

## 3 Pin and Signal Mappings

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

<sup>1</sup> Signal is active low

<sup>2</sup> Target Disconnect (GND)

<sup>3</sup> Keyed, no pin

<sup>4</sup> Not Connected - Not Used

**Table 1**  
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 compact 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-ISO20-QS-03

## QUICK START GUIDE

## Blackhawk™ 1.8v/3.3v/5.0v Isolation Adapter (20-pin)

**This Quick Start Guide describes Revision 2.0 of our 20-pin Isolation Adapter. If you have a previous revision, please refer to the guide that matches your version. If you are not sure what you are using, contact Blackhawk Support.**

### Installation Requirements

- Emulators with a compact TI 20-pin JTAG Socket.
- TI development Board with a compact TI 20-pin JTAG header and 1.8v, 3.3v or 5.0v IO voltages.  
If you do not meet the 20-20 pin requirements between the emulator and target board, you can use a 14e-20t pin converter as needed.

The following isolation adapter is described in this document.

- BH-ADP-ISO20-2** (SKU: 12137B, revision 2.0)  
For electrical Isolation of a target board and emulator with compact TI 20-pin JTAG connection.

### Features • Benefits • Specifications

- Supports I/O voltages of 1.8v/3.3v/5.0v targets
- Works with TI XDS Emulators and Debug probes, including XDS100v2, XDS110, XDS200, XDS510, XDS560 and XDS560v2-class emulators
- 5K Vrms galvanic isolation
- Withstands ±10kV Surge per IEC 61000-4-5
- PCB isolation clearance and creepage distance of 6mm
- High speed operation: Up to 20MHz TCK
- Logic powered from target - JTAG pin 5 (TVD)
- Current consumption is 60-80 mA nominal (100 mA max)
- Bi-directional EMU0 and EMU1 support

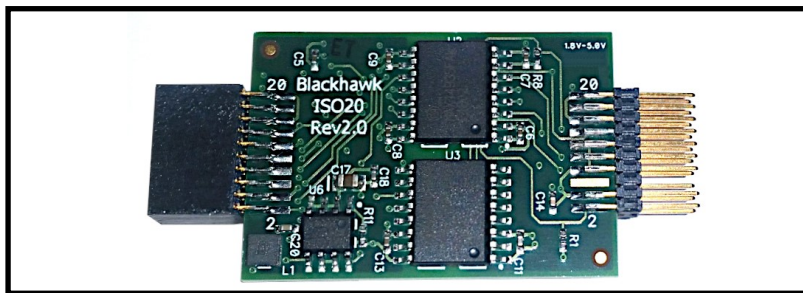
### Important Environmental Considerations

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.

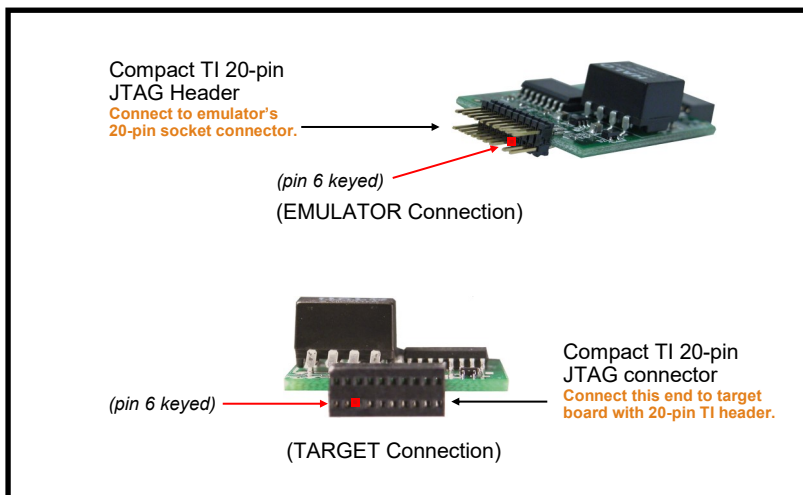
# 1 20-pin Configurations

The Isolation Adapters described below (see figures 1 and 2) allow an emulator with the compact TI 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-ISO20-2

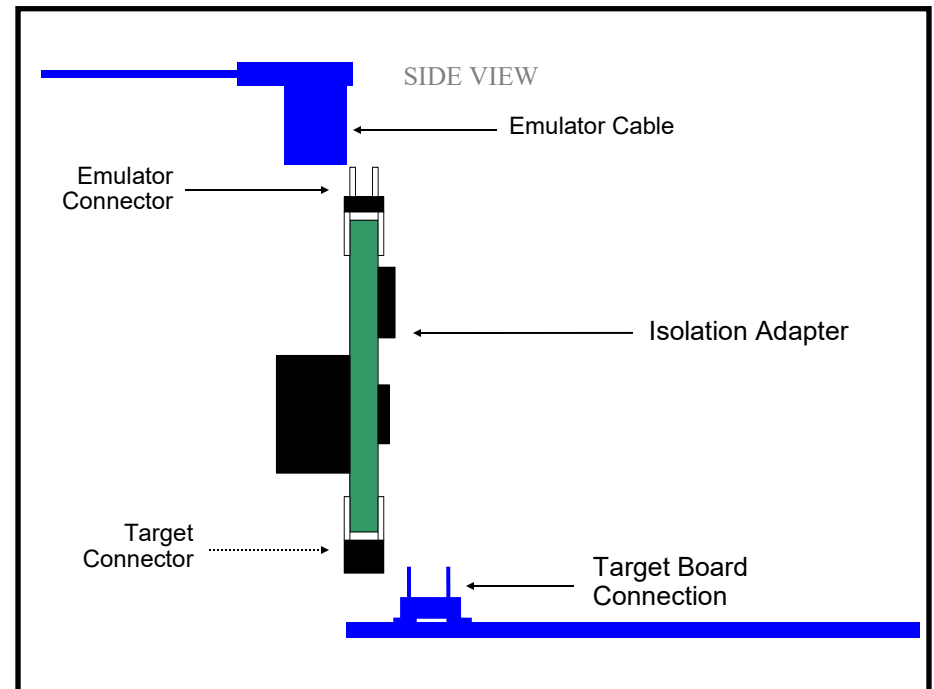


**Figure 2**  
Connector edge views of the BH-ADP-ISO20-2 Adapter

# 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 JTAG signals, and can be used with most TI XDS-class emulators with a compact TI 20-pin socket connector. See table 1 for a list of JTAG signals.

Figure 3 shows the connection orientation of the Isolation Adapter between an emulator cable on top and a header on a target board.



**Figure 3**  
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.