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CEC1x02 Development Board

User's Guide

Microchip Direct Order #DM990013

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Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our web site (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a "DS" number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is "DSXXXXXA", where "XXXXX" is the document number and "A" is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics to open a list of available online help files.

INTRODUCTION

This chapter contains general information that will be useful to know before using the CEC1x02 Development Board. Items discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- The Microchip Web SiteThe Microchip Web Site
- Development Systems Customer Change Notification Service
- Customer Support
- Document Revision History

DOCUMENT LAYOUT

This document describes how to use the CEC1x02 Development Board as a development tool. The manual layout is as follows:

- **Chapter 1. "Introduction"** – Shows a brief description of the CEC1x02 Development Board.
- **Chapter 2. "Features"** – Provides information on the layout of the CEC1x02 Development Board.
- **Chapter 3. "Recommended Tools and Accessories"** – Contains information about the CEC1x02 Development Board tools provided.
- **Chapter 4. "Powering the CEC1x02 Development Board"** – Provides information on powering the CEC1x02 Development Board.
- **Chapter 5. "Jumper Options"** – Summarizes several jumpers for the CEC1x02 Development Board.
- **Chapter 6. "Initial Hardware Setup"** – Includes detailed information on initial setup for the CEC1x02 Development Board.

- **Chapter 7. "Programming and Testing"** – Includes steps for programming and testing the CEC1x02 Development Board.
- **Chapter 8. "Schematics"** – CEC1x02 Development Board schematic diagrams.
- **Chapter 9. "Bill of Materials"** – Provides the CEC1x02 Development Board Bill of Materials (BOM).

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

Description	Represents	Examples
Arial font:		
Italic characters	Referenced books	*MPLAB® IDE User's Guide*
	Emphasized text	...is the *only* compiler...
Initial caps	A window	the Output window
	A dialog	the Settings dialog
	A menu selection	select Enable Programmer
Quotes	A field name in a window or dialog	"Save project before build"
Underlined, italic text with right angle bracket	A menu path	*File>Save*
Bold characters	A dialog button	Click **OK**
	A tab	Click the **Power** tab
N'Rnnnn	A number in verilog format, where N is the total number of digits, R is the radix and n is a digit.	4'b0010, 2'hF1
Text in angle brackets < >	A key on the keyboard	Press <Enter>, <F1>
Courier New font:		
Plain Courier New	Sample source code	`#define START`
	Filenames	`autoexec.bat`
	File paths	`c:\mcc18\h`
	Keywords	`_asm, _endasm, static`
	Command-line options	`-Opa+, -Opa-`
	Bit values	`0, 1`
	Constants	`0xFF, 'A'`
Italic Courier New	A variable argument	*`file`*`.o`, where *`file`* can be any valid filename
Square brackets [ ]	Optional arguments	`mcc18 [options]` *`file`* `[options]`
Curly brackets and pipe character: { | }	Choice of mutually exclusive arguments; an OR selection	`errorlevel {0|1}`
Ellipses...	Replaces repeated text	`var_name [, var_name...]`
	Represents code supplied by user	`void main (void) { ... }`

THE MICROCHIP WEB SITE

Microchip provides online support via our web site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

DEVELOPMENT SYSTEMS CUSTOMER CHANGE NOTIFICATION SERVICE

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To register, access the Microchip web site at www.microchip.com, click on Customer Change Notification and follow the registration instructions.

The Development Systems product group categories are:

- **Compilers** – The latest information on Microchip C compilers, assemblers, linkers and other language tools. These include all MPLAB C compilers; all MPLAB assemblers (including MPASM assembler); all MPLAB linkers (including MPLINK object linker); and all MPLAB librarians (including MPLIB object librarian).
- **Emulators** – The latest information on Microchip in-circuit emulators.This includes the MPLAB REAL ICE and MPLAB ICE 2000 in-circuit emulators.
- **In-Circuit Debuggers** – The latest information on the Microchip in-circuit debuggers. This includes MPLAB ICD 4 in-circuit debuggers and PIC-kit 4 debug express.
- **MPLAB IDE** – The latest information on Microchip MPLAB IDE, the Windows Integrated Development Environment for development systems tools. This list is focused on the MPLAB IDE, MPLAB IDE Project Manager, MPLAB Editor and MPLAB SIM simulator, as well as general editing and debugging features.
- **Programmers** – The latest information on Microchip programmers. These include production programmers such as MPLAB REAL ICE in-circuit emulator, MPLAB ICD 4 in-circuit debugger and MPLAB PM3 device programmers. Also included are nonproduction development programmers such as PICSTART Plus and PIC-kit4.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at:
http://www.microchip.com/support

