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iC6000 BlueBox

iC6000 BlueBox On-Chip Analyzer - Hardware and software platform for debugging and testing the embedded microcontroller platforms which are based on the microcontroller architectures featuring the Aurora trace interface.

Functionality can be further extended with the addition of the I/O Module, enabling the synchronous capture of analog and digital signals in parallel to trace information. Such capability is used for advanced debugging of complex applications together with our winIDEA Integrated Development Environment (IDE), as well as for thorough testing in conjunction with our testing environment testIDEA.

Complementing the hardware is a range of software which target three key areas of embedded development: debugging, timing-analysis and testing.

winIDEA - Integration Development Environment (IDE) delivers the visual insights required to debug your embedded application. At the simplest level, winIDEA provides all the usual functionality of an IDE (breakpoints, stepping and device programming). Supported by a target microcontroller, winIDEA can also visualize the timing and code coverage of the application via the trace interface, as well as combine data captured by the IOM6 Accessories. Various third-parties also provide software tools to perform advanced worst-time-execution analysis based upon the data winIDEA can export. When a Real-Time Operating System (RTOS) is in use, the state of the RTOS and its tasks can also be visualized. More information system.com/winideaide.

testIDEA - testIDEA environment simplifies the development of unit tests for embedded applications. By making use of the winIDEA environment, this application makes it easy to locate source code functions and generate test cases for them. Tests are then executed using the Original Binary Code (OBC) method, testing the object code running on the target microcontroller. The tests, which are stored as YAML files, can easily be added to a project, maintained in a repository, and then automatically executed together with Continuous Integration (CI) tools such as Jenkins. More information system.com/testidea.

isystem.connect - There are times when it is more efficient to write a script to execute a task that requires many clicks within a visual development environment. This is where our Software Development Kit (SDK) isystem.connect comes in. The well-documented interface provides access to Python, Java, and other languages so that any action available within winIDEA and testIDEA can be scripted. Scripts can also be executed directly from within winIDEA, thereby allowing the developer to extend its functionality. More information system.com/sdk.

iSYSTEM's solutions run under Microsoft® Windows®, GNU, Linux OS; or optionally within the Eclipse environment via a plugin. Software can be downloaded from the Downloads page at <http://www.isystem.com>.

Important safety notice

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 - Please 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.

Package content

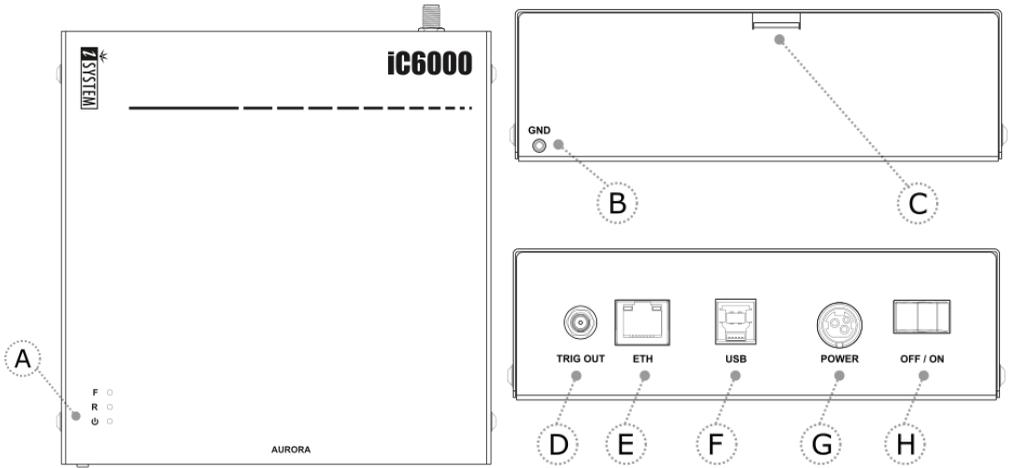
The standard iC5700 order is delivered with the following components:

iC6000 Base Unit including the preassembled Aurora DTM and Aurora Cable	Power supply	USB 3.0 cable
IC60000-1 + IC6002x-1 + IC6004x-1	Ordering code: IC30000-PS	Ordering code: BB-USB30-180
		
