Infineon TC1736, TC1762, TC1764, TC1765, TC1766, TC1766ED, TC1784
- Infineon TC1767, TC1767ED, TC1792, TC1796, TC1796ED
- Infineon TC1784, TC1791, TV1793, TC1797, TC1797ED, TC1798, TC1798ED
- Infineon TC1910, TC1912, TC1920A, TC1920B, TC1100, TC1115, TC1130

32-Bit Traveo™ Derivatives (Infineon Technologies)

- Infineon TRAVEO T2G Body Entry CYT2B6, CYT2B7, CYT2B9, CYT2BL
- Infineon TRAVEO T2G Body High End CYT3BB, CYT4BB, CYT4BF
- Infineon TRAVEO T2G Cluster CYT2CL, CYT3DL, CYT4DN

32-Bit MOTIX™ Derivatives (Infineon Technologies)

- Infineon TLE988x, TLE9881, TLE9883, TLE989x, TLE9891, TLE9893

32-Bit PowerPC® and PowerArchitecture™ Derivatives

- e200z0, e200z3, e200z4, e200z6, e200z7 Core, PowerPC Book E architecture
- NXP MPC551x, MPC553x, MPC555x, MPC556x, MPC560x, MPC563x, MPC564x, MPC566x
- NXP MPC574x, MPC577x (MCA)
- NXP S32R274, S32R372 (MCA)
- STMicroelectronics SPC56x, SPC56EL, SPC56HK
- STMicroelectronics SPC57x, SPC57EM80, SPC58x, SPC58EG84, SPC58NE84, SPC58EC80 (MCA)
- AMCC PPC440, PPC460
- eTPU Enhanced Time Processing Unit
- Xilinx XC5VFX Virtex 5

64-Bit Cortex-A53™ Derivatives

- NXP S32G233, S32G234, S32G254, S32G274 (MCA)
- NXP S32G399, S32G398, S32G378 (MCA)
- NXP S32V234 (MCA)

32-Bit Cortex-R52™ Derivatives

- NXP S32Z and S32E, S32S247
- STMicroelectronics Stellar SR6G7C3, SR6G7C4, SR6G7C6, SR6G7C7, SR6P7C3, SR6P7C7 (MCA)

32-Bit RISC-V™ Derivatives

- SiFive E20, E21, E24, FE310, E31, E34, E76

32-Bit Cortex-M0, -M3, -M33, -M4, -M7, -R4, -R5F, -R52, -A8, -A9™ Derivatives

- Actel SmartFusion, A2Fxxx, Atmel AT91SAM3, Energy Micro EFM32G
- Infineon XMC1000, XMC1200, XMC1300, XMC4000, XMC4500, TLE98xx
- Luminary Micro LM3S, Nuvoton NuMicro NUC1000
- NXP Kinetis MK10, MK20, MK30, MK50, MK60, i.MX51, IMX5xx, S32K, S32S, EM773, LPC1000, LPC1300, LPC1700, LPC1800DUAL, LPC4000, MKV56, MKV58, i.MX51, IMX5
- Renesas RA6M, RA4M, RA4E, RA6T, RA6E
- STMicroelectronics STM32
- Texas Instruments RM42, RM46, RM48, OMAP35, AM35, AM37, AM38, DM37, TMS470, TMS570, Sitara AM243x, AM2434, AM2432, AM2431
- Toshiba TX03, TPMP330
- Xilinx Zynq-7000 XC7Z

32-Bit ARM7™, ARM9™, ARM11™, XScale Derivatives

- Analog Devices ADuC70xx
- Atmel® AT91xx (e.g. AT91M40, AT91SAM7S32, AT91RM9200)
- Cirrus Logic EP93xx
- Hilscher NetX10, NetX50, NetX100, NetX500
- Intel® XScale IPX42x, IPX45x, IPX46, PXA255, PXA275, IXP4
- Net Silicon™ NET+ARM® NS7520, NS9700, NET+15, NET+20, NET+40, NET+50
- NEC/Siemens ERTEC200, ERTEC400
- NetSilicon NS7520, NS93xx, NS97xx
- NET+15, NET+20, NET+40, NET+50
- NXP LPC2100, LPC2200, LPC2300, LPC2400, LPC2800, LPC3180, LPC3200
- NXP PAC2700, MAC7100, MAC7200, MC9328
- NXP i.MX1, i.MX21, i.MX31, i.MX35, i.MX37
- STMicroelectronics ST30, STR7, STR9
- Texas Instruments TMS470, OMAP5912

