

## PIC24F16KA102 PIM Limitations

The result of multiplexing the functions from a 28-pin part to the 100-pin PIM header is that many of the functions are not available. All of the built-in functionality on the Explorer 16 board can be used simultaneously; however, all PICtail™ Plus daughter boards, as well as any other expansion boards available for Explorer 16, will not function with the PIC24F16KA102 PIM due to the I/O limitations of the part.

## Tips for Using the PIC24F16KA102 PIM

- Several of the Explorer 16 LEDs are driven by the Port Expander. Check the mapping table, as well as the schematic for connections. The PIC24F16KA102 port pins are not mapped to the corresponding port I/O on the Explorer 16 board. Make sure to use Table 1 and Table 2 as a cross-reference to ensure you use the correct device pin in your application.

### Americas

Atlanta - 678-957-9614  
 Boston - 774-760-0087  
 Chicago - 630-285-0071  
 Cleveland - 216-447-0464  
 Dallas - 972-818-7423  
 Detroit - 248-538-2250  
 Kokomo - 765-864-8360  
 Los Angeles - 949-462-9523  
 Phoenix - 480-792-7200  
 Santa Clara - 408-961-6444  
 Toronto - 905-673-0699

### Asia/Pacific

Australia - Sydney - 61-2-9868-6733  
 China - Beijing - 86-10-8528-2100  
 China - Chengdu - 86-28-8665-5511  
 China - Hong Kong SAR - 852-2401-1200  
 China - Nanjing - 86-25-8473-2460  
 China - Qingdao - 86-532-8502-7355  
 China - Shanghai - 86-21-5407-5533  
 China - Shenyang - 86-24-2334-2829  
 China - Shenzhen - 86-755-8203-2660  
 China - Wuhan - 86-27-5980-5300  
 China - Xiamen - 86-592-2388138  
 China - Xian - 86-29-8833-7252  
 China - Zhuhai - 86-756-3210040  
 India - Bangalore - 91-80-3090-4444  
 India - New Delhi - 91-11-4160-8631  
 India - Pune - 91-20-2566-1512  
 Japan - Yokohama - 81-45-471-6166  
 Korea - Daegu - 82-53-744-4301  
 Korea - Seoul - 82-2-554-7200  
 Malaysia - Kuala Lumpur - 60-3-6201-9857  
 Malaysia - Penang - 60-4-227-8870  
 Philippines - Manila - 63-2-634-9065  
 Singapore - 65-6334-8870  
 Taiwan - Hsin Chu - 886-3-6578-300  
 Taiwan - Kaohsiung - 886-7-536-4818  
 Taiwan - Taipei - 886-2-2500-6610  
 Thailand - Bangkok - 66-2-694-1351

### Europe

Austria - Weis - 43-7242-2244-39  
 Denmark - Copenhagen - 45-4450-2828  
 France - Paris - 33-1-69-53-63-20  
 Germany - Munich - 49-89-627-144-0  
 Italy - Milan - 39-0331-742611  
 Netherlands - Drunen - 31-416-690399  
 Spain - Madrid - 34-91-708-08-90  
 UK - Wokingham - 44-118-921-5869

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## Introducing the PIC24F16KA102 PIM

### Overview

The PIC24F16KA102 PIM is designed to demonstrate the capabilities of the PIC24F16KA102 family using the Explorer 16 Demonstration Board kit. Table 1 and Table 2 detail the pin mapping of the 28-pin device PIM to the 100-pin PIM header.

- The 28-pin to 100-pin table lists the device pins and shows what functions are mapped to each.
- The MCP23S17 28-pin table shows a listing of the Explorer 16 functions and what port expander pin is mapped to that function.

### MCP23S17 Port Expander

The PIC24F16KA102 PIM has an on-board Port Expander to provide an interface to the advanced capabilities of the Explorer 16 Development Board. The Port Expander is used to drive the LCD display on the Explorer 16 board. It is also used to drive several of the LEDs on the Explorer 16 board. See Table 2, as well as the schematic in Figure 1 for more detailed information.

### PIC24F16KA102 PIM Features

Due to having the Port Expander, the 28-pin device is capable of performing all of the base functions on the 100-pin Explorer 16 board, which are demonstrated with the demo code loaded into the part.