Ethernet cable	Grounding wire	User Manual
Ordering code: BB-ETHCAT5-200	Ordering code: BB-WIRE	
		

Specifications

GENERAL	
Operating temperature	10°C to 40°C
Storage temperature	-10°C to 60°C
Humidity	5% to 80% RH
MECHANICAL	
Size	155 x 155 x 65 mm
Weight	approx. 800g
OPERATION	
Communication interfaces to PC	USB 2.0, USB 3.0, 10/100 Ethernet
Supply voltage	10V to 24V DC
Power consumption	< 15W
ELECTRICAL	
Debug signal valid input voltage range	1.8V to 5.5V DC
Debug signals	47 Ohm series termination/protection resistors, ESD protection devices, 100mA resettable fuses
All inputs except the TDO	10 kOhm pull-up resistor
TDO input	10 kOhm pull-down resistor
TMS and TDI debug signals	10 kOhm pull-up resistor
RESET	1k Ohm pull-up resistor, buffer-driven to prevent current flow into an unpowered iC6000 from a powered target board
TAR_VREF (target reference voltage) pin	100 kOhm input impedance

Device overview



Device description

The **top face** of the iC6000 features:

A – The indicator lights provide the status of the iC6000 hardware as follows.

 Power Indicator

- On – Powered on
- Off – Powered off

 R – Running Indicator

- On – Target microcontroller is executing code
- Off – Target microcontroller is halted

 F –Free Indicator

- On – BlueBox is available for a connection from a host PC
- Off – Active connection to the BlueBox from a host PC exists

The **front face** of the iC6000 features:

B – The grounding socket (marked GND) should be used, together with the supplied Grounding Wire to create an electrical connection between the iC6000 and the target circuitry. The socket is suitable for a 2 mm Multi Contact Plug (also known as a Banana Plug) if building a longer or a replacement cable on your own.

C – The location where the Aurora cable exits the iC6000 BlueBox after the assembly.

The **rear face** of the iC6000 features the remaining connectors as follows:

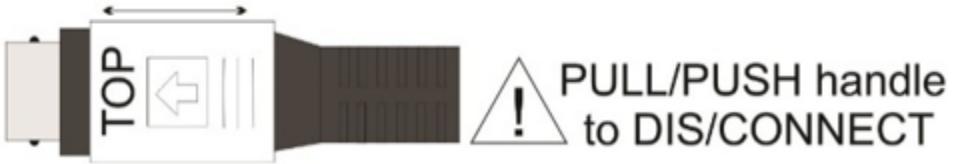
D – Trig Out Socket - BlueBox trace trigger event can optionally stimulate Trig Out signal, on which an external hardware (e.g. oscilloscope or logic analyzer) connected to this socket, can trigger concurrently.

E – 10/100 Ethernet Socket

F – USB 3.0 Socket - It is **highly recommended** to use the supplied USB 3.0 cable delivered with your iC6000 as it has been confirmed to fulfill the maximum USB 3.0 transfer rate (5Gbit/s). Use of alternate cables must be undertaken at your own risk.

The USB 3.0 interface provides the highest possible data transfer rate of the two available interfaces. It is highly recommended to use the USB 3.0 when using the trace feature due to the quantity of data to be uploaded to the PC.

G – Power Supply Socket - The socket and the plug are latching to stop the plug from being accidentally pulled out of the socket. To remove the power plug from the socket, always pull gently of the sleeve of the plug and never on the wire.



Both the 10/100 Ethernet Socket and the USB 3.0 Socket can be connected to a network/PC simultaneously. The active interface will be determined by whichever interface winIDEA connects to first.



