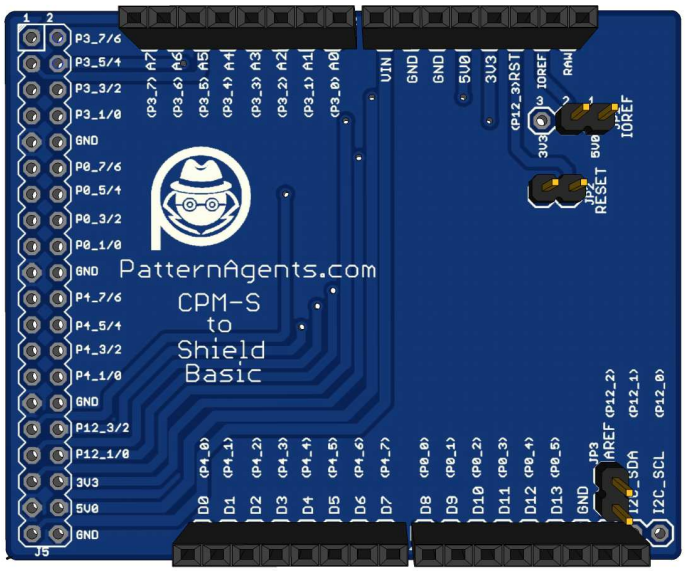


CPM-S to Arduino Shield Adaptor

Getting Started Guide
for the CPM Module Bus
To Arduino Shield Adaptor

http://www.patternagents.com/products.html

Revision 2.1.11
PCD #272A

Congratulations on your purchase of the "CPM-S to Arduino Shield Adaptor" board!

The PatternAgents "CPM-S to Arduino Shield Adaptor" board has the following features :

1) CPM-S (Slave) Forty (40) Pin Male Connector.
2) Arduino "Leonardo" Extended, Stacking Shield Connector(s).
3) Support for Arduino "Leonardo" I2C Pins.
4) Configurable for 3.3V or 5.0V operation.
5) Configurable for Arduino programmable Reset (optional jumper).
6) Configurable for Arduino IOREF (optional jumper).
7) Configurable for Arduino AREF (optional jumper).

Overview :

The PatternAgents "CPM-S to Arduino Shield Adaptor" board is designed to enable products that incorporate a CPM-M (Master) Forty (40) Pin Female connector to utilize Arduino Shield boards. Current products that incorporate a CPM-M (Master) Forty (40) Pin Female connector, and are compatible with the PatternAgents "CPM-S to Arduino Shield Adaptor board are :

Cypress CY8CKIT-001 : (Supports up to three (3) "CPM-S to Arduino Shield Adaptors")
Cypress CY8CKIT-030 : (Supports up to two (2) "CPM-S to Arduino Shield Adaptors")
Cypress CY8CKIT-050 : (Supports up to two (2) "CPM-S to Arduino Shield Adaptors")
Cypress CY3280-28xxx : (Supports one (1) "CPM-S to Arduino Shield Adaptor")
Cypress CY3280-22x45 : (Supports one (1) "CPM-S to Arduino Shield Adaptor")

(Not an Exhaustive list as more products are routinely released)

Getting Started :

To use the PatternAgents "CPM-S to Arduino Shield Adaptor" board simply plug it into a CPM-M (Master) socket and you are to start programming. You don't have to worry about putting little jumper wires into the wrong spots, or having wires pull out when you move your board around.

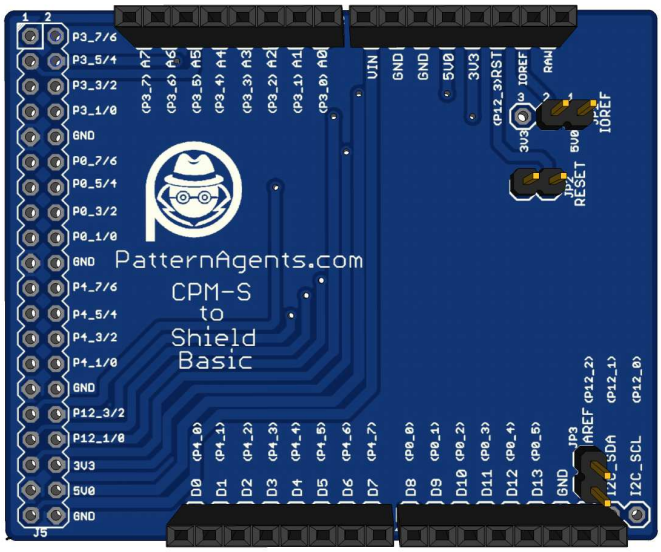
NOTE: *Always make sure the power is OFF, before adding or removing boards!*

Stack-Thru Models (optional request):

As an option, PatternAgents "CPM-S to Arduino Shield Adaptor" boards can populated with "Stack-Thru" connectors, which allow Arduino Shields to be added to the top or bottom of the board stack.

NOTE: *Always make sure the stacking pins don't contact a metal surface (like a metal table).*

CPM to Arduino Shield Adaptor

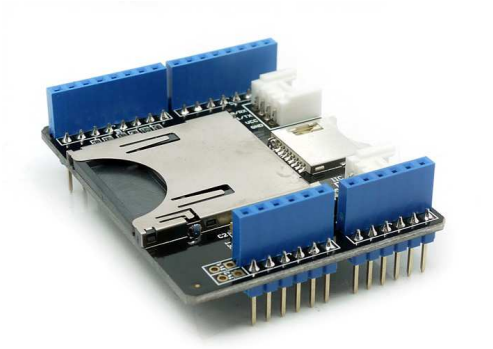


Top View

Contents :

Example of CY8CKIT-030 board, Arduino Adaptor, and SeeedStudio SD CARD Shield :

