**Documentation for PCFtool Interface**

This document describes the communication with the USB interface between the frontend and the PCFtool, which enumerates itself as virtual serial port. For communication every serial command line tool (e.g. hterm) could be used.

PCFtool itself implements an interface for communicating with PCF79xx automotive key transponder ICs via Monitor and Download interface (MDI). It enables lots of interactions with the PCF79xx chip like writing and reading to EEROM and EROM, unlocking (=erasing) locked chips.

**Description of implemented Commands**

In order to program data to the PCF chip, the data must first be sent to an internal buffer on the PCFtool. In the next step, the user sends a command to the PCFtool to program the data from its internal buffer to the PCF chip.

**Commands for controlling PCFtool**

|  |  |  |  |
| --- | --- | --- | --- |
| **CMD** | **Parameter** | **Description** | **Comments** |
| 09 | 0X 00 0Y 00 | **Connect**  Erase Chip:  X = 0: Normal connect  X = 1: Connect and Erase chip  MDI Sequence Type  Y=0: 26A0700  Y=1: PCF7945 | Locked chip must first be deleted after connecting MDI, afterwards it is unlocked and can be accessed |
| 2B | YY XX ZZ VV  WW0…WWx MM0…MM3 | **Program ER Buf**  Start Address:  YY: Start Adress low byte  XX: Start Adress high byte  Data Length:  ZZ: Length low byte  VV: Length high byte  Data payload:  WW0…WWx: Data to be written  Checksum:  MM0…MM3: CRC32 highest byte to lowest byte. Can be left all zero, then no CRC is used |  |
| 3B |  | **Program EE Buf:** See command „Program ER Buf“ |  |
| 4B |  | Program ER |  |
| 1B |  | Program EE |  |
| 5B |  | Program EE Manual |  |
| 6B | XX YY 00 00 | Program Special Bytes (Page 127) XX: byte[2]  YY: byte[3] |  |
| 0D |  | Read ER |  |
| 1D |  | Read EE |  |
| 4D |  | Read ER Buf CRC |  |
| 0E |  | Protect |  |
| 5D | 00 00 0Y 00 | Calculate Checksum  Y=0: EROM\_NORM  Y=1: EROM  Y=2: EEROM  Y=3: ROM |  |

**Feedback (Answer from Tool) Bitmask:**

|  |  |  |
| --- | --- | --- |
| **Bit Nr.** | **Info** | **Detail** |
| 0 | OK | Performed Action was successfully executed |
| 1 | Too less data | PCF returned less data than expected |
| 2 | Err. State received | PCF responded with an error status to the cmd / data former sent |
| 3 | Receive Timeout | PCF did not respond (return data) to the last action or cmd. No SCL edges were detected. |
| 4 | Prog special pages error | After writing special page 127 (byte 2 and 3) to EEROM, PCF did not confirm afterwards |
| 5 |  |  |
| 6 |  |  |