*When powering on the system, switch the BlueBox unit on **before** powering on the Target. When powering down the system, power off the Target before powering off the BlueBox unit!*

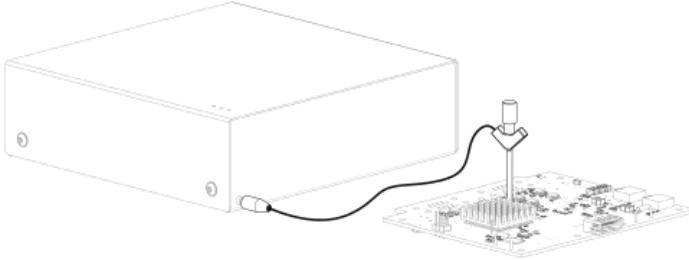
FBridge port is not Ethernet port!

Use only original iSYSTEM accessories for powering and connecting with the BlueBox unit. Consult with iSYSTEM before attempting to use any other accessory.

Connecting the iC6000 to the Target

Grounding wire

Always start by connecting the BlueBox to the Target with the Grounding wire. Refer to www.isystem.com/groundingwire for more information or scan the **QR code** below for a visual representation on how to connect iSYSTEM Hardware.



If the Grounding wire is not connected, the ground potential difference between the BlueBox hardware 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 hardware and the Target, leading to the possible destruction of electronic components within the BlueBox hardware, the Target or both.

Power Supply

The iC6000 unit accepts a wide input voltage range from 10V to 24V DC, thus enabling the BlueBox hardware to work also with a 12V or 24V vehicle battery.

The necessary power supply (Part No. IC30000-PS) is delivered with the unit. The power supply comes with the EU (type F power plug), USA (type B power plug), India (type D power plug) or China (type I power plug) power cord depending on the delivery address. Refer to the [Accessories](#) chapter for a spare power cord when required. An optional 12V power supply adapter suitable for use in a vehicle can be ordered using the ordering code IC30000-PS-CAR12V.

Aurora DTM module

The iC6000 comes preassembled with one of the available Aurora DTM modules supporting different debug interfaces.

The target microcontroller architecture and the debug interface type must be specified when ordering the iC6000. Based on this information, the corresponding Aurora DTM module and [High-Speed Aurora cable](#) are mounted and delivered with the iC6000 order.

If a later Aurora DTM module exchange is required, for example to connect the iC6000 to the microcontroller architecture supported by different Aurora DTM module, the exchange has to be carried out by iSYSTEM.

Next table shows which Aurora DTM module is required for the specific debug interface and which High-Speed Aurora cable is required for the specific microcontroller architecture:

Architecture	Debug Interface	Trace Interface	iC6000 Aurora DTM Ordering Code	iC6000 Aurora Cable Ordering Code
Freescale MPC57xx	JTAG	Aurora	iC60022-1	iC60041-1
ST SPC57	JTAG		iC60022-1	iC60041-1
Infineon Aurix	JTAG		iC60022-1	iC60040-1
Infineon Aurix	DAP		iC60023-1	iC60040-1
Renesas RH850	LPD		iC60024-1	iC60042-1

The iC6000 Hardware Configuration

Infineon Aurix microcontrollers can provide two debug interfaces, the **JTAG** and the **DAP** interface. The user has to have this in mind during the target design by connecting accordingly the JTAG or the DAP debug interface signals to the target debug connector.

The DAP interface has better throughput performance and features less physical signals comparing to the JTAG interface. Therefore, the DAP is the recommended debug interface for the Aurix family.

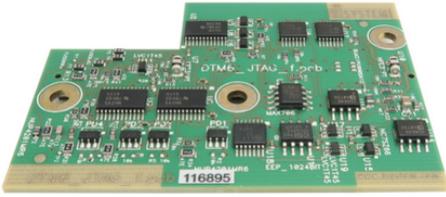
The Aurora DTM module features protection and minimal electronic logic adjusting the iC6000 to the specific target microcontroller debug interface. Refer to the [Specifications](#) chapter for more details.



