



# Infineon DAP/DAPE II Active Probe Hardware User Manual

V1.1, September 2023

## **General safety instructions**

Please read the following safety precautions carefully before putting this device to use to avoid any personal injuries, damage to the instrument, or to the target system. Use this instrument only for its intended purpose as specified by this manual to prevent potential hazards.

## **Use included power cord and power supply**

The enclosed power supply has been approved for use by iSYSTEM. Please contact iSYSTEM if you need to consider an alternative power.

## **Use grounding wire**

Prior to applying power to either the BlueBox or the target, connect the device and the target system together with the included grounding wire. This is to avoid potential damage caused by any voltage difference between the device and the target system.

## **Use proper overvoltage protection**

Ensure proper protection to avoid exposing the BlueBox device or the operator to overvoltage surges (e.g. caused by thunderstorm, mains power).

## **Do not operate without cover**

Do not operate the device with cover removed.

## **Avoid circuit and wire exposure**

Do not touch exposed components or wires when the device is powered.

## **Do not operate with suspected damage**

If you suspect damage may have occurred, the BlueBox device must be inspected by qualified service personnel before further operation.

## **Do not operate the device outside its rated supply voltage or environmental range**

Consult with iSYSTEM before using equipment outside of the parameters provided in this manual.



This symbol is used within the manual to highlight further safety notices.




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# Package content

Infineon DAP/DAPE II Active Probe enables debugging, tracing and testing of Infineon's AURIX™ microcontroller family. It supports DAP and DAPE debug interface operating at their maximum frequency. Its small and compact hardware size allows for connecting to a target microcontroller in a confined space as far as 10 m away.

The Infineon DAP/DAPE II Active Probe kit is delivered with the following components:

Infineon DAP/DAPE II Active Probe	Two 10-pin 1.27mm 10cm long ribbon cables	1m FNet Cable
Ordering code: IC57163-1	Ordering code: IA10PIN10PIN127-AP	Ordering code: BB-FNET-100
		

