xTAG-PRO User Guide

1 Getting started with xTAG-PRO

1. Connect the adapter card to your xTAG-PRO using the ribbon cables, see Section §5 :
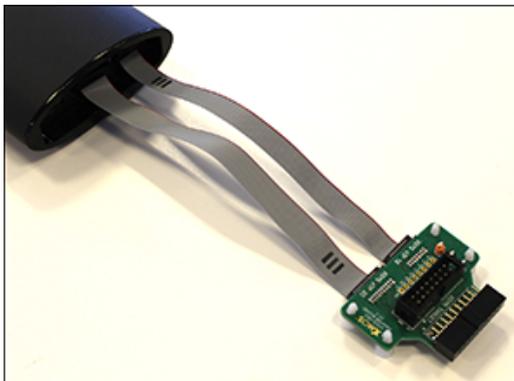
Figure 1:
20-pin and 16-pin ribbon cables connected to xTAG-PRO and adapter card

2. Connect your development board to the xTAG-PRO using the xSYS connector or use another ribbon cable to connect to the analog header on the adapter card (analog cable is not supplied in the kit).

3. Connect the xTAG-PRO into your development system using a USB-A-to-USB-B cable, see Section §3.1.

4. Open your application in xTIMEcomposer Studio and run a Run Configuration (or call `xrun -l` from the command line), see Section §3.2.

5. Check the LEDs on xTAG-PRO for the current status, see Figure 4.

2   Description

The xTAG-PRO is a high quality debug adapter for xCORE multicore microcontrollers, providing:

▶ Analog header with 4-channel analog inputs

▶ xSYS header for 2-channel digital inputs

▶ Dynamic power monitoring

▶ Fully compatible with xTAG-2

▶ Multi-state LEDs

▶ Push button interrupt or system reset

2.1   What's in the box?

▶ xTAG-PRO

▶ xTAG-PRO adapter card

▶ 20-pin ribbon cable

▶ 16-pin ribbon cable

If you want to connect a device to the analog header, you need to source a suitable cable. Details of the header are shown in Figure 9.

3   Requirements

3.1   Power

The xTAG-PRO requires a 5V power supply from the development system; you need a USB-A-to-USB-B cable to connect the device to your development system.

3.2   Development tools

xTAG-PRO requires xTIMEcomposer version 13.0.2 or later (Community or Enterprise Edition). The tools include a graphical development environment based on the industry standard Eclipse IDE, providing a choice between GUI-based tools and command-line tools. For information on using the tools see the xTIMEcomposer User Guide[1]

Linux users may need to update their permissions - further information is available on the XCore Community site[2]

To use the xSCOPE to instrument and monitor your applications, you need to use the scope library. Documentation and examples of how to use xSCOPE are available in the xTIMEcomposer User Guide.
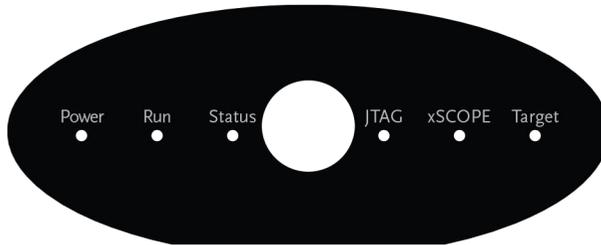
3.3   Firmware

The latest firmware for the xTAG-PRO can be downloaded from the XMOS website.

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[1] http://www.xmos.com/published/tools-user-guide
[2] http://www.xcore.com/questions/1973/how-enable-usb-drivers-linux-development-tools

4 LEDs and push button

The LEDs indicate the status of the device as shown in Figure 4:

| LED	Status	Description
Power	Green	The xTAG is powered on
Run	Green	Target is running
	Red	Target is in debug mode and stopped
Status	Green	Target stop reason is expected e.g. breakpoint, print message
	Red	Target stop reason is unexpected e.g. exception
JTAG	Green	There is JTAG activity with the target happening
	Off	No JTAG
xSCOPE	Green Flashing	xSCOPE is enabled
	Off	No xSCOPE
Target	Green	Target device is detected after a Run Configuration or Debug Configuration is used (xrun or xgdb command)
	Red	Target device is not detected after a Run Configuration or Debug Configuration is used (xrun or xgdb command)