Make sure that the matching High-Speed Aurora cable is used together with the specific DTM Aurora module.

The following Aurora DTM modules are available:

iC6000 DTM Aurora/JTAG (MPC57xx, SPC57, Aurix)



Ordering code

IC60022-1

iC6000 DTM Aurora/DAP (Aurix)



Ordering code

IC60023-1

Both, 2-pin and 3-pin (Wide Mode) DAP debug interfaces are supported. The DAP interface width is configurable in winIDEA.

iC6000 DTM Aurora/LPD (RH850)



Ordering code

IC60024-1

High-Speed Aurora cable

The iC6000 comes preassembled with one of the available High-Speed Aurora cables supporting different microcontroller architectures.

The target microcontroller architecture and the debug interface type must be specified when ordering the iC6000. Based on this information, the according Aurora DTM module and High-Speed Aurora cable are mounted and delivered with the iC6000 order. Refer to the above table to see which High-Speed Aurora cable is required for the specific microcontroller architecture and which Aurora DTM module is required for the specific debug interface:

The High-Speed Aurora cable comes preassembled with the iC6000. For this reason, the target microcontroller architecture and the debug interface type must be specified when ordering the iC6000.

22-pin High-Speed Aurora cable for Infineon Aurix



Ordering code	IC60040-1
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This cable is required to connect the iC6000 to Infineon Aurix based target featuring Samtec 22-pin ERF8 debug connector.

Target connector and the placement

The target should feature a matching part, for example, Samtec part number: ASP-137969-01 (Samtec Series ERF8, Rugged High Speed Socket).

It's recommended to position the connector in a way that even-numbered signals are located at the edge of the PCB. This way the Aurora cable connects to the target debug connector without being twisted.

Infineon Aurix microcontrollers can provide two debug interfaces, the JTAG and the DAP interface. The user has to have this in mind during the target design by connecting accordingly the JTAG or the DAP debug interface signals along the Aurora trace interface to the 22-pin ERF8 target debug connector.



For the JTAG debug interface, this cable is used in conjunction with the Aurora/JTAG DTM (ordering code IC60022-1).

For the DAP debug interface, this cable is used in conjunction with the Aurora/DAP DTM (ordering code IC60023-1).

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+	1	2	Vref	Reference Voltage	I
I	AGBT TX0_N	TX0-	3	4	TCK / DAP0	JTAG / DAP Clock	O / O
	Ground	GND	5	6	TMS / DAP1	JTAG / DAP Data pin	O / IO
	Not Connected	NC	7	8	TDI	JTAG	O
	Not Connected	NC	9	10	TDO	JTAG	I
	Ground	GND	11	12	nTRST	JTAG	O
	Not Connected	NC	13	14	CLK+	AGBT Clock	O
	Not Connected	NC	15	16	CLK-	AGBT Clock	O
	Ground	GND	17	18	TGO	AGBT Trigger out	I
	Not Connected	NC	19	20	NC	Not Connected	O
	Not Connected	NC	21	22	nPORST	Power On Reset	IO

22-pin ERF8 Aurix target pinout

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

Infineon TriCore target can also feature a standard 10-pin 1.27mm DAP or 16-pin 2.54mm JTAG target debug connector exposing only the debug interface without the Aurora trace interface.

The iC6000 unit can be used to connect to such targets through a small adapter connecting at the end of the 22-pin High-Speed Aurora cable.

10-pin 1.27 mm DAP Adapter



Ordering code

IASAM22TRICOREPIN10-1

Infinion TriCore target can also feature a standard 10-pin 1.27mm DAP target debug connector exposing only the debug interface without the AGBT interface. The Active Probe can be used to connect to such targets through a small adapter connecting at the end of Samtec 22-pin ERF8 connector. The 10-pin connector 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
I	Reference Voltage	Vref	1	2	DAP1	DAP Data pin	O / IO
	Ground	GND	3	4	DAP0	DAP Clock	O / O
	Ground	GND	5	6	DAP2	Optional 2nd Data pin	I
	Not Connected	NC	7	8	DAPEN	Optional 3rd Data pin	O
	Ground	GND	9	10	nPORST	Power On Reset	IO

10-pin 1.27mm TriCore DAP pinout

Signal Direction is described from the BlueBox perspective.

