



CR391 FWupdate Manual

Revision 008

16 January 2023



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
008	2023-1-16	MTL	Add PICkit4

CONTENTS

1	SCOPE	3
2	WARNINGS AND CAUTIONS	3
3	APPLICABLE DOCUMENTS	3
4	GENERAL	3
5	ICD3/4 programming	4
5.1	MPLAB8 (discontinued)	5
5.2	MPLAB IPE	6
6	Pickit4 programming	7
7	SCS_Boot-loader	8

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 ICD3/4 PROGRAMMING

The MicroChip ICD3 or ICD4 is used to initially program the CRC (when manufactured) and must be used when the boot-loader must be updated.

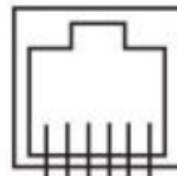


The ICD3/4 can be purchased from Softcon or from any MicroChip agent.

Note ICD3 and ICD4 has been discontinued and replaced with PICKit4

ICD 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



1 2 3 4 5 6

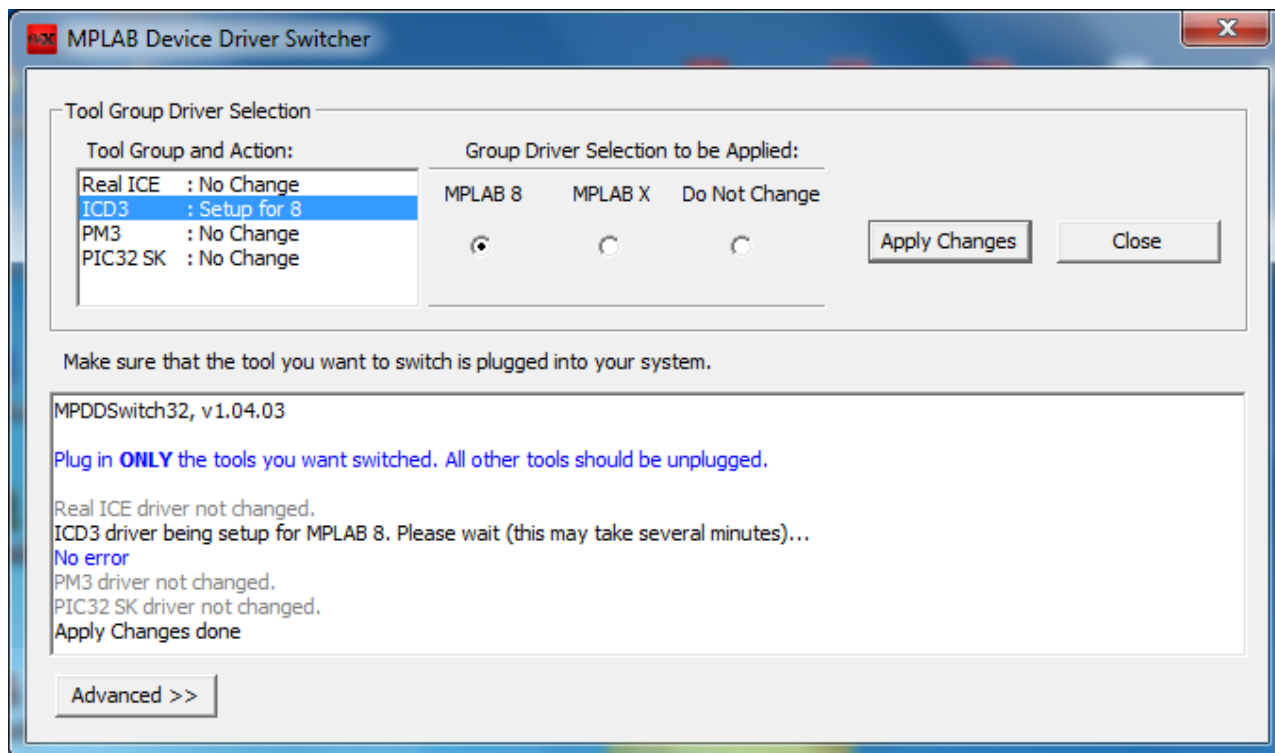
6 5 4 3 2 1

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 ICD3/4 programmer is connected to a USB port.