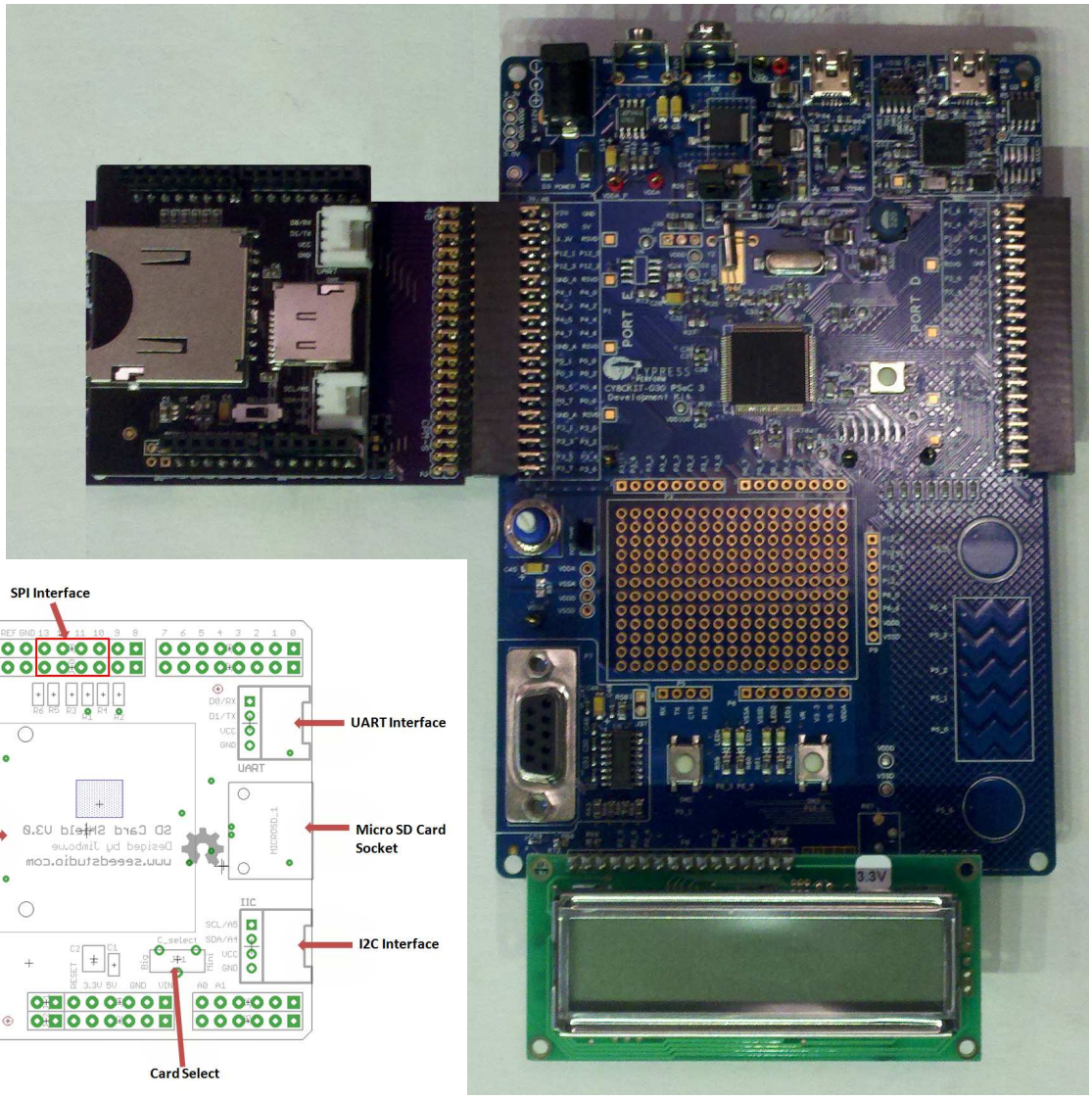
Attach the PatternAgents "CPM-S to Arduino Shield Adaptor" board to the CY8CKIT-030 Port E connector, and install the SeeedStudio SD CARD Shield, into the "CPM-S to Arduino Shield Adaptor" board, as shown in the image below:



SeeedStudio SD Card Shield
http://www.seeedstudio.com/depot/sd-card-shield-p-492.html?cPath=109

SDCARD
uSDCARD
I2C (Grove Standard)
TTL UART (Grove Standard)

Availability: Radio Shack, Fry's, Web Stores ($15.00)



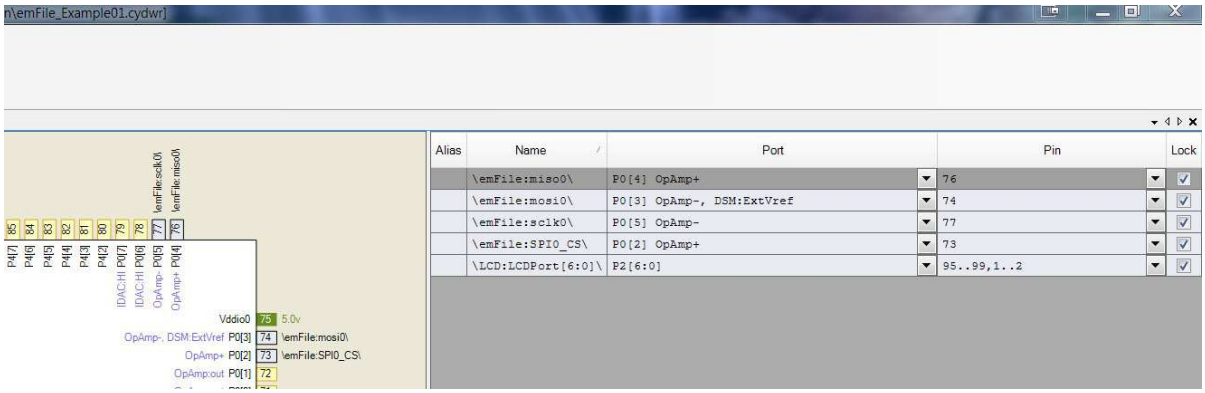
PORT "E" I/O Assignment from CY8CKIT-030/050 board to SeeedStudio SDCARD Shield :

