PMod Interface

Single Width PMod

Host		Peripheral	
1		1	
2	E	2	
3	d	3	
4	g	4	
5	e	5	
6		6	
0.40"	0.15"		

Fig 1: Standard Six-Pin Connector Placement

Double Width PMod

Host			Peripheral	
1	7		7	1
2	8	E	8	2
3	9	d	9	3
4	10	g	10	4
5	11	e	11	5
6	12		12	6
Top	Bot	0.45"	0.20"	Bot	Top

Fig 2: Standard Twelve-Pin Connector Placement

I2C Interface

1	2		SCL	SCL
3	4	E	SDA	SDA
5	6	d	GND	GND
7	8	g	VCC	VCC
		e		

I^2C Module PCB

Fig 3: Standard Module Dimensions

Pmod Pin	Standard Pin			Edge	Standard Pins			Edge	Pmod Pins	
1	2	IO			1	2			7	1
2	4	IO		E	3	4		E	8	2
3	6	IO		d	5	6		d	9	3
4	8	IO		g	7	8		g	10	4
5	10	GND		e	9	10		e	11	5
6	12	VCC			11	12			12	6
7	1	IO								
8	3	IO								
9	5	IO								
10	7	IO								
11	9	GND								
12	11	VCC								

Pmod Pin	Standard Pin			Edge	Standard Pins			Edge	Pmod Pins	
1	11	IO			12	11			7	1
2	9	IO		E	10	9		E	8	2
3	7	IO		d	8	7		d	9	3
4	5	IO		g	6	5		g	10	4
5	3	GND		e	4	3		e	11	5
6	1	VCC			2	1			12	6
7	12	IO								
8	10	IO								
9	8	IO								
10	6	IO								
11	4	GND								
12	2	VCC								

Type 1 GPIO			Type 1A Expanded GPIO			Type 2 SPI			Type 2A Expanded SPI			Type 3 UART			Type 4 UART			Type 4A Expanded UART			Type 5 H-Bridge			Type 6 Dual H-Bridge		
Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction	Pin	Signal	Direction
1	IO1	In/Out	1	IOA1	In/Out	1	SS	Out	1	SS	Out	1	CTS	Out	1	CTS	In	1	CTS	In	1	DIR	Out	1	DIR1	Out
2	IO2	In/Out	2	IOA2	In/Out	2	MOSI	Out	2	MOSI	Out	2	RTS	In	2	TXD	Out	2	TXD	Out	2	EN	Out	2	EN1	Out
3	IO3	In/Out	3	IOA3	In/Out	3	MISO	In	3	MISO	In	3	RXD	In	3	RXD	In	3	RXD	In	3	SA	In	3	DIR2	Out
4	IO4	In/Out	4	IOA4	In/Out	4	SCK	Out	4	SCK	Out	4	TXD	Out	4	RTS	Out	4	RTS	Out	4	SB	In	4	EN2	Out
5	GND		5	GND		5	GND		5	GND		5	GND		5	GND		5	GND		5	GND		5	GND	
6	VCC		6	VCC		6	VCC		6	VCC		6	VCC		6	VCC		6	VCC		6	VCC		6	VCC	
			7	IOB1	In/Out				7	INT	In							7	INT	In						
			8	IOB2	In/Out				8	RESET	Out							8	RESET	Out						
			9	IOB3	In/Out				9	N/S	N/S							9	N/S	N/S						
			10	IOB4	In/Out				10	N/S	N/S							10	N/S	N/S						
			11	GND					11	GND								11	GND							
			12	VCC					12	VCC								12	VCC							

Type 2 SPI

SS - Slave Select. Active low to enable slave device

MOSI - Master Out Slave In. Data from master to slave

MISO - Master In Slave Out. Data from slave to master

SCK - Serial clock. Data clock from master to slave

Type 3 UART

CTS - Permission for peripheral to send data to host

RTS - Request from peripheral to send data to host

RXD - Data from peripheral to host

TXD - Data from host to peripheral

Type 4 UART

CTS - Device will only transmit when this signal is asserted

RTS - Device is ready to receive data

RXD - Data from peripheral to host

TXD - Data from host to peripheral

Type 4A Expanded UART

CTS - Device will only transmit when this signal is asserted

RTS - Device is ready to receive data

RXD - Data from peripheral to host

TXD - Data from host to peripheral

INT - Interrupt signal from peripheral to host

RESET - Reset signal for host to reset peripheral

N/S - Not-specified depending on the module these pins may be unconnected or additional module specific inputs or outputs.

