FIC Bus for Peripheral Chip Access  Chapter 9

```
Freq equ 4
SDA equ 4 : Set to 4,10, or 20 for 4MHz, 10MHz, or 20MHz
SCL equ 3 : I2C serial clock bit of PORTC

(a) Equates

cblock
.
.
DEVADD
:Device's I2C address x 2
INTADD
:Internal address
DATAGUT
:Data to be written into INTAGU during a write
DATAIN
:Data to be read from INTAGU during a read
TXBUFF
:Buffer for each byte sent by TX
RXBUFF
:Buffer for each byte received by RX
.
.
endc

(b) Variables

Figure 9-8 I2C equates and variables.

The I2Cin subroutine of Figure 9-9 is similar to the I2Cout subroutine. It calls the Start subroutine and then the TX subroutine twice to send DEVADD (plus R/W = 0) and INTADD. Then it calls the Start subroutine to restart, the TX subroutine to send DEVADD (plus R/W = 1), the RX subroutine to read back a byte (with NOACK), and finally the Stop subroutine.

9.4 DAC OUTPUT

Two digital-to-analog converter outputs are easily added to a PIC with the MAX518 eight-pin DIP or SO-8 surface-mount part shown in Figure 9-10. Each output channel produces an output voltage that ranges from 0 V up to 255/256ths of the power supply voltage, giving roughly 20-mV output increments. An output of 2.50 V will appear on the OUT0 pin if the following three bytes are sent to the chip:

B'01011000' B'00000000' B'10000000'

An output of 1.25 V will appear on the OUT1 pin following

B'01011000' B'00000001' B'01000000'

The MAX518 chip includes a power on reset circuit that drives the two outputs to 0 V initially. Because the MAX518 may come out of reset after the PIC chip comes out of reset, the MAX518 may ignore commands sent to it immediately after the PIC comes out of reset.

The two address inputs, AD1 and AD0, provide an adjustable part of the chip's I2C address. With 5 bits fixed at 01011 and two adjustable bits, it is possible to connect four MAX518 chips to a PIC. Each chip must have its AD1 and AD0 pins tied to a different combination of +5 V and GND. The four 7-bit addresses become B'0101100', B'0101101', B'0101110', and B'0101111'.

Figure 9-9 I2C