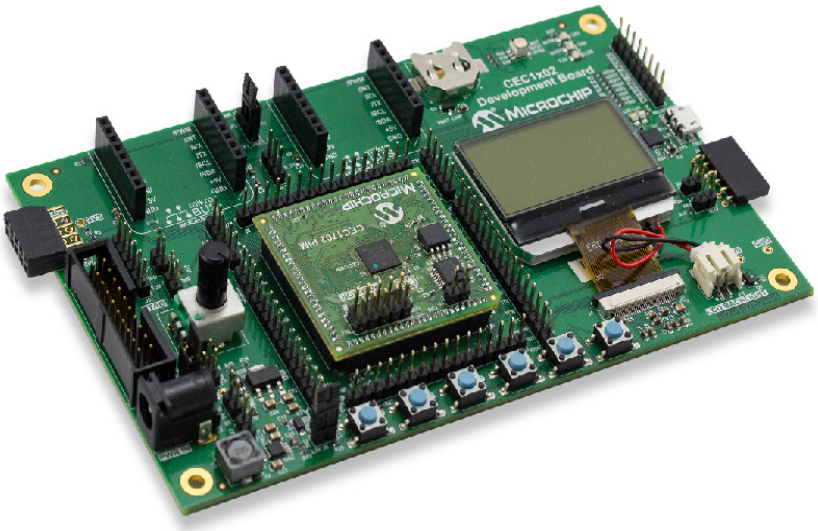
DOCUMENT REVISION HISTORY

Revision	Section/Figure/Entry	Correction
DS50002727A (02-21-18)	Document Release	

Chapter 1. Introduction

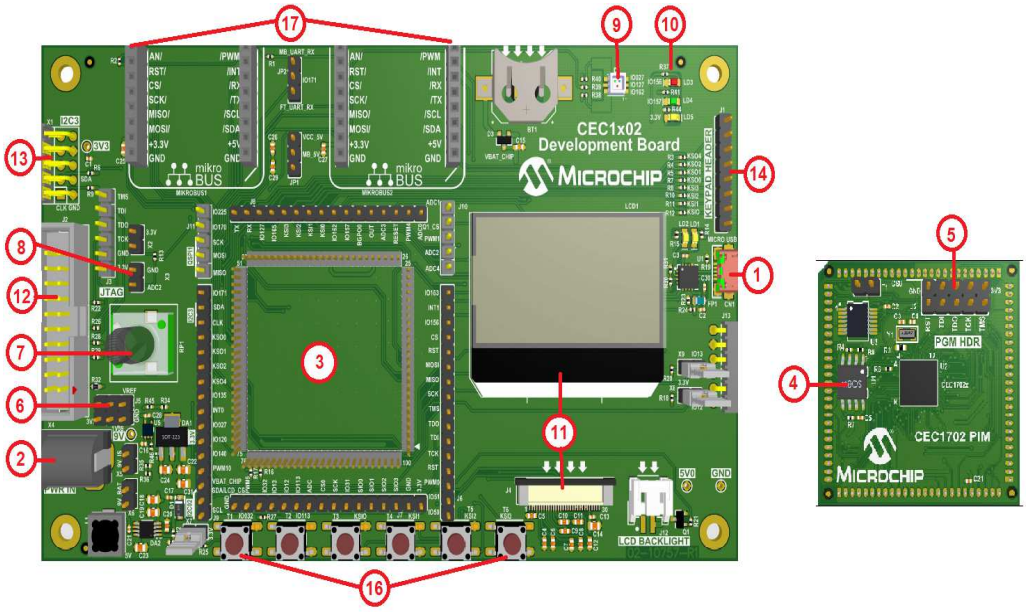
The CEC1x02 Development Board is intended as a development, demonstration, and testing platform for Internet-of-Things applications using the CEC1702, a 32-bit ARM® Cortex®-M4-based microcontroller with additional security peripherals. The board features a variety of hardware options (including a power supply, user interface, serial communications, and expansion headers) that enable rapid prototyping and development of embedded, secure Internet-of-Things applications. In addition to the native hardware features provided by the CEC1x02 Development Board, hardware expansion is possible through the use of mikroBUS™ accessory boards.

The CEC1x02 Development Board features a Plug-In-Module (PIM), which has a CEC1702Q-B2 device without a programmed key so users can create their own private key to store into the CEC1702 for their end applications.



Chapter 2. Features

2.1 CEC1X02 DEVELOPMENT BOARD LAYOUT



1. USB micro-B connector — Provides power to the board and provides an interface for serial input/output or I2C using the Microchip MCP2221A USB-to-UART/I2C serial converter.
2. Power Adapter Plug — Provides another way to apply power to the board by external power adapter from 6 V to 16 V, such as AC002014 - 9 V Wall Mount Power Supply.
3. Connector for Plug-In Module (PIM) — Initially the board is supported with CEC1702PIM.
4. SST26VF016B (on the CEC1702PIM) — Serial Quad I/O (SQI) flash to store the program image for the CEC1702 and provides additional persistent storage for application information.
5. JTAG Debugger/SPI Flash Programming Header (on the CEC1702PIM) — Shared header design for SWD-mode JTAG or external SPI flash connection controlled by VCC_RST pin.
6. eFuse programmability — Ability to evaluate, develop and program all aspects of the CEC1702, including the keys used for authentication.
7. 10 kΩ Potentiometer — Useful as an analog signal source for ADC demonstration or user interface purposes.
8. Analog-to-Digital Converter expansion header — Provides an expansion header for variable-resistance circuit elements, such as a thermistor.
9. Color LED — Full-color PWM-driven LED.