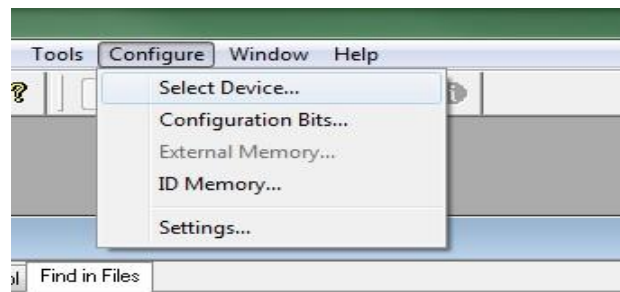
If the ICD3 is not detected by USB when the program is run (only when alternating MPLABX and MPLAB8), run the MPLAB Device Driver Switcher and select ICD3 and MPLAB8 or MPLABX and Apply Changes.



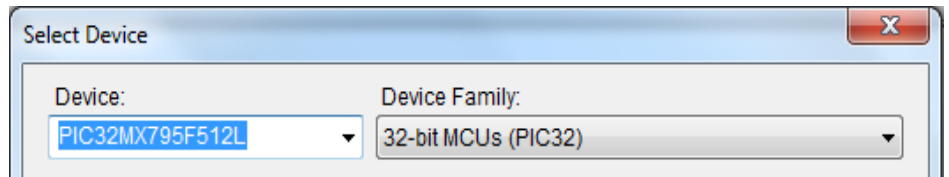
5.1 MPLAB8 (DISCONTINUED)

Install and run MPLAB8.

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

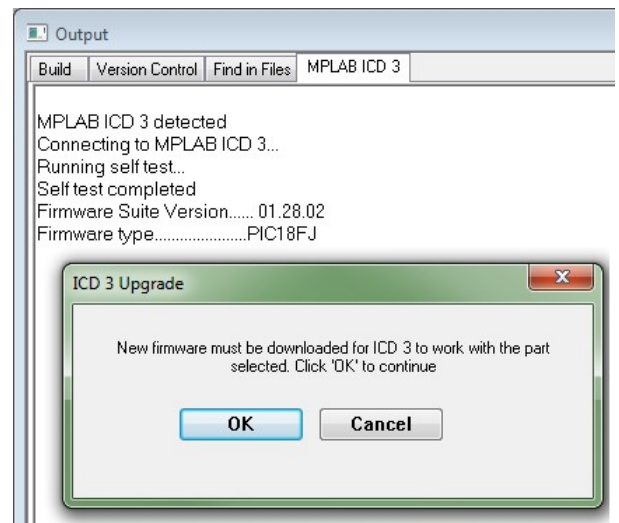
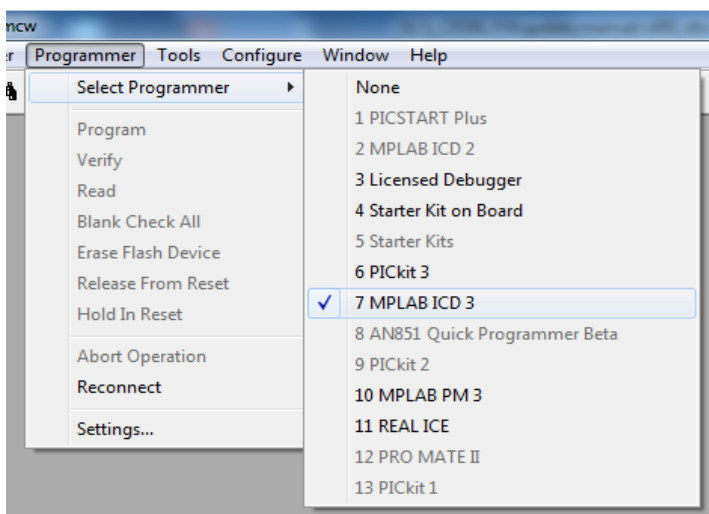


Select the PIC32 device from the list and PIC32MX795F512L (the last on the list).



