SMH Technologies®

15/01/2025

Driver v. 1.00

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Interfacing FlashRunner 2.0 with SONY CXD Devices

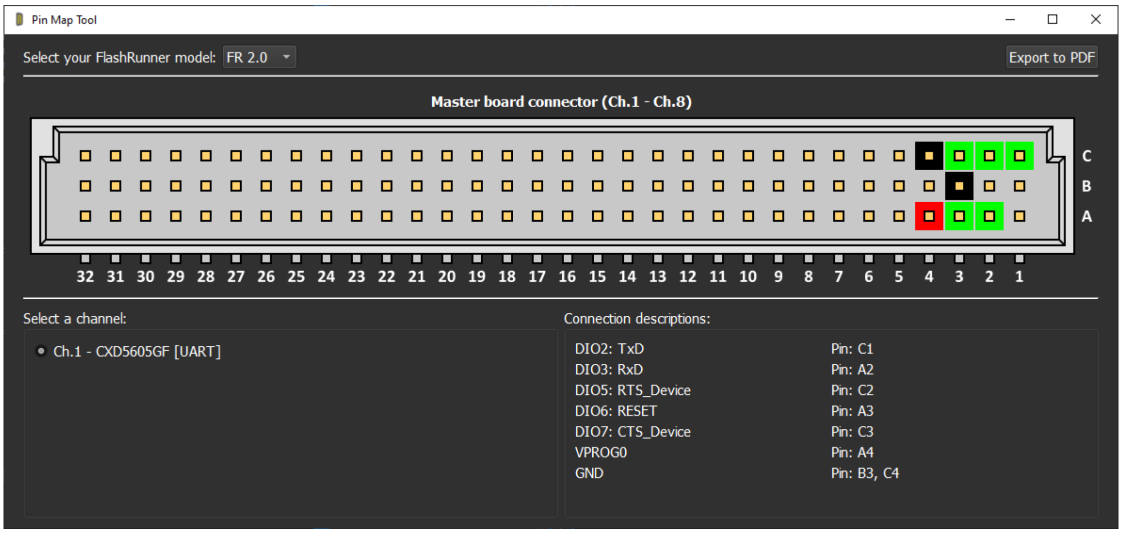
SMH Technologies S.r.l.

CXD Protocols and PIN maps

All the CXD devices support the UART protocol.

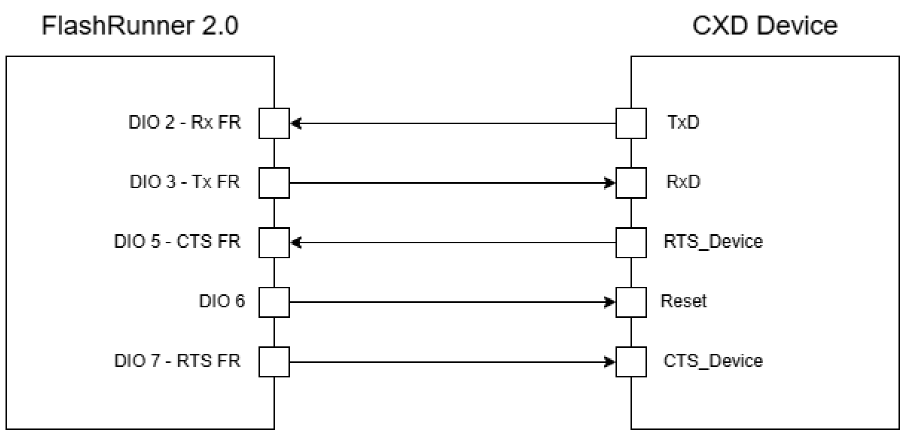
```
#TCSETPAR CMODE <UART>
```

UART PIN MAP



DIO2: TxD	Pin: C1
DIO3: RxD	Pin: A2
DIO5: RTS_Device	Pin: C2
DIO6: RESET	Pin: A3
DIO7: CTS_Device	Pin: C3
VPROG0	Pin: A4
GND	Pin: B3, C4

This device can support RTS and CTS flow control **only if enabled with the corresponding command**, with the configuration being the following:



FR: FlashRunner 2.0
D: Target Device

In this configuration, if either RTS line is driven high, communication must be halted until the line returns to a low state. This ensures that transmission is controlled and prevents data loss if either device's receive buffer becomes full.

CXD Programming characteristics

This chapter will analyze the programming characteristics of CXD devices, with particular attention to how the FlashRunner interacts with them in different situations.

CXD Flash Memory

This device can store the injected firmware in one of two memory options: internal eMRAM or external Flash. Upon startup, it will first check the internal eMRAM for the firmware and, if found, execute it. If no firmware is detected in the internal memory, the device will then search the external Flash memory. If no firmware is found in either memory, the device will automatically enter Special Mode.