32-Bit SuperH™ SH-2A Derivatives

- Renesas SH7201, SH7211, SH7251, SH7254, SH72666, SH7267

32-Bit RH850 Derivatives

- RH850-G3K RH850/F1L RH850/F1K RH850/F1KM-S4 RH850/F1KH-D8 RH850/F1KM-S2 RH850/F1KM-S1, RH850/E1L RH850/E1M
- RH850-G3M RH850/F1H RH850/P1H-C RH850/P1L-C RH850/P1M RH850/P1M-C
- RH850-G4M RH850/E2 RH850/E2H RH850/E2M, RH850/U2B, RH850/U2A

32-Bit Synopsys ARC® Derivatives

- DesignWare ARCEM4, EM5, EM5, EM7, EM9, EM11, EM22
- DesignWare ARC EV7x
- DesignWare ARC HS3x, HS4x, HS5x
- ARC EV based Parallel Processing Unit (PPU) for AURIX TC4x

16-Bit C166 Derivatives (Infineon Technologies)

- Infineon EGOLD, C166CBC, C161U, C165H, C165 UTAH
- Infineon XC166, C166S V2, XC161CJ, XC164CS
- Infineon XC2000, XC2000ED, XC2287, XC2387, XC2787, XE166, XE164, XE167
- all other XC166/XC2000/XE166 derivatives

16-Bit C166 Derivatives* (Micronas Semiconductor)

- Micronas SDA6000, SDA6001

* C16x-related products and services are provided only to existing customers with existing projects. C16x support is not available for new projects.

16-Bit ST10 Derivatives* (STMicroelectronics)

- ST10F167, ST10F168, ST10F251, ST10F252, ST10F269, ST10F275, ST10F276
- ST10F280, ST10F282, ST10F290
- all other ST10x derivatives

* ST10-related products and services are provided only to existing customers with existing projects. ST10 support is not available for new projects.

Simulators

32-Bit Power Architecture™ Derivatives

- UDE® Sim
- Synopsis Virtualizer

32-Bit TriCore™ Derivatives (Infineon Technologies)

- TSIM TriCore™ TC1.3, TC1.6, TC1.8 Instruction Set Simulator
- Synopsys Virtualizer

Compilers

Supported output formats of binary and debug information

- *.elf, *.axf — ELF/DWARF binary object file with debug information
- *.out — Binary objects file with debug information
- *.abs, *.bin — Intel binary objects file
- *.hex, *.h66, *.h86 — Intel HEX file, ASCII text
- *.sre, *.s19 — Motorola S records file, ASCII text

TriCore™ Compiler

- GNU C/C++ Compiler for TriCore (HighTec EDV-Systeme GmbH)
- Tasking TriCore C/C++ Compiler VX-Toolset (Altium™)
- Green Hills C/C++ Compiler for TriCore
- Wind River Diab C/C++ Compiler for TriCore

Power Architecture® Compiler

- GNU C/C++ Compiler for Power Architecture®
- Wind River Diab C/C++ Compiler for Power Architecture®
- NXP CodeWarrior Compiler
- Green Hills C/C++ Compiler for Power Architecture®
- Byte Craft's eTPU Compiler

Cortex-M/R/A, ARM7™, ARM9™, ARM11™, XScale Compiler

- GNU C/C++ Compiler for ARM®
- RealView MDK-ARM Compiler for ARM®
- Tasking ARM C/C++ Compiler VX-Toolset (Altium™)
- Wind River Diab C/C++ Compiler for ARM®
- ImageCraft Compiler
- Texas Instruments CodeComposer

SuperH SH-2A Compiler

- Renesas C/C++ Compiler for SH-2A

C166*, ST10*, XC166, XC2000 Compiler

- Keil CA166 C-Compiler
- Tasking C166 C/C++ Compiler VX-Toolset (Altium™)

* C16x-related products and services are provided only to existing customers with existing projects. C16x support is not available for new projects.

