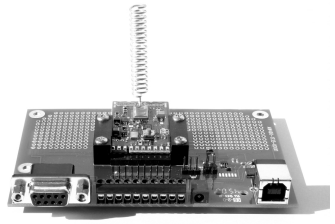
CIRRONET

IM1800-1

Transceiver Interface Module

- ***Interface Module for the DM1800 and DM1810 Transceiver Modules***
- ***RS232 or USB Host Computer Interface***
- ***Choice of USB or External DC Power Sources***
- ***Supports Analog and Logic Inputs and a Logic Output***

The IM1800-1 is designed as an application interface module for the DM1800/DM1810 series transceivers. The IM1800-1 can be powered from either its USB interface or from an external DC power input. The IM1800-1 provides both RS232 and USB host computer interfaces. The IM1800-1 USB interface is supported by a host computer virtual serial port driver. In addition, the IM1800-1 provides terminal block connections for an analog input, a logic input and a logic output. Direct connections to the DM1800/DM1810 transceiver UART are also provided on the IM1800-1. terminal block.



Absolute Maximum Ratings

Rating	Value	Units
VIN	-0.3 to +10.2	V
All Other Input/Output Connections	-0.3 to +4.0	V
Non-Operating Ambient Temperature Range	-40 to +85	°C

Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Digital Output Source Current				0.5		mA
Digital Output Sink Current				1		mA
Serial Port Data Rate				9.6		kb/s
Power Supply Input Voltage Range	VIN		+3		+10	V
Regulated Power Supply Output Voltage, VIN +3.3 to +10 V	VOUT			+3.0		Vdc
Current Available for External Circuitry					10	mA
Ambient Operating Temperature	T_A		0		70	°C

IM1800-1 Applications

The IM1800-1 is a companion interface board for the DM1800/DM1810 transceiver modules. It has two uses:

First, the IM1800-1 can be used as a general purpose interface for DM1800/DM1810 transceiver modules. For this application, the IM1800-1 provides a captured screw I/O terminal block, serial port and USB interfaces, and a choice of USB, coaxial plug or terminal block for the DC power supply input. For DM1800 and DM1810 base stations and field nodes, the IM1800-1 supports serial communications through either the serial port the USB interface, or by direct connection to the UART on the DM1800 module.

Second, the IM1800-1 can be used as a development platform for applications where a DM1800 or DM1810 transceiver will be installed a customer's board. In addition to the features listed above, the IM1800-1 provides a connector strip J3 for connecting a flat cable to a customer's application board (or for a logic analyzer/oscilloscope connection), and a "bread board" area for building and testing interface circuits.

Power Supply Options

The IM1800-1 will accepts an external DC power supply voltage in the range of +3 to +10 V. This voltage is routed to the regulator on the DM1800 or DM1810. The external power supply voltage can be connected to the IM1800-1 VIN on terminal block J2 or to the coaxial power connector J6. The IM1800-1 can also be powered from the USB connector J1. When the IM1800-1 is powered from the USB connector, no connection should be made to the VIN terminal on terminal block J2 or to the coaxial power connector J6.

Serial I/O Options

The IM1800-1 provides RS232 plus direct connections to the DM1800 or DM1810 UART on terminal block J2. Note that the UART I/O is 3 V CMOS logic. The serial port on transceiver can also be interfaced through the serial port-USB bridge IC on the IM1800-1. Only one interface should be used at a time; the other serial interfaces should remain unconnected. For RS232 operation, place a jumper between J9-1 and J9-2. For USB operation, place a jumper between J9-2 and J9-3. No jumper should be used on J9 when connecting directly to the UART. The IM1800-1 USB interface is based on the Silicon Labs CP2101 IC. The CP2101 drivers can be downloaded from silabs.com. After the correct driver has been installed on a host PC, the USB interface will appear as a serial port.

Bread Boarding Area

Referring to Figure 1, the IM1800-1 bread boarding area is supplied with ground connections on eyelet Row 13 (vertical row of eyelets on right side), VOUT on eyelet Row 3, and USB VBUS on eyelet Row 2. VOUT and the I/O signals from the DM1800 are also provided in two locations on Row 1. Refer to the table on Page 3 for details. Note that the DM1800 or DM1810 can provide up to 10 mA for supplying external circuitry. Additional power can be provided by adding a 3 V regulator in the bread boarding area and running it from VBUS. *Take caution not to operate circuitry from VBUS that directly interfaces the transceiver I/O signals to avoid damaging the transceiver and/or IM1800-1.* Any components placed on the bread boarding area directly under where the transceiver module plugs in must be no taller than 0.1 inch.

