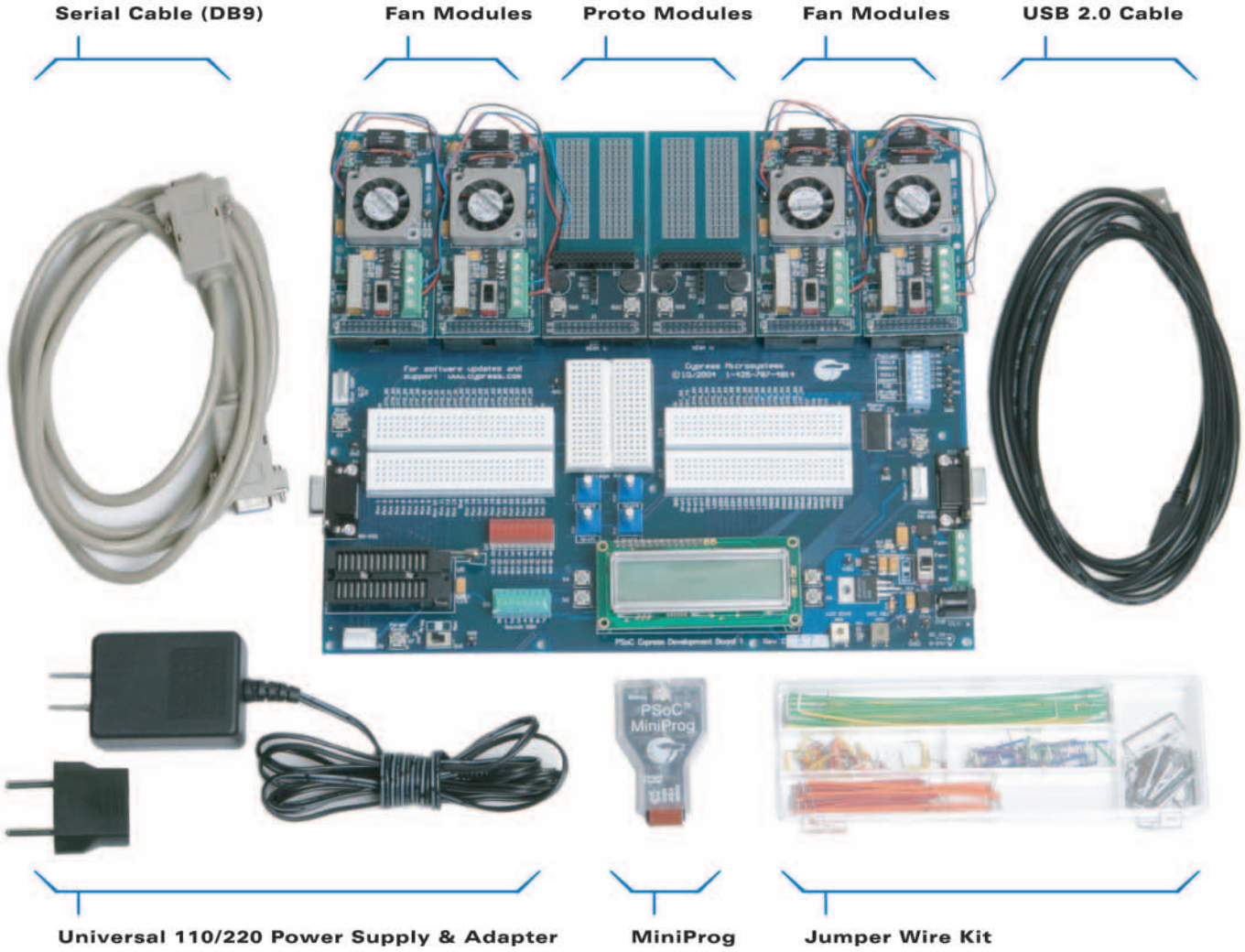
PSoC™ EXPRESS
Visual Embedded Design

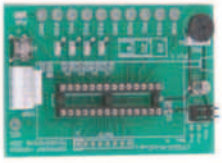
EXPRESS Start

CY3210-ExpressDK
Getting Started Guide



Kit Contents:

- Development Board
- Four Fan Modules
- Two Proto Modules
- MiniProg - In-System Programmer
- MiniEval PCB - Evaluation Board
- Universal 110/220 Power Supply
- European Plug Adapter
- USB 2.0 Cable
- Jumper Wire Kit
- Serial Cable (DB9)
- Six 28-Pin DIP Samples:
  - Two CY8C24423A-24PXI
  - Two CY8C27443-24PXI
  - Two CY8C29466-24PXI



Not Pictured:

- Serial Debug & Test Commands Card
- Fan & Proto Module Guides
- Development Kit Registration Card
- PSoC EXPRESS™ CD-ROM
- Application Notes
- Express Start

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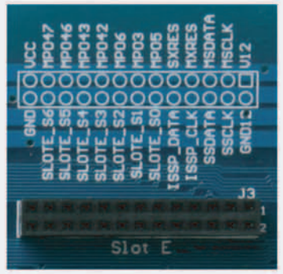
Development Board Details

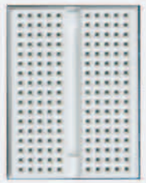
1 Module Ports

Connect fan or proto modules to development board (labeled as Slots A - F).



2 Prototyping Breadboard

extra Breadboard space for prototyping, useful for making long connections.



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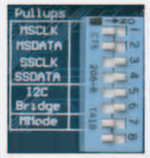


On-board Monitor (OBM) Switches

- Switch 1: Pullup for secondary I2C bus to slots (not used at this time)
- Switch 2: Pullup for secondary I2C bus to slots (not used at this time)
- Switch 3: I2C pullup, use to enable the main I2C bus pullup resistors for SSCLK as SSDATA respectively. When ON, a 2.7K resistor is connected between the signal and VDD. "This should be ON anytime" the Master PSoC is used to communicate with the Target PSoC. Both switch 3 and 4 should be in the same position.
- Switch 4: I2C Pullup (same operation as switch 3)
- Switch 5: Bridge, use to connect the I2C bus of the target PSoC to the I2C bus of the master PSoC. This should be ON anytime the Master PSoC is used to communicate with the Target PSoC. Both switch 5 and 6 should be in the same position.
- Switch 6: Bridge (same operation as switch 5)
- Switch 7: Master Mode (not used at this time)
- Switch 8: (not used at this time)
- (See Getting Started on the back of the board)

4 EIA-232 Connection

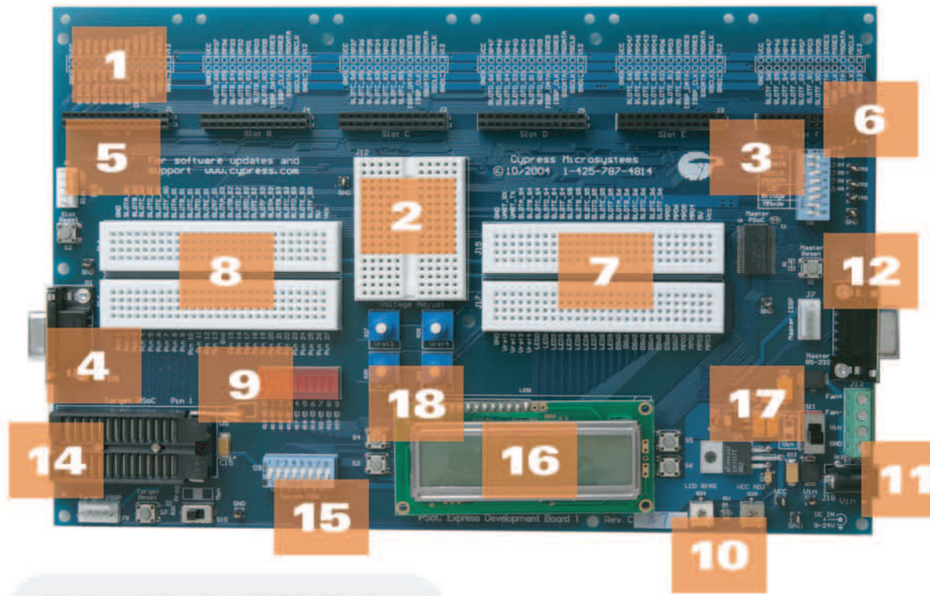
Connects to UART_RX and UART_TX on module breadboard right. Converts RS-232 levels to logic levels.