10. Status Indication LED — Output LED for the CEC1702's Blinking/Breathing LED hardware module.
11. 128x64 pixel LCD — EastRising ERC12864 SPI-interface LCD. Useful for displaying user application text/images.
12. JTAG Debugging headers — Provides a standard 20-pin header and a 1x6 header for flexibility.
13. I2C Expansion Header
14. 4x4 Keypad Header
15. GPIOs headers — Expansion headers to access all GPIOs of CEC1702.
16. 6x general-purpose pushbuttons
17. 2x mikroBUS™ Interfaces — Useful for attaching a wide array of hardware expansion boards to extend the functionality of the platform.

Chapter 3. Recommended Tools and Accessories

For development with the CEC1702 Development Board, we have enabled multiple tools options as shown below:

1. Recommended - Microchip Development Tools - MPLAB®X v4.10 or later, XC32 Compiler v2.05 or later, and ICD 4 or Segger J-Link debugger.
2. Keil® µVision® IDE and the MDK-ARM® Standard Cortex®-M compiler license, and Keil uLinkPro/2/Me or Segger J-Link debugger.
3. IAR Embedded Workbench® for Arm v7.70 or later, and I-JET debugger.
4. MikroElektronika mikroC PRO for ARM® IDE v5.0 or later, and mikroProg™ for CEC debugger/programmer.
5. GNU ARM® Embedded Toolchain or others similar that can support Cortex-M4F.

Microchip provides several free firmware projects and libraries that are compatible with the CEC1x02 Development Board. These demos show the basic functionality of the CEC1x02 Development Board and the CEC1702. Details on the usage of these example projects can be found in the documentation accompanying the projects.

The CEC1x02 Development Board's mikroBUS™ expansion headers allow interfacing with a wide variety of click boards™. A list of boards that may facilitate application development is available from MikroElektronika.

MikroElektronika is a trusted third-party tool provider.

Chapter 4. Powering the CEC1x02 Development Board

The CEC1x02 Development Board can be powered directly through the USB micro-B port of the USB-Serial converter (CN1). The 5 V input from the USB voltage rail is regulated to 3.3 V by an MCP1755S voltage regulator.

Optionally, the CEC1x02 Development Board can be powered by an external power supply through the Power Plug (X4). The 6 V to 16 V input from the external power voltage rail is regulated to 5 V by an MCP16312 voltage regulator. Then the 5 V is regulated to 3.3 V, which is the same as using USB micro-B port.

A shunt diode (D1) can be used to allow measurement of the total system power consumption when using the USB micro-B port or a jumper (X5) is provided to allow measurement of the total system power consumption when using an external power supply. A jumper (X7) is provided to allow current measurement on the 3.3 V rail.

Chapter 5. Jumper Options

The CEC1x02 Development Board has several jumpers, summarized as follows:

Jumper	Description	Details
J1	KeyPad Header	Connect to an external keypad up to 4x4
J2	JTAG Header	Standard 20 pin ARM®-JTAG Connector.
J3	JTAG Header	1x6 JTAG Connector.
J5	Voltage Reference Input Select	Selects the positive voltage input to the VREF_ADC pin. Shorting the pin 1-2 to "VREF" will provide a Vdd/3.3V reference. Shorting the center pin 3-4 to "VPP" will provide a reference voltage of ~1.59 V; this voltage is required by the CEC1702's EFUSE programming sequence. See the "CEC1702 Data Sheet EFUSE" chapter for additional information.
J6, J7, J8, J9, J10, J11	GPIO Expansion Header	Connect to CEC1702 GPIO pins.
J12	LCD Backlight Power	Connect to LCD display power cable.
J13	MCP2221A I2C Header	Connect to external I2C device(s) to the MCP2221A.
JP1	MB_5V, VCC_5V Select	Selects between MB_5V or VCC_5V
JP2	GPIO171/UART_RX Select	Selects between MikroBUS™ UART_RX and USB-UART device UART_RX
X1	I2C Expansion Header	Connect to external I2C device(s).
X2	ADC Header Pull-up	Enables a 3.3 V pull-up for the Analog-to-Digital Converter expansion header.
X3	ADC Header	Connect to an external ADC device.
X5	VIN Connection	Can be used for total system power consumption measurement when using external power supply.
X6	BATT 9V	Optional header to support 9V battery for portable environment where need.
X7	3.3V Current Sense	Provides a test point to measure the power consumption on the 3.3 V rail. Removing this jumper will also hard-reset the board.
X8, X9	MCP2221A I2C signals pull-high	Pull-up the MCP2221A I2C signals.

