

USB Interface

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Connection parameter

USB serial interface (COM Port)

- **Baud rate:** 57600
- **Parity:** None
- **Stop bits:** 1

Host -> HILMux

Send control command to HILmux via USB serial interface.

Syntax

Request:

<HEADER> <CMD>

Response:

<HEADER> <STATUS>

Header: ASCII "HMUX" => 0x48 0x4d 0x55 0x58

CMD:

- CMD_SET_U1_MODE = 0x00
- CMD_SET_U2_MODE = 0x01
- CMD_SET_LOCK_MODE = 0x02
- CMD_GET_U1_MODE = 0x03
- CMD_GET_U2_MODE = 0x04
- CMD_GET_LOCK_MODE = 0x05
- CMD_GET_ALIVE_FACTORY_SETTING = 0x06
- CMD_ENTER_BOOTLOADER = 0x07
- CMD_LAST_ELEMENT = 0x08
- CMD_BOOTLOADER_ENTER_LOADER = 0xFF

STATUS:

- UC_STATE_DISCONNECTED = 0x00
- UC_STATE_XETK = 0x01
- UC_STATE_LB = 0x02
- UC_STATE_INVALID = 0x03

examples set UC1 modes:

- CMD_SET_U1_MODE UC_STATE_XETK: 0x48 0x4d 0x55 0x58 0x00 0x01 => 48 4d 55 58 00 01
- CMD_SET_U1_MODE UC_STATE_LB: 0x48 0x4d 0x55 0x58 0x00 - 0x02 => 48 4d 55 58 00 02
- CMD_SET_U1_MODE UC_STATE_DISCONNECTED: 0x48 0x4d 0x55 0x58 0x00 0x00 => 48 4d 55 58 00 00

examples set UC2 modes:

- CMD_SET_U2_MODE UC_STATE_XETK: 0x48 0x4d 0x55 0x58 0x01 0x01 => 48 4d 55 58 01 01
- CMD_SET_U2_MODE UC_STATE_LB: 0x48 0x4d 0x55 0x58 0x01 0x02 => 48 4d 55 58 01 02
- CMD_SET_U2_MODE UC_STATE_DISCONNECTED: 0x48 0x4d 0x55 0x58 0x01 0x00 => 48 4d 55 58 01 00

examples set lock states:

- CMD_SET_LOCK_MODE LOCK_STATE_UNLOCKED: 0x48 0x4d 0x55 0x58 0x02 0x00 => 48 4d 55 58 02 00
- CMD_SET_LOCK_MODE LOCK_STATE_LOCKED: 0x48 0x4d 0x55 0x58 0x02 0x01 => 48 4d 55 58 02 01

HILMux -> Host:

Receive status from HILmux via USB serial interface

Header: ASCII "HMUX" => 0x48 0x4d 0x55 0x58

enum STATUS:

- STATUS_U1_MODE = 0x00

- STATUS_U2_MODE = 0x01
- STATUS_LOCK_MODE = 0x02
- STATUS_ALIVE_FACTORY_SETTING = 0x03
- STATUS_LAST_ELEMENT = 0x04
- STATUS_BOOTLOADER_ALIVE_FACTORY_SETTING = 0xFF

examples get UC1 modes:

- CMD_SET_U1_MODE UC_STATE_XETK: 0x48 0x4d 0x55 0x58 0x00 0x01 => 48 4d 55 58 00 01
- CMD_SET_U1_MODE UC_STATE_LB: 0x48 0x4d 0x55 0x58 0x00 - 0x02 => 48 4d 55 58 00 02
- CMD_SET_U1_MODE UC_STATE_DISCONNECTED: 0x48 0x4d 0x55 0x58 0x00 0x00 => 48 4d 55 58 00 00

examples get UC2 modes:

- CMD_SET_U2_MODE UC_STATE_XETK: 0x48 0x4d 0x55 0x58 0x01 0x01 => 48 4d 55 58 01 01
- CMD_SET_U2_MODE UC_STATE_LB: 0x48 0x4d 0x55 0x58 0x01 0x02 => 48 4d 55 58 01 02
- CMD_SET_U2_MODE UC_STATE_DISCONNECTED: 0x48 0x4d 0x55 0x58 0x06 0x00 => 48 4d 55 58 01 00

examples get lock states:

- CMD_SET_LOCK_MODE LOCK_STATE_UNLOCKED: 0x48 0x4d 0x55 0x58 0x02 0x00 => 48 4d 55 58 02 00
- CMD_SET_LOCK_MODE LOCK_STATE_LOCKED: 0x48 0x4d 0x55 0x58 0x02 0x01 => 48 4d 55 58 02 01

examples get serial number:

- CMD_GET_SERIAL_NUMBER: 0x48 0x4d 0x55 0x58 0x06 => 48 4d 55 58 06

examples enter bootloader:

- CMD_ENTER_BOOTLOADER: 0x48 0x4d 0x55 0x58 0x07 => 48 4d 55 58 07

STATUS_(BOOTLOADER_)ALIVE_FACTORY_SETTING Data:

Field	Type	Comment
REVISION	u8	Currently only 0x01. Future revisions might have different data and size after this.
INVALID	u8	0xEE if it's a production unit. Anything else is a development unit (usually 0xDD).
COMMIT_SHORT_SHA1	4 bytes	First 4 bytes of commit sha ([0][1][2][3] » e.g. 4c2c5654)
SERIAL_NUMBER	4 bytes	Serialnumber in hex (HILmux-[0][1][2][3] » e.g. HILmux-0A0BCCDD)
PRODUCTION_DATE.YEAR	u16	In little Endian. e.g. 2024
PRODUCTION_DATE.MONTH	u8	1 to 12
PRODUCTION_DATE.DAY	u8	1 to 31
PRODUCTION_TIME.HOUR	u8	1 to 23
PRODUCTION_TIME.MINUTE	u8	1 to 59
PRODUCTION_TIME.SECOND	u8	1 to 59
PRODUCTION_TIME.PADDING	1 byte	Not defined, but should be 0x00 in practice. Pads ProductionTime to 4 bytes.

Example:

- STATUS_ALIVE_FACTORY_SETTING: 48 4D 55 58 03 01 ee f00dabfd 02020012 e807 05 01 17 30 32 00
 - => HMUX STATUS_ALIVE_FACTORY_SETTING Rev1 Prod commit-f00dabfd HILmux-02020012 2024-05-01 23:48:50
- `python3 -i hilmux_proto.py`: `FactorySetting.decode(bytes.fromhex("01eef00dabfd02020012e807050117303200"))`
 - => `FactorySettingRev1(invalid=0xEE, git_commit_short=f00dabfd, serialnumber=02020012, production_date=2024-05-01, production_time=23:48:50)`