# ImageWriter

## *MicroChip PIC18F2XX0/2X21/2XX2/2XX5/4XX0/4X21/4XX2/4XX5 Device Support Detail & Setup*

**ImageWriter Support Hierarchy**

**Manufacturer:** MicroChip **Library:** MCT-PIC18F-CUSTOM.cab

**Device:** PIC18F2221, PIC18F2321, PIC18F2410, PIC18F2420, PIC18F2450, PIC18F2455, PIC18F2480, PIC18F2510, PIC18F2515, PIC18F2520, PIC18F2525, PIC18F2550, PIC18F2580, PIC18F2585, PIC18F2610, PIC18F2620, PIC18F2680, PIC18F2682, PIC18F2685, PIC18F4221, PIC18F4321, PIC18F4410, PIC18F4420, PIC18F4450, PIC18F4455, PIC18F4480, PIC18F4510, PIC18F4455, PIC18F4480, PIC18F4510, PIC18F4515, PIC18F4520, PIC18F4525, PIC18F4550, PIC18F4580, PIC18F4585, PIC18F4610, PIC18F4620, PIC18F4680, PIC18F4682, PIC18F4685

# Objects for PIC18F2XX0/2X21/2XX2/2XX5/4XX0/4X21/4XX2/4XX5

| Flow Object Name: | Program / Execute | Verify | Load | Object Size (Bytes) | |
|---|---|---|---|---|---|
| EEPROM | ● | ● | ● | PIC18F2221 | 0x100 |
| | | | | PIC18F4221 | 0x100 |
| | | | | PIC18F2321 | 0x100 |
| | | | | PIC18F4321 | 0x100 |
| | | | | PIC18F2420 | 0x100 |
| | | | | PIC18F2480 | 0x100 |
| | | | | PIC18F4420 | 0x100 |
| | | | | PIC18F4480 | 0x100 |
| | | | | PIC18F2455 | 0x100 |
| | | | | PIC18F4455 | 0x100 |
| | | | | PIC18F2520 | 0x100 |
| | | | | PIC18F2550 | 0x100 |
| | | | | PIC18F2580 | 0x100 |
| | | | | PIC18F4520 | 0x100 |
| | | | | PIC18F4550 | 0x100 |
| | | | | PIC18F4580 | 0x100 |
| | | | | PIC18F2525 | 0x400 |
| | | | | PIC18F2585 | 0x400 |
| | | | | PIC18F4525 | 0x400 |
| | | | | PIC18F4585 | 0x400 |
| | | | | PIC18F2620 | 0x400 |
| | | | | PIC18F2680 | 0x400 |
| | | | | PIC18F4620 | 0x400 |
| | | | | PIC18F4680 | 0x400 |
| | | | | PIC18F2682 | 0x400 |
| | | | | PIC18F4682 | 0x400 |
| | | | | PIC18F2685 | 0x400 |
| | | | | PIC18F4685 | 0x400 |
| USER ID | ● | ● | ● | 0x08 | |
| CONFIG | ● | ● | ● | 0x0E | |
| DEVICE ID | | ● | ● | 0x02 | |
| CHIP ERASE | ● | | | | |
| p_MCT18F[1] | ● | | ● | 0x08 | |

| Flow Object Name: | Program / Execute | Verify | Load | Object Size (Bytes) | |
|---|---|---|---|---|---|
| FLASH | ● | ● | ● | PIC18F2221 | 0x1000 |
| | | | | PIC18F4221 | 0x1000 |
| | | | | PIC18F2321 | 0x2000 |
| | | | | PIC18F4321 | 0x2000 |
| | | | | PIC18F2450 | 0x4000 |
| | | | | PIC18F4450 | 0x4000 |
| | | | | PIC18F2410 | 0x4000 |
| | | | | PIC18F4410 | 0x4000 |
| | | | | PIC18F2420 | 0x4000 |
| | | | | PIC18F2480 | 0x4000 |
| | | | | PIC18F4420 | 0x4000 |
| | | | | PIC18F4480 | 0x4000 |
| | | | | PIC18F2455 | 0x6000 |
| | | | | PIC18F4455 | 0x6000 |
| | | | | PIC18F2510 | 0x8000 |
| | | | | PIC18F4510 | 0x8000 |
| | | | | PIC18F2520 | 0x8000 |
| | | | | PIC18F2550 | 0x8000 |
| | | | | PIC18F2580 | 0x8000 |
| | | | | PIC18F4520 | 0x8000 |
| | | | | PIC18F4550 | 0x8000 |
| | | | | PIC18F4580 | 0x8000 |
| | | | | PIC18F2515 | 0xC000 |
| | | | | PIC18F4515 | 0xC000 |
| | | | | PIC18F2525 | 0xC000 |
| | | | | PIC18F2585 | 0xC000 |
| | | | | PIC18F4525 | 0xC000 |
| | | | | PIC18F4585 | 0xC000 |
| | | | | PIC18F2610 | 0x10000 |
| | | | | PIC18F4610 | 0x10000 |
| | | | | PIC18F2620 | 0x10000 |
| | | | | PIC18F2680 | 0x10000 |
| | | | | PIC18F4620 | 0x10000 |
| | | | | PIC18F4680 | 0x10000 |
| | | | | PIC18F2682 | 0x14000 |
| | | | | PIC18F4682 | 0x14000 |
| | | | | PIC18F2685 | 0x18000 |
| | | | | PIC18F4685 | 0x18000 |