If the 10-pin 1.27 mm pitch ribbon cable gets damaged, it can be ordered as a spare part under the ordering codes:

- IA10PIN10PIN127
- IA10PIN10PIN127-CUST - Custom cable length must be specified at the order.

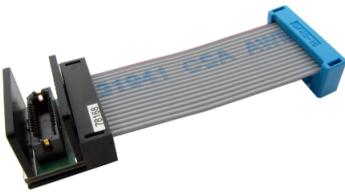


Note that the optional length should be reasonable (e.g. 10 cm) since the quality of electrical signals degrades with prolonging the cable.



iSYSTEM gives no assurance for BlueBox operation with this cable. The cable is meant to be used only for boundary cases where BlueBox can't be connected to the target hardware through the standard debug adapter, e.g. due to the physical obstacles of the target system. In such cases, operating the BlueBox at lower debug frequency scan speeds and not using the trace functionality at all, might be still an acceptable compromise. It's up to the user to thoroughly test and qualify the BlueBox operation using custom length ribbon cable and to determine working winIDEA settings for the system.

16-pin 2.54 mm JTAG Adapter



Ordering code

IASAM22TRICOREPIN16

This adapter must be ordered separately to connect to the target featuring 16-pin 2.54mm pitch JTAG target debug connector. The adapter can be used only in conjunction with the iC6000 DTM Aurora/JTAG module (IC60022-1).

The following pinout is valid on the target side:

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
O / IO	JTAG / DAP Data pin	TMS / DAP1	1	2	Vref	Reference Voltage	I
I	JTAG	TDO	3	4	GND	Ground	
	Not Connected	NC	5	6	GND	Ground	
O	JTAG	TDI	7	8	nPORST	Power On Reset	IO
O	JTAG	nTRST	9	10	NC	Not Connected	
O / O	JTAG / DAP Clock	TCK / DAP0	11	12	GND	Ground	
	Not Connected	NC	13	14	NC	Not Connected	
	Not Connected	NC	15	16	NC	Not Connected	

16-pin 2.54mm TriCore JTAG pinout

Signal Direction is described from the BlueBox perspective.

34-pin High-Speed Aurora cable for NXP MPC57xx and ST SPC57



Ordering code

IC60041-1

This cable is delivered under the IC60041-1 ordering code and is required to connect the iC6000 to Freescale MPC57xx or ST SPC57 based target providing Samtec 34-pin ERF8 debug connector.

Target connector and the placement

A target should feature a matching part, for example, Samtec part number: ASP-137973-01 (Samtec Series ERF8, Rugged High Speed Socket). It's recommended to position the connector in a way that even-numbered signals are located at the edge of the PCB. This way the Aurora cable connects to the target debug connector without being twisted.

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+	1	2	Vref	Reference Voltage	I
I	AGBT TX0_N	TX0-	3	4	TCK	JTAG	O

Signal Direction	Signal Description	Signal	Pin	Pin	Signal	Signal Description	Signal Direction
	Ground	GND	5	6	TMS	JTAG	0
		AGBT TX_P1	7	8	TDI	JTAG	0
		AGBT TX_N1	9	10	TDO	JTAG	I
	Ground	GND	11	12	JCOMP	JTAG TRST (optional)	0
		AGBT TX_P2	13	14	NC	Not Connected	
		AGBT TX_N2	15	16	EVTI0	Nexus Event Input	0 (not used)
	Ground	GND	17	18	~EVT00	Nexus Event Output	I
		AGBT TX_P3	19	20	nPORST	Power On Reset	0
		AGBT TX_N3	21	22	nRESET	Reset	IO
	Ground	GND	23	24	GND	Ground	
	Not Connected		25	26	AGBT CLK_P	AGBT Clock	0
	Not Connected	NC	27	28	AGBT CLK_N	AGBT Clock	0
	Ground	GND	29	30	GND	Ground	
	Not Connected	NC	31	32	NC	Not Connected	
	Not Connected	NC	33	34	NC	Not Connected	