Figure 4:
LED status

The push button on the xTAG-PRO can be used to interrupt or reset the device as shown in Figure 5:

Status	Description
xTAG running	Interrupts the device and drops back to the debugger in xTIMEcomposer
xTAG not running	Resets the device

Figure 5:
Push-button
status

5   xTAG-Pro adapter card

The xTAG-PRO adapter card provides an xSYS header (J4) and an analog header (J3) for connection to target devices. The adapter is connected to the xTAG-PRO by a 20-pin ribbon cable (xSYS xTP20 - J5) and a 16-pin ribbon cable (xSYS xTP16 - J2).
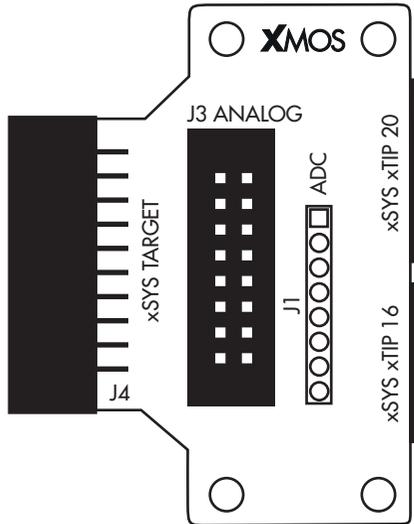
Figure 6:
xTAG-PRO
adapter card

The features you want to use dictate which ribbon cables you require:

	20-pin cable	16-pin cable
xSYS connector	Required	
xSYS connector + 5V power	Required	Required
Analog connector	Required	Required

The signals for the xSYS xTP ribbon connectors are shown below:

Signal	Position	Position	Signal
XL_DN1	0	1	GND
XL_DN0	2	3	GND
XL_UP_0	4	5	GND
XL_UP_1	6	7	GND
DBG	8	9	SRST_N
MSEL	10	11	GND
TDO	12	13	GND
TCK	14	15	GND
TMS	16	17	GND
TDI	18	19	GND

Figure 7:
xSYS xTIP20
20-pin 0.05"
header (J5)

Signal	Position	Position	Signal
DIG_IN1	0	1	GND
DIG_IN0	2	3	GND
UART_DN	4	5	5V
UART_UP	6	7	GND
ADC_IN3	8	9	ADC_IN2
GND	10	11	ADC_IN1_N
ADC_IN1_P	12	13	GND
ADC_IN0_P	14	15	ADC_IN0_N

Figure 8:
xSYS xTIP16
16-pin 0.05"
header (J2)

5.1 Analog header (J3)

The analog connector includes 4 ADC input signals including 2 shunt signals (ADC_IN0_P/N and ADC_IN1_P/N) with 100:1 gain for power monitoring, and 2 low voltage I/O signals for digital input.

Test Point	Signal	Position	Position	Signal
	ADC_IN0_P	0	1	GND
	ADC_IN0_N	2	3	GND
	ADC_IN1_P	4	5	GND
	ADC_IN1_N	6	7	GND
	ADC_IN2	8	9	GND
	ADC_IN3	10	11	GND
TP1	DIG_IN0	12	13	GND
TP2	DIG_IN1	14	15	GND

Figure 9: Analog IDC header (J3)

The signals are also available through the 0.5" IDC header J1.

| Signal	Position
GND	0
ADC_IN0_P	1
ADC_IN0_N	2
ADC_IN1_P	3
ADC_IN1_N	4
ADC_IN2	5
ADC_IN3	6
GND	7

Figure 10: ADC header (J1)

5.2   xSYS header (J4)

The xSYS header can be used to connect to any XMOS development kit. The connector includes a 2-wire xCONNECT Link used by xSCOPE, UART and JTAG. The header includes a 5V signal which requires both the 20-pin and 16-pin cables to be connected for use.

