Interfacing FlashRunner 2.0 with AB32 devices

Protocols

SWD for all AB32 devices.

PIN Map

SWD:

- DIO 1 - RST
- DIO 2 - SWCLK
- DIO 5 - SWDIO

Available Operations

- **A31G1x Series**

MEMORY	MASSERASE	ERASE PAGE	BLANKCHECK	PROGRAM	VERIFY R	VERIFY S	READ	DUMP
Flash [F]	✓	✓	✓	✓	✓	✓	✓	✓
Option Area[O]				✓	✓		✓	✓

Other commands available:

- `#TPCMD UNPROTECT`
- `#TPCMD GET_PROTECTION`
- `#TPCMD SET_PROTECTION [Value]`
- `#TPCMD CHECK_PROTECTION [Value]`
- `#TPCMD RESTORE_OPTION_BYTES`
- `#TPCMD OVERVIEW_OPTION_BYTES`
- `#TPCMD GET_DEVICE_INFORMATIONS`
- `#TPCMD ERASE [Address] [Size]`
- `#TPCMD WRITE_OPTION_BYTE [Address] [Value]`
- `#TPCMD COMPARE_OPTION_BYTE [Address] [Value]`
- `#TPCMD READ_MEM8 [Address] [Byte Count]`
- `#TPCMD READ_MEM16 [Address] [16-bit Word Count]`
- `#TPCMD READ_MEM32 [Address] [32-bit Word Count]`

Parameters List

#TCSETPAR ENTRY_CLOCK

`#TCSETPAR ENTRY_CLOCK`

Default value is 4 MHz.

Frequency used into Connect procedure before raising the PLL of the device, if device PLL is available.

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#TCSETPAR PLL_ENABLED

#TCSETPAR PLL_ENABLED

Default value YES.

Accepted parameters YES / NO.

Enable the PLL of the device at the highest possible frequency.

Commands List

#TPCMD CONNECT

#TPCMD CONNECT

Connect function. Power on and entry.

Example of Connect Procedure wih LOG LEVEL 1:

```
|---#TPCMD CONNECT
|Protocol selected SWD.
|Entry Clock is 4.00 MHz.
|Trying Hot Plug connect procedure.
|IDCODE: 0x2BA01477.
|Designer: 0x23B, Part Number: 0xBA01, Version: 0x2.
|ID-Code read correctly at 4.00 MHz.
|JTAG-SWD Debug Port enabled.
|Scanning AP map to find all APs.
|AP[0] IDR: 0x24770011, Type: AMBA AHB3 bus.
|AP[0] ROM table base address 0xE00FF000.
|CPUID: 0x410FC241.
|Implementer Code: 0x41 - [ARM].
|Found Cortex M4 revision r0p1.
|Cortex M4 Core halted [0.001 s].
|The device's Read Protection Level level is 0.
|PLL Enabled.
|Requested Clock is 37.50 MHz.
|Generated Clock is 37.50 MHz.
|Good samples: 4 [Range 3-6].
|IDCODE: 0x2BA01477.
|Designer: 0x23B, Part Number: 0xBA01, Version: 0x2.
|ID-Code read correctly at 37.50 MHz.
|Time for Connect: 0.107 s.
```

#TPCMD MASSERASE

#TPCMD MASSERASE <Memory Type>

Masserase command isn't available for Option Bytes Area.

With this command, a Masserase of the device memory will be performed, whether this memory is made up of a single bank or two banks.

If the Readout Protection Level (Read Protection Level) is set at level 1, this Masserase command will proceed by changing the protection level to level 0.

By this operation, an internal Masserase of the device will be automatically performed.

Masserase depending on the Read Protection Level value:

If Read Protection Level level is 1, erase all memory of selected type with option bytes procedure.

If Read Protection Level level is 0, erase all memory of selected type with standard procedure if available.

Available for all AB32 Devices.

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#TPCMD UNPROTECT

#TPCMD UNPROTECT

Remove the Flash write protected sectors and perform a Masserase F of all Flash memory.
If there are no write protected sectors in the flash memory, then a standard Masserase F is performed.
Available for all AB32 Devices.

#TPCMD ERASE

#TPCMD ERASE <Memory Type>

Erase command isn't available for Option Bytes Area.
Erase all memory with Page/Sector erase.
With this command, a Page/Sector Erase of the device FLASH memory will be performed, whether this memory is made up of a single bank or two banks.
Typically running the Page Erase of the entire Flash memory takes much longer than running the Masserase command.
If the Readout Protection Level (Read Protection Level) isn't set at level 0, an error will be returned.
Available for all AB32 Devices.

#TPCMD ERASE <Memory Type> <Start Address> <Size>

Erase selected part of memory with sector/page erase.
Erase command isn't available for Option Bytes Area.
The driver will automatically convert the value of Start Address and Size to the corresponding number of pages.
If this command is performed on a device with two FLASH memory banks but configured on a single bank, the driver automatically manages the different size of the pages.
If the Read Protection Level (Read Protection Level) is not set to level 0, an error will be returned.
Available for all AB32 Devices.