The CEC1702PIM has several jumpers, summarized as follows:

Jumper	Description	Details
J2	JTAG/SPI Header	Shared header design is mated with MikroE's mikroProg for CEC programming/debugger device
T1	VCC_RST Grounded	Put CEC1702 in reset for SPI flash programming if jumper wires to an external SPI flash programmer such as Dediprog SF100.

Chapter 6. Initial Hardware Setup

The **CEC1x02 Development Board** should have all the required jumpers installed for power up through the USB micro-B port (CN1). You can plug-in the USB micro-B Cable from the PC to the board and +3.3V power LED (LD5) should be turned on.

eFuse Programming:

Please note that the CEC1702PIM is populated with the Bx "blank" version of device which will stay in factory automatic test equipment (ATE) mode, which means the boot ROM will not load any firmware from the external SPI flash device until eFuse programming is completed. However, the JTAG port is enabled in this mode, so using the JTAG debugger to download code into SRAM for execution will work fine.

Please refer to "CEC1702" Product Page for User's Guide & Utility.

Note:	Before performing eFuse programming on CEC1x02 development board, you must jumper-wire J5 pin 3-4 to connect 1.59 V to the VREF_ADC pin.

Using JTAG for development:

Without performing the eFuse programming, the CEC1702 Bx "blank" device JTAG port is enabled. You can connect the selected JTAG debugger to the JTAG header, using the selected IDE development tools to select the CEC1702 device and configure the debugger settings accordingly and then click on the 'debug' option to download the compiled application firmware into the SRAM for execution.

For End-Product Evaluation - Building SPI Flash Image & Programming to external SPI flash:

Please refer to the product page sample projects. Depending on which IDE you have selected, building the SPI image by an external utility may be required. The details are included in the corresponding sample projects. After building a correct 2 MB size SPI image, you should use external SPI flash programmer to flash the image into the external SPI flash on the CEC1702PIM. Finally, power cycle the board to see if the firmware is being executed as expected.

Chapter 7. Programming and Testing

7.1 PROGRAMMING

1. Ensure the CEC1702PIM is installed into the **CEC1x02 Development Board.**
2. Install jumper X7 is installed.
3. Programming the SPI Flash with **mikroProg™**:
   a) Connect the mikroProg to J2 on CEC1702 PIM board.
   b) Launch the mikroProg suite.

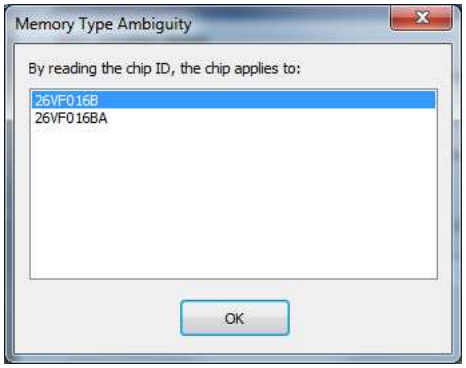
   c) Click on **Detect MCU** to display: CEC1702.
   d) Click on **Load** to load the binary file to program to SPI Flash.
   e) Click on **Write** to write binary file to SPI Flash.

4. Programming the SPI Flash with **DediProg SF100**:
   a) Connect the Dediprog SF100 to J2 on CEC1702 PIM board as follows:

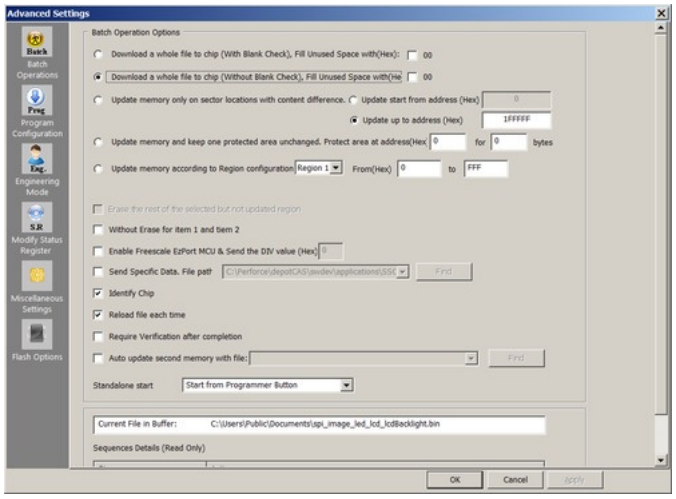
DediProg SF100	CEC1702 PIM
VCC	<1> VCC_3.3V
MOSI	<2> JTAG_TMS/SHD_SIO0
SCK	<4> JTAG_TCK/SHD_SCK
MISO	<6> JTAG_TDO/SHD_SIO1
CS	<7> SHD_CS0
GND	<9> GND

   b) Install jumper T1 on CEC1702 PIM board before programming.
   c) Open the Dediprog Software then select the SPI Flash chip ID: 26VF016B. Click **OK**.

