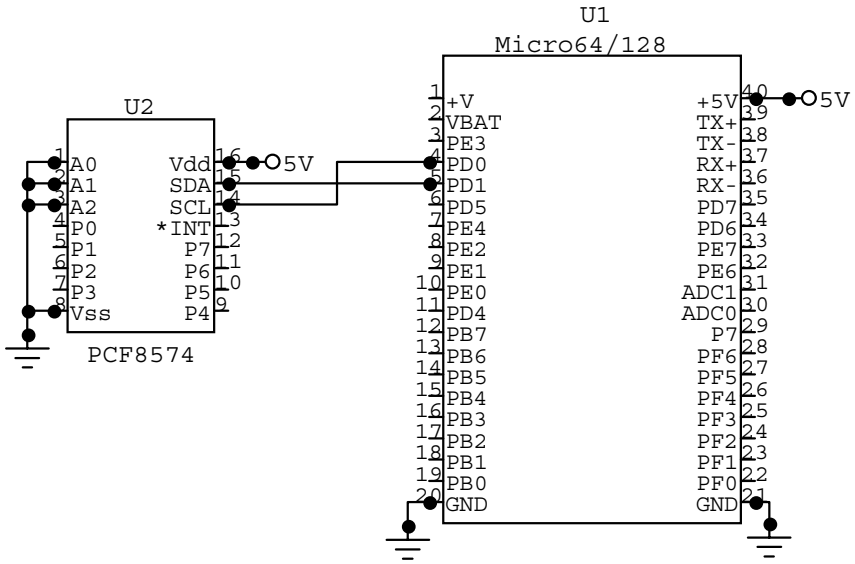
Micromint, Inc	**AN751**
	Micro64/128
I^2C Digital Input/Output Expansion	12/3/04

Introduction: This application note demonstrates how to connect and access a PCF8574 I^2C I/O Expander to the Micro64/128 for additional Digital I/O.

Background: Micro64/128 has 29 digital I/O available for the end user to connect digital devices to. Some applications need more than 29 digital I/O. A quick and easy way to add 8 additional digital I/O is to use a PCF8574 I^2C I/O Expander manufactured by Philips Semiconductors. The following schematic shows how to connect a PCF8574 I^2C I/O Expander to the Micro64/128.



How it works: There are two different PCF8574 I^2C I/O Expanders, the PCF8574 and the PCF8574A. The difference between them is the base address. The both have three address lines (A0-A2) which allow the user to set the address of the device. A specific address is set by pulling the lines high or low as shown in the table below. The maximum number of each chip that can be connected to the I^2C bus is eight. That can give you a maximum of 128 additional I/O. The BASCOM-AVR program demonstrates how to use Micro64/128 Utilities to access a chip with the address of 40H.

PCF8574			
Chip Address	A2	A1	A0
40H	GND	GND	GND
42H	GND	GND	+5V
44H	GND	+5V	GND
46H	GND	+5V	+5V
48H	+5V	GND	GND
4AH	+5V	GND	+5V
4CH	+5V	+5V	GND
4EH	+5V	+5V	+5V

PCF8574A			
Chip Address	A2	A1	A0
70H	GND	GND	GND
72H	GND	GND	+5V
74H	GND	+5V	GND
76H	GND	+5V	+5V
78H	+5V	GND	GND
7AH	+5V	GND	+5V
7CH	+5V	+5V	GND
7EH	+5V	+5V	+5V

Program Listing:

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'*********************************************************************
'Project : Demo program on how to access an I2CIO expander. Micro64
'Company : Micromint, Inc.
'
'*********************************************************************

$regfile = "m64def.dat"
$baud1 = 9600


'Configure the serial port.
Config Com2 = Dummy , Synchrone = 0 , Parity = None , Stopbits = 1 , Databits = 8 , Clockpol = 0
'Configure PORTD.6 as an ouput and the rest of the port as inputs.
Ddrd = 64


'Open the serial port
Open "com2:" For Random As #1

Dim B As Byte
'The data sent over the I2C bus must be loacted at $HFFD in order for the utilities to work.
Dim I2cdatatx As Byte At &HFFD
'The Slave Address must be loacted at $HFFB in order for the utilities to work.
Dim Sladdr As Byte At &HFFB
'The Utilities puts the results from a read over the I2C bus at address &HFFE
Dim I2cdatarx As Word At &HFFE
Portd.6 = 1
'A Call to &H7C23 enables the I2C bus to 100kHz.
$asm
  !Call &H7C23;
$end Asm

Do
   Print #1 , "Please enter a number from 0 to 255 and to set the I/O expanders digital I/O."
   Print #1 ,
   Input #1 , B
   Sladdr = &H40
   I2cdatatx = B
   'Call to transmit over the I2C bus
   $asm
     !Call &H7CB8
   $end Asm
   Waitms 200
   Sladdr = &H40
   $asm
     !Call &H7CDD
   $end Asm
   Print #1 , "The digital I/O is set to " ; I2cdatarx ; "."
   Print #1 ,
Loop

Close #1

End
```