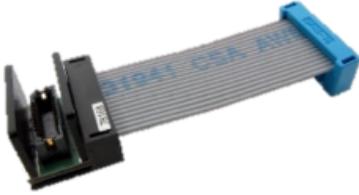
34-pin ERF8 MPC57xx / SPC57 target pinout

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

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.

NXP MPC5xxx and ST SPC5 target can also feature a standard 14-pin 2.54mm JTAG target debug connector exposing only the debug interface without the Aurora interface. The iC6000 unit can be used to connect to these targets through a small adapter connecting at the end of the 34-pin High-speed Aurora cable.

14-pin 2.54 mm JTAG Adapter



Ordering code

IASAM34MPCPIN14

If your target features 14-pin 2.54mm pitch JTAG target debug connector, use iSYSTEM 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 iSYSTEM solutions supporting MPC5xxx/SPC5 Aurora trace interface (e.g. MPC5x/SPC5x Aurora Active Probe or iC6000 BlueBox in conjunction with DTM Aurora/JTAG module (IC60022-1)).

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(EVTIO)	7	8	nPORST	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.

34-pin High-speed Aurora cable for Renesas RH850



Ordering code

IC60042-1

This cable is delivered under the IC60042-1 ordering code and is required to connect the iC6000 to Renesas RH850/P1H-C based target providing Samtec 34-pin ERF8 debug connector.

Target connector and the placement

The target should feature a matching part, for example, Samtec part number: ASP-137973-01 (Samtec Series ERF8, Rugged High Speed Socket). It's recommended to position the connector in a way that even-numbered signals are located at the edge of the PCB. This way the Aurora cable connects to the target debug connector without being twisted.

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	JTAG	O
	Ground	GND	5	6	Reserved		
I	AGBT TX1_P	TX1_P	7	8	LPDI	JTAG	O
I	AGBT TX1_N	TX1_N	9	10	LPDO	JTAG	I
	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	nEVT0	Nexus Event Output	I
		Reserved	19	20	FLMD1	Flash Mode	
		Reserved	21	22	RESETn	Reset	IO
	Ground	GND	23	24	GND	Ground	
		Reserved	25	26	CLK_P	AGBT Clock	O
		Reserved	27	28	CLK_N	AGBT Clock	O
	Ground	GND	29	30	GND	Ground	
		Reserved	31	32	LPDCLKOUT	LPD	I
		Reserved	33	34	Reserved		

34-pin ERF8 RH850 target pinout

Blue colored signals are Aurora trace signals.

Signal Direction is described from the BlueBox perspective.

Renesas RH850 target can also feature a standard 14-pin 2.54mm LPD target debug connector exposing only the debug interface without the Aurora interface. The iC6000 can be used to connect to these targets through a small adapter connecting at the end of the 34-pin High-speed Aurora cable.

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 Probe (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.

Aurora Interface Board Layout Guidelines



Aurora interface runs at speeds up to 5Gbps, which means high-speed board layout guidelines and practice must be considered while routing Aurora physical interface from the transmitter to the receiver.

On the iC6000 side the Aurora interface lines are connected directly to the FPGA implementing the physical Aurora interface. These lines exhibit the following characteristics:

Aurora receive data lanes (AGBT_TX marked on the target side)

To ensure interoperability between drivers and receivers of different vendors, AC coupling at the receiver input is used. 100nF AC coupling capacitors for connection to the transmitter are used at Aurora receiver input pins.

Aurora transmit data lanes (AGBT_RX marked on the target side)

This direction is normally not applicable for Nexus trace operation. The iC6000 has no AC coupling capacitors on these lines. They must be located on the target (receiver) side.