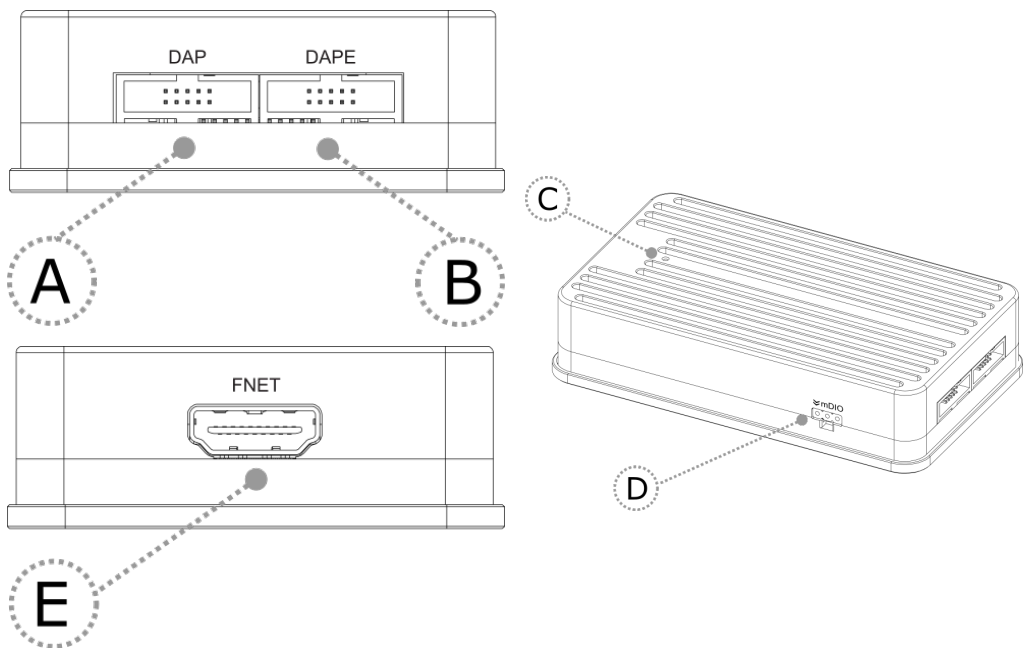
# Specifications

GENERAL	
Supply voltage	9.0V DC via FNet cable
Operating temperature	10°C to 40°C
Storage temperature	-10°C to 60°C
Humidity	5% to 80% RH
MECHANICAL	
Size	95 x 55 x 20 mm
Weight	0.155 kg
Cable length	10 cm
OPERATION	
Communication interface to BlueBox	iSYSTEM proprietary FNet
Debug signal valid input voltage range	5.0V (max. 5.5V)
Power consumption	Max. 2.5 W (dependent on operation mode)
TARGET SIGNALS	
Debug signals	33 Ohm series termination/protection resistors
DAP1-3 and DAPE1-3	10k Ohm pull-down
DAP_RESET	1k Ohm pull-up



5 mA via VREF needed for hot-attach functionality.

# Operation



**A** – 10-pin DAP connector, with the following pinout:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
I	Reference Voltage	Vref	1	2	DAP1	DAP Data	I/O
	Ground	GND	3	4	DAPE0	DAP Clock	O
	Ground	GND	5	6	DAP2	Optional 2nd Data Pin	I/O
	Not Connected	NC	7	8	nTRST/DAPE <sub>N</sub>	Optional 3rd Data Pin	I/O
	Ground	GND	9	10	nRESET	Reset	O



*10-pin DAP pinout*

**B** – 10-pin DAPE connector, with the following pinout:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
I	Reference Voltage	Vref	1	2	DAPE1	DAP Data	I/O
	Ground	GND	3	4	DAPE0	DAP Clock	O
	Ground	GND	5	6	DAPE2	Optional 2nd Data Pin	I/O
	Not Connected	NC	7	8	DAPEN/DAP <sub>3</sub>	Optional 3rd Data Pin	I/O
	Ground	GND	9	10	NC	Not Connected	

*10-pin DAPE pinout*

**C** – The indicator light provides the status of the Active Probe as follows:

-  Permanently green – Powered on and ready to use.
-  Blinking green – Establishing connection with the BlueBox.



Blinking blue – Reprogramming SPLASH.



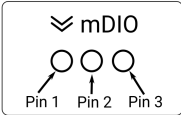
Permanently magenta – Golden image loaded and ready to use.

**D** – mDIO port with the marked Pin1 on the housing

mDIO port provides two digital signals, which can interact with the embedded target. Each can be configured either for input or output operation.

Number	Name
Pin1	IO0
Pin2	IO1
Pin3	GND

*mDIO port pinout*



*mDIO port on the Active Probe*

**E** – FNet connector, that connects the Active Probe to the iC5700 BlueBox. The FNet cable is delivered with the Active Probe.

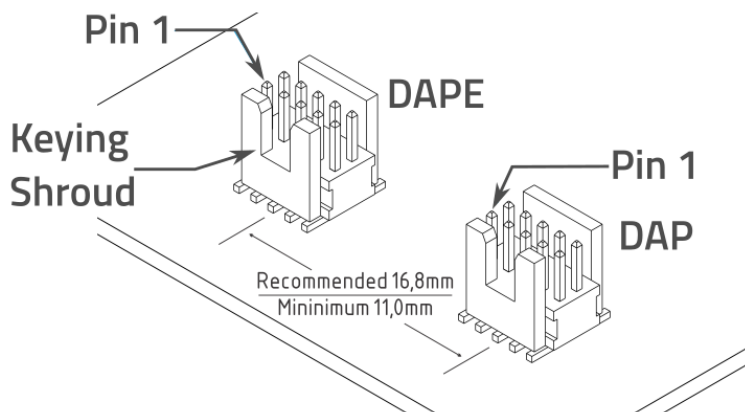


When powering on the system, switch the BlueBox on before powering on the target. When powering down the system, power off the target before powering off the BlueBox!  
Use only original accessories for powering and connecting with the BlueBox. Consult with technical support before attempting to use any other accessory.

