USB-2-I2C
Conversion Kit for HDJD-JD11

Operating Hardware Manual

Introduction

The USB-2-I2C kit is a simple conversion board, which allows USB connectivity for existing Illumination & Color Management (ICM) development kit that uses parallel port interface to connect to an IBM-PC computer. This conversion board doesn't need any new USB driver to work since the driver is come pre-installed in Windows 2000/XP operating system.

The USB-2-I2C conversion kit comes with the following:

- USB-2-I2C Conversion Board (Figure 1-1)
- Parallel port conversion cable
- USB cable
- USB-2-I2C Conversion Kit Operating Hardware Manual
- CMS Program (V1.5.0) for communicating with HDJD-J822
- CMS Program (V2.1.0) for communicating with ADJD-J823

If you are missing any part of the kit, please contact your nearest Avago Technologies sales office listed in the back of this publication for help.

USB-2-I2C Conversion Board

The USB-2-I2C conversion board has the following hardware features:

1. USB port and associated hardware for direct connection to an IBM-PC computer USB port
2. 5V to 3.3V voltage level shifter IC
3. Micrcontroller for USB to I2C data transfer
4. Jumper to select either using USB +5V or external +5V
5. PCB mounting socket for external +5V supply
6. PWM Flex connector that connects to external LED driver
7. HDJD-JD04 Flex Connector that connect the HDJD-JD04 flexible circuit board
8. PWM header pin that connects to external LED driver
9. General purpose external I/O connector to connect to the unused I/O port of the onboard microcontroller
10. I2C interface that connects to existing ICM development kits that needs USB connectivity. This interface connects to a parallel port conversion cable.
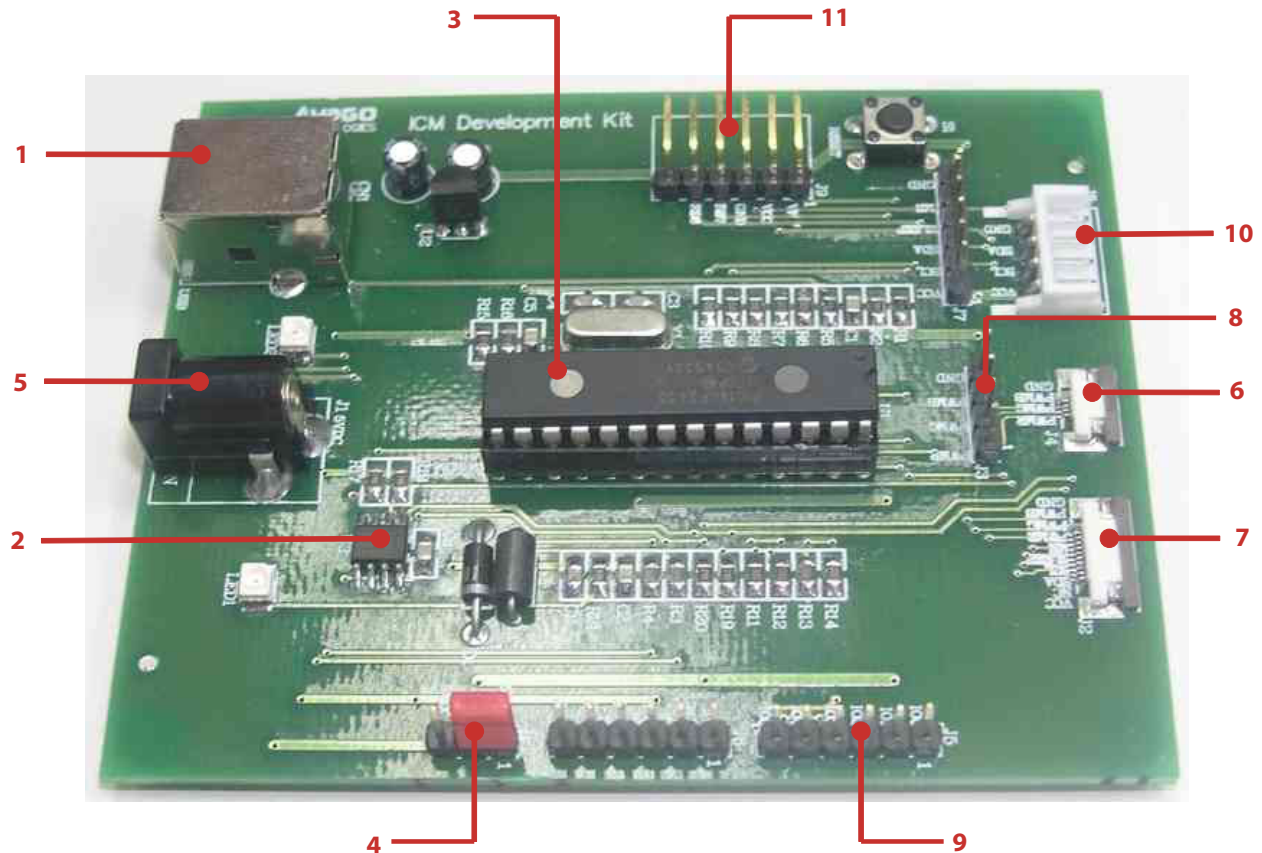11. In-circuit programming port for microcontroller