Table 1: 28-Pin to 100-Pin Pinout Mapping

Pin #	PIC24F16KA102 Pinout	Pin #	PIM Function
1	MCLR/Vpp/RA5	13	MCLR
2	AN0/VREF+/CN2/RA0	20	Potentiometer
3	AN1/VREF-/CN3/RA1	21	Temp. Sensor
4	PGD1/AN2/C1IND/C2INB/U2TX/CN4/RB0	91	LED D9
5	PCG1/AN3/C1INC/C2INA/U2RX/U2BCLK/CN5/RB1	80	Switch S4
6	AN4/C1INB/C2IND/U1RX/U1BCLK/CN6/RB2	49	UART RX
7	AN5/C1INA/C2INC/CN7/RB3	92	Switch S5/ LED D10
8	Vss	9	Ground
9	OSCI/CLKI/CN30/RA2	63	OSCI Osc. In
10	OSCO/CLKO/CN29/RA3	64	OSCO Osc. Out
11	SOSCI/U2RTS/CN1/RB4	74	SOSCO Sec. Osc. Out
12	SOSCO/T1CK/U2CTS/CN0/RA4	73	SOSCI Sec. Osc. In
13	Vdd	Vdd	+3.3V
14	PGD3/SDA1/CN27/RB5	27	ICSP™ PGD
15	PGC3/SCL1/CN24/RB6	26	ICSP PGC
16	U1TX/INT0/CN23/RB7	50	UART TX
17	U1CTS/SCL1/CN22/RB8	40	UART CTS
18	U1RTS/SDA1/CN21/RB9	39	UART RTS
19	IC1/CN9/RA7	83	Switch S3
20	OC1/C2OUT/INT2/CTED1/CN8/RA6	—	N/A
21	PGD2/SDI1/PMD2/CN16/RB10	11	RG7
22	PGC2/SCK1/CN15/RB11	10	RG6
23	AN2/HLVDIN/CTED2/CN14/RB12	61	RA5
24	AN11/SDO1/CTPLS/CN13/RB13	12	RG8
25	AN10/CVREF/RTCC/OCFA/C1OUT/INT1/CN12/RB14	84	RD7
26	REF0/SS1/T2CK/T3CK/CN11/RB15	79	RD12
27	Vss	Vss	Vss
28	Vdd	Vdd	3.3V

Table 2: MCP23S17 28-Pin to 100-Pin Pinout Mapping

Pin #	MCP23S17 Pinout	Pin #	100-Pin PIM Function
1	GPB4	100	LED D4
2	GPB5	58	LED D5
3	GPB6	59	LED D6
4	GPB7	60	LED D7
5	Vdd		3.3V
6	Vss		Vss
7	CS		N/A <sup>(1)</sup>
8	SCK	10	SCK
9	SDI	11	SDI
10	SDO	12	SDO
11	A0		N/A <sup>(2)</sup>
12	A1		N/A <sup>(2)</sup>
13	A2		N/A <sup>(2)</sup>
14	RESET	13	MCLR
15	INTA		N/A <sup>(3)</sup>
16	INTB		N/A <sup>(3)</sup>
17	GPA0	93	LCD Data 0
18	GPA1	94	LCD Data 1
19	GPA2	98	LCD Data 2
20	GPA3	99	LCD Data 3
21	GPA4	100	LCD Data 4
22	GPA5	3	LCD Data 5
23	GPA6	4	LCD Data 6
24	GPA7	5	LCD Data 7
25	GPB0	81	LCD-Enable
26	GPB1	82	LCD-R/W
27	GPB2	44	LCD-RS
28	GPB3	17	LCD D4

- Note 1: The Chip Select (CS) pin is connected to pin 20 (RA6) of the PIC24F16KA102.  
 Note 2: The address lines are hardwired to Vss, making the address of the MCP23S17 '000'.  
 Note 3: The interrupt lines of the MCP23S17 are not used.

# Introducing the PIC24F16KA102 PIM

Figure 1: 100-Pin Header, 28-Pin Device, Port Expander Schematic

