

Interfacing FlashRunner 2.0 with PIC16 devices

Supported Protocols

- **ICSP High Voltage Programming:** the MCLR/VPP pin is connected to VPROG1. You can set the value of VPP with the additional parameter #TCSETPAR VPROG1 <value_in_mV>.
- **ICSP Low Voltage Programming:** the MCLR/VPP pin is connected to DIO0. Not all devices support this programming mode.

Additional Parameters

- **EEPROM_ADDR_MODE:** select if the EEPROM portion of your firmware should be read word aligned (WORD, default) or byte aligned (BYTE).
- **ISP_PGC:** set the pull-up for the Clock line. PUENABLE (default) enables the pull-up, PUDISABLE disables it.
- **ISP_PGD:** set the pull-up for the Data line. PUENABLE (default) enables the pull-up, PUDISABLE disables it.
- **PROGMODE:** select High-Voltage programming enable with either VPP first (HVP) or VDD first (HVD). VPP first entry ensures that no code will execute while communicating with the device, while VDD first is recommended if the device is powered by an external supply. Remember that many devices do not have access to both programming entries.

Algorithm Commands

The letter after the command names specifies on which memory region the command is to be executed:

- F: Flash
- E: EEPROM
- W: Config Words
- I: User ID
- C: entire chip (used only for the command MASSERASE)

Many commands support the parameters <start_addr> and , that specify to execute the command, respectively, from which address and for how many addresses.

CONNECT

Powers-on the device, enters programming mode and checks the connection. Warning: some devices do not have a device ID, and thus there is not a reliable way to know if the device is correctly connected to the FlashRunner2.0. In that case, the programming cycle could fail during the commands BLANKCHECK or VERIFY.

MASSERASE

MASSERASE <C|F|E>, or **MASSERASE** <start_addr>

Erases the selected memory. If a Chip erase is initiated (MASSERASE C), all the memories of the device will be erased. The Flash memory of many devices cannot be erased without erasing the configuration words. Some devices can erase single rows of Flash memory. For backward compatibility reasons, the command can also be written as ERASE <C|F|E> <start_addr> , with the same effect.

BLANKCHECK

BLANKCHECK <F|E|I|W>, or **BLANKCHECK** <F|E|I|W> <start_addr>

Checks that the selected memory is clear.

PROGRAM

PROGRAM <F|E|I|W>, or **PROGRAM** <F|E|I|W> <start_addr>

Programs the selected memory using the data loaded into the FRB file.

VERIFY

VERIFY <F|E|I|W> R, or **VERIFY** <F|E|I|W> R <start_addr>

Verifies that the data written into the selected memory corresponds to the data of the FRB file.

READ

READ <F|E|I|W>, or **READ** <F|E|I|W> <start_addr>

Reads the selected memory, printing it into the communications log of the workbench.

DUMP

DUMP <F|E|I|W>, or **DUMP** <F|E|I|W> <start_addr>

Reads the selected memory, dumping it into the dumping file. For backward compatibility reasons, the dumped file of the EEPROM is always byte aligned, regardless of the selected parameter EEPROM_ADDR_MODE.

RUN

Powers the device without entering programming mode, so that the programmed code can be executed. A delay (in seconds) can be specified.

DISCONNECT

Powers-off the device.