When the PatternAgents "CPM-S to Arduino Shield Adaptor" board is installed into Port E (Left Side) of a CY-C8CKIT-030/050 development kit, as shown to the left, and the SeeedStudio SDCARD Shield is installed, then default I/O Assignment is :

Arduino	Port E	Notes	SDCARD Shield
D10	P0_2	SPI0 SS	SDCARD Connector
D11	P0_3	SPI0 MOSI	SDCARD Connector
D12	P0_4	SPI0 MISO	SDCARD Connector
D13	P0_5	SPI0 SCK	SDCARD Connector

Example CY8CKIT-030 board and SeeedStudio SD CARD Shield PSoC Creator Project (emFile_Example01) :

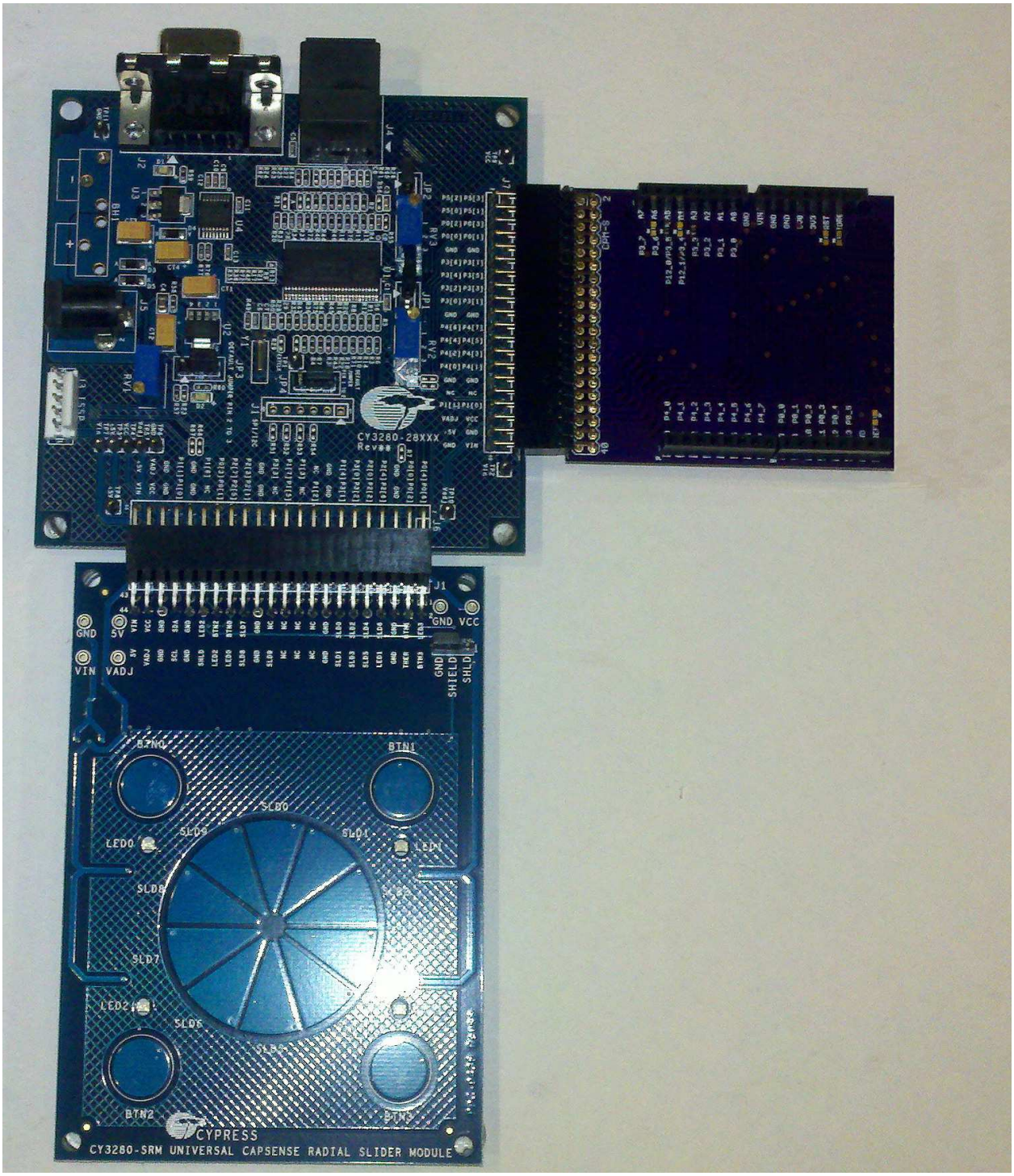
Utilizes Segger "emFile" file system component example project, "emFile_Example01" with (emFile_Example01.cydwr) pin assignment as :



NOTE: Read all project example installation directions (and follow the instructional video) at :
http://www.cypress.com/?rID=58694
http://www.cypress.com/?docID=39399

Example for CY3280-28xxx (PSoC1 "NEON" family)
with CY3280-SRM (Capacitive Slider Radial Module),
Arduino shield adaptor, and Character LCD Shield:

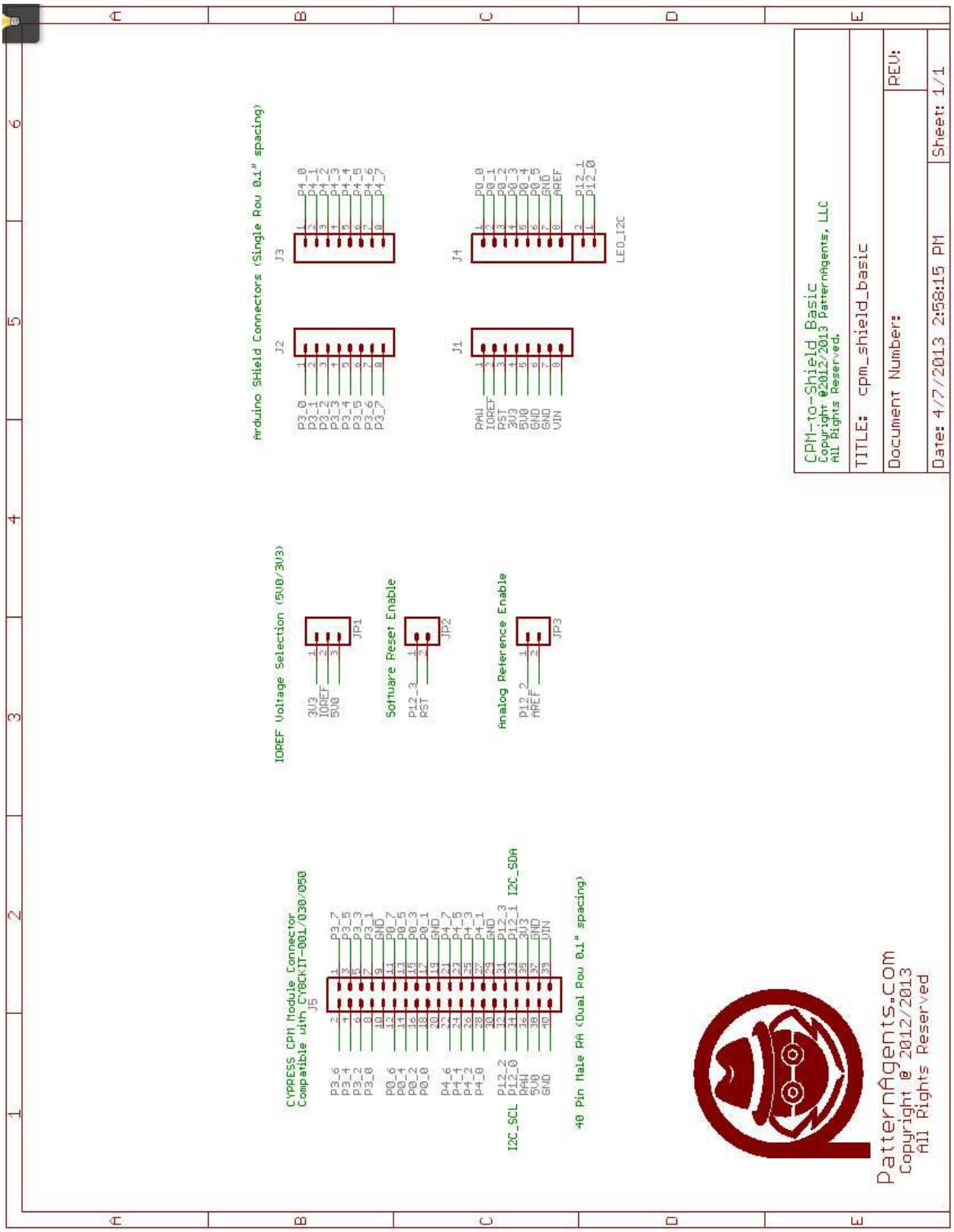
Attach the PatternAgents "CPM-S to Arduino Shield Adaptor" board to the CY3280-28xxx CPM connector. Then any Arduino compatible shield peripheral board can easily be attached to the "CPM-S to Arduino Shield Adaptor" board , as shown in the image below:



PORT "E" I/O Assignment for CY3280-28xxx (PSoC1 "NEON" family) with CY3280-SRM (Capacitive Slider Radial Module), Arduino shield adaptor, and Character LCD Shield installed:

When the PatternAgents "CPM-S to Arduino Shield Adaptor" board is installed into Port E (Left Side) of a CY-C8CKIT-030/050 development kit, and a Character LCD Shield is attached,
the Shield I/O Assignment is as follows :

Arduino	Port E	Notes	LCD Shield
A0	P0_0	Analog Input 0	Button 0
A1	P0_1	Analog Input 1	Button 1
A2	P0_2	Analog Input 2	Button 2
A3	P0_3	Analog Input 3	Button 3
A4	P5_0	Analog Input 4	Unused
A5	P5_1	Analog Input 5	Unused
A6	P5_2	Analog Input 6	Unused
A7	P5_3	Analog Input 7	Unused
D0	P4_0	UART0 RX	LCD DB4
D1	P4_1	UART0 TX	LCD DB5
D2	P4_2	PWM0	LCD DB6
D3	P4_3	PWM1	LCD DB7
D4	P4_4	PWM2	LCD EN
D5	P4_5	PWM3	LCD RS
D6	P4_6	PWM4	LCD RW
D7	P4_7	PWM5	LCD LED
D8	P3_0	GPIO0	Button 4
D9	P3_1	GPIO1	Button 5
D10	P3_2	SPI0 SS	Unused
D11	P3_3	SPI0 MOSI	Unused
D12	P3_4	SPI0 MISO	Unused
D13	P3_5	SPI0 SCK	Unused
D14	P1_0	I2C_SDA	I2C0 SDA
D15	P1_1	I2C_SCL	I2C0 SCL


