



CR391 FWupdate Manual

Revision 007

20 February 2021



Revision History

| Version | Date | Person | Reason For Changes |
|---------|------------|--------|---|
| 001 | 2014-12-12 | MTL | New document from Boot-loader and programming manuals |
| 002 | 2015-2-10 | MTL | When in boot-load, green LED a s 2x per second |
| 002 | 2015-2-10 | MTL | Add RS485 boot-loader |
| 003 | 2015-4-18 | MTL | General corrections |
| 004 | 2016-4-15 | MTL | Add ICD3 connections |
| 005 | 2016-8-15 | TDP | Changed Bootloader setup (Softwin3) |
| 006 | 2017-3-08 | TDP | Correct document formatting |
| 007 | 2021-2-20 | MTL | Link document to SW3 BootLoader help |

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1 SCOPE

This manual contains all information on programming and updating the firmware (FW) of the Softcon product CR391 card reader controller (hereafter referred to as the CRC). The document contains the information on all versions of the controller (fully populated and bare-bones) and includes programming using the MicroChip programmer (ICD3), and updating via the TCP and RS485 boot-loaders.

2 WARNINGS AND CAUTIONS

The controller poses no hazard to the user of such equipment if installed correctly. The controller is powered by 110 or 220/240 VAC and should therefore always be kept locked with the transformer plate screwed into place. Both fuses on the board are rated at 2 amps and should never be exceeded. All supply voltages, environmental specifications, as well as general specifications should be considered when installing the controller.

Where the CRC effects control, potential hazards may occur, depending on the item being controlled. Correct system design and implementation should eliminate such hazards.

While programming or updating, the CRC stops performing the normal application (APP) functions it was configured to do (e.g. access control). Updating may result in the settings and databases being changed / corrupted, requiring a reset and re-configuration.

3 APPLICABLE DOCUMENTS

All information specific to programming and updating the CR391 controller is included in this document. All information specific to the CR391 controller is listed in the document CR391.manual.doc.

Functionality of the CRC is listed in the document CR39x.Library.manual.doc. The library manual lists all functions available in Softcon products and a functions table specifies the controllers that are enabled for each function.

The CR391 can be programmed using the CR374 or CR375 programmers. The HH booklet (SCS_CR39x.HH.booklet.pdf) describes the use of the HH.

The CR391 booklet (SCS_CR391.booklet.pdf) described the CR391 HW (connections and links). The CR391 lid inserts (SCS_CR391.lid.pdf) are installed in the product lid, are included here as appendixes.

The PC SW manuals are available for information on the LAN systems. All documents are available on WWW.softconserv.com

4 GENERAL

The CRC FW (the software program within the controller) comprises of a boot-load section and an APP section.

The small boot-load section contains a TCP and/or RS485 (slave) communication driver and updates the APP section FW with data received from the communication TCP or RS485 port. The boot-loader section automatically starts when the CRC powers-up and the HH link is in, if no update commands are received on the communication port within 10 seconds, the APP section starts. The APP section re-starts the boot-loader section on commands received from the TCP or RS485 ports. While in the boot-loader section, no function other than receiving data from the communication port and updating the APP section is done. When the update is complete, the APP is re-started. Should the update not run to completion (e.g. the communication fails), the APP cannot run (requires a full update).

The APP section performs functions as configured to do, typically access control, vending, input monitoring, etc.

Initially the CRC must be programmed using the ICD3 (this is done when the product is manufactured). The boot-loader and APP sections are programmed. Thereafter the CRC can be re-programmed with the latest version or updated via the TCP or RS485 connection.

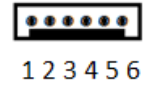
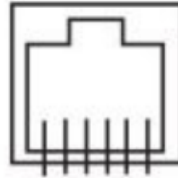
Certain updates may require the CRC to be re-programmed, i.e. cannot be updated via TCP or RS485. This is required when the boot-loader section must be updated.

5 ICD3 PROGRAMMING

The MicroChip ICD3 is used to initially program the CRC (when manufactured) and must be used when the boot-loader must be updated.