Select **Programmer > MPLAB ICD3**

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



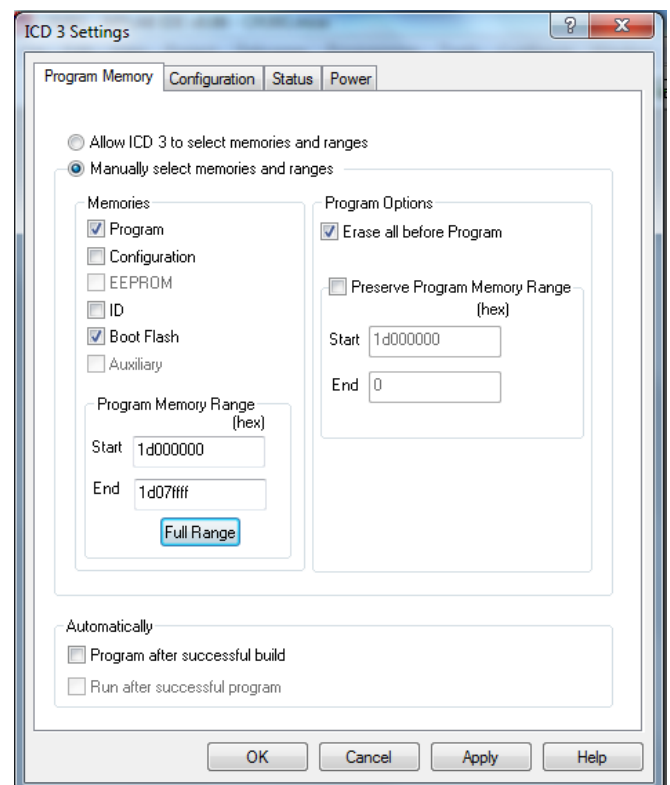
Select **Programmer > Setting**

Select **File > Import**

Select the file CR391P_Vxx.yy.hex

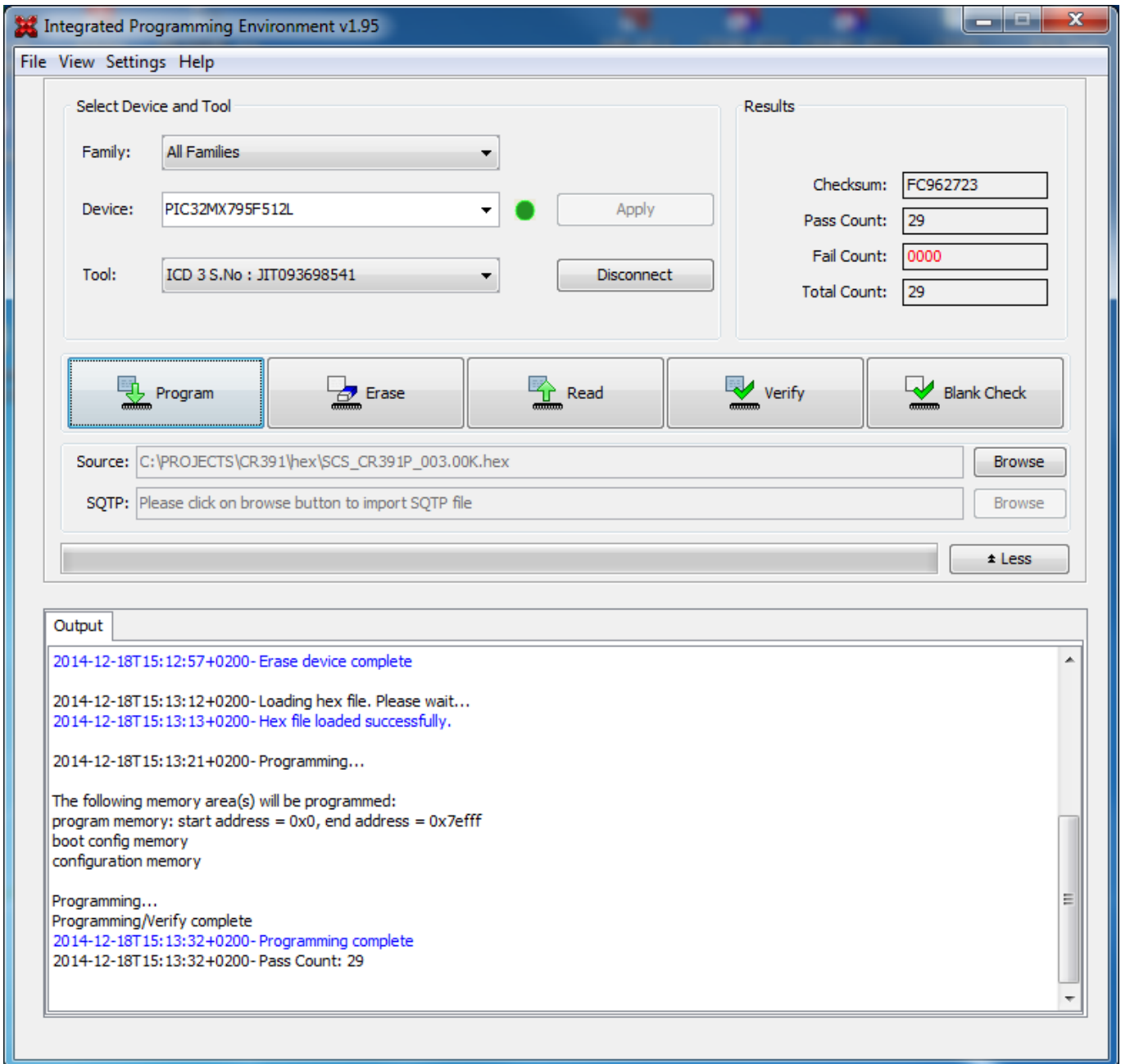
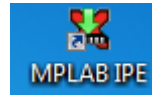
Where xx.yy is the version to be programmed e.g. CR391P_V003.00J.hex

