

TASKING[®]

**MPC5X/SPC5X AURORA ACTIVE PROBE
HARDWARE USER MANUAL**

V2.2, March 2024

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 TASKING. Please contact TASKING 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 TASKING 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

The MPC5x/SPC5x Aurora Active Probe is delivered with the following components:

MPC5x/SPC5x Active Probe

Ordering code:
IC57150



1m FNet Cable

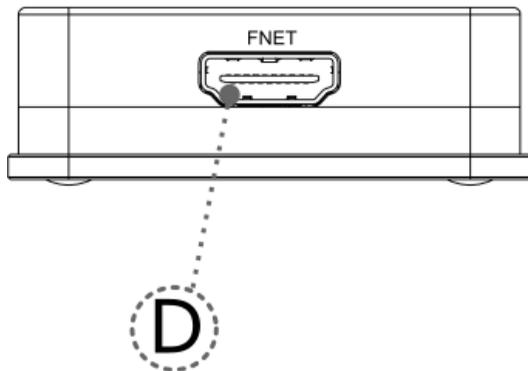
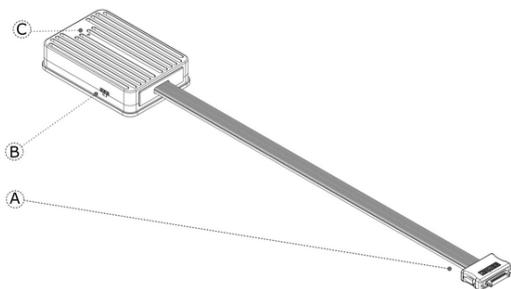
Ordering code:
BB-FNET-100



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	80 x 55 x 18 mm
Weight	0.125 kg
Cable length	31 cm
OPERATION	
Communication interface to BlueBox	TASKING proprietary FNet
Debug signal valid input voltage range	3.3V (max. 3.6V)
Power consumption	Max. 1.5W (dependent on operation mode)
Number of supported AGBT lanes	Up to 4
Maximum AGBT bitrate	5Gbps
AGBT clock source options	Active Probe
PROTECTION	
Debug signals	33 Ohm series termination/protection resistors, ESD protection devices
VREF	1k Ohm input impedance

Device description



A – 34-pin ERF8 MPC5xxx/SPC5 target pinout:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
I	AGBT TX0_P	TX0+	1	2	Vref	Reference Voltage	I
I	AGBT TX0_N	TX0-	3	4	TCK	JTAG	O
	Ground	GND	5	6	TMS	JTAG	O
I	AGBT TX1_P*	TX1+	7	8	TDI	JTAG	O
	AGBT TX1_N*	TX1-	9	10	TDO	JTAG	I
	Ground	GND	11	12	nJCOMP	JTAG TRST (optional)	O
	AGBT TX2_P*	TX2+	13	14	NC	Not Connected	
	AGBT TX2_N*	TX2-	15	16	EVTI0	Nexus Event Input	O (not used)
	Ground	GND	17	18	EVT00	Nexus Event Output	I
	AGBT TX3_P*	TX3+	19	20	nPORESET	Power On Reset	O
	AGBT TX3_N*	TX3-	21	22	nRESET	Reset	IO
	Ground	GND	23	24	GND	Ground	
	Not Connected	NC	25	26	AGBT CLK_P	AGBT Clock	O
	Not Connected	NC	27	28	AGBT CLK_N	AGBT Clock	O
	Ground	GND	29	30	GND	Ground	
	Not Connected	NC	31	32	NC	Not Connected	
	Not Connected	NC	33	34	NC	Not Connected	

34-pin ERF8 MPC5x/SPC5x target pinout

Blue colored signals are Aurora trace signals.

The JCOMP is an optional pin. Some microcontrollers don't have this pin. Internally, this is actually the JTAG TRST, which resets the JTAG TAP state machine. Because the JTAG TAP state machine can be reset also by the TMS and the TCK, this pin is optional also for the debugger. If the microcontroller has the JCOMP pin but it is not connected to the target debug connector, it must be set to the non-active state in the target via a pull-up resistor. If not, then the JTAG TAP state machine remains in reset and debugging is not possible.