5 Module ISSP Connector

In-System Serial Program (ISSP) a PSoC that is on a module. (Not used at this time, for future module.)

6 Test Points

- TP2: I2C data signal
- TP3: I2C clock signal
- TP4: secondary I2C bus data signal (routed to Module ports, presently not used).
- TP5: secondary I2C bus clock signal (routed to Module ports, presently not used).

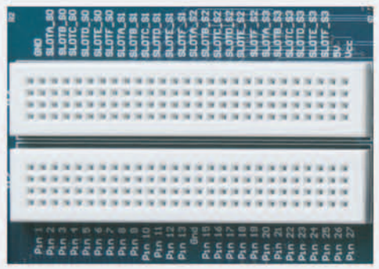


12 EIA-232 On-board Monitor (OBM) Interface

Page four of the Express Start details the On-board Monitor system.

8 Module Breadboard Left

Connect to Module signals.



Target PSoC I/O Breadboard

Connect to Target PSoC I/O.

9 Module ISSP Connector

To turn on an LED, connect it to a voltage between 2.5V and 5V via the On-board Resources Breadboard (LED0-LED9).

10 LCD Bias, VDD Adjust

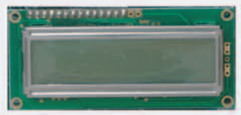
Adjust the contrast of the LCD, or adjust VDD (shipped pre-trimmed).

15 Switches

ON connects to VDD. OFF disconnects (floats). Driver: Switch, Pull Down Internal. Access the switches via the On-board Resources Breadboard (DSW0-DSW7).

16 On-board Monitor (OBM) Display

Page four of the Express Start details the On-board Monitor system.



11 External Power Supply

If desired, connect an external power supply to Fan+ and Fan-.

13 ISSP Connector

Connect the MiniProg to the ISSP (In-System Serial Programming) connector as shown in picture.

14 Socket for Target PSoC

Program a PSoC device with your PSoC Express Project

Programming switch

Turn switch to "Prog" to enable programming of the target PSoC. (Mod not used at this time, for future release).

17 Power Supply Switch

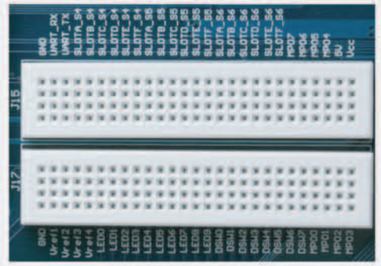
- +FAN - Isolates external supply from Vin. Connects external supply (Fan+, Fan-) to module ports' V12.
- Vin - Connects Vin to module ports' V12.
- See Getting Started on the back of the board.

18 Reference Voltages

The four potentiometers are connected across GND and VDD. Access the reference voltages via the On-Board Resources Breadboard (Vref 1-Vref4).

7 Module Breadboard Right

Connect to module signals.



On-board Resources Breadboard

Connect to the reference voltages, LEDs, and switches.

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On-Board Monitor

Advanced Functionality

The OBM (On-Board Monitor) provides important test, debug, and control functions for your PSoC Express designs.

Features:

- Scan I2C bus for devices.
- I2C communication via target PSoC
- Heater control (control a PWM output signal to each module port)
- Temperature feedback (monitor voltage of pin 15 for each module port)

Master PSoC Processor:

This processor performs both monitor and control functions. Use the display menus and switches to utilize these functions.