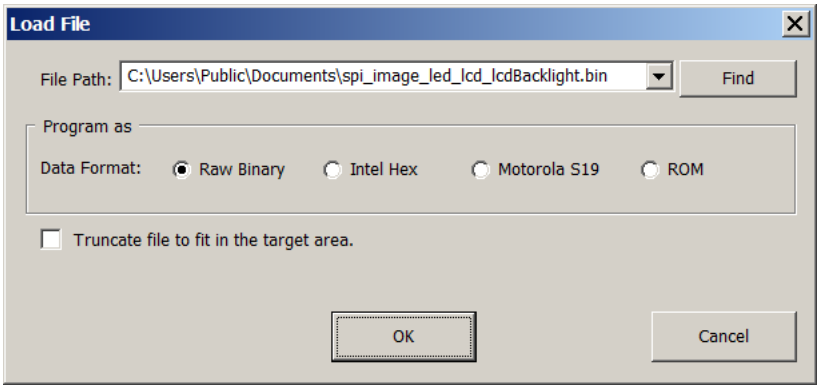
Note: Please install SFv6.0.4.41 or later, older versions may not able to detect the device.



   d) Options settings: Press the **Config** button.



e) Click on **File** to select test binary, for example: spi_image_led_lcd_lcdBack-light.bin from the sample project.



f) Click **Batch** and it will start 'erase and program'.

g) After the programming has completed successfully, remove jumper T1 on CEC1702 PIM board.

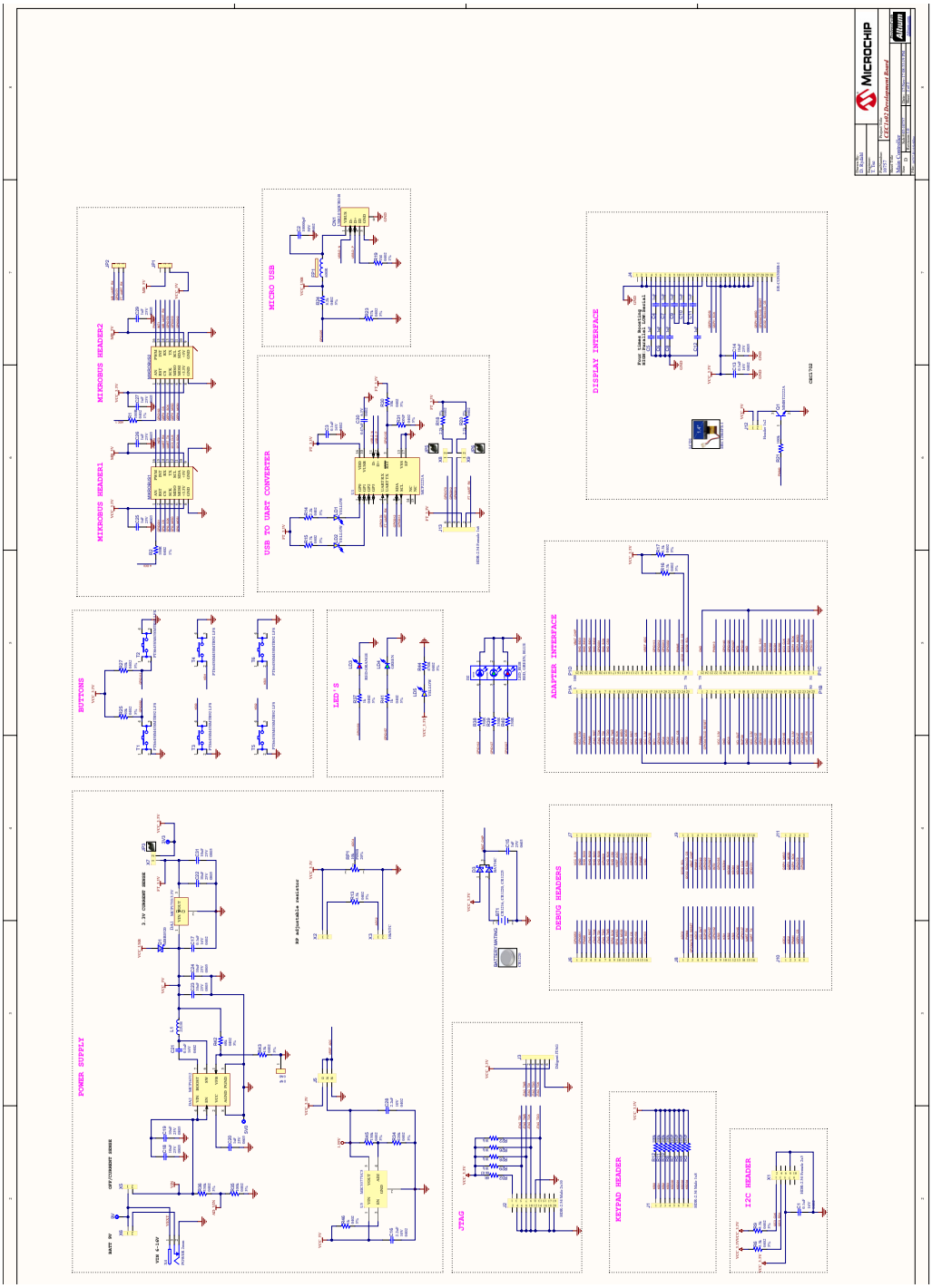
h) Unplug SF100 from J2.