[1] Default Clock Speed = 500KHz

# I/O Multi Connector Setup for PIC18F2XX0/2X21/2XX2/2XX5/4XX0/4X21/4XX2/4XX5 High Voltage ICSP Method

| ImageWriter: | | Target: |
|---|---|---|
| ***Connector Pin #*** | ***Pin Name*** | ***Connections*** |
| 1 | GND | GND |
| 2 | GND | GND |
| 3 | TXD (MOSI/TDO) | See note 1 |
| 4 | RXD (MISO/TDI) | PGD |
| 5 | RTS (TMS) | NOCONN |
| 6 | CTS | NOCONN |
| 7 | XCLK | PGC |
| 8 | RST | NOCONN |
| 9 | SCL | NOCONN |
| 10 | SDA | NOCONN |
| 11 | GND | GND |
| 12 | GND | GND |
| 13 | VPP/EXT_IN | 12.0V DC |
| 14 | VPP/EXT_OUT | MCLR |
| 15* | Target V+ (7.0V max) | Supply 4.5-5.5 V |
| 16* | Target V+ (7.0V max) | Supply 4.5-5.5 V |
| 17 | GND | GND |
| 18 | GND | GND |
| 19 | ImageWriter Power | Supply 9-24 VDC |
| 20 | ImageWriter Power | Supply 9-24 VDC |

1 Pin 3 must be connect to Pin 4 with an external 1K Ohm resistor in series.
*Maximum Pin-Driver output voltage = 4.2V.
*MicroChip specifies that VCC may be 2.0-5.5V for programming operations; however bulk-erase is only valid with VCC at 4.5V or higher. If you use chip-erase, you must provide 4.5V DC or higher VCC levels.

## Support Notes:

1. Onboard programming is supported via both Low and High Voltage ISCP methods. Use only one of the ImageWriter Pin-connection's methods above to connect ImageWriter to your target board.
2. Block limits are not changeable on the Flash Code array. You must program the entire array (including boot-block) for each operation. A Chip Erase operation is not required for the Flash array or the EEPROM array, prior to programming.

3. Fuse bit mapping is per manufacturer data-sheet. All bits stored in ImageWriter memory must be properly set. Note that Config bytes are from device address 0x300000 -> 0x30000D. Byte0 and Byte 7 are often not implemented on 18F series devices, but must be present in your data-space.

## I/O Multi Connector Setup for PIC18F2XX0/2X21/2XX2/2XX5/4XX0/4X21/4XX2/ 4XX5 Low Voltage ICSP Method

| ImageWriter: | | Target: |
|---|---|---|
| ***Connector Pin #*** | ***Pin Name*** | ***Connections*** |
| 1 | GND | GND |
| 2 | GND | GND |
| 3 | TXD (MOSI/TDO) | See note 1 |
| 4 | RXD (MISO/TDI) | PGD |
| 5 | RTS (TMS) | NOCONN |
| 6 | CTS | NOCONN |
| 7 | XCLK | PGC |
| 8 | RST | MCLR |
| 9 | SCL | NOCONN |
| 10 | SDA | NOCONN |
| 11 | GND | GND |
| 12 | GND | GND |
| 13 | VPP/EXT_IN | NOCONN |
| 14 | VPP/EXT_OUT | NOCONN |
| 15* | Target V+ (7.0V max) | Supply 4.5-5.5 V |
| 16* | Target V+ (7.0V max) | Supply 4.5-5.5 V |
| 17 | GND | GND |
| 18 | GND | GND |
| 19 | ImageWriter Power | Supply 9-24 VDC |
| 20 | ImageWriter Power | Supply 9-24 VDC |

[1] Pin 3 must be connect to Pin 4 with an external 1K Ohm resistor in series.

*Maximum Pin-Driver output voltage = 4.2V.

*MicroChip specifies that VCC may be 2.0-5.5V for programming operations; however bulk-erase is only valid with VCC at 4.5V or higher. If you use chip-erase, you must provide 4.5V DC or higher VCC levels.

# Support Notes:

1. Onboard programming is supported via both Low and High Voltage ISCP methods. Use only one of the ImageWriter Pin-connection's methods above to connect ImageWriter to your target board.
2. Block limits are not changeable on the Flash Code array. You must program the entire array (including boot-block) for each operation. A Chip Erase operation is not required for the Flash array or the EEPROM array, prior to programming
3. Fuse bit mapping is per manufacturer data-sheet. All bits stored in ImageWriter memory must be properly set. Note that Config bytes are from device address 0x300000 -> 0x30000D. Byte0 and Byte 7 are often not implemented on 18F series devices, but must be present in your data-space.

## Disclaimer

Typical implementation of **ImageWriter** includes but is not limited to external power provision to **ImageWriter**, device access restrictions on the target board, external hardware on the target board, or software changes created by the user affecting timing, device erasure, programming, or verification. Data I/O warranty coverage applies only when the product is used in conformance with technical specifications put forth by Data I/O and by the semiconductor device manufacturer.

In the interest of achieving the highest levels of safety and quality, Data I/O recommends that all programming processes be tested and documented in a prototype project prior to transition to volume manufacturing. For additional information see In-System Programming Design Guidelines (http://www.dataio.com/isp).

**ImageWriter** programs semiconductor devices through the use of circuits designed precisely to operate in accordance with specifications outlined by the device manufacturer. Provision and calibration of power supplies are critical for proper operation. **ImageWriter** has been fully tested by Data I/O Corporation for quality performance.