The ICD3 can be purchased from Softcon or from any MicroChip agent. Pinouts are as follows:

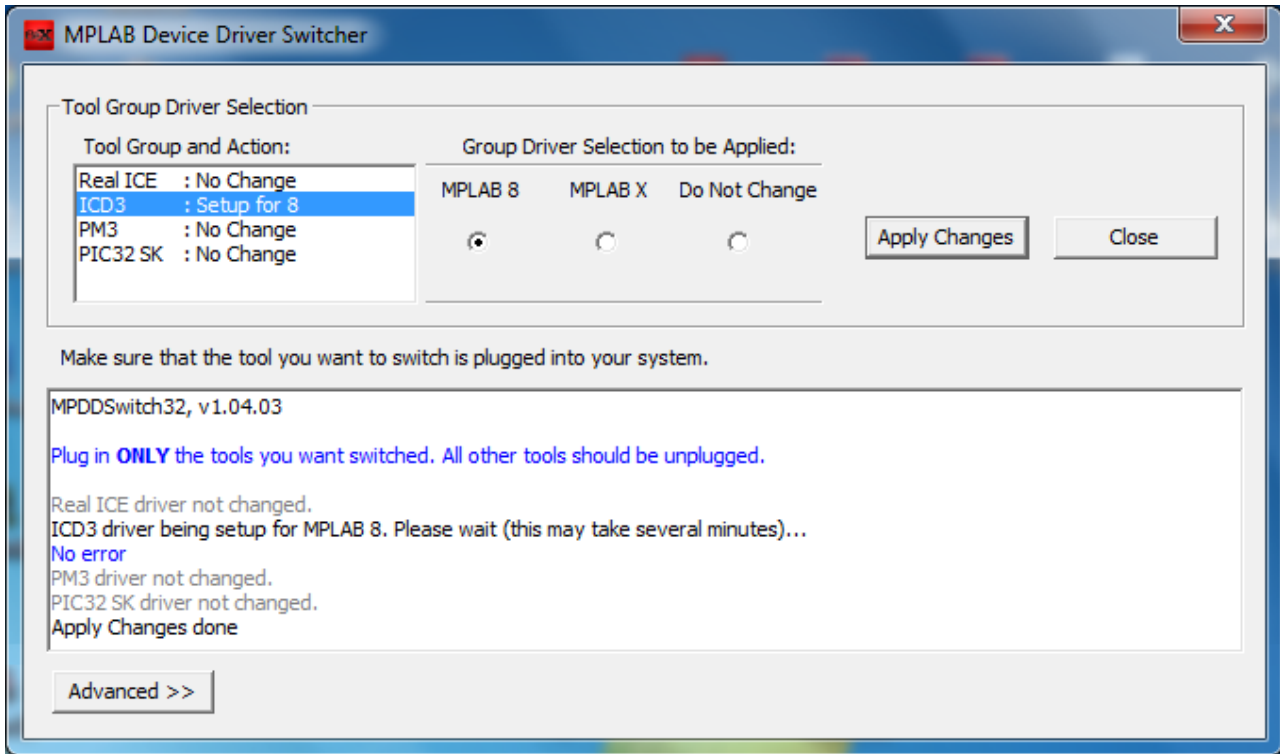
| Function | PCB Molex | ICD3 RJ-11 |
|----------|-----------|------------|
| MCLR | 1 | 6 |
| 3V3 | 2 | 5 |
| GND | 3 | 4 |
| PGD | 4 | 3 |
| PGC | 5 | 2 |
| PGM | 6 | 1 |



Four software (SW) versions of the ICD3 programmers are available:

- MPLAB8 Older version of the development tool (discontinued).
- MPLABX New version of the development tool. Not described here – use MPLAB IPE.
- MPLAB IPE Programmer only of MPLABX (requires MPLABX installation).
- MPLAB CMD Command line programmer. Requires MPLAB8 or MPLABX installed.

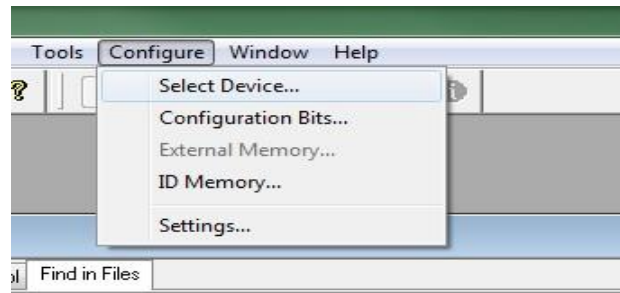
MPLAB8 or MPLABX is installed on a PC and the ICD3 programmer is connected to a USB port. If the ICD3 is not detected by USB when the program is run (only when alternating MPLABX and MPLAB8), run the MPLAB Device Driver Switcher and select ICD3 and MPLAB8 or MPLABX and Apply Changes.



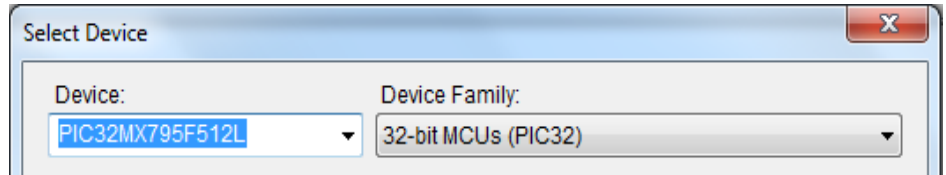
5.1 MPLAB8

Install and run MPLAB8.

