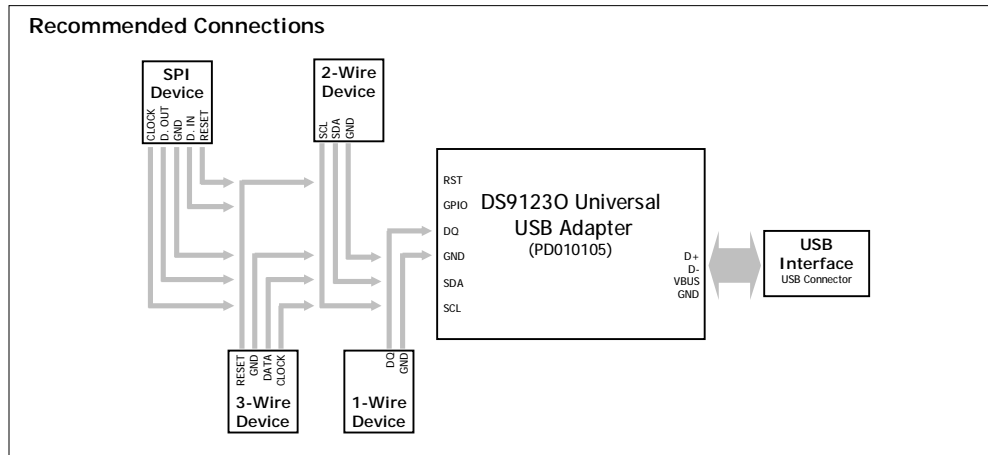


### DS91230 Universal USB Adapter

Board Designation: PD010105, PD022305, or PD022405  
 Board Function: USB Port to 1-wire, 2-wire, 3-wire, or SPI adapter  
 Device Type: N/A  
 Operating Temperature Range: -40C to 85C  
 ESD Rating: +/-2K contact HBM on all I/O pins

#### Maximum Voltage per Pin relative to GND:

VP (J1 Pin 3)	5V
DQ, RST, SDA, SCL, PIO	5V
Other I/O pins on J1, J3	5V, use open drain connections with weak pull ups only
D+, D-, VBUS	5V



#### Operation:

The DS91230 Universal USB Adapter is a type 1 HID device that converts standard USB communication into a 1-wire, 2-wire, 3-wire, or SPI interface. The DS91230 is powered completely from the USB interface. A PIC16C745 microprocessor running at 6MHz generates all timing for communication. Each RJ-11 output is bi-directional open drain and has 50 ohms series resistance to protect the processor pins. Each output has a 2.7K weak pull up to VBUS and DQ (RJ-11 pin 3) has a programmable strong pull up to VBUS through Q1.

#### Changing the pull up voltage:

All board communication outputs have 2.7K pull ups to the 5V USB supply by default. To change the pull up voltage, remove the zero ohm jumper labeled R1 located on the bottom side of the interface board, then connect the desired pull up voltage supply between VP (J1 pin 3) and GND (J2 pin 4, J4 pin4, or any even numbered pin of J1 and J3).

**Connections:**

The following is a pin list of all connectors and headers on the DS9123. Note that the outputs on J2 are also duplicated on J3.

**USB Interface (J4)**

Pin	Signal Name	Operation
J4 Pin 1	VBUS	USB Power Source
J4 Pin 2	D-	USB Data Out
J4 Pin 3	D+	USB Data In
J4 Pin 4	GND	Ground Reference

**EV Board Outputs (J2)**

Pin	Signal Name	1-Wire	2-Wire	3-Wire	SPI
J2 Pin 1	RST			RESET	RESET
J2 Pin 2	GPIO				DATA IN
J2 Pin 3	DQ	DQ			
J2 Pin 4	GND	Ground	Ground	Ground	Ground
J2 Pin 5	SDA		SDA	DATA	DATA OUT
J2 Pin 6	SCL		SCL	CLOCK	CLOCK

**Signal Header (J1)**

Pin	Signal Name	Operation
JP1 Pin 1	RB7	Available unused GPIO pin, port B
JP1 Pin 3	VP	External pull-up connection for board outputs
JP1 Pin 5	RA0	Available unused GPIO pin, port A
JP1 Pin 7	RA1	Available unused GPIO pin, port A
JP1 Pin 9	RA2	Available unused GPIO pin, port A
JP1 Pin 11	RA3	Available unused GPIO pin, port A
JP1 Pin 13	RA5	Available unused GPIO pin, port A
JP1 Pin 15		No Connection
JP1 All other	GND	Ground Reference

**Signal Header (J3)**

Pin	Signal Name	Operation
JP3 Pin 1	RB4	Strong pull-up control signal
JP3 Pin 3	SCL	Clock for 2-wire, 3-wire/SPI communication
JP3 Pin 5	SDA	Data for 2-wire, 3-wire, data out for SPI
JP3 Pin 7	DQ	Data for 1-wire communication
JP3 Pin 9	GPIO	Data In for SPI communication
JP3 Pin 11	RST	Reset for 3-wire/SPI communication
JP3 Pin 13	RB0	Available unused GPIO pin, port B
JP3 Pin 15	D+	USB Data In
JP3 Pin 17	D-	USB Data Out
JP3 Pin 19	VBUS	USB Power Source
JP3 All other	GND	Ground Reference

**Bill of Materials:**

Qty	Description	Part Number	Vendor	Designators
1	CAP SMA SMD 10uF	PCS4106CT	DIGI-KEY	C1
2	CAP 0603 SMD .33pF	BC1231CT	DIGI-KEY	C2,C3
3	CAP 0603 SMD .1uF	511-1179-2-ND	ROHM/DIGI-KEY	C4,C5,C6
1	USB-A MALE CONNECTOR	UAR70-4K5C10	ACON	J1
1	RJ-11-6 Mod 6-6 Low Profile	A9031-ND	AMP/ DIGI-KEY	J2
1	TRANSISTOR BSS84	BSS84CT-ND	DIGI-KEY	Q1
1	RESISTOR 0603 SMD 0.0 Ω	301-0	XICON/MOUSER	R1
1	RESISTOR 0603 SMD 10K Ω	RHM10KGTR	ROHM/DIGI-KEY	R2
5	RESISTOR 0603 SMD 2.7K Ω	RHM2.7KGTR	ROHM/DIGI-KEY	R3,R4,R5,R6,R7
5	RESISTOR 0603 SMD 47 Ω	RHM47GTR	ROHM/DIGI-KEY	R8,R9,R10,R11,R12
1	RESISTOR 0603 SMD 1.5K Ω	RHM1.5KGTR	ROHM/DIGI-KEY	R13
1	PIC PROCESOR 28PIN-SOIC	PIC16C745-I/SO	MICROCHIP	U1
1	CRYSTAL SMD 6.0 MHz 32pF	XC679CT	DIGI-KEY	Y1

**Circuit Schematic:**

See DS9123O Schematic PD010105.pdf

**Board Layout:**