Signal direction definition:

O - Output from the Active Probe to the target microcontroller

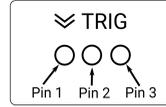
I - Input to the Active Probe from the target microcontroller

B – mDIO port marked as TRIG 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

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 – FNet connector, that connects the Active Probe to the iC7max or iC5700. 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.

Target connector

The target should feature a matching part, for example, Samtec part number: ASP-137973-01.

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

14-pin 2.54mm JTAG Converter



Ordering code

IASAM34MPCPIN14

If your target features 14-pin 2.54mm pitch JTAG target debug connector, use 14-pin 2.54 mm JTAG Converter which acts as a pinout converter. It must be ordered separately. The converter is used only in conjunction with solutions supporting MPC5xxx/SPC5 Aurora trace interface (e.g. MPC5x/SPC5x Aurora Active Probe).

The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
O	JTAG	TDI	1	2	GND	Ground	
I	JTAG	TDO	3	4	GND	Ground	
O	JTAG	TCK	5	6	GND	Ground	
O (not used)	Nexus Event Input	EVTI(EVTI0)	7	8	nPORESET	Power On Reset	O
IO	Reset	nRESET	9	10	TMS	JTAG	O
I	Reference Voltage	Vref	11	12	GND	Ground	
	Not Connected	NC	13	14	nJCOMP	JTAG TRST (optional)	O

14-pin 2.54mm MPC5xxx/SPC5 pinout

Signal Direction is described from the BlueBox perspective.

Mandatory pins on the microcontroller side are GND, VDD, RESET, TMS, TDI, TDO and TCK.

The JCOMP is an optional pin. Some microcontrollers don't have this pin. Internally, this is actually the JTAG TRST, which resets the JTAG TAP state machine. Because the JTAG TAP state machine can be reset also by the TMS and the TCK, this pin is optional also for the debugger. If the microcontroller has the JCOMP pin but it is not connected to the target debug connector, it must be set to the non-active state in the target via a pull-up resistor. If not, then the JTAG TAP state machine remains in reset and debugging is not possible.

Hardware Setup and Configuration



For detailed visual presentation of the hardware setup and configuration, refer to the *Getting started Tutorial* - use the link isystem.com/start.

1. Connect the power supply cable. BlueBox should be switched off.
2. First connect the BlueBox to the PC via USB cable. 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.
5. Connect Active Probe's ribbon cable(s) to the Target.



Although it looks similar to the HDMI interface, the FNet Port is not compatible with HDMI or any HDMI accessories. Connecting the hardware to HDMI accessories will damage the hardware and will render the hardware warranty void.

6. Power ON the hardware in the following order:
 - a. BlueBox
 - b. Target
7. Install winIDEA and create a new workspace.
8. Configure Debug channel modes via **Hardware / CPU Options / SoC**.



For troubleshooting refer to Knowledge Base - use the link kb.isystem.com.

More general settings are described in [winIDEA Help](#).

Accessories

Analog/Digital and Network Trace

Description	Ordering Code
Hub (3 x FNet & FBridge)	IC57031
CAN/LIN	IC57040
ADIO	IC57041
ARM HSSTP II Active Probe	IC57125-1
Infineon DAP/DAPE II Active Probe	IC57163-1
Infineon AGBT Active Probe	IC57164
MPC5x/SPC5x Aurora Active Probe	IC57150
Infineon SGBT (HSTCU) Active Probe	IC57166
RH850 Aurora Active Probe	IC57176

MPC5x/SPC5x Active Probe Accessories

Description	Ordering Code
1.0m FNet Cable	BB-FNET-100
3.0m FNet Cable	BB-FNET-300
5.0m FNet Cable	BB-FNET-500
14-pin 2.54 mm JTAG Adapter	IASAM34MPCPIN14
mDIO Cable	BB-AP-MDIO-20

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



More information about our products via sales@tasking.com.

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