CPM-to-Shield Basic
Copyright @2012/2013 PatternAgents, LLC
All Rights Reserved.
TITLE: cpm_shield_basic
Document Number:
REV:
Date: 4/7/2013 2:58:15 PM
Sheet: 1/1
Arduino Shield Connectors (Single Row 0.1" spacing)
J2
J3
J1
J4
P3_0
P3_1
P3_2
P3_3
P3_4
P3_5
P3_6
P3_7
P4_0
P4_1
P4_2
P4_3
P4_4
P4_5
P4_6
P4_7
RAW
IOREF
RST
3V3
5V0
GND
VIN
P0_0
P0_1
P0_2
P0_3
P0_4
P0_5
AREF
P12_1
P12_0
LED_I2C
IOREF Voltage Selection (5V0/3V3)
JP1
Software Reset Enable
P12_3
JP2
Analog Reference Enable
P12_2
JP3
CYPRESS CPM Module Connector
Compatible with CY8CKIT-001/030/050
J5
I2C_SCL
I2C_SDA
40 Pin Male RA (Dual Row 0.1" spacing)
PatternAgents.com
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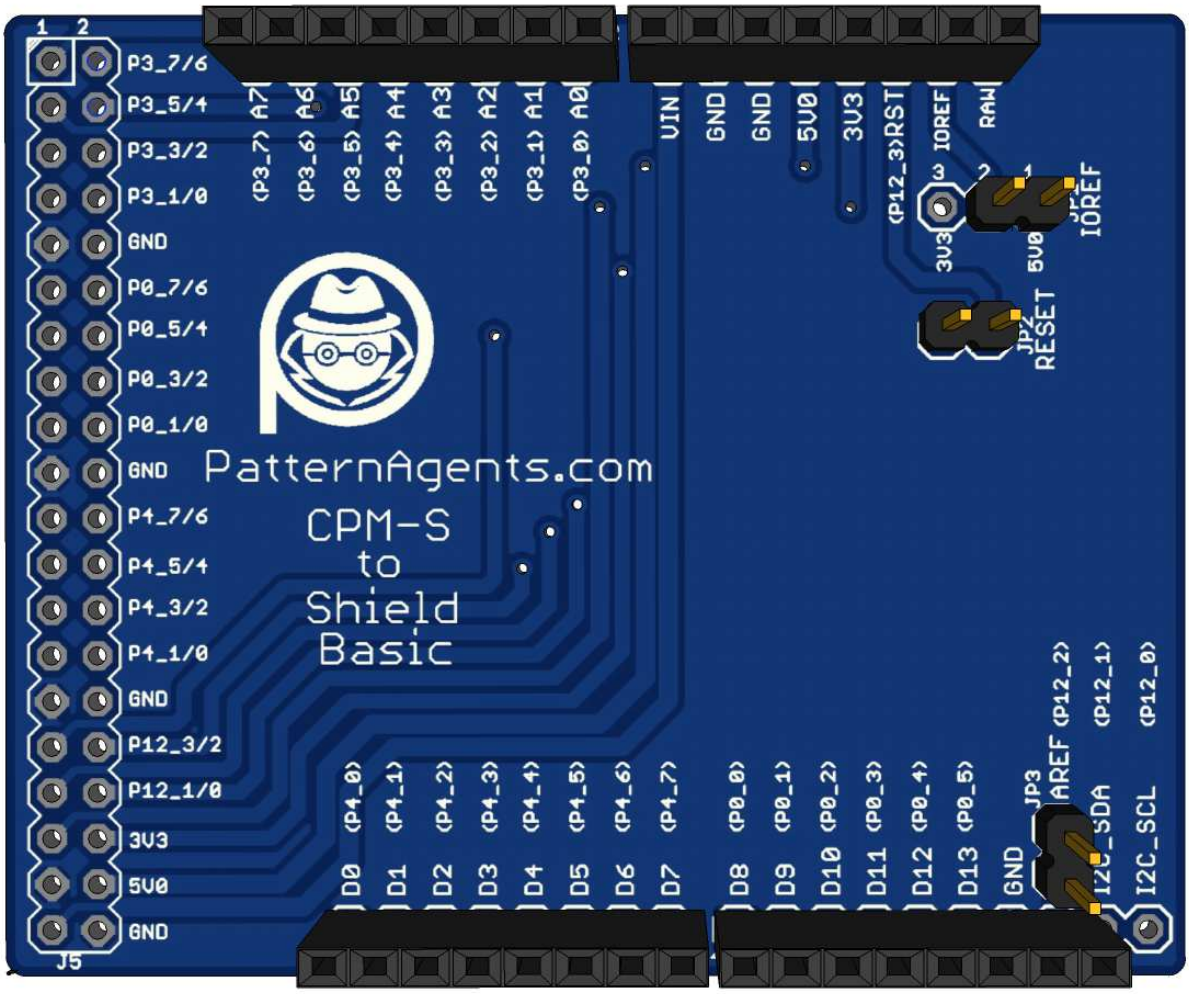
All Rights Reserved

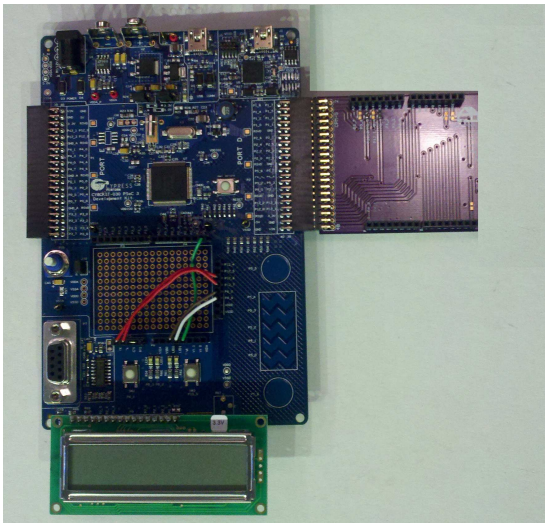

PatternAgents.com
CPM-S
to
Shield
Basic
J5
JP3
IOREF
RESET
JP2
P3_7/6
P3_5/4
P3_3/2
P3_1/0
GND
P0_7/6
P0_5/4
P0_3/2
P0_1/0
GND
P4_7/6
P4_5/4
P4_3/2
P4_1/0
GND
P12_3/2
P12_1/0
3V3
5V0
GND
A7
A6
A5
A4
A3
A2
A1
A0
VIN
GND
GND
5V0
3V3
RST
IOREF
RAW
D0
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
GND
AREF
SDA
SCL