# Recommended Target Debug Connectors and Position

The target debug connector is a 10-pin, 1.27mm, double-row connector (e.g. Samtec FTSH-105-01-L-DV, Samtec FTSH-105-01-L-DV-K with Keying Shroud).

1. Use the target debug connector(s) with the **Keying Shroud** option since incorrect connection can cause damage to the hardware.
2. Pin 1 of the connector(s) should be located toward the PCB's edge to prevent the need to twist or fold the debug ribbon cable(s) (see the picture below).
3. When using DAP and the DAPE debug interfaces, the **DAPE connector** should be placed to the left of the **DAP connector** when looking from the edge of the PCB. The connectors must be at least 11.0 mm apart, although a distance of 16.8 mm is recommended. The goal should be to link the Active Probe to the target hardware via non-twisted and, when DAPE is used, parallel ribbon cables.



# mDIO cable



Ordering code

BB-AP-MDIO-20

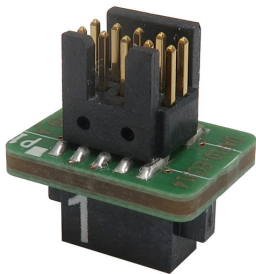
mDIO Cable is used to connect the Active Probe mDIO port with the signals around the debugged microcontroller, which can then be either read or controlled by the debugger. For example, the debugger can periodically service an external watchdog through the mDIO output or just read and record an external signal through the mDIO input. It must be ordered separately. Length of the cable is 20 cm.

The following pinout is valid on the Active Probe side:

Number	Name	Color
Pin1	IO0	White
Pin2	IO1	Brown
Pin3	GND	Black

mDIO Cable pinout

# ECU14 DAP 10-pin 1.27mm Converter



Ordering code	IADAP10ECU14
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The ECU14 converter and the pinout has been defined by Bosch. The ECU14 DAP 10-pin converter is connecting at the end of the 10-pin 1.27mm Infineon DAP2 Wide D. Adapter (Ordering code IC50163-2) or [Infineon DAP/DAPE II Active Probe](#) (Ordering code IC57163-1) acting as a pinout converter is available for TriCore targets featuring the ECU14 10-pin 1.27mm target debug connector. It must be ordered separately.

**A1** - The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
	Ground	GND	1	2	DAP0	DAP clock	O
	Not Connected	NC	3	4	DAP2	Optional 2nd Data pin	I/O
I/O	DAP Data pin	DAP1	5	6	DAPEN	Optional 3rd Data pin	I/O
	Not Connected	NC	7	8	Vref	Reference voltage	I
	Not Connected	NC	9	10	nRESET	Reset	O

Revision A1: 10-pin ECU14 target pinout

**A2** - The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
	Ground	GND	1	2	DAP0	DAP clock	O
I/O	Optional 3rd Data pin	nTRST/DAPE N	3	4	DAP2	Optional 2nd Data pin	I/O
I/O	DAP Data pin	DAP1	5	6	DAPEN	Optional 3rd Data pin	I/O
	Not Connected	NC	7	8	Vref	Reference voltage	I
	Not Connected	NC	9	10	nRESET	Reset	O

Revision A2: 10-pin ECU14 target pinout

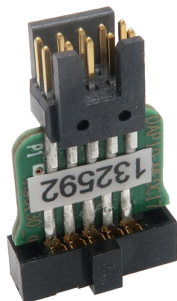
Signal Direction is described from the BlueBox perspective.



The pin next to the alignment pin is pin 10 and not pin 1!  
Pin is marked with a number 1 directly on the converter target connector.



# MEDC17 DAP 10-pin 1.27mm Converter



Ordering code

IADAP10MEDC17


The MEDC17 converter and the pinout has been defined by Bosch. Converter is connected at the end of the 10-pin 1.27mm Infineon DAP2 Wide D. Adapter (Ordering code IC50163-2) or [Infineon DAP/DAPE II Active Probe](#) (Ordering code IC57163-1) acting as a pinout converter and is available for TriCore targets featuring the MEDC17 10-pin 1.27mm target debug connector. The adapter must be ordered separately.