CXD Special Mode

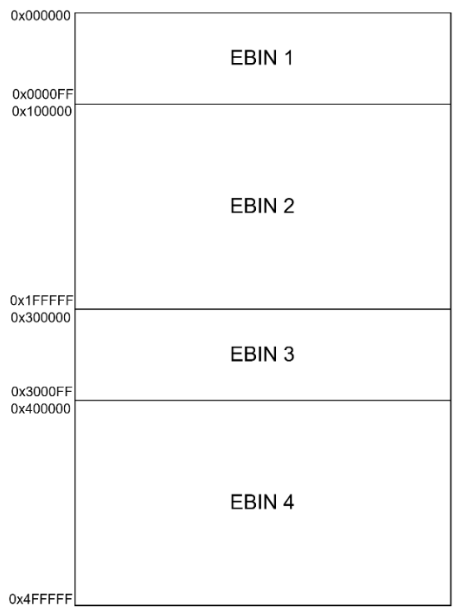
If the device is blank, it enters a "special mode" in which only the program operation is accepted. No other commands can be executed, and any attempts will return an "Unknown [command]" error. The FlashRunner will detect this mode and issue a warning, indicating that only the PROGRAM command is executable.

Below is an example of a command being executed while the device is in special mode:

```
---#TPCMD SEND_COMMAND @CSBR 9600
Device response:
CSBR 9600
Unknown (@CSBR)
Device in special mode. Only the PROGRAM command is accepted at this time.
Time for @CSBR 9600: 3 ms
```

CXD Memory Map and Firmware Files

The **memory map** included in this driver **does not** accurately **reflect** the **actual locations** where data will be stored. Instead, it is a conceptual map designed to manage the firmware files of these devices.
The firmware files that need to be programmed onto the device have a proprietary "*.ebin*" extension. When generating the FRB file, these "*.ebin*" files must first be converted into standard binary format and then loaded into the appropriate memory sections, as outlined in the diagram below.



This can be done through the Workbench FRB manager by editing and changing the start address of the conflicting files to the appropriate start address, as represented in the diagram above.

CXD Available Commands

CXD Standard Commands

MEMORY	MASSERASE	BLANKCHECK	PROGRAM	VERIFY READOUT	VERIFY CHECKSUM	READ	DUMP
Flash [F]	✓		✓				

CXD Additional Commands

Commands for Flash memory:

#TPCMD CHANGE_CLOCK
#TPCMD SEND_COMMAND
#TPCMD RTS_CTS_ENABLE

CXD Driver Commands

Here you can find the complete list of all available commands for the CXD driver.

CXD Standard Commands

This section will analyze standard commands, which are typically common across different drivers.

```
Memory type:
F → FLASH
```

#TPCMD CONNECT

`#TPCMD CONNECT`
This function performs the entry and is the first command to be executed when starting the communication with the device.

#TPCMD MASSERASE

`#TPCMD MASSERASE <F>`
Masserase command for Flash memory of target device.

#TPCMD PROGRAM

`#TPCMD PROGRAM <F>`
Programs all Flash memory based on the data in the FRB file.

#TPCMD DISCONNECT

`#TPCMD DISCONNECT`
Disconnect function. Power off and exit.

CXD Additional Commands

Additional commands are specialized commands designed to perform specific functions.
They enable the execution of complex procedures with a single command and provide access to important information from the device.
Typically, these commands are available in the final section of the Graphical User Interface when creating a project.

Additional Commands

#TPCMD CHANGE_CLOCK

Syntax: #TPCMD CHANGE_CLOCK <clock value>

<clock value>	Clock value in Hz (e.g. 115200)

Description: Command to change the communication frequency during the program execution.
Usually required after a @CSBR command. If there is no need to change between different frequencies during execution, use the TCSETPAR PROTCLK parameter instead.

Examples: Correct command execution:

```
---#TPCMD CHANGE_CLOCK 115200
Frequency changed to 115200Hz.
```

#TPCMD SEND_COMMAND

Syntax: #TPCMD SEND_COMMAND <@command> <args 1> <args 2> <args 3> <args 4> <args 5> <args 6>

<@command>	Command to be sent to the device via UART interface. It must start with the @ symbol.
<args 1> → <args 6>	Arguments required for the command, if needed.

Description: This command is realized to send commands to the device via the UART interface. To know all available commands, check the device documentation.

Examples: Correct command execution:

```
---#TPCMD SEND_COMMAND @CSBR 9600
Device response:
[CSBR] Done
Time for @CSBR 9600: 10 ms
```

#TPCMD RTS_CTS_ENABLE

Syntax: #TPCMD RTS_CTS_ENABLE <YES/NO>

<YES/NO>	Enable/Disable RTS and CTS lines.

Prerequisites: RTS and CTS lines connected to the device.

Note: This command is needed only if the device manages the communication with these additional flow controls.

Description: This command is designed to support RTS and CTS flow control. When set to YES, these two lines will be utilized for communication. If set to NO, the lines will be disabled. **By default, if not activated through this command, the two lines will not be used.**

Examples: Correct command execution:

```
---#TPCMD RTS_CTS_ENABLE YES
RTS and CTS lines enabled for the communication.
```

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CXD Driver Changelog

Info about driver version 1.00 - 15/01/2025
Supported Flash memory Commands for CXD5605GF/CXD5607GF devices.
Supported RTS and CTS communication.