

# 3 20e\_cTI-60t\_TI Pin Converter

The **20e\_cTI-60t\_TI** Pin Converter is designed to attach an emulator cable with a 20-pin cTI JTAG connection to a target board with 60 pin trace connector.

1. **Make sure the target is not powered when connecting!**
2. Connect the 20 pin Male connector to your cTI emulator.
3. Connect the 60 pin Male socket to your target board.

## WARNING

Caution should be exercised in connecting this adapter to the JTAG emulator and the target JTAG header. Pay special attention to the orientation and keying and pin outs. Be careful to connect with the correct orientation. This adapter is not intended to be hot pluggable. Unplug power from all sources prior to connect or disconnect.

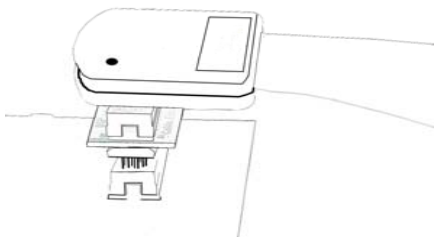
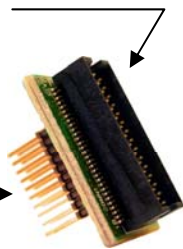


FIGURE 1—Typical target board cable connection orientation

Target Board Connection:  
60 pin SAMTEC connector

Emulator Connection:  
20 pin cTI male header  
(0.050" x 0.100")



## 60-Pin Target TI Header Pin out

Pin	Name	Pin	Name	Pin	Name
A1	GND	B6	EMU12	C11	EMU6
A2	GND	B7	TDO	C12	EMU4
A3	GND	B8	TVD	C13	EMU3
A4	GND	B9	EMU9	C14	EMU1
A5	GND	B10	EMU7	C15	ID3
A6	GND	B11	EMU5	D1	NC
A7	GND	B12	TCLK	D2	GND
A8	TYPE 0	B13	EMU2	D3	GND
A9	GND	B14	EMU0	D4	GND
A10	GND	B15	ID1	D5	GND
A11	GND	C1	ID2	D6	GND
A12	GND	C2	EMU18	D7	GND
A13	GND	C3	TRST/	D8	TYPE 1
A14	GND	C4	EMU16	D9	GND
A15	TGTRST/	C5	EMU15	D10	GND
B1	ID0	C6	EMU13	D11	GND
B2	TMS	C7	EMU11	D12	GND
B3	EMU17	C8	TCLKRTN	D13	GND
B4	TDI	C9	EMU10	D14	GND
B5	EMU14	C10	EMU8	D15	GND

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# QUICK START GUIDE

# Blackhawk™ JTAG Pin Converters (20e\_cTI)

## Installation Requirements

- Emulator with new compact 20 pin TI (cTI) JTAG socket
- TI development Board with 14, 20(ARM®), or 60 pin JTAG header

## Pin Converters

This document covers the installation and use of (3) pin converters designed to work with an emulator that has the new compact TI (cTI) 20-pin JTAG connection (header pin to signal shown in the table to the right). The pin converters described in this document are:

- **20e\_cTI-20t\_ARM Pin Converter**  
For connecting to a target board with 20-pin MultiICE connector.
- **20e\_cTI-14t\_TI Pin Converter**  
For connecting to a target board with standard TI 14-pin JTAG connector (pin 6 keyed).
- **20e\_cTI\_60t\_TI Pin Converter**  
For connecting to a target board that has the TI 60-pin trace header.

## Compact TI (cTI) 20-Pin JTAG Header Signal Table

Pin	Name	Pin	Name
1	TMS	2	nTRST <sup>†</sup>
3	TDI	4	TDIS
5	TVD	6	KEY
7	TDO	8	GND
9	RTCK	10	GND
11	TCK	12	GND
13	EMU0	14	EMU1
15	nSRST <sup>†</sup>	16	GND
17	EMU2	18	EMU3
19	EMU4	20	GND

<sup>†</sup> Signals are active low

## Important Environmental Considerations

Caution is necessary to minimize ESD (Electro-static Discharge) which can damage electronic components. Use in a controlled environment where ESD materials and practices are employed is highly recommended.