7.2 TESTING

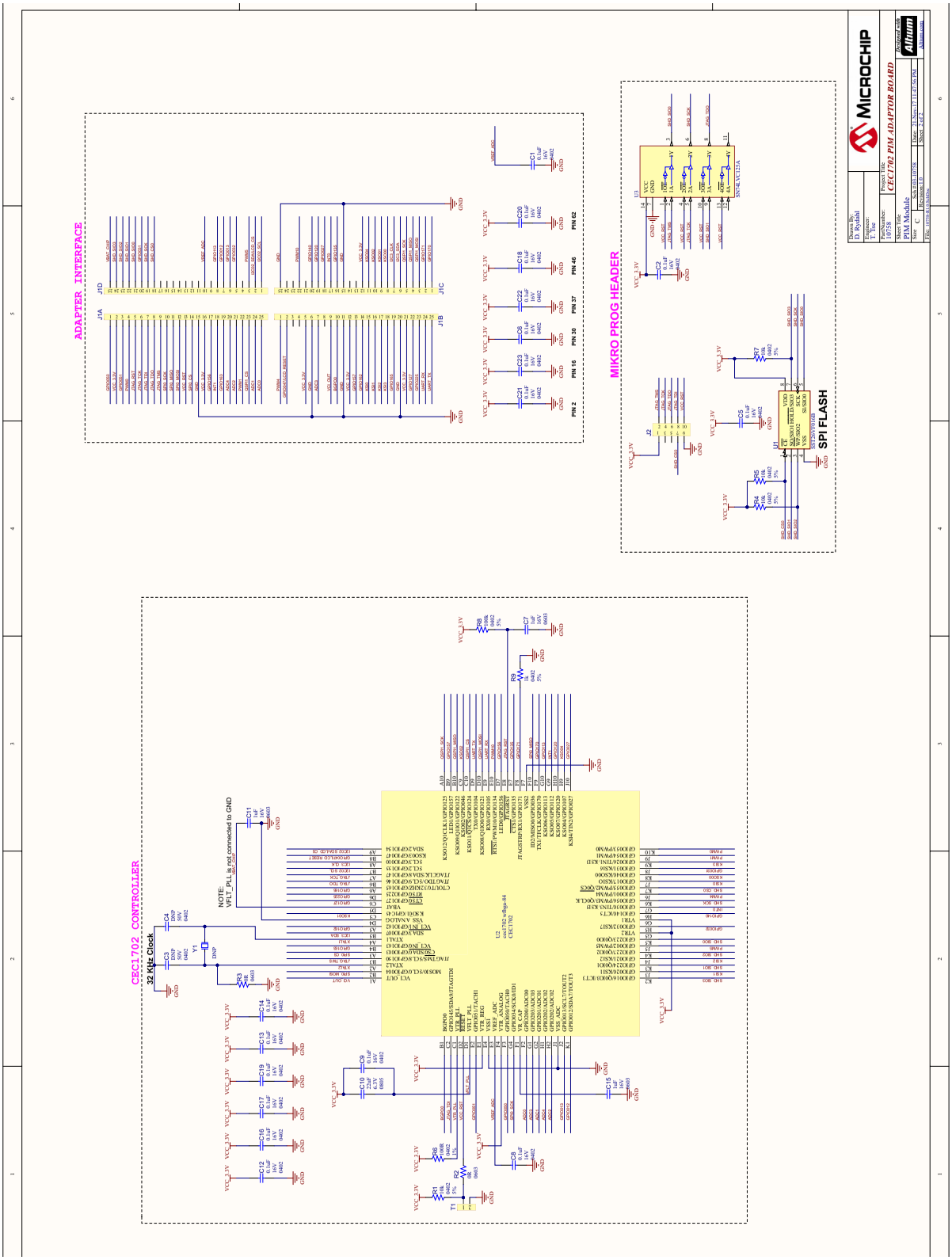
1. Plug-in USB micro-B Cable to CN1.
2. LEDs (D2, LD3, LD4) should all blink if the application firmware was loaded and executed as expected.
3. The LCD Display should show the Microchip Logo.
4. Test Done!