Application Circuit

The IM1800-1 includes a temperature and battery voltage monitoring application circuit. To use this circuit, install a jumper between J10-1 and J10-2 and another jumper between J11-1 and J11-2. Setting Digital Out high on the transceiver selects the thermistor temperature circuit, and setting it low selects the battery monitoring circuit. See the latest version of Application Notes AN1800 or AN1810 for details of the thermistor circuit. The battery monitor delivers a signal to the transceiver that is 25% of the battery voltage.

I/O and Power Supply Precautions

All analog and digital input signals must be within the range of 0 to VOUT. Applying a signal outside of this range may damage the transceiver and/or IM1800-1. External DC power supplies must be in the range of +3 to +10 V. Suitable external power supplies include batteries and transformer isolated, regulated DC power supplies. Be cautious when using unregulated "wall transformer" DC supplies. The output voltage of these unregulated supplies can be much higher than the nameplate value when powering low current loads.

Connector and Terminal Block Descriptions

Pin	Name	Description
J1-1	VBUS	This is the USB VBUS. The IM1800-1 and its transceiver module can be powered from this supply.
J1-2	D-	This is the USB D- signal.
J1-3	D+	This is the USB D+ signal.
J1-4 to J1-6	GND	These are signal and power supply grounds for the USB connector.
J2-1 J3-1	GND	This is a signal and power supply ground.
J2-2 J3-2	VIN	This is the power supply positive input. The allowed input voltage range is +3 to +10 V.
J2-3 J3-3 G	VOUT	When the IM1800-1 VIN is in the range of +3.0 to +3.3 V, VOUT is in the range of +2.7 to +3.0 V. When the IM1800-1 is in the range of +3.3 to +10 V, VOUT is regulated at +3.0 Vdc. Up to 10 mA can be supplied for powering external circuits such as thermistor-resistor networks. External circuitry must not impress more than 10 mV_{p-p} ripple on the regulated output voltage.
J2-4 J3-4 F	BIND	This is connected to a logic input on the radio module's microcontroller, and is configured with a weak pull-up. When this pin is momentarily grounded (to J1-1 or J1-10, the module is placed into the bind mode, allowing this module to be associated with other modules to form a network.
J2-5 J3-5 E	DIGITAL IN	This is connected to a logic input on the radio module's microcontroller, and is configured with a weak pull-up, allowing both logic signals and contact closures referenced to J-1 or J-10 to be read. The value of this input is sent over the RF channel as a response to an RF command. The input voltage range on this pad is 0 to VOUT. Applying a voltage outside of this range may damage the module.
J2-6 J3-6 D	ANALOG IN	This is connected to the radio module's microcontroller 10-bit analog-to-digital (ADC) converter. The ADC input range is 0 to VOUT, and the input voltage range on this pad is 0 to VOUT. Applying a voltage outside of this range may damage the module. The reading is sent over the RF channel as a response to an RF command.
J2-7 J3-7 C	DIGITAL OUT	This is connected to a logic output on the radio module's microcontroller through a 1 kilohm resistor, which provides short-circuit protection. The value of this output is set or read over the RF channel as a response to an RF command.
J2-8 J3-8 B	SERIAL RX	This is connected to the radio module's microcontroller serial data input (UART). Data to this input is received at 9.6 kb/s, using 8 data bits, no parity, and one stop bit. The input voltage range on this pad is 0 to VOUT. Applying a voltage outside of this range may damage the module.
J2-9 J3-9 A	SERIAL TX	This is the connected to the radio module's microcontroller serial data output (UART) through a 1 kilohm resistor, which provides short-circuit protection. Data from this output is sent at 9.6 kb/s, using 8 data bits, no parity, and one stop bit.
J2-10 J3-10	GND	This is a signal and power supply ground.
J4-1	-	This pin is not connected.
J4-2	TXD	This pin is the RS232 serial data output.
J4-3	RXD	This pin is the RS232 serial data input.
J4-4	-	This pin is not connected.
J4-5	GND	This is a signal and power supply ground for the RS232 connector.
J4-6 to J4-9	-	These pins are not connected.
J6-1	VIN	This is the coaxial power plug positive VIN input.
J6-2	GND	This is the coaxial power plug ground.