# 1 20e\_cTI-20t\_ARM Pin Converter

The **20e\_cTI-20t\_ARM** Pin Converter is designed to attach an emulator cable with a 20-pin cTI JTAG connection to a target board with 20 pin MultICE connector.

1. **Make sure the target is not powered when connecting!**
2. Connect the 20 pin Male connector to your cTI emulator.
3. Connect the 20 pin Female socket to your target ARM.

## WARNING

Caution should be exercised in connecting this adapter to the JTAG emulator and the target JTAG header. Pay special attention to the orientation and keying and pin outs. Be careful to connect with the correct orientation. This adapter is not intended to be hot pluggable. Unplug power from all sources prior to connect or disconnect.

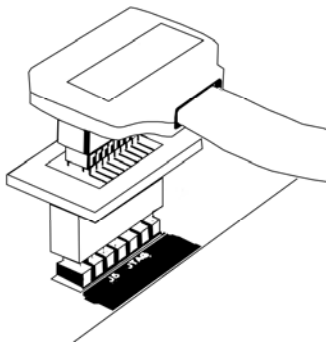


FIGURE 1—Typical target board cable connection orientation

## 20-Pin Target ARM Header Pin out

Pin	Name	Pin	Name
1	VDD	2	VDD
3	nTRST <sup>†</sup>	4	GND
5	TDI	6	GND
7	TMS	8	GND
9	TCK	10	GND
11	RTCK	12	GND
13	TDO	14	GND
15	nSRST <sup>†</sup>	16	GND
17	NC	18	GND
19	NC	20	GND

<sup>†</sup> Signals are active low

# 20e\_cTI-14t\_TI Pin Converter 2

The **20e\_cTI-14t\_TI** Pin Converter is designed to attach an emulator cable with a 20-pin cTI JTAG connection to a target board with 14 pin connector with pin 6 keyed.

1. **Make sure the target is not powered when connecting!**
2. Connect the 20 pin Male connector to your cTI emulator.
3. Connect the 14 pin Female socket to your target TI.

## WARNING

Caution should be exercised in connecting this adapter to the JTAG emulator and the target JTAG header. Pay special attention to the orientation and keying and pin outs. Be careful to connect with the correct orientation. This adapter is not intended to be hot pluggable. Unplug power from all sources prior to connect or disconnect.

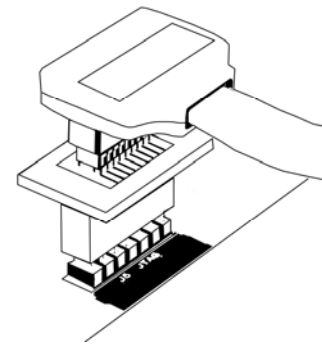


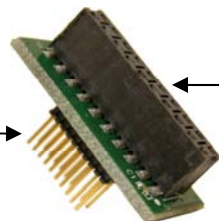
FIGURE 1—Typical target board cable connection orientation

## TI 14-Pin Target Header Pin out

Pin	Name	Pin	Name
1	TMS	2	nTRST <sup>†</sup>
3	TDI	4	GND
5	TVD	6	KEY
7	TDO	8	GND
9	RTCK	10	GND
11	TCLK	12	GND
13	EMU0	14	EMU1

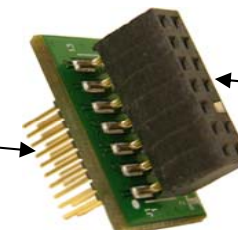
<sup>†</sup> Signals are active low

Emulator Connection:  
20 pin cTI male header  
(0.050" x 0.100")



Target Board Connection:  
20 pin female socket header  
(0.100" x 0.100")

Emulator Connection:  
20 pin cTI male header  
(0.050" x 0.100")



Target Board Connection:  
14 pin female socket header -  
pin 6 keyed. (0.100" x 0.100")