Type 5 H-Bridge

DIR - Motor direction

EN - Motor enable, active high

SA - feedback sense A

SB - feedback sense B

Type 6 Dual H-Bridge

DIR1 - Motor/Phase 1 direction, active high

EN1 - Motor/Phase 1 enable

DIR2 - Motor/Phase 2 direction, active high

EN2 - Motor/Phase 2 enable

Pmod "High Speed"			XADC Pmod			Low Speed		
Pin	**Signal**	**LVDS Pair**	**Pin**	**Signal**	**LVDS Pair**	**Pin**	**Signal**	**LVDS Pair**
1	JA1_P	JA1	1	JA1_P	JA1	1	IO1	NA
2	JA1_N	JA1	2	JA2_P	JA2	2	IO2	NA
3	JA2_P	JA2	3	JA3_P	JA3	3	IO3	NA
4	JA2_N	JA2	4	JA4_P	JA4	4	IO4	NA
5	GND		5	GND		5	GND	
6	VCC		6	VCC		6	VCC	
7	JA3_P	JA3	7	JA1_N	JA1	7	IO1	NA
8	JA3_N	JA3	8	JA2_N	JA2	8	IO2	NA
9	JA4_P	JA4	9	JA3_N	JA3	9	IO3	NA
10	JA4_N	JA4	10	JA4_N	JA4	10	IO4	NA
11	GND		11	GND		11	GND	
12	VCC		12	VCC		12	VCC	

* 0 Ohm series resistor
* ESD protection

TMDS_33 input + output

LVDS_25 input

* No series resistor
* ESD protection

* ~200 Ohm series resistor
* Sometimes ESD protection

LVDS_25 input/output

~XADC Pmod		
Pin	**Signal**	**LVDS Pair**
1	JA1_N	JA1
2	JA2_N	JA2
3	JA3_N	JA3
4	JA4_N	JA4
5	GND	
6	VCC	
7	JA1_P	JA1
8	JA2_P	JA2
9	JA3_P	JA3
10	JA4_P	JA4
11	GND	
12	VCC	

Digilent Arty	Artix 7	100E	
JA	Low Speed		
JB	High Speed	Group 1	No ESD?, JB1 - SRCC, JB2 - MRCC
JC	High Speed		No ESD?
JD	Low Speed		Uses mostly clock pins
Digilent Nexys Video	Artix 7	GigE, HDMI In, HDMI Out, DP Out -- FMC(2 x HDMI In)	
JA	Low Speed	Group 1	
JB	High Speed	Group 2	
JC	High Speed		
JXADC	XADC	Group 3	100 Ohm Resistor
Digilent Nexys 4 DDR	Artix 7		
JA	Low Speed		
JB	Low Speed		
JC	Low Speed		
JD	Low Speed		
JXADC	XADC		
Digilent Genesys 2	Kintex 7	GigE, HDMI In, HDMI Out, DP In, DP Out, VGA Out -- FMC(2 x HDMI In)	
JA	High Speed	Group 1	
JB	High Speed		
JC	Low Speed	Group 2	
JD	Low Speed		
JXADC	XADC	Group 3	
Digilent Zybo	Zynq	GigE, HDMI BiDir, VGA Out	
JA	XADC	Group 1	
JB	High Speed	Group 2	
JC	High Speed		
JD	High Speed		JD3 - SRCC
JE	Low Speed		
JF	Low Speed	Group 3	MIO PMOD?
ZedBoard	Zynq	GigE, HDMI Out, VGA Out	
JA1	Low Speed	Group 1	
JB1	Low Speed		

JC1	High Speed		Group 2	
JD1	High Speed			
JE1	Low Speed			MIO PMOD?
Digilent PYNQ	Zynq		GigE, HDMI In, HDMI Out	
PMODA	High Speed		Group 1	200 Ohm Resistor, JA3 - MRCC
PMODB	High Speed			200 Ohm Resistor
TOFE LowSpeedIO				Check Spacing
P2	XADC		Group 1	
P1	XADC			
P4	Low Speed			
P3	Low Speed		Group 2	
Numato Mimas V2	Spartan 6			Check Spacing
P6	~XADC			
P7	~XADC			
P8	~XADC			
P9	~XADC			
Numato Waxwing	Spartan 6			Check Spacing
P3	XADC			
P5	XADC			
P4	XADC			
MicroZed	Zynq			
J5				MIO PMOD???
MyIRTech Z-turn with IO Cape	Zynq			
XADC?				
PMOD1?				
PMOD2?				
PMOD3?				
Pipistrello	Spartan 6			
PMOD	Low Speed			No resistors or ESD
icoBoard	Lattice??			
P1	Low Speed			Check
P3	Low Speed			Check