PORT "D" I/O Assignment for Cypress CY8CKIT-030/050 Development Kits :

When the PatternAgents "CPM-S to Arduino Shield Adaptor" board is installed into Port D (Right Side) of a CY-C8CKIT-030/050 development kit, as shown below, the default I/O Assignment is :

Arduino	Port D	Notes
A0	P1_0	**JTAG SWDIO
A1	P1_1	**JTAG SWDCK
A2	P1_2	Analog Input
A3	P1_3	**JTAG SWO
A4	P1_4	Analog Input
A5	P1_5	Analog Input
A6	P1_6	Analog Input
A7	P1_7	Analog Input
D0	P5_0	UART0 RX
D1	P5_1	UART0 TX
D2	P5_2	PWM0
D3	P5_3	PWM1
D4	P5_4	PWM2
D5	P5_5	PWM3
D6	P5_6	PWM4
D7	P5_7	PWM5
D8	P2_0	**GPIO0
D9	P2_1	**GPIO1
D10	P2_2	**SPI1 SS
D11	P2_3	**SPI1 MOSI
D12	P2_4	**SPI1 MISO
D13	P2_5	**SPI1 SCK
D14	P12_1	I2C_SDA
D15	P12_0	I2C_SCL
AREF	P12_2	***Install JP3 (Zero Ohms)
RESET	P12_3	***Install JP2 (Zero Ohms)

Notes ** : When using Port D Connector, by default P1 is used for JTAG and P2 for LCD. These pins may need to reprogrammed to be able to be used properly.

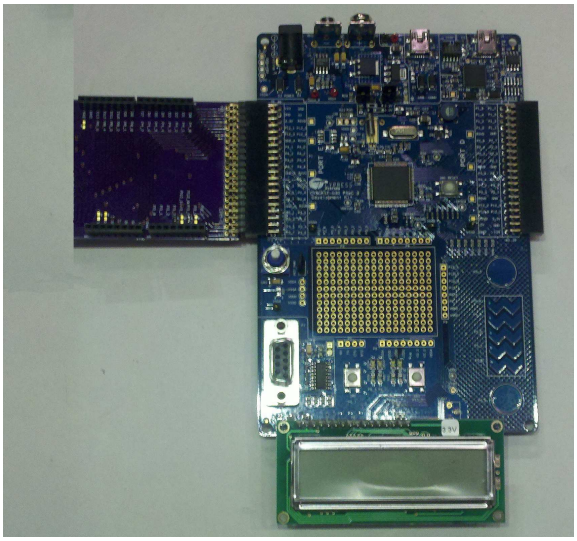


PORT "E" I/O Assignment for Cypress CY8CKIT-030/050 Development Kits :

When the PatternAgents "CPM-S to Arduino Shield Adaptor" board is installed into Port E (Left Side) of a CY-C8CKIT-030/050 development kit, as shown below, the default I/O Assignment is :

Arduino	Port E	Notes
A0	P3_0	Analog Input
A1	P3_1	Analog Input
A2	P3_2	Analog Input
A3	P3_3	Analog Input
A4	P3_4	Analog Input
A5	P3_5	Analog Input
A6	P3_6	Analog Input
A7	P3_7	Analog Input
D0	P4_0	UART0 RX
D1	P4_1	UART0 TX
D2	P4_2	PWM0
D3	P4_3	PWM1
D4	P4_4	PWM2
D5	P4_5	PWM3
D6	P4_6	PWM4
D7	P4_7	PWM5
D8	P0_0	GPIO0
D9	P0_1	GPIO1
D10	P0_2	SPI1 SS
D11	P0_3	SPI1 MOSI
D12	P0_4	SPI1 MISO
D13	P0_5	SPI1 SCK
D14	P12_1	I2C_SDA
D15	P12_0	I2C_SCL
AREF	P12_2	***Install JP3 (Zero Ohms)
RESET	P12_3	***Install JP2 (Zero Ohms)

Notes ** : The Port E Connector is the preferred connector for Analog Shield use, and gives the most pins available that are not already used by the CY8CKIT-030/050 board.



I/O Configuration :
The mapping of CPM-M (Master) I/O signals to Arduino Signals depends on which product you are using and which CPM-M (Master) socket you are plugged into. The default Legends printed on the the PatternAgents "CPM-S to Arduino Shield Adaptor" board (P0/P3/P4) assume that the board is plugged into PORT E of a CY8CKIT-030/CY8CKIT-050 board; which is the most common usage case. If you plug the PatternAgents "CPM-S to Arduino Shield Adaptor" board into a different CPM-M (Master) socket you will need to use the schematic on the last page of this document to determine your actual I/O signal assignment and configuration.

Arduino I/O Voltage Configuration :
The Cypress CY8CKIT-xxx boards have the ability to configure I/O signals for different voltage levels, and can be configured for either 3.3V or 5.0V volt levels. It is important to determine if your Arduino Shield requires 3.3V or 5.0V volt levels, and configure your CY8CKIT-xxx board correctly. Refer to the manual for your CPM-M (Master) board for the correct voltage settings.

NOTE: Always *make sure voltages are set correctly for your Arduino shield or you can damage it.*

RESET Control Mode (optional Configuration) :

In the default configuration, the jumper is not installed, as inadvertent operation could result; the Arduino Bus Connector might be held in "Reset" state and might not operate correctly. If a programmable hardware reset is required, then install a jumper in JP2.

Arduino	CPM-S	Jumper
RESET	P12-3(SIO)	JP2 Installed

NOTE: *For most purposes you need not change this configuration.*

AREF Control Mode (optional Configuration) :

In the default configuration, the jumper is not installed, as inadvertent operation could result ; the Arduino Bus Connector could receive an incorrect analog reference voltage and might not operate correctly. If an Analog hardware reference voltage is required, then install a jumper in Jp3.