The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
			1	2			
	Ground	GND	3	4	DAP0	DAP clock	O
I/O	DAP Data pin	DAP1	5	6			
I/O	Power on Reset	nRESET	7	8	nTRST/DAPEN	Optional 3rd Data pin	I/O
I/O	Reference Voltage	Vref	9	10	DAP2	Optional 2nd Data pin	I/O


10-pin MEDC17 target pinout

Signal Direction is described from the BlueBox perspective.



The pin next to the alignment pin is pin 10 and not pin 1!

Pin is marked with a number 1 directly on the converter target connector.



The converter connects to the target via a 10-pin 1.27mm connector, Samtec SFM-105-02-L-D-A. A target should feature a matching part, for example Samtec TFM-105-02-L-D.

# 10-pin DAP2 to 22-pin ERF8 DAP2 Converter



Ordering code	IA10PINDAP22PINSAM
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A converter connecting at the end of the 10-pin 1.27 mm DAP debug cable is available for Infineon 22-pin ERF8 Aurix pinout. This converter must be ordered separately.

The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
	Not Connected	NC	1	2	Vref	Reference Voltage	I
	Not Connected	NC	3	4	DAP0	DAP Clock	O
	Ground	GND	5	6	DAP1	DAP Data pin	I/O
	Not Connected	NC	7	8	NC	Not Connected	
	Not Connected	NC	9	10	DAP2	Optional 2nd Data pin	I/O
	Ground	GND	11	12	nTRST	JTAG	O
	Not Connected	NC	13	14	NC	Not Connected	
	Not Connected	NC	15	16	NC	Not Connected	
	Ground	GND	17	18	NC	Not Connected	
	Not Connected	NC	19	20	NC	Not Connected	
	Not Connected	NC	21	22	RESET	Reset	I/O

22-pin ERF8 AURIX target pinout

Signal Direction is described from the BlueBox perspective.



When initially connecting the BlueBox to a target, ensure the debug adapter pinout matches the Target connector to avoid potential hardware failure.

This debug adapter features resettable fuses on pins 2, 4, 5, 6, 10, 11, 12, 17 and 22. These fuses protect debug signals against overcurrent and cycle back to a conductive state after the excessive current fades away.

The debug adapter connects to the target via a 22-pin ERF8 connector, Samtec ASP-137971-02. The target must have populated a matching part, for example Samtec ASP-137969-01, Samtec Series ERF8, Rugged High Speed Socket.

[Cross Table Converters/Debug Adapters/Active Probes](https://www.isystem.com/cross-table)  
[isystem.com/cross-table](https://www.isystem.com/cross-table)

[How to connect Hardware \(video\)](https://www.isystem.com/cross-table)  
[isystem.com/connect-hardware](https://www.isystem.com/cross-table)

# DAP 10-pin 1.27mm to HSTCU (USB-C) Converter



Ordering code

IADAP10-HSTCU

This converter is used to connect via 10-pin 1.27mm Infineon DAP2 Wide Debug Adapter (Ordering code IC50163-2) or [Infineon DAP/DAPE II Active Probe](#) (Ordering code IC57163-1) to the USB-C target debug connector. The converter must be ordered separately.



When attaching this converter to the Active Probe, make sure its marking A and marking B is aligned and matches with the markings on the Active Probe connector.

The following pinout is valid on the converter side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
I	Reference Voltage	Vref	1	2	DAP1	DAP Data pin	I/O
	Ground	GND	3	4	DAP0	DAP clock	O
	Ground	GND	5	6	DAP2	Optional 2nd DAP Data pin	I/O
	Not Connected	NC	7	8	DAP3	Optional 3rd DAP Data pin	I/O
	Ground	GND	9	10	nRESET	Reset	I/O