Figure 1. USB-2-I2C Conversion Board

USB-2-I2C Conversion Kit Hardware User Guide

This guide describes the USB-2-I2C conversion board, including hardware component layout and schematic.

Chapter 1 : Introduction

- This chapter introduces the USB-2-I2C Conversion Kit and provides a brief description of the hardware.

Chapter 2 : Hardware Description

- This chapter describes in detail the hardware of the USB-2-I2C Conversion Board.

Reference Documents

Reference documents listed below are included in the CD-ROM.

- CMS Program User Guide
  (included in the CMS installation program)
- USB-2-I2C User Guide

Hardware Detail

The USB-2-I2C Conversion Kit hardware is extremely simple to use and is intended to help user by providing a tool for user to convert the parallel port based development kit into USB compatible port.

Power Supply

The conversion board is designed to run without any sort of power supply by harnessing the power from the PC USB port (+5V). The power port is provided on the board in case user would like to use an external power supply if the power requirement is more than 500mA. JP1 is used to switch between these two form of supply source.
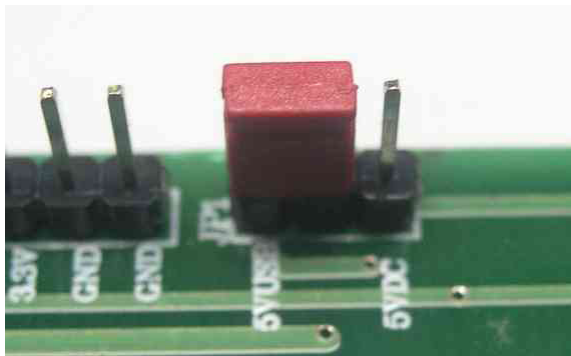

Figure 2. JP1 Power Selector

USB Port

A USB port interface is to provided for easy interfacing with an IBM-PC computer. The port is used to emulate I2C communication, using the onboard microcontroller as the protocol translator. Normal type-B USB cable is used to hook up the board with the computer.

Onboard I2C Voltage Level Shifter

An onboard voltage level shifter, Philips P82B96, is provided to allow the board to work with different I2C bus voltage.

External Input-Output Connector

Various ports are provided to allow easy interfacing with additional peripherals (not included with this kit). These ports include :

- PWM output in header pin and flex-cable connector (J3/4)
- External I/O pin (J5) for user development purpose
- HDJD-JD04 flex-cable connector (J2) for interfacing with ADJD-J823 flex-cable version

I2C port for parallel cable convertor

This port is hook up with the parallel cable convertor (included in the kit) to allow user to interface with Avago Technologies ICM development kit that uses parallel port interface.
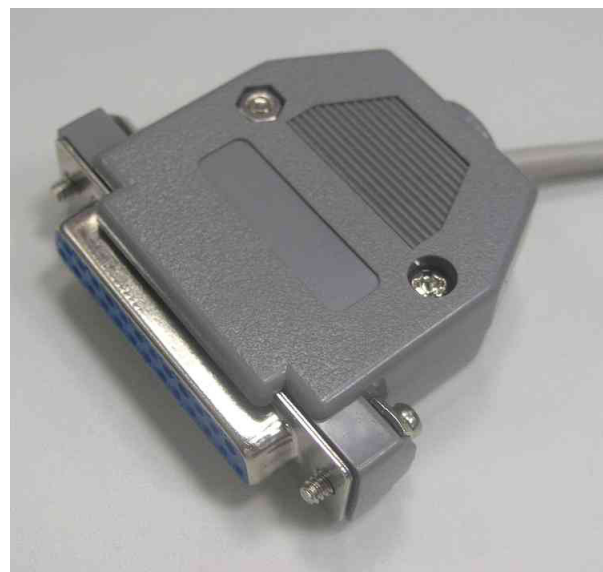

Figure 3. Parallel Convertor Cable

In-Circuit Serial Programming (ICSP) Connector

By way of the header connector (J9), the PIC18LF2455 protocol translator microcontroller can be connected for onboard reprogramming. The ICSP connector utilizes RB6 and RB7 of the microcontrller for in-circuit serial programming. This connector is compatible with Microchip Promate 2 programmer or ICD-2 in-circuit debugger, which support ICSP interface.