Select **Configure > Select Device...**

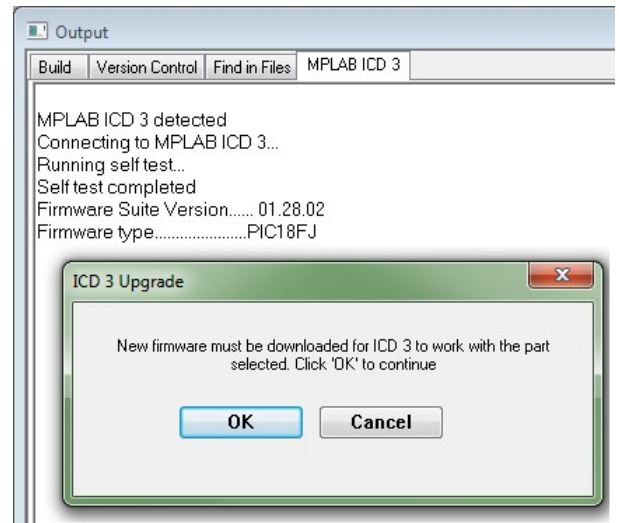
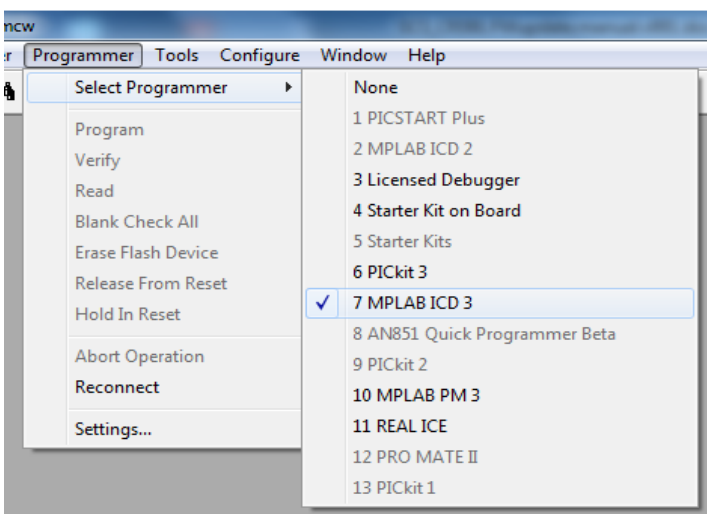


Select the PIC32 device from the list and PIC32MX795F512L (the last on the list).

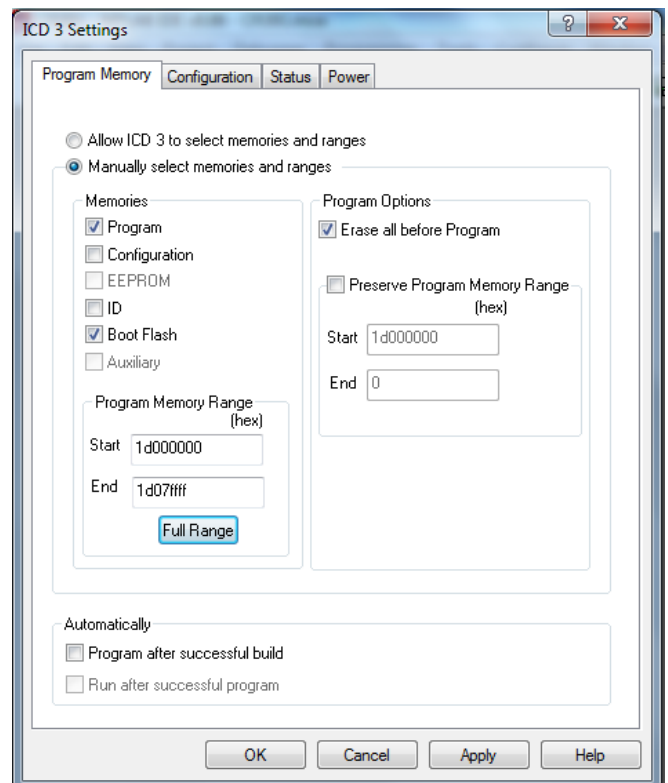


Select **Programmer > MPLAB ICD3**

If the ICD3 has the incorrect version, MPLAB IDE will automatically upgrade the device. Click OK