Arduino	CPM-S	Jumper
AREF	P12-2(SIO)	JP3 Installed

NOTE: *For most purposes you need not change this configuration.*

IOREF Control Mode (optional Configuration) :

In the default configuration, the jumper is installed for 5.0V Arduino Shields. The IOREF hardware pin indicates what voltage level the peripheral shield is operating with.

Arduino	CPM-S	Jumper
IOREF	5.0V	JP1 –1 to 2
IOREF	3.3V	JP1 –2 to 3

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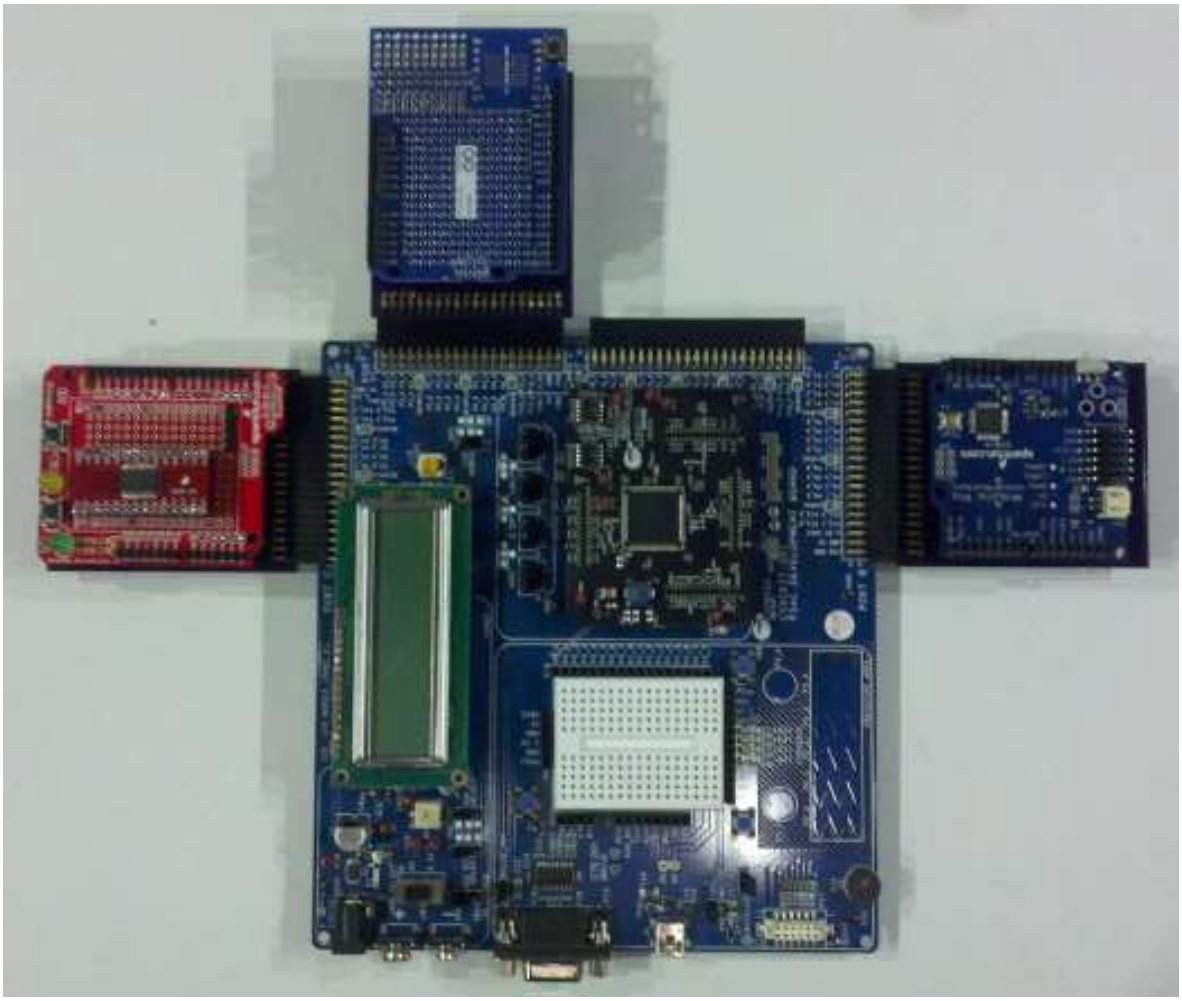
FAQ :

1) Does the PatternAgents “CPM-S to Arduino Shield Adaptor” board have any “active “ components?

   No. The CPM-S to Arduino Shield Adaptor” board is completely passive, and only rearranges signals from the development board to the Ardunio socket/board, with as little degradation as possible.

2) Can I use multiple PatternAgents “CPM-S to Arduino Shield Adaptor” boards on a single development kit base board?

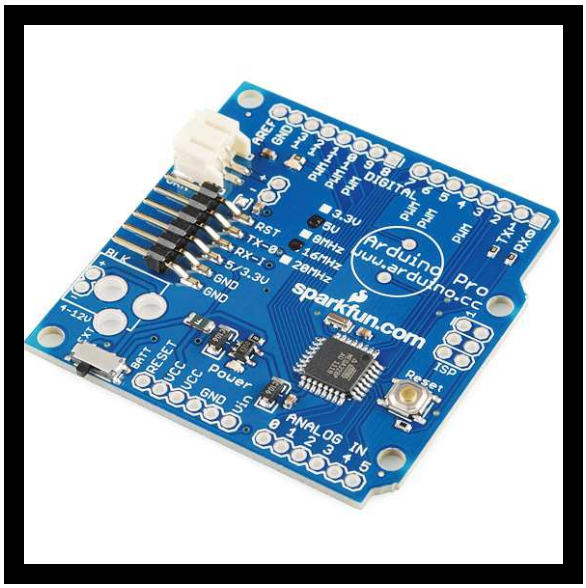
   Yes. You can often install multiple, “CPM-S to Arduino Shield Adaptor” boards, but you may not get every pin supported, as some pins on different development boards may map to either unimplemented pins or to pins already used by an onboard peripheral, such as the LCD display, capacitive touch buttons, LEDs, Prototyping Area, etc. May sure to verify your pin assignment in your project file for conflicts.