Real Time Operating Systems

- Wittenstein SAFERTOS
- FreeRTOS
- Hilscher - rcX for netX
- OSEK RealTime Interface - ORTI
- Keil RTX Real Time Kernel
- CMX-RTX
- Mentor Graphics - Nucleus PLUS RTOS
- Micriμm MicroC/OS-II
- HighTec PXROS - PXMON Support
- Enea OSE Real-Time Illuminator

Other Software Tools

- INCHRON - chronVIEW
- Eclipse Platform 4.8 – 4.27 (64-bit)
- Infineon DAvE - The Digital Application virtual Engineer
- EasyCODE CASE - Tools
- ORTI - OSEK Run-time interface of the OSEK operating system
- Razorcat Tessy - Automated module testing of C-Code
- RTI StethoScope - Real-Time Graphical Monitoring Tool

Other Hardware tools

Supported USB-to-Serial converter

- Digitus USB 1.1 to Serial Converter (Prolific chipset)

Appendix C – Trouble Shooting

Trouble Shooting Checklist

Please read this **UDE Manual Appendix.pdf** and the hints very conscientious. If the problem is not soluble, the fastest way is to download the **UDE Support Checklist Form** from **https://www.pls-mc.com/downloads/UDE_Support_Checklist_Form.pdf**, fill out and e-mail it to the PLS Support Line at **support@pls-mc.com**.

Run UDE®, open the affected workspace, set the Message View Log level to Maximum and reproduce the problem. Open menu **Help – UDE Support Request Form**, fill out the necessary fields and save it as a ZIP file. Now please send the ZIP file as attachment including the used password to the PLS Support Line at **support@pls-mc.com**.

Our Support team will contact you as soon as possible.

Latest Versions on World Wide Web

You may find the latest versions of UDE® Universal Debug Engine and other components on our Web site **https://www.pls-mc.com/download.htm** for downloading.

Note: Please see also the FAQ site on **https://www.pls-mc.com/faq.htm**.

Known Issues with UDE®

Installation fails

Please make sure that you have full rights (**administrator rights**) for the installation process of UDE®.

If there are any installation errors, please ensure that all system requirements are fulfilled. Uninstall the UDE® software and install it again. To do so, you can use the setup program from the CD-ROM that helps you reinstalling the software. If the problem persists, please contact the PLS Support Team at **support@pls-mc.com**.

Can't get target connection

If you do not get connection to the microcontroller board and the dialog box 'Establishing connection failed ..' is shown please...

- check all cables and read the board's and the Universal Access Device's **documentation** for correct installation and usage
- check the microcontroller board **power supply**
- press **RESET** on the microcontroller board.

If you still cannot connect to the microcontroller board, please contact the PLS Support Team at **support@pls-mc.com**.

How to report errors

The UDE® software was built and tested under accurateness. Anyhow errors will be occurring. Please give the PLS team your valuable feedback as we continue to build the next version of UDE® Universal Debug Engine.

Please act the following steps when an error in UDE® occurs:

1. Increase the UDE® internal Debug Trace Level. Use the menu **Config - Debug Server Configuration - Debug Server - Diagnostic Messages-Debug Trace Level** and set the value to 100 respectively pull the slider to the right for 'Report all Messages'.
   If the debugger cannot connect to the target, answer the occurring error box with 'Ignore' and make the setting described above. Restart UDE®.
2. Cause the error and note the procedure.
3. Use the menu **Help – UDE Support Request Form** and fill out the form.
4. Save the result in a zip file and send it as e-mail to the PLS Support Team at **support@pls-mc.com**

or

1. Increase the UDE® internal Debug Trace Level. Use the menu **Config - Debug Server Configuration - Debug Server - Diagnostic Messages-Debug Trace Level** and set the value to 100 respectively pull the slider to the right for 'Report all Messages'.
   If the debugger cannot connect to the target, answer the occurring error box with 'Ignore' and make the setting described above. Restart UDE®.
2. Cause the error and note the procedure.
3. Write the content of the 'Command View' into a file. Use the context menu, choose **Save...** or push the Ctrl-S / Strg-S keys. Choose a file name, for example `CommandLog.txt` and save the file.
4. Use the UDEAdmin.exe from the UDE® program directory to create a report of installed components of UDE® and save it as `Components.txt`.
5. Please send an e-mail to the PLS Support Team at **support@pls-mc.com** with following content:
   - a short description of the procedure to cause the error
   - the generated file `CommandLog.txt`
   - the generated file `Components.txt`
   - the file `_connection_lost_report_***.txt` from your UDE® directory
   - the used target configuration file `*.cfg`. If you do not know, where the file can be found, please open the menu **Config - Target Configuration** and get the file location from the Target Configuration File box. If the debugger cannot connect to the target, answer the occurring error box with 'Ignore'.