Chapter 8. Schematics

8.1 CEC1X02 DEVELOPMENT BOARD



8.2 CEC1702PIM



Chapter 9. Bill of Materials

9.1 CEC1X02 DEVELOPMENT BOARD

Reference	Description	Manufacturer	Manufacturer Part Number
BATTERY MATING	BATTERY LITHIUM 3 V COIN 12.5 mm	Panasonic	CR1220
BT1	HOLDER BATTERY COIN 12 mm DIA THM	MPD	BK-885-TR
C1,C3,C13,C17,C21	CAP CER 0.1 µF 10 V X5R 0402	Murata	GRM155R71C104KA88D
C2	CAP CER 10000 pF 50 V 10% X7R SMD 0402	Murata	GRM155R71E103KA01D
C4,C5,C6,C7,C8, C9,C10,C11,C12,C15, C20,C25,C26,C27,C29	CAP CER 1 µF 25 V 10% X7R SMD 0603	TDK	CGA3E1X7R1E105K080 AC
C14,C18,C19,C22,C23, C24, C31	CAP CER 10 µF 25 V 10% X5R SMD 0805	Murata	GRM21BR61E106KA73L
C16,C28	CAP CER 2.2 µF 10 V 10% X5R SMD 0402	Murata	GRM155R61A225KE95D
C30	CAP CER 0.47 µF 6.3 V 10% X5R SMD 0402	Murata	GRM155R60J474KE19D
CN1	CON USB2.0 MICRO-B FEMALE SMD R/A	FCI	10104110-0001LF
D1	DIODE SCHOTTKY 20 V 500 mA SOD123	Fairchild	MBR0520L
D2	LED RGB DIFFUSED 6SMD	Cree Inc	CLX6A-FKB-CJNN-RFJBB7A363
D3	Diode Schottky 30 V 0.2 A 3-Pin SOT-23 T/R	Fairchild	BAT54C
DA1	IC REG LIN 3.3 V 300 mA SOT223-3	MICROCHIP	MCP1755S-3302E/DB
DA2	IC REG BUCK ADJ 1A SYNC 8MSOP	MICROCHIP	MCP16312-E/MS
FP1	FERRITE BEAD 600 OHM 1206 1LN	TDK	MPZ2012S601AT000
J1	CON HDR-2.54 Male 1x8 Gold 5.84 mH TH	FCI	68001-108HLF
J2	CON HDR-2.54 Male 2x10 Gold Shroud 6.35 mH TH VERT	Samtec	TST-110-01-G-D
J3	CON HDR-2.54 Male 1x6 Gold 5.84 mH TH VERT	FCI	68001-106HLF
J4	CON FFC/FPC ER-CON30HB-1 0.5 mm 30P Female SMD R/A	EastRising	ER-CON30HB-1
J5	CON HDR-2.54 Male 2x3 Gold 5.84 mH TH VERT	Samtec	TSW-103-07-S-D
J6,J7,J8,J9	CON HDR-2.54 Male 1x16 Gold 5.84 mH TH VERT	Samtec	TSW-116-07-G-S
J10,J11	CON HDR-2.54 Male 1x5 Gold 5.84 mH TH VERT	Samtec	TSW-105-07-S-S

Reference	Description	Manufacturer	Manufacturer Part Number
J12	CON HDR-2 Male 1x2 SHROUDED LOCK SMD RA	EastRising	ER-CON2.0-2P-SMD
J13	CON HDR-2.54 Female 1x6 Gold TH R/A	Sullins	PPPC061LGBN-RC
JP1,JP2	CON HDR-2.54 Male 1x3 Tin 5.84 mH TH VERT	Samtec	TSW-103-07-T-S
JP3,JP5,JP6	MECH HW JUMPER 2.54 mm 1x2 Handle Gold	TE Connectivity	881545-2
L1	INDUCTOR 22UH 1.65 A 96 MOHM SMD 7.3X7.3X4.5	Bourns Inc.	SRR0745A-220M
LCD1	DISPLAY LCD MODULE COG GRAPHIC 128x64 DISPLAY	EastRising	ERC12864FS-1
LD1, LD2, LD5	DIO LED YELLOW 1.8 V 30 mA 70mcd Clear SMD 0805	Lite On Inc.	LTST-C170KSKT
LD3	DIO LED RED ORANGE 2 V 10 mA 2mcd Clear SMD 0805	Lite On Inc.	LTST-C170EKT
LD4	DIO LED GREEN 2 V 30 mA 35mcd Clear SMD 0805	Lite On Inc.	LTST-C170KGKT
MIKROBUS1, MIKRO-BUS2	mikroBUS HOST	Sullins Connector Solutions	PPTC081LFBN-RC
P1A,P1B,P1C,P1D	CON HDR-1.27 Male 1x25 Gold 5.84 mH TH VERT	Samtec	TMS-125-01-G-S
Q1	TRANS BJT NPN MMBT2222A 40 V 1 A 350 mW SOT-23	Fairchild	MMBT2222A
R1,R2	RES TKF 100R 1% 1/10 W SMD 0402	Panasonic	ERJ-2RKF1000X
R3,R4,R5,R7,R8, R10,R11,R12,R21	RES TKF 100 k 1% 1/10 W SMD 0402	Panasonic	ERJ-2RKF1003X
R14	RES TKF 2.2 k 5% 1/16 W SMD 0402	Vishay Dale	CRCW04022K20JNED
R15	RES TKF 4.7 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ472X
R18,R20	RES TKF 2.2 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ222X
R19	RES TKF 1M 1% 1/10 W SMD 0402	Panasonic	ERJ-2RKF1004X
R22,R26,R28,R29,R30	RES TKF 10 k 5% 1/16 W SMD 0402	Vishay	CRCW040210K0JNED
R23	RES TKF 47 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ473X
R24	RES TKF 8.2 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ822X
R25,R27	RES TKF 10 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ103X
R31	RES TKF 10 k 5% 1/16 W SMD 0402	Vishay	CRCW040210K0JNED
R32	RES TKF 0R 1/10 W SMD 0603	Panasonic	ERJ-3GSY0R00V
R34	RES TKF 220 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ224X
R35	RES TKF 100 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ104X
R36	RES TKF 330 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ334X
R37,R41,R46	RES TKF 1 k 5% 1/16 W SMD 0402	Panasonic	ERJ-2GEJ102X
R38,R39,R40	RES TKF 330R 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ331X
R42	RES TKF 68 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ683X
R43	RES TKF 13 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ133X
R44	RES TKF 470R 5% 1/16 W SMD 0402	Yageo	RC0402JR-07470RL
R45	RES TKF 130 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ134X
R6,R9,R13,R16,R17	RES TKF 3.3 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ332X
RP1	Res Variable 10 k 20% TH P090S	TT ELECTRONICS/BI	P090S-04F20BR10K