10-pin Infineon DAP pinout

The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
	Ground	GND	A1	B12	NC	Not Connected	
	Not Connected	NC	A2	B11	NC	Not Connected	
	Not Connected	NC	A3	B10	NC	Not Connected	
	Not Connected	NC	A4	B9	NC	Not Connected	
IO	Target Reset Pin	nRESET	A5	B8	DAP1	DAP Data	I
IO	Optional 2nd DAP data	DAP2	A6	B7	nTRST*	JTAG	
IO	Optional 3rd DAP data	DAP3	A7	B6	NC	Not Connected	
O	DAP Clock	DAP0	A8	B5	Vref	Reference Voltage	I
	Not Connected	NC	A9	B4	NC	Not Connected	
	Not Connected	NC	A10	B3	NC	Not Connected	
	Not Connected	NC	A11	B2	NC	Not Connected	
	Ground	GND	A12	B1	GND	Ground	

USB-C pinout

Signal Direction is described from the BlueBox perspective.

\* Permanently pulled-up.



When initially connecting the BlueBox to a target, ensure the debug adapter pinout matches the Target connector to avoid potential hardware failure.

# Hardware Setup and Configuration



For detailed visual presentation of the hardware setup and configuration, refer to [Getting started tutorial](https://kb.isystem.com/start). Use short link [isystem.com/start](https://kb.isystem.com/start).

1. Connect the power supply cable. BlueBox should be switched off.
2. First connect via USB. Later you can configure TCP/IP connection to work remotely.
3. Connect the Grounding wire to the BlueBox and the Target.



If the Grounding wire is not connected, the ground potential difference between the BlueBox and the Target can exceed well over 1000V even before any of the devices are powered up. This voltage difference is discharged over the BlueBox and the Target, leading to the possible destruction of electronic components.

4. Connect FNet cable of Active Probe to the BlueBlux FNet port.



Although it looks similar to the HDMI interface, the FNet Port is not compatible with HDMI or any HDMI accessories.

Connecting iSYSTEM hardware to HDMI accessories will damage the hardware and will render the iSYSTEM hardware warranty void.

5. Allocate the pin 1 on the Target and the ribbon cable connector.
6. Push (and remove) the connector PARALLEL to the Target.
7. (optional) Repeat step 2. and 3. with the DAPE cable.
8. Power ON the hardware in the following order:
  - a. BlueBox
  - b. Target
9. Install winIDEA and create a new workspace.
10. Configure Debug channel modes via *Hardware / CPU Options / SoC*.

► For troubleshooting refer to [Knowledge Base](https://kb.isystem.com) - [kb.isystem.com](https://kb.isystem.com).  
More general settings are described in [winIDEA Help](#).

Analog/Digital and Network Trace

Ordering Code	Description
IC57031	IOM6 Hub (3 x FNet & FBridge)
IC57040	IOM6 CAN/LIN
IC57041	IOM6 ADIO
IC57125-1	ARM HSSTP II Active Probe
IC57163-1	<a href="#">Infineon DAP/DAPE II Active Probe</a>
IC57164	Infineon AGBT Active Probe
IC57150	MPC5x/SPC5x Aurora Active Probe
IC57166	Infineon SGBT (HSTCU) Active Probe

Infineon DAP/DAPE II Active Probe Accessories

Description	Ordering Code
Two 10-pin, 1.27mm, 10cm long DAP interface ribbon cables	IA10PIN10PIN127-AP
ECU14 DAP 10-pin 1.27mm Converter	IADAP10ECU14
MEDC17 DAP 10-pin 1.27mm Converter	IADAP10MEDC17
10-pin DAP2 to 22-pin ERF8 DAP2 Converter	IA10PINDAP22PINSAM
<a href="#">DAP 10-Pin 1.27 to HSTCU (USB-C) Converter</a>	IADAP10-HSTCU
10-pin, 1.27mm, custom length DAP interface ribbon cable	IA10PIN10P-AP-CUST
1.0m FNet Cable	BB-FNET-100
3.0m FNet Cable	BB-FNET-300
5.0m FNet Cable	BB-FNET-500

Please refer to the iC5700 BlueBox for all current iC5700 accessories.



More information about our products on [www.isystem.com](http://www.isystem.com) or via [sales@isystem.com](mailto:sales@isystem.com).

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