IM1800-1 I/O Connectors

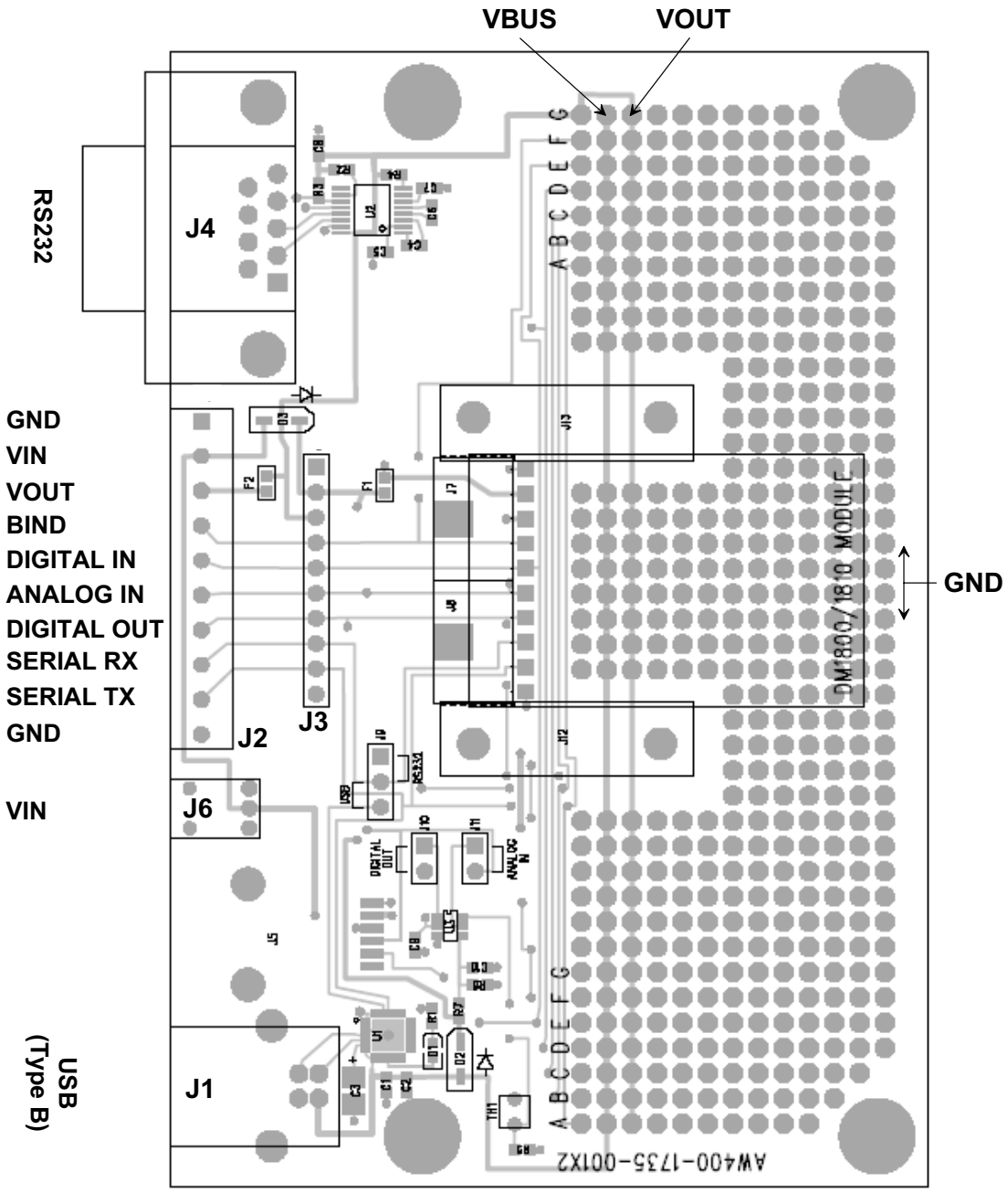
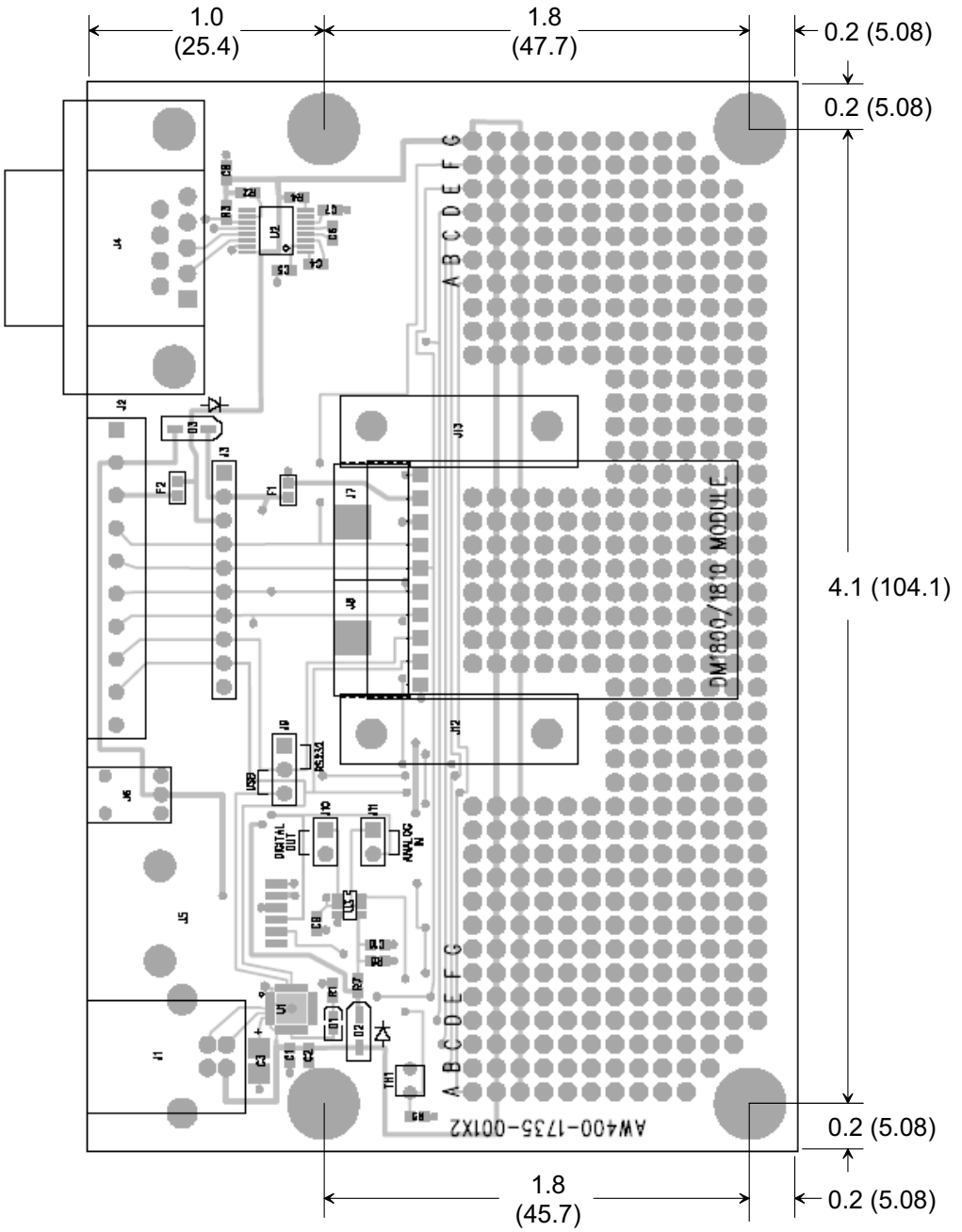


Figure 1

CAUTION: Electrostatic Sensitive Device. Observe precautions when handling.

IM1800-1 Mounting Dimensions



mounting hole diameter 0.125 (3.175)

dimensions in inches (mm)

Figure 2

Note: Specifications subject to change without notice.

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