3 Pin and Signal Mappings

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

† Signals are active low

Table 1
Standard TI 4-pin JTAG Header

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

† Signals are active low
* Not Connected

Table 2
Compact TI 20-pin JTAG Header

4 Additional Information

The Blackhawk Isolation Adapter is compatible with all Blackhawk JTAG Emulators currently in production and with most other emulators that conform to the Texas Instruments 14 and 20-pin JTAG headers. Compatibility with target hardware which is non-standard or existed prior to 1998 should be verified to conform to the IEEE 1149.1 specification prior to using the adapter.

Use of the Blackhawk Isolation Adapter does not guarantee that damage will not occur to hardware that is subjected to extreme voltage surge. Damage to devices on the scan chain may still be possible under certain circumstances beyond the scope of tolerances generally accepted as "normal operation".

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BH-ISO14_20-QS-02

QUICK START GUIDE

Blackhawk™ 3.3v/5.0v Isolation Adapters

This Quick Start Guide describes two (2) different Isolation Adapters. Please refer to the parts of this guide that match the type of Isolation Adapter that you have purchased and is included.

Installation Requirements

- Emulators with a standard TI 14-pin or compact TI 20-pin JTAG Socket.
- TI development Board with a standard TI 14-pin or compact TI 20-pin JTAG header and 3.3v or 5.0v IO voltages.
  If you do not meet the 14-14 or 20-20 pin requirements between the emulator and target board, you can use a 14e-20t or 20e-14t pin converter as needed.

The following isolation adapters are described in this document.

- **BH-ADP-ISO14**
  For electrical Isolation of a target board and emulator with standard TI 14-pin JTAG connection.

- **BH-ADP-ISO20**
  For electrical Isolation of a target board and emulator with compact TI 20-pin JTAG connector.

Features • Benefits • Specifications

- Supports I/O voltages of 3.3v/5.0v targets
- Works with XDS510 and XDS560-class emulators
- Designed using UL60950 and UL1577 standards
- 1,500 Vrms galvanic isolation voltage
- PCB isolation clearance and creepage distance of 4mm
- High speed operation: Up to 30MHz TCK
- 25kV/µs transient immunity
- Logic powered from target - JTAG pin 5 (TVD)
- Current consumption is 60-80 mA nominal (100 mA max)
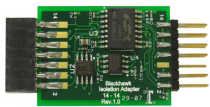- Digital Isolators: SI844x and ADuM1250

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.
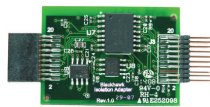
1 14 and 20-pin Configurations

The Isolation Adapters described below (see figures 1 to 4) allow an emulator with the standard TI 14-pin or compact 20-pin JTAG socket (EMU) to connect to a target board with the corresponding JTAG header (TGT). *Use a pin converter if your emulator and target board do not have the same JTAG connections.*
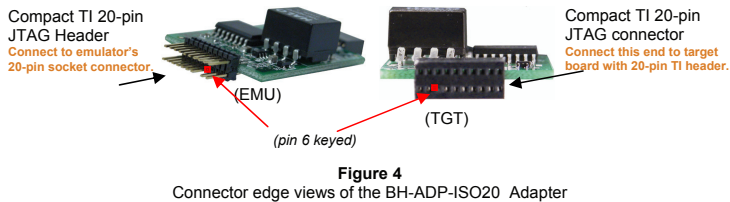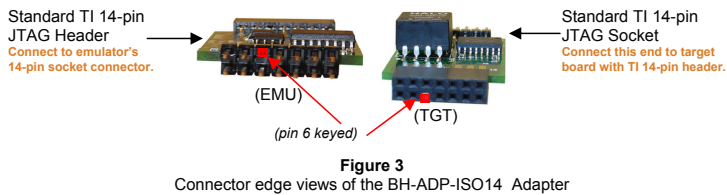
Use of this adapter will isolate floating grounds and minimize current spikes from damaging the emulator, the target, and the development machine.
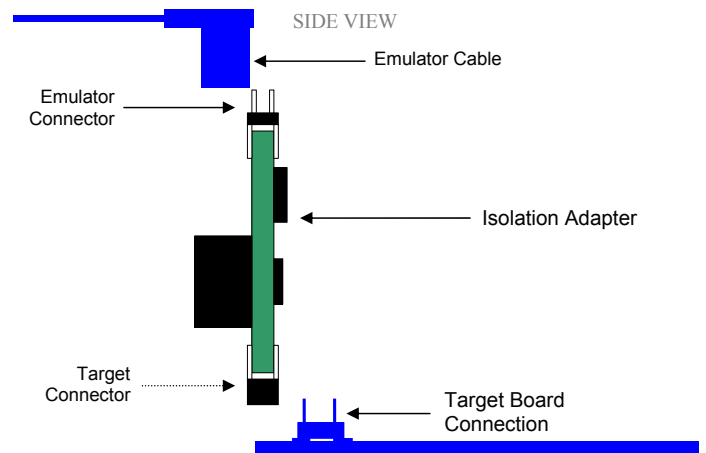
Figure 1
Top view of BH-ADP-ISO14

Figure 2
Top view of BH-ADP-ISO20

Standard TI 14-pin JTAG Header
Connect to emulator's 14-pin socket connector.

Standard TI 14-pin JTAG Socket
Connect this end to target board with TI 14-pin header.

(EMU)

(TGT)

(pin 6 keyed)

Figure 3
Connector edge views of the BH-ADP-ISO14 Adapter

Compact TI 20-pin JTAG Header
Connect to emulator's 20-pin socket connector.

Compact TI 20-pin JTAG connector
Connect this end to target board with 20-pin TI header.

(EMU)

(TGT)

(pin 6 keyed)

Figure 4
Connector edge views of the BH-ADP-ISO20 Adapter

Typical Connections 2

Using this adapter provides backwards compatibility to standard debug connections and does not perform any processing or contain any on-board logic. It is strictly a Isolation Adapter, routing only pins 1-14, or 1-20 on relative adapter, and can be used with XDS510™ and XDS560™-class emulators with a 14-pin or 20-pin socket connector.

Figure 5 shows the connection orientation of the Isolation Adapter between an emulator cable on top and a header on a target board.

SIDE VIEW

Emulator Cable

Emulator Connector

Isolation Adapter

Target Connector

Target Board Connection

Figure 5
Side view of the Isolation adapter connection orientation

WARNING
Caution should be exercised in connecting these adapters 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. These adapters are not intended to be hot pluggable. Unplug power from all sources prior to connect or disconnect.