Using USB-2-I2C Conversion Kit (using HDJD-JD11)

The following image illustrates how the conversion board is connected with Avago Technologies HDJD-JD11 ICM evaluation kit.

Since the parallel conversion cable doesn't have power pin, power supply is needed to power up HDJD-JD11 ICM Evaluation Kit. Make sure the jumper JP1 on USB-2-I2C conversion board is set to 5VUSB.

Connect the USB cable to an IBM-PC computer USB port. Once the cable is connected, 2 LED indicators on the USB-2-I2C should be lighted up. The power indicator will light up first follow by the enumeration indicator (usually after 1-2 seconds). When both indicators light up, it means the USB enumeration on the PC is complete and the board is ready to use with the CMS software (v1.5.0). For instruction on how to use CMS software, please refer to the software guide document that comes with the CMS software installation program. The document is accesible through the Start Menu -> Program -> CMS 1.5.0 -> Software Guide.
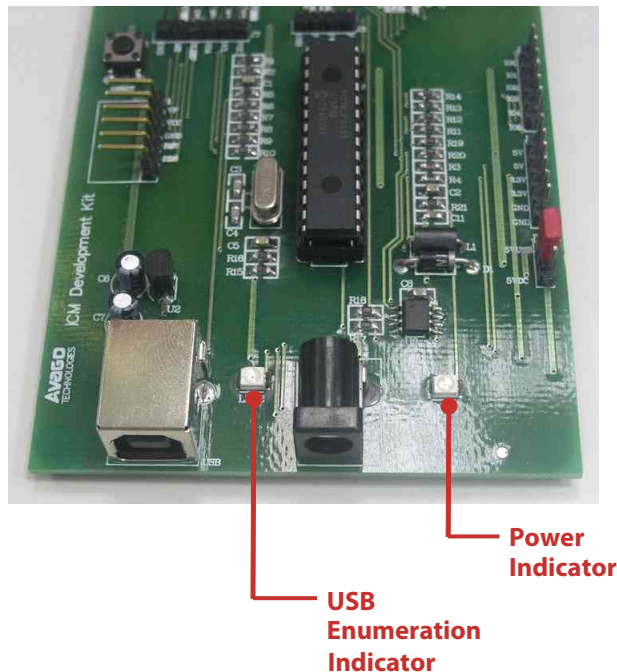

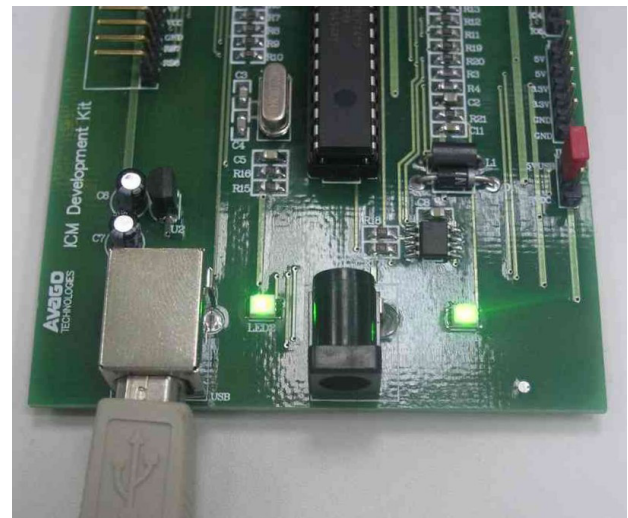Figure 4. Setup connection for USB-2-I2C with HDJD-JD11

Power Indicator

USB Enumeration Indicator

Figure 5. Disconnect state

Figure 6. Connect and successful enumeration state

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Schematic

The following figure shows the schematic of the USB-2-I2C Conversion Board.

Figure 7. USB-2-I2C conversion board schematic

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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