Aurora clock lane (AGBT_CLK marked on the target side)

100nF AC coupling capacitors are located on the CLK output to protect drivers from possibly getting shorted. Target side has usually its own AC coupling.

The following guidelines should be considered during the target board layout design to ensure the correct operation of the Aurora trace interface. Note that the quality (signal integrity) of the Aurora interface signals to the external Aurora capable trace tool is critical for correct and reliable trace operation.

- All Aurora trace port lines on the PCB should be as short as possible (max 2.5 cm).
- Traces should run on the same layer, or layers with the same impedance.
- Preferred layer impedance is 50 Ohm.
- Samtec ERF8 connector ground pins should be connected directly to the PCB GND plane.
- Trace clock should have only point-to-point connection. Stubs must be strictly avoided.
- It is strongly recommended for the data lines to be point-to-point only too. If any stubs are needed, they should be as short as possible. When longer are required, there should be a possibility to optionally disconnect them (e.g. by solder jumpers).

Trace port data bus inner crosstalk is not so important, but it is critical to isolate the whole bus from the other target signals, including from the Aurora trace clock.

Aurora DTM modules

Different target debug interfaces are supported through a specific Aurora DTM module. The Aurora DTM module exchange can be carried out by iSYSTEM only.

Ordering code	Description
IC60022-1	iC6000 DTM Aurora/JTAG (MPC57xx, SPC57, Aurix)
IC60023-1	iC6000 DTM Aurora/DAP (Aurix)
IC60024-1	iC6000 DTM Aurora/LPD (RH850)

High-Speed Aurora cable

Different High-Speed Aurora cables are available to connect the iC6000 to the specific embedded target architecture.

Ordering code	Description
IC60040-1	22-pin High-speed Aurora cable for Infineon Aurix
IC60041-1	34-pin High-speed Aurora cable for NXP MPC57xx and ST SPC57
IC60042-1	34-pin High-speed Aurora cable for Renesas RH850

Power supplies and cables

Ensure proper operation of your iC6000 operation by using approved iSYSTEM power supplies and cables.

Ordering code	Description
IC30000-PS	19V Power Supply
IC30000-PS-CAR12V	12V Car Power Supply
BB-USB30-180	1.8 m USB 3.0 Cable
BB-USB30-A10M	10 m Active USB 3.0 Cable (type A-A)
BB-PSC-EU	Power Supply Cord - EU Plug (type F Plug)
BB-PSC-US	Power Supply Cord - USA Plug (type B Plug)
BB-PSC-IN	Power Supply Cord - India Plug (type D Plug)
BB-PSC-CN	Power Supply Cord - China Plug (type I Plug)
BB-ETHCAT5-200	2 m Cat 5 Ethernet Cable
BB-WIRE	Grounding Wire

EU Declaration of Conformity (DoC)

We

iSYSTEM AG für Informatiksysteme
Carl-Zeiss-Str. 1, 85247 Schwabhausen
Germany

declare that the DoC is issued under our sole responsibility and belongs to the following product:

BlueBox debugger and analyzer solution
Type: iC3000, iC5000, iC5500, iC5700, iC6000, iTAG.2K

Identification allowing traceability:

Object of the declaration is identified by a product type and unique serial number for each individual device.

The object of declaration described above is in conformity with the relevant Union harmonization legislation:

EMC directive 2014/30/EU and RoHS directive 2011/65/EU

The following harmonized standards and technical specifications have been applied to:

- EN 55032: 2012
- EN 55024: 2010
- EN 61000 - 3 - 2: 2014
- EN 61000 - 3 - 3: 2013

Signed for and on behalf of:



Martin Gröstenberger, CFO



Werner Fischer, COO

Schwabhausen, 21. March 2017

iSYSTEM AG f. Informatiksysteme - Carl-Zeiss-Str. 1 - 85247 Schwabhausen - USt-IdNr. DE128231221
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