Select **Programmer > Setting**



Select **File > Import**

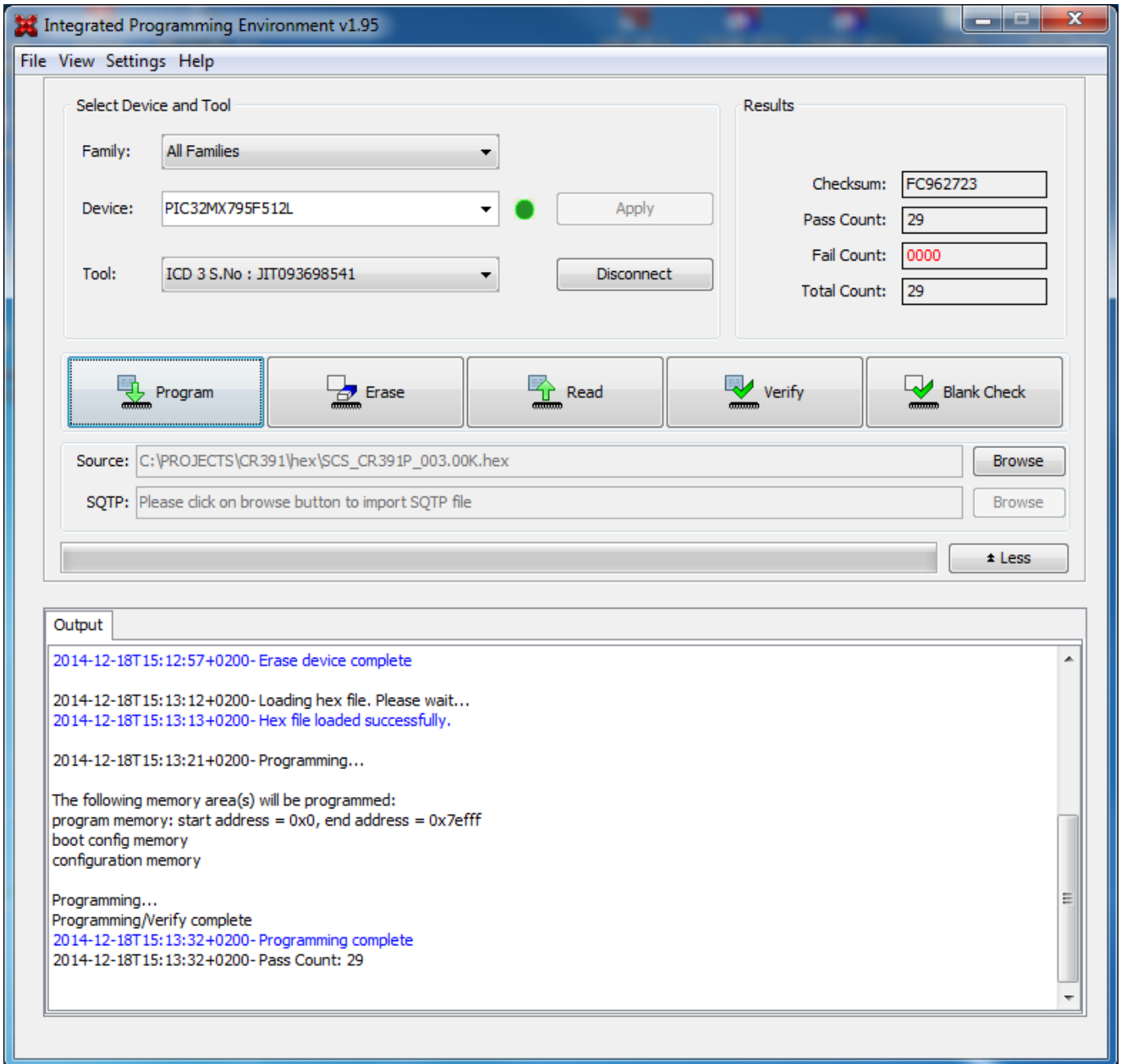
Select the file CR391P_Vxx.yy.hex

Where xx.yy is the version to be programmed (e.g. CR391P_V003.00J.hex)

Select **Programmer > Program**

5.2 MPLAB IPE

Install MPLABX and run MPLAB IPE



Select the **Device** PIC32MX795F512L and **Apply**.
The ICD programmer detected will be displayed, click **Connect**. The button changes to Disconnect.
Click **Erase**. Erase Complete is be shown.
Select **Source**, **Browse** and select the .hex file to be programmed. Loaded is shown.
Click **Program**. Programming complete is displayed.

6 SCS_BOOT-LOADER

This option updates controllers connected to the Ethernet (TCP/IP) or LAN (RS-485) – connected to SoftWin3 or mKnock (later mKnock version).

See SCS_sw3_BootLoader.help [SCS_sw3_BootLoader_help](#)