TASKING®

RH850 AURORA ACTIVE PROBE HARDWARE USER MANUAL

V1.4, 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.

Contents

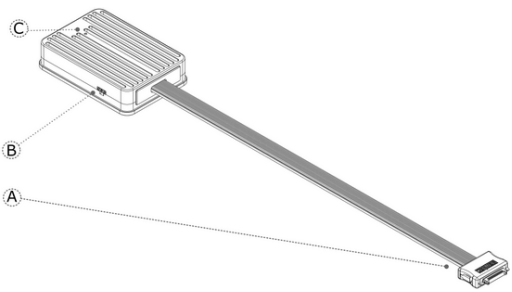
Introduction

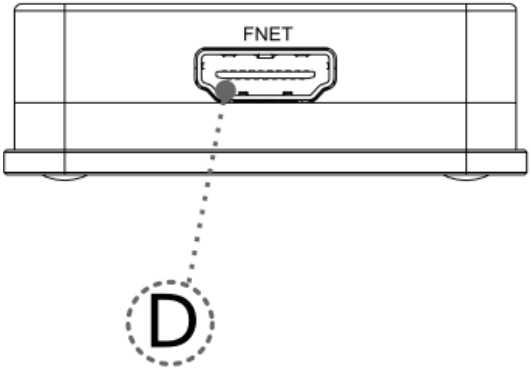
The RH850 Aurora Active Probe is delivered with the following components:

RH850 Aurora Active Probe	1m FNet Cable
Ordering code: IC57176	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
OPERATION	
Communication interface to BlueBox	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





A – RH850 Aurora target pinout:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
I	AGBT TX0_P	TX0_P	1	2	Vref	Reference Voltage	I
I	AGBT TX0_N	TX0_N	3	4	LPDCLK	Debug Clock	O
	Ground	GND	5	6	TMS	JTAG	O
		Reserved	7	8	LPDI	Debug Signal	O
		Reserved	9	10	LPDO	Debug Signal	I
	Ground	GND	11	12	nTRST	Debug Signal	O
		Reserved	13	14	FLMD0	Flash Mode	O
		Reserved	15	16	nEVTI	Nexus Event Input	O
	Ground	GND	17	18	nEVTO	Nexus Event Output	I
		Reserved	19	20	FLMD1	Flash Mode	
		Reserved	21	22	RESETn	Reset	I/O
	Ground	GND	23	24	GND	Ground	
	Not Connected	NC	25	26	CLK_P	AGBT Clock_P	O
	Not Connected	NC	27	28	CLK_N	AGBT Clock_N	O
	Ground	GND	29	30	GND	Ground	
	Not Connected	NC	31	32	LPDCLKOUT	Debug Clock	I
	Not Connected	NC	33	34	Reserved		

34-pin ERF8 RH850 target pinout

Blue colored signals are Aurora trace signals.
Signal Direction is described from the BlueBox perspective.

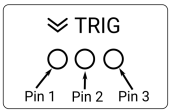
Signal direction definition:
O - Output from the Active Probe to the target microcontroller
I - Input to the Active Probe from the target microcontroller

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	IOØ
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.

mDIO Cable

Ordering code	BB-AP-MDIO-20

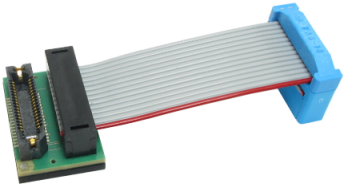
mDIO Cable is used to connect the Active Probe mDIO port with the signals around the debugged microcontroller, which can then be either read or controlled by the debugger. For example, the debugger can periodically service an external watchdog through the mDIO output or just read and record an external 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	IOØ	White
Pin2	IO1	Brown
Pin3	GND	Black

mDIO Cable pinout

14-pin 2.54 mm LPD Adapter



Ordering code	IASAM34RH850PIN14

Adapter must be ordered separately to connect to the target featuring 14-pin 2.54mm pitch LPD target debug connector. This adapter can be used in conjunction with the iC6000 DTM Aurora/LPD module (IC60024-1) and RH850 Aurora Active Prove (Ordering code IC57176).