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 PICKIT4 PROGRAMMING



The MicroChip PICKit4 replaces ICD3 and ICD4 is used to initially program the CRC (when manufactured) and must be used when the boot-loader must be updated.

Pickit4t can be purchased from Softcon or from any MicroChip agent.

The Micro SD Card (SDC) is loaded with files (typically 530kByte) provided by Softcon. Files available on SoftconUSB and or www.softconserv.com downloads. Simply connect PICKit4 to the PCB ICD connector and push the Programmer To-Go button.

REQUIREMENTS

SDC formatted FAT32.

32GB or less, generally FAT32.

Reformat tools from NTFS available.

File conf.ptg (root folder)

Text file points to data folder that has programming data, typically:

```
DIR = "0:/CR391U_795_10214A.ptg"
```

Data Folder

Typically:

```
CR391U_675_10214A.ptg
CR391U_695_10214A.ptg
CR391U_795_10214A.ptg
```

SDC can have multiple folders, only one pointed to by conf.ptg is used.

Each uP type must have appropriate folder (provided by Softcon). Folder name indicated the uP and the version.

Simply edit or replace conf.ptg to point to the appropriate folder.

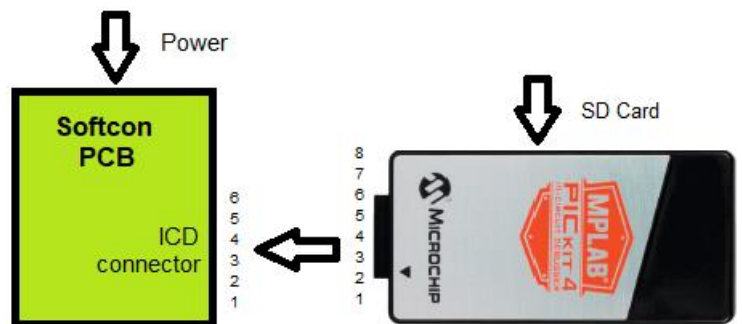
To load files and folders or edit conf.ptg, insert the SDC into a SD card reader plugged into a USB port.

SD cards and SDC readers available from Softcon (provided with PICKit4).

Cables as follows, available from Softcon.



Function	PCB Molex	PICKit Strip
MCLR	1	1
VDD (3V3 or 5V)	2	2
GND	3	3
PGD	4	4
PGC	5	5
PGM	6	6
Not used		7
Not used		8



PROGRAM STEPS

1. If not already on the SDC, use a SDC – USB reader to: Load appropriate data folder on the SDC. Load / edit conf.ptg on the SDC to point to the data folder.
2. Insert the SDC into the PICKit4 card slot (note the insert direction as shown above – upside down, connector inside).
3. Connect PICKit4 to the IDC programming connector on the powered up Softcon PCB.
4. PICKit4 must flash green. If red, SDC absent or inserted incorrectly.
5. **Firmly** push on the red logo for 2 seconds – PICKit flashes blue while programming, back to green flashing. If flashes red, the incorrect file folder is pointed to by conf.ptg (must match the uP type).

7 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](#)