P2	Low Speed		Check	
P4	Low Speed		Check	

2 x Dual PMOD	3 x Dual PMOD	1 x Dual PMOD	2 x Dual PMOD	1 x Dual PMOD	1 x Dual PMOD

HDMI Transmitter Expansion Module

P1

Module PMod Pin	~XADC Signal	P1 Numato Pin
1	TMDS-TX-2_P	2
2	TMDS-TX-1_P	4
3	TMDS-TX-0_P	6
4	TMDS-TX-CLK_P	8
5	GND	10
6	VCC	12
7	TMDS-TX-2_N	1
8	TMDS-TX-1_N	3
9	TMDS-TX-0_N	5
10	TMDS-TX-CLK_N	7
11	GND	9
12	VCC	11

P2

Module PMod Pin	Low Speed Signal	P2 Numato Pin
1	TMDS-TX-SCL	2
2	TMDS-TX-HOT	4
3	NC	6
4	NC	8
5	GND	10
6	VCC	12
7	TMDS-TX-CEC	1
8	TMDS-TX-SDA	3
9	NC	5
10	NC	7
11	GND	9
12	VCC	11

RTL8211E Gigabit Ethernet Expansion Module

P1

Module PMod Pin	Low Speed Signal	P1 Numato Pin
1	NC	2
2	ETH_RXCTL	4
3	ETH_RXD1	6
4	ETH_RXD3	8
5	GND	10
6	VCC	12
7	NC	1
8	ETH_RXD0	3
9	ETH_RXD2	5
10	ETH_INT_B	7
11	GND	9
12	VCC	11

P2

Module PMod Pin	Low Speed Signal	P2 Numato Pin
1	NC	2
2	ETH_TXCLK	4
3	ETH_TXD1	6
4	ETH_TXD3	8
5	GND	10
6	VCC	12
7	NC	1
8	ETH_RXCLK	3
9	ETH_TXD0	5
10	ETH_TXD2	7
11	GND	9
12	VCC	11

P3

Module PMod Pin	Low Speed Signal	P3 Numato Pin
1	ETH_RESET_B	2
2	ETH_MDIO	4
3	MAC_SDA	6
4	FPGA_CLK	8
5	GND	10
6	VCC	12
7	ETH_TXCTL	1
8	ETH_MDC	3
9	MAC_SCL	5
10	SYSCLK	7
11	GND	9
12	VCC	11

FT234 Expansion Module

P1

Module PMod Pin	Low Speed Signal	P1 Numato Pin
1	CBUS0	2
2	NC	4
3	NC	6
4	NC	8
5	GND	10
6	VCC	12
7	TXD	1
8	RTS	3
9	RXD	5
10	CTS	7
11	GND	9
12	VCC	11

VGA Display Expansion Module

P1

Module PMod Pin	Low Speed Signal	P1 Numato Pin
1	R1	2
2	G2	4
3	G1	6
4	B1	8
5	GND	10
6	VCC	12
7	R2	1
8	R0	3
9	G0	5
10	B0	7
11	GND	9
12	VCC	11

P2

Module PMod Pin	Low Speed Signal	P2 Numato Pin
1	Vsync	2
2	NC	4
3	NC	6
4	NC	8
5	GND	10
6	VCC	12
7	Hsync	1
8	NC	3
9	NC	5
10	NC	7
11	GND	9
12	VCC	11

Micro SD Expansion Module

P1

Module PMod Pin	Low Speed Signal	P1 Numato Pin
1	DAT2	2
2	CMD	4
3	DAT0	6
4	NC	8
5	GND	10
6	VCC	12
7	DAT3	1
8	CLK	3
9	DAT1	5
10	NC	7
11	GND	9
12	VCC	11

Pmod SD: Full-sized SD Card Slot

P1

Module PMod Pin	Low Speed Signal	P1 Direction
1	SS	Out
2	MOSI	Out
3	MISO	In
4	SCK	Out
5	GND	
6	VCC	
7	DAT1	
8	DAT2	
9	CD	
10	WP	
11	GND	
12	VCC	