

PIC10F220/222

8.9.2 WAKE-UP FROM SLEEP

The device can wake-up from Sleep through one of the following events:

1. An external Reset input on GP3/MCLR/VPP pin, when configured as MCLR.
2. A Watchdog Timer Time-out Reset (if WDT was enabled).
3. A change on input pin GP0, GP1 or GP3 when wake-up on change is enabled.

These events cause a device Reset. The \overline{TO} , \overline{PD} GPWUF bits can be used to determine the cause of a device Reset. The \overline{TO} bit is cleared if a WDT time-out occurred (and caused wake-up). The \overline{PD} bit, which is set on power-up, is cleared when SLEEP is invoked. The GPWUF bit indicates a change in state while in Sleep at pins GP0, GP1 or GP3 (since the last file or bit operation on GP port).

Caution: Right before entering Sleep, read the input pins. When in Sleep, wake up occurs when the values at the pins change from the state they were in at the last reading. If a wake-up on change occurs and the pins are not read before re-entering Sleep, a wake-up will occur immediately even if no pins change while in Sleep mode.

Note: The WDT is cleared when the device wakes from Sleep, regardless of the wake-up source.

8.10 Program Verification/Code Protection

If the Code Protection bit has not been programmed, the on-chip program memory can be read out for verification purposes.

The first 64 locations and the last location (Reset Vector) can be read, regardless of the code protection bit setting.

8.11 ID Locations

Four memory locations are designated as ID locations where the user can store checksum or other code identification numbers. These locations are not accessible during normal execution, but are readable and writable during program/verify.

Use only the lower 4 bits of the ID locations and always program the upper 8 bits as '1's.

8.12 In-Circuit Serial Programming™

The PIC10F220/222 microcontrollers can be serially programmed while in the end application circuit. This is simply done with two lines for clock and data, and three other lines for power, ground and the programming voltage. This allows customers to manufacture boards with unprogrammed devices and then program the microcontroller just before shipping the product. This also allows the most recent firmware, or a custom firmware, to be programmed.

The devices are placed into a Program/Verify mode by holding the GP1 and GP0 pins low while raising the MCLR (VPP) pin from VIL to VIH (see programming specification). GP1 becomes the programming clock and GP0 becomes the programming data. Both GP1 and GP0 are Schmitt Trigger inputs in this mode.

After Reset, a 6-bit command is then supplied to the device. Depending on the command, 16 bits of program data are then supplied to or from the device, depending if the command was a Load or a Read. For complete details of serial programming, please refer to the PIC10F220/222 Programming Specifications.

A typical In-Circuit Serial Programming connection is shown in Figure 8-10.

FIGURE 8-10: TYPICAL IN-CIRCUIT SERIAL PROGRAMMING™ CONNECTION