Reference	Description	Manufacturer	Manufacturer Part Number
T1,T2,T3,T4,T5,T6	SWITCH TACT SPST 12 V 50 mA PTS645SM43SMTR92 LFS SMD	Wurth Electronics Inc	430182043816
U1	MCHP INTERFACE USB I2C/UART MCP2221A-I/ML QFN-16	MICROCHIP	MCP2221A-I/ML
U5	IC REG LDO ADJ 0.15 A SC70-5	MICROCHIP	MIC5377YC5-TR
X1	CON HDR-2.54 Female 2x5 GOLD TH R/A	Samtec	SSQ-105-02-G-D-RA
X2,X3,X5,X6,X7, X8,X9	CON HDR-2.54 Male 1x2 Tin 6.75 mH TH VERT	Molex	0901200122
X4	CON POWER 2 mm 5.5 mm SWITCH TH R/A	CUI Inc.	PJ-002AH

9.2 CEC1702PIM DEVELOPMENT BOARD

Reference	Description	Manufacturer	Manufacturer Part Number
C1,C2,C5,C6,C8, C9,C12,C13,C14,C16, C17,C18,C19,C20,C21, C22,C23	CAP CER 0.1 µF 16 V 10% X7R SMD 0402	Murata	GRM155R71C104KA88D
C10	CAP CER 22 µF 6.3 V 20% X5R SMD 0805	Murata	GRM21BR60J226ME39L
C7,C11,C15	CAP CER 1 µF 16 V 10% X5R SMD 0603	AVX	0603YD105KAT2A
J1A,J1B,J1C,J1D	CON HDR-1.27 Female 1x25 TH VERT	Preci-Dip	851-87-025-10-001101
J2	CON HDR-2.54 Male 2x5 0.100" (2.54 mm) TH VERT	Samtec	TSW-105-07-G-D
R1,R4,R5,R7	RES TKF 10 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ103X
R2,R3	RES TKF 0R 1/10 W SMD 0603	Panasonic	ERJ-3GSY0R00V
R6	RES TKF 100R 1% 1/10 W SMD 0402	Panasonic	ERJ-2RKF1000X
R8	RES TKF 100 k 5% 1/10 W SMD 0402	Panasonic	ERJ-2GEJ104X
R9	RES TKF 1 k 5% 1/16 W SMD 0402	Panasonic	ERJ-2GEJ102X
T1	CON HDR-2.54 Male 1x2 Tin 6.75 mH TH VERT	Molex	0901200122
U1	MCHP MEMORY SERIAL FLASH 16M 104 MHz SST26VF016B-104I/SM SOIJ-8	MICROCHIP	SST26VF016B-104I/SM
U2	CRYPTO EMBEDDED CONTROLLER 480 K CEC1702Q-C2-I/SX	MICROCHIP	SST26VF016B-104I/SM
U3	IC LOGIC SN74LVC125ADBR Quad Bus Buffer Gate SSOP-14	TI	CEC1702Q-C2-I/SX
Y1 (DNP)	CRYSTAL 32.768 kHz 12.5 pF SMD ABS07	Seiko	SC32S-12.5PF20PPM
C3,C4 (DNP)	CAP CER 10 pF 50 V 5% NP0 SMD 0402	Murata	GRM1555C1H100JZ01D

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