

Trenz Electronic GmbH info@trenz-electronic.de www.trenz-electronic.de JTAG Connection Application Note

Rev. 1.0 as of 2008-11-17

TE0140, TE0143, TE0146

TE0140 on Baseboard

The JTAG interface of the TE0140 on the TE0143 baseboard can be accessed using a Xilinx Platform Cable USB in two ways:

- through the 9-pin JTAG header connector J5;
- through the 10-pin JTAG header connector J6.

Connectors J5 and J6 of the TE0143 baseboard are shown in Figure 1.



Figure 1: J5 and J6.



Figure 2: access through J5.

JTAG through J5

The JTAG interface of the TE0140 on the TE0143 baseboard can be accessed through the 9-pin JTAG header connector J5 by performing the following steps:

- supply power to the TE0143 baseboard through either the 5 V power supply connector J9 or the USB connector J11 (do not forget to set jumper J10 accordingly);
- connect the flying leads of the Xilinx Platform Cable USB JTAG programmer to header connector J5 as shown in Figure 2;



Figure 3: access through J5 (detail).



Figure 4: access through J6.

JTAG through J6

The JTAG interface of the TE0140 on the TE0143 baseboard can be accessed through the 10-pin JTAG header connector J6 by performing the following steps:

- supply power to the TE0143 baseboard through either the 5 V power supply connector J9 or the USB connector J11 (do not forget to set jumper J10 accordingly);
- connect the Xilinx Platform Cable USB JTAG programmer to header connector J6 as shown in Figure 4 through the following cables or connectors:
- Xilinx 14-pin female to 9-pin (7 contacts) male adapter connector normally used for flying leads as shown in Figure 5;
- Trenz Electronic 9-pin (7 contacts) female to 10-pin (7 contacts) male adapter connector as shown in Figure 5;
- Trenz Electronic 10-pin female to 10-pin female ribbon cable;

Xilinx 14-pin female to 9-pin male adapter connector cannot be mismatched. Trenz Electronic 9-pin (7 contacts) female to 10-pin (7 contacts) male adapter connector cannot be mismatched.

Trenz Electronic 10-pin female to 10-pin female ribbon cable must be connected to header connector J6 paying attention to keep wire number 1 (normally marked with a color) at the border side as shown in Figure 7.

Warning! Please make sure that pin 1 of the ribbon cable matches pin 1 of the header connector J6.

Pin 1 of J6 is located in correspondence of the label "J6" itself as sown in Figure 6.



Figure 5: access through J6 (detail).



Figure 6: pin 1 of J6 (red spot).



Figure 7: access through J6 (detail).



TE0146 on Baseboard

The JTAG interface of the TE0140 on the TE0143 baseboard can be accessed by using a Xilinx Platform Cable USB through the general-purpose 2x20-pin header connectors J1 and J3.

Warning! The dedicated JTAG header connectors J5 and J6 on the TE0143 baseboard carrying a TE146 are without function.

The TE0143 baseboard is suited to power the TE0146 module and to gain access to its B2B signals, but not to access the JTAG interface of the TE0146 module through its dedicated JTAG header connectors J5 and J6. This is because the board was originally developed for the double-connector TE0140 series modules without SDRAM. When The TE0146 was extended with SDRAM, the right B2B connector had to be removed, and just a subset of the corresponding signals could be migrated on the remaining left one.

The JTAG interface of the TE0146 on the TE0143 baseboard can be accessed by performing the following steps:

- supply power to the TE0143 baseboard through either the 5 V power supply connector J9 or the USB connector J11 (do not forget to set jumper J10 accordingly);
- connect the flying leads of the Xilinx Platform Cable USB JTAG programmer to general-purpose 2x20-pin header connectors J1 and J3 as shown in Figure 8 and detailed in Table 1;



Figure 8: access through J1 and J3.

connector	pin	signal
J1	2	TDO
J1	4	TDI
J1	6	ТСК
J1	8	TMS
J1	10	GND
]3	20	VREF

Table 1: pinout of the JTAG signals on the TE0143baseboard header connectors.



Figure 9: access through J1 and J3(detail).



Figure 10: TE0140 direct connection.

TE0140 direct connection

The JTAG interface of the TE0140 micromodule can be accessed directly through its card edge header connector by performing the following steps:

- 1. supply power to the TE0140 micromodule through its USB connector
- connect the Xilinx Platform Cable USB JTAG programmer to the card edge connector as shown in Figure 10 through the following cables or connectors::

- Xilinx 14-pin female to 9-pin (7 contacts) male adapter connector normally used for flying leads;
- Trenz Electronic 9-pin (7 contacts) female to 10-pin (7 contacts) male adapter connector;
- Trenz Electronic 10-pin female to 10-pin female card edge connector ribbon cable;

Warning! Please make sure that pin 1 of the ribbon cable matches pin 1 of the card edge header connector.

Pin 1 is labeled on the card edge header connector.



Figure 11: TE0140 direct access (detail).



Figure 12: TE0146 direct connection.

TE0146 direct connection

The JTAG interface of the TE0146 micromodule can be accessed directly through its card edge header connector by performing the following steps:

- 1. supply power to the TE0146 micromodule through its USB connector
- connect the Xilinx Platform Cable USB JTAG programmer to the card edge connector as shown in Figure 12 through the following cables or connectors:
- Xilinx 14-pin female to 9-pin (7 contacts) male adapter connector

• Trenz Electronic 10-pin female to 10-pin female card edge connector ribbon cable;

Warning! Please make sure that pin 1 of the ribbon cable matches pin 1 of the card edge header connector.

Pin 1 is labeled on the card edge header connector.



Figure 13: TE0146 direct connection(detail).

Ordering Information

JTAG platform cable kit



Figure 14: Xilinx Platform Cable.

Xilinx USB to JTAG Platform Cable ships with each of the items shown in Table 2 plus a 1.8-meter, Hi-Speed USB, A-B cable.

Item	part number
Platform Cable USB II	HW-USB-II-G
Ribbon Cable, 6-inch	HW-RIBBON14
Flying Wire Set	HW-USB-FLYLEADS-G

Table 2: Xilinx platform cable kit

The Xilinx platform cable kit is available at Trenz Eectronic Shop with ordering number HW-USB-II-G.

For further reference on the Xilinx Platform Cable USB II please consult http://www.xilinx.com/support/documentation/data_sheets/ds593.pdf

Adapter Connector

Trenz Electronic 9-pin (7 contacts) female to 10-pin (7 contacts) male adapter connector is available at Trenz Eectronic Shop with ordering number TE0147-00.



Figure 15: TE0147-00 adapter connector.

This adapter connector can be built according the connection diagram shown in Figure 16.



Figure 16: connection diagram.

Figure 17 shows the pin numbering of the 10-pin header of the adapter connector (red spot: pin 1, green spot: pin 2).



Figure 17: TE0147-00 adapter connector (header side).

Figure 18 shows the pin numbering of the 9-pin receptacle of the adapter connector (red spot: pin 1, soldered pin: pin 2).



Figure 18: TE0147-00 adapter connector (receptacle side).

References

For further reference on how to access the TE0140 or the TE0146 micromodule via the JTAG interface, please consult the "Spartan-3 FPGA Micromodule" TE0140 user manual or the "Spartan-3 FPGA Micromodule with SDRAM" TE0146 user manual.

Revision History

Rev	Date	Who	Description
1.0	2008-11-17	FDR	created

 Table 3: revision history.