Appendix D - CE Declarations

CE Declaration

CE

CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EG-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EC directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 2**
Designation for equipment: High-Speed Communication Add-On Board

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2006/95/EG.

The product meets the CE Low Voltage Regulation 2006/95/EC.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2004/108/EG nach folgenden Normen:

For verification in accordance with CE directive 2004/108/EC the following standards were applied:

EN 55022 : 2003 - 12
EN 55024 : 2003 - 10

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 01.07.2004

Dr.-Ing. Stefan Weiße
Entwicklungsleiter, Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EG-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EC directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 2+**
Designation for equipment: High-Speed Communication Add-On Board

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2006/95/EG.

The product meets the CE Low Voltage Regulation 2006/95/EC.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2004/108/EG nach folgenden Normen:

For verification in accordance with CE directive 2004/108/EC the following standards were applied:

EN 55022 : 2003 - 12
EN 55024 : 2003 - 10

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 01.07.2005

Dr.-Ing. Stefan Weiße
Entwicklungsleiter, Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

CE

CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EG-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EC directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 2 compact**
Designation for equipment: High-Speed Communication Add-On Board

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2006/95/EG.

The product meets the CE Low Voltage Regulation 2006/95/EC.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2004/108/EG nach folgenden Normen:

For verification in accordance with CE directive 2004/108/EC the following standards were applied:

EN 55022 : 2003 - 12
EN 55024 : 2003 - 10

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 01.10.2005

Dr.-Ing. Stefan Weiße
Entwicklungsleiter, Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

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CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EG-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EC directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 3**
Designation for equipment: High-Speed Communication Add-On Board

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2006/95/EG.

The product meets the CE Low Voltage Regulation 2006/95/EC.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2004/108/EG nach folgenden Normen:

For verification in accordance with CE directive 2004/108/EC the following standards were applied:

EN 55022 : 2008 - 05
EN 55024 : 2003 - 10

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 01.02.2010

Dr.-Ing. Stefan Weiße
Entwicklungsleiter, Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

CE

CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EG-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EC directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 2^{pro}**
Designation for equipment: High-Speed Communication Add-On Board

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2006/95/EG.

The product meets the CE Low Voltage Regulation 2006/95/EC.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2004/108/EG nach folgenden Normen:

For verification in accordance with CE directive 2004/108/EC the following standards were applied:

EN 55022 : 2008 - 05
EN 55024 : 2003 - 10

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 22.08.2011

Dr.-Ing. Stefan Weiße
Entwicklungsleiter, Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EU-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EU directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 2^{pro} V2**
Designation for equipment: High-Speed Communication Add-On Board

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2014/35/EU.

The product meets the CE Low Voltage Regulation 2014/35/EU.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2014/30/EU nach folgenden Normen:

For verification in accordance with CE directive 2014/30/EU the following standards were applied:

EN 55022 : 2011 - 12
EN 55024 : 2011 - 09

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 01.07.2016

Matthias Noack
Entwicklungsleiter Hardware,
Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

CE Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der einschlägigen EU-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EU directives. A conformity assessment method as provided for in the directives has been performed.

Firma: **PLS** Programmierbare Logik & Systeme GmbH
Company: Technologiepark D - 02991 Lauta

Gerätebezeichnung: **Universal Access Device 2^{next}**
Designation for equipment: High-Speed Trace and Communication Add-On Device

Das Produkt erfüllt die Bestimmungen der Richtlinie Niederspannungsrichtlinie 2014/35/EU.

The product meets the CE Low Voltage Regulation 2014/35/EU.

Der Nachweis der elektromagnetischen Verträglichkeit erfolgte entsprechend EG-Richtlinie 2014/30/EU nach folgenden Normen:

For verification in accordance with CE directive 2014/30/EU the following standards were applied:

EN 55022 : 2011 - 12
EN 55022 1 : 2016 - 08
EN 55024 : 2011 - 09

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- Sonstige Technische Dokumentation

The above company shall keep the following technical documentation in readiness for inspection:

- Operating instructions
- Design diagrams
- Test documents
- Other technical documentation

Lauta, 01.05.2017

Matthias Noack
Entwicklungsleiter Hardware,
Chief-Technical-Officer
PLS Programmierbare Logik & Systeme GmbH

Appendix E - Copyrights

List of Open Source Software Components

This chapter contains a list of open source software (OSS) components used within the product under the terms of the respective licenses. The source code corresponding to the open source components is also provided along with the product wherever mandated by the respective OSS license.

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