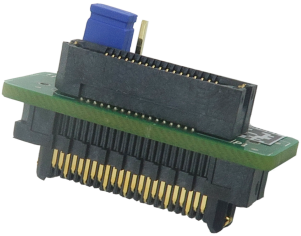
The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
O	LPD	LPDCLK	1	2	GND	Ground	
O	JTAG	TRST	3	4	FLMD0	Flash Mode	O
I	LPD	LPDO	5	6	FLMD1	Flash Mode	
O	LPD	LPDI	7	8	Vref	Reference Voltage	I
O		Reserved	9	10	NC	Not Connected	
I	LPD	LPDCLKOUT	11	12	GND	Ground	
I/O	Reset	RESET	13	14	GND	Ground	

14-pin 2.54mm RH850 target pinout

Signal Direction is described from the BlueBox perspective.

RH850 Aurora 34-pin to Aurora 46-pin Converter



Ordering code	IASAM34RH850SAM46

If your RH850/U2B target features 46-pin target debug connector. It must be ordered separately. The converter is used only in conjunction with RH850 Aurora Active Probe. The following pinout is valid on the Active Probe side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	SignalDirection
I	AGBT TX0_P	TX0_P	1	2	Vref	Reference Voltage	I
I	AGBT TX0_N	TX0_N	3	4	LPDCLK	Debug Clock	O
	Ground	GND	5	6	TMS	JTAG	O
		Reserved	7	8	LPDI	Debug Signal	O
		Reserved	9	10	LPDO	Debug Signal	I
	Ground	GND	11	12	nTRST	Debug Signal	O
		Reserved	13	14	FLMD0	Flash Mode	O
		Reserved	15	16	nEVTI	Nexus Event Input	O
	Ground	GND	17	18	nEVTO	Nexus Event Output	I
		Reserved	19	20	FLMD1	Flash Mode	
		Reserved	21	22	nRESET	Reset	I/O
	Ground	GND	23	24	GND	Ground	
	Not Connected	NC	25	26	CLK_P	AGBT Clock_P	O
	Not Connected	NC	27	28	CLK_N	AGBT Clock_N	O
	Ground	GND	29	30	GND	Ground	
	Not Connected	NC	31	32	LPDCLKOUT	Debug Clock	I
	Not Connected	NC	33	34	WDGDIS	Watchdog disable	O

34-pin RH850 Aurora pinout

The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
I	AGBT TX0_P	TX0_P	1	2	Vref	Reference Voltage	I
I	AGBT TX0_N	TX0_N	3	4	LPDCLK	Debug Clock	O
	Ground	GND	5	6	FLMD1	Flash Mode	O
		Reserved	7	8	nAURORESET*	Debug Signal	
		Reserved	9	10	NC	Not Connected	
	Ground	GND	11	12	nTRST	JTAG	O
		Reserved	13	14	FLMD0	Flash Mode	O
		Reserved	15	16	nEVTI	Nexus Event Input	O
	Ground	GND	17	18	nEVTO	Nexus Event Output	I

		Reserved	19	20	NC	Not Connected	
		Reserved	21	22	nRESET	Reset	I/O
	Ground	GND	23	24	GND	Ground	
	Not Connected	NC	25	26	CLK_P	AGBT Clock_P	O
	Not Connected	NC	27	28	CLK_N	AGBT Clock_N	O
	Ground	GND	29	30	GND	Ground	
	Not Connected	NC	31	32	WDGDIS	Watchdog disable	O
	Not Connected	NC	33	34	NC	Not Connected	
	Ground	GND	35	36	GND	Ground	
	Not Connected	NC	37	38	TMS	JTAG	O
	Not Connected	NC	39	40	LPDI	Debug Signal	O
	Ground	GND	41	42	GND	Ground	
	Not Connected	NC	43	44	LPDO	Debug Signal	I
	Not Connected	NC	45	46	LPDCLKOUT	Debug Clock	I

46-pin RH850 Aurora pinout

*nAURORESET can be connected to nRESET via J1
Signal Direction is described from the BlueBox perspective.

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.

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

RH850 Aurora Active Probe Accessories

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

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

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

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