User Interface Screens:

- Screen 1 (Version) displays firmware version.
- Screen 2 (Function Option) displays function options.
- Screen 3 (I2C Bus Scan Results) displays the result of scanning the I2C bus for devices. Up to 5 device addresses will appear. If there are more than 5 devices, a "+" will be placed at the lower right hand corner.
- Screen 4 (Select Module Port) selects which module port (slot) to monitor. S5 and S6 scroll between module ports. S4 selects chosen module port.
- Screen 5 (Slot Display) displays the voltage output (mVolts) of pin 15 of the selected module port. When a Fan Module is connected, the output of an LM20 is monitored. The calculated temperature is also displayed. The PWM output may be adjusted by pressing S5 and S6. These keys adjust the PWM output in increments of 10%. The PWM output is connected to pin 17 of each of the slot connectors. The frequency of these signals is ~250 Hz, except for the PWM signal for slot C which is ~5 Hz.
- Screen 6 (Select I2C Address) selects the I2C address of the device that will be monitored. S5 and S6 are used to select the address. S4 selects the chosen I2C address.
- Screen 7 (Select Offset) selects the I2C sub-address offset. The sub-address offset is the internal address of the data in the I2C device. S5 and S6 adjust the offset by increments of two. S4 selects the chosen offset.
- Screen 8 (Select Register Count) select 1, 2, or 3 values to monitor. S4 displays registers.
- Screen 9 (Monitor Registers) monitor up to three integer values from the target PSoC. The target PSoC is polled at a ~5 Hz. Press any key to return to the Select Register Count screen.

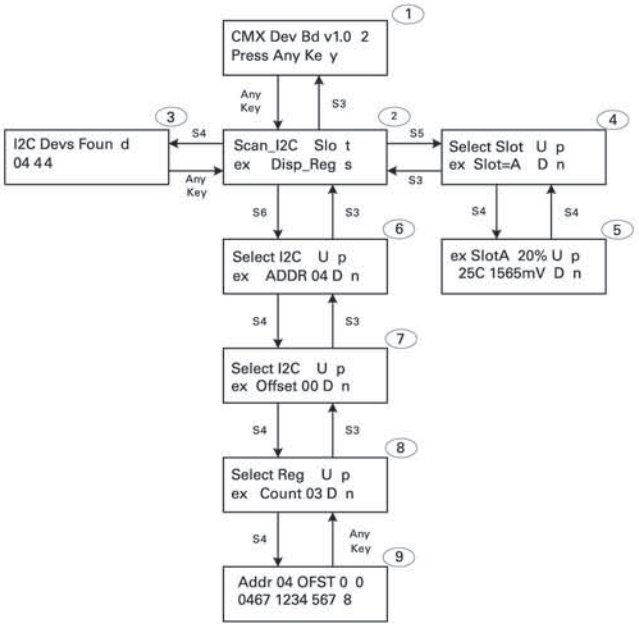
OBM Hardware Elements:

- Master PSoC Processor
- Display & Menu Switches (S3, S4, S5, S6)
- EIA-232 transceiver & connector

Display Menus:

The menus are navigated with the switches around the LCD (S3, S4, S5, S6)

User Interface Screens



EIA-232 On-board Monitor (OBM) Interface:

Some debug and test commands can be accomplished from the EIA-232 serial port via a terminal emulator.

For a complete list of the commands and syntax see the "Serial Debug & Test Commands for the CY3210- ExpressDK."

Serial Port Settings:

- Baud 38400
- 8 data bits
- No flow control
- 1 stop bit

Terminal Emulator Commands:

Below is a list of the commands as accessed with the HELP command.

WR ADDR sub-addr [11 22 aa bb]	; Write data
RD ADDR CNT	; Read data
CRD ADDR CNT	; Continuous Read
ARD ADDR CNT	; ASCII Read
SCAN [ADDR1 ADDR2]	; Scan from ADDR1 to ADDR2
CIRD ADDR CNT	; Continuous integer read
SLOT ADDR [Duty_Cycle]	; Get Slot params and set PWM
HELP	; This command

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