FAQ (continued) :

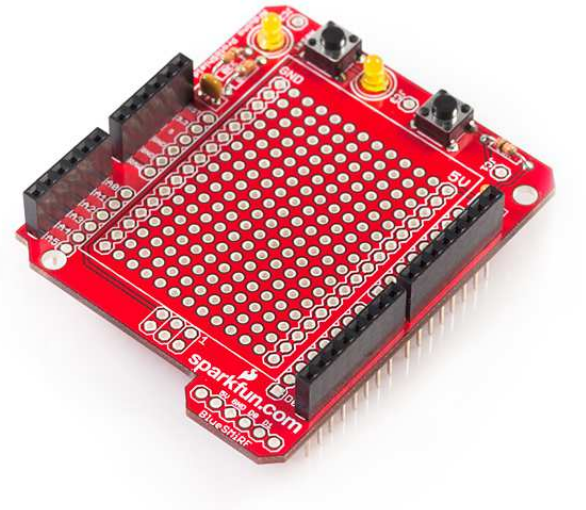
3) Can I use the “CPM-S to Arduino Shield Adaptor” with an “Arduino” CPU Board?

Yes. Any “Host” Arduino CPU board can be connected on the top/bottom side of the “CPM-S to Arduino Shield Adaptor” Board depending on what connector you install (i.e. female only, or stack-through connectors). This allows for multi-CPU/multi-processor/ multiple architecture (i.e. big/little) configurations.



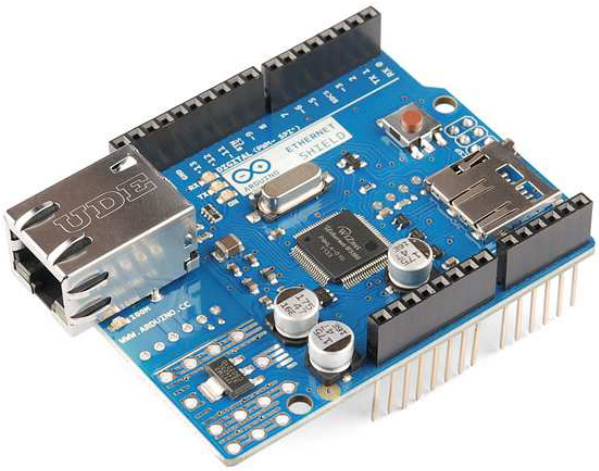
4) Can I use the “CPM-S to Arduino Shield Adaptor” with “Arduino” prototyping supplies ?

Yes. Any Arduino prototyping board can be connected on the top/bottom side of the “CPM-S to Arduino Shield Adaptor” Board depending on what connectors you install (i.e. male/female only, or stack- through).



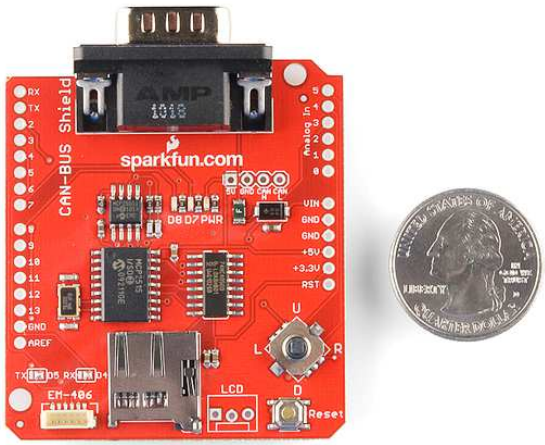
5) Can I use the “CPM-S to Arduino Shield Adaptor” with other “Arduino” shields ?

Yes. (Almost) any Arduino shield board can be connected on the top/bottom side of the “CPM-S to Arduino Shield Adaptor” Board depending on what connectors you install (i.e. male/female only, or stack-through)



Arduino Ethernet Shield :

Image from :
https://www.sparkfun.com/products/9026



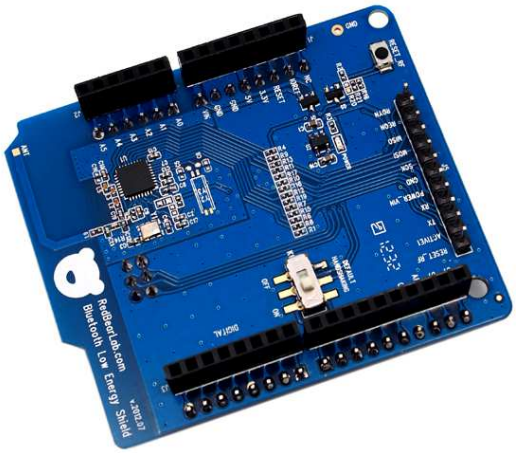
Arduino CAN-BUS Shield :

Image from :
https://www.sparkfun.com/products/10039

Arduino Color LCD Shield :

Image from :
https://www.sparkfun.com/products/9363

provides an easy method of connecting the popular Nokia 6100 LCD to your PSoC.



Arduino BlueTooth LE Shield :

Image from :
https://www.seedstudio.com

PatternAgents provides community and commerce for electronics designers so that they can collaborate using shared design patterns, practices, and resources; connect with others in the industry, conceptualize and create new ideas, commercialize their designs, and keep up on the latest technologies and concepts.