Signal	Position	Position	Signal
5V	0	1	NC
MSEL	2	3	GND
TDI	4	5	XL_UP1
TMS	6	7	GND
TCK	8	9	XL_UP0
DBG	10	11	GND
TDO	12	13	XL_DN0
SRST_N	14	15	GND
UART_DN	16	17	XL_DN1
UART_UP	18	19	GND

Figure 11: xSYS female header (J4)

5.3 Adapter card schematic
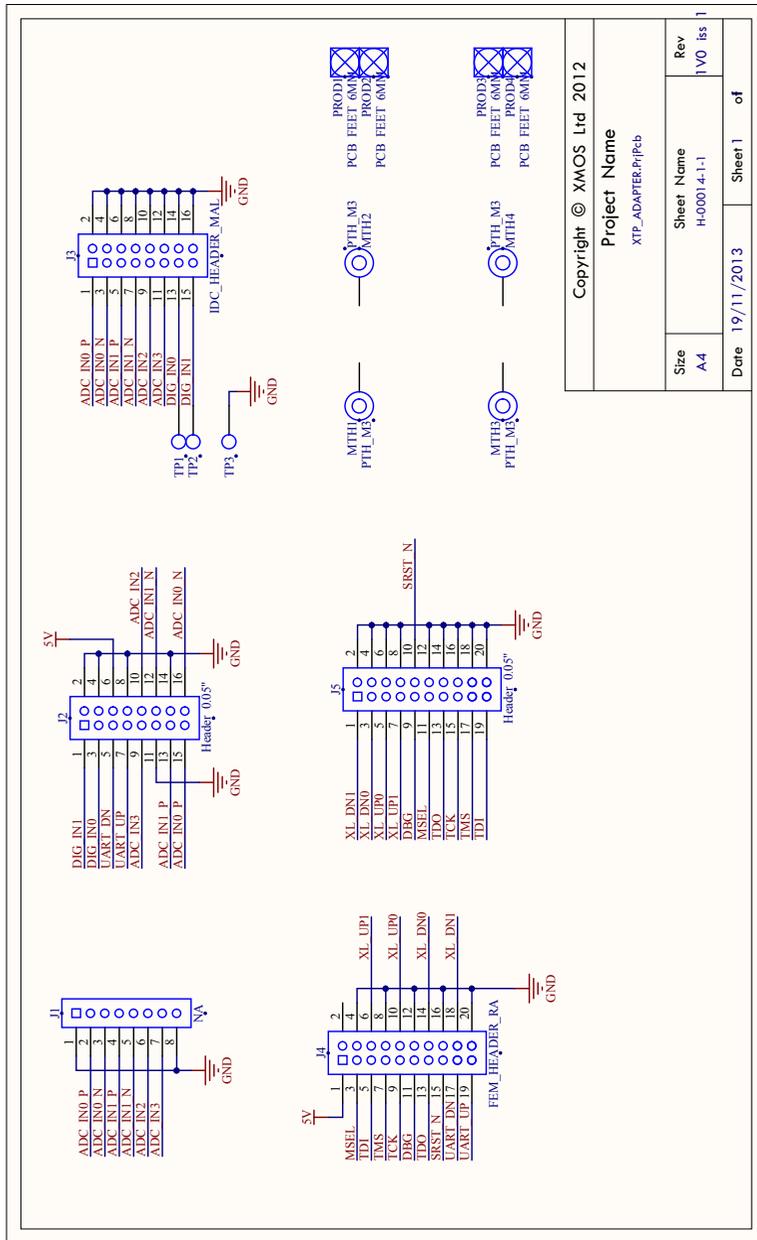
Figure 12: xTAG-PRO adapter card schematic

6 Regulations

The xTAG-PRO is subject to the European Union WEEE directive and should not be disposed of in household waste. Alternative requirements may apply outside of the EU.

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