

Connecting the **RTBx** to embedded targets

This technical note describes strategies to connect the **RTBx** datalogger to embedded targets and includes a technical specification for **RTBx** digital inputs.

Connection strategies

The **RTBx** can collect data from various resources on embedded targets, including:

- GPIO ports
- Address buses
- Data buses

Electrical signaling

The **RTBx** accepts Low Voltage Differential Signaling (LVDS) signals. If LVDS is not supported by the target hardware, TTL signals can be converted to LVDS either on the hardware itself or by using an adapter that we provide. The track length for TTL signaling should be kept as short as possible to ensure good signal quality at high data transmission rates, so it is preferable to convert the signal on the hardware itself.

To convert TTL signals to LVDS on the target hardware, an FPGA or dedicated LVDS drivers can be used.

When converting signals through an adapter, special consideration must be taken to avoid signal integrity issues. This is especially true if the TTL drivers on the board are not capable of driving a terminated load. High quality adapters are available to convert electrical signals from embedded hardware to be compatible with the **RTBx**.

Physical connection

The **RTBx** uses 68 pin VHDCI cables to connect to target hardware. Each VHDCI cables transmits 16-bits with an LVDS signal. These cables can be used to connect to the embedded target in multiple ways.

If possible, the best solution is to build dedicated VHDCI connectors that carry LVDS signals on the target hardware to connect the **RTBx** directly, as shown in Figure 1. VHDCI connectors such as part number 71430-0019 can be used to do this. Connecting the **RTBx** in this way results in a secure connection and helps to maintain signal quality.

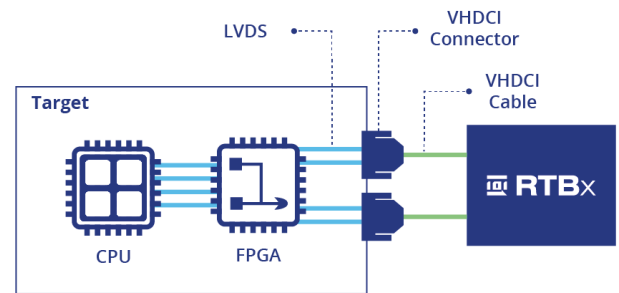


Figure 1. Direct connection

If this is not possible and your target carries an LVDS signal, the next best option is to use an LVDS adapter along with flying leads or custom cables to connect output pins on your embedded target to the **RTBx**, see Figure 2. LVDS adapters and 34 pin flying leads are available to connect the **RTBx** to embedded targets in this way.



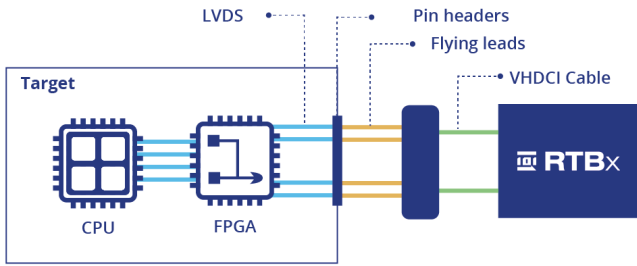


Figure 2. Connection via LVDS with an adapter

If your board does not support LVDS signals, the **RTBx** can connect using a TTL adapter along with flying leads or custom cables to connect output pins on your embedded target to the **RTBx** (Figure 3). TTL adapters and 34 pin flying leads are available to connect the **RTBx** to embedded targets in this way.

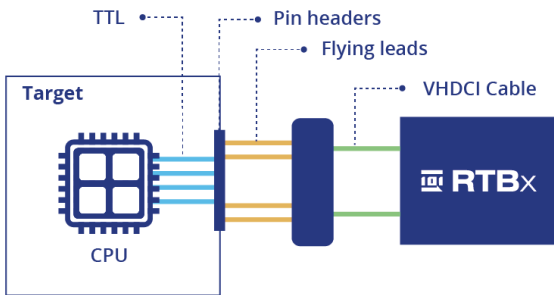


Figure 3. Connection via TTL with an adapter



Figure 4. RTBx VHDCI cables



Figure 5. RTBx adapter (high impedance TTL)

Standard connectors and adapters

The following standard connectors and adapters are available for the **RTBx**:

- VHDCI cables to physically connect to the target (Figure 4).
- LVDS and TTL adapters to convert digital signals to be compatible with the **RTBx** (Figure 5).
- 25cm long flying leads to connect hardware pins to **RTBx** adapters, suitable for TTL and LVDS inputs (Figure 6).

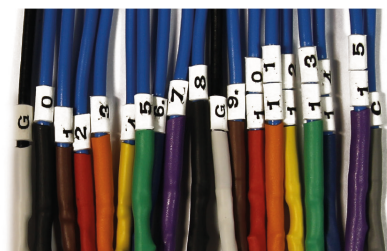


Figure 6. RTBx flying leads (TTL)

Technical specifications

Technical specifications for **RTBx** digital inputs are shown in Table 1.

Custom connectors and adapters

In addition to the standard connectors and adapters available, we can work with you to develop custom ones. This includes the following:

- Custom leads that connect to an adapter and match the output pins on your embedded target and signal carried by them. These can be used to make it easier to connect and disconnect the **RTBx** or to connect to pins that do not have 0.1" pin spacing.
- Custom adapters to convert the electrical signal carried from your embedded target when the standard adapters can not be used to do this.

For more information, contact our support team at support@rapitasystems.com.

Table 1. **RTBx** digital inputs

Property	LVDS (Direct/ ALVDS adapter)	TTL adapter (Low impedance)	TTL adapter (High impedance)	1.8V TTL adapter (High impedance)
<i>Compatibility</i>	LVDS LVPECL PECL (N)ECL Universal differential inputs	3.3 V TTL		1.8 V TTL
<i>Maximum input voltage</i>	-3.0 V ~ 5.0 V	-0.3 V ~ 3.6 V		-0.5 V ~ 4.6 V
<i>Input voltage hysteresis</i>	25 mV	Low: < 0.8 V High: > 2 V		Low: < 0.35 V High: > 0.65 V
<i>Input termination</i>	Differential 125 Ohms	100 Ohms	50K Ohms	50K Ohms
<i>Connection requirements</i>	No termination required on floating inputs			