#TPCMD BLANKCHECK

#TPCMD BLANKCHECK <Memory Type>

Verify if all memory of selected type is erased.
Blankcheck command isn't available for Option Bytes Area.
If the Read Protection Level (Read Protection Level) is not set to level 0, an error will be returned.
Available for all AB32 Devices.

#TPCMD BLANKCHECK <Memory Type> <Start Address> <Size>

Verify if selected part of memory of selected type is erased.
Blankcheck command isn't available for Option Bytes Area.
If the Read Protection Level (Read Protection Level) is not set to level 0, an error will be returned.
Available for all AB32 Devices.

#TPCMD PROGRAM

#TPCMD PROGRAM <Memory Type>

Program all memory of selected type.
Available for all AB32 Devices.

#TPCMD PROGRAM <Memory Type> <Start Address> <Size>

Program selected part of memory of selected type.
Available for all AB32 Devices.

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#TPCMD VERIFY

#TPCMD VERIFY <R/S> <Memory Type>

Verify all memory of selected type.
R: Readout - S: Checksum 32Bit.
Available for all AB32 Devices.

#TPCMD VERIFY <R/S> <Memory Type> <Start Address> <Size>

Verify selected part of memory of selected type.
R: Readout - S: Checksum 32Bit.
Available for all AB32 Devices.

#TPCMD READ

#TPCMD READ <Memory Type>

Read all memory of selected type.
Available for all AB32 Devices.

#TPCMD READ <Memory Type> <Start Address> <Size>

Read selected part of memory of selected type.
Available for all AB32 Devices.

#TPCMD DUMP

#TPCMD DUMP <Memory Type>

Dump all memory of selected type.
Available for all AB32 Devices.

#TPCMD DUMP <Memory Type> <Start Address> <Size>

Dump selected part of memory of selected type.
Available for all AB32 Devices.

#TPCMD RESTORE_OPTION_BYTES

#TPCMD RESTORE_OPTION_BYTES

This command is used to restore Option Bytes to a default value, when they are in a not optimal condition, due for example to an incorrect input file.
With this command, as you can guess from the name itself, it is possible to return the Option Bytes to the Default state (when this operation is possible).
The Default value of the Option Bytes is often the one present when the device leaves the factory.
More precisely, in the various Reference Manuals you can find the various default values for each AB32 family and subfamily.
Remember to use this command when you are not be able to restore manually the option bytes.
Available for all AB32 Devices.

#TPCMD OVERVIEW_OPTION_BYTES

#TPCMD OVERVIEW_OPTION_BYTES

Reads all option bytes present in the device and represents these values with various tables in the Real Time Log.
Available for all AB32 Devices.

#TPCMD GET_PROTECTION

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Print into Real Time Log the current Read Protection Level present into target device.
Available for all AB32 Devices.

#TPCMD SET_PROTECTION

```
#TPCMD SET_PROTECTION <Protection>
```

Set inserted Read Protection Level level into target device.
Protection value in HEX format [0x00 - 0xFF].
The Read Protection Level 0 has value 0x3.
The Read Protection Level 1 has value 0x2.
Other values set Read Protection Level to level 1.
When Level 1/2 is active, programming the protection option byte (Read Protection Level) to Level 0 causes the Flash memory to be mass-erased.
Available for all AB32 Devices.

#TPCMD CHECK_PROTECTION

```
#TPCMD CHECK_PROTECTION <Protection>
```

Check if current Read Protection Level protection level into device is the same as the one entered as a command parameter.
If it is different, the command returns an error.
The parameter values of this command can be 0, 1, 2.
Available for all AB32 Devices.

#TPCMD WRITE_OPTION_BYTE

```
#TPCMD WRITE_OPTION_BYTE <Address> <Value>
```

Writes the Option Byte to the selected address (Address) with the entered value (Value).
The reserved bits of the Option Bytes are not changed.
Available for all AB32 Devices.

#TPCMD COMPARE_OPTION_BYTE

```
#TPCMD COMPARE_OPTION_BYTE <Address> <Value>
```

Compare the Option Byte at the selected address (Address) with the entered value (Value).
The reserved bits of the Option Bytes are not considered.
Available for all AB32 Devices.

#TPCMD GET_DEVICE_INFORMATIONS

```
#TPCMD GET_DEVICE_INFORMATIONS
```

Reads all information present in the device and represents these values with a table in the Real Time Log.
Available for all AB32 Devices.

#TPCMD READ_MEM8

```
#TPCMD READ_MEM8 <Address> <Byte Count>
```

It reads [Byte Count] bytes from the memory at the selected [Address] address and prints the data read in the Terminal and in the Real Time Log.
Available for all AB32 Devices.

#TPCMD READ_MEM16

```
#TPCMD READ_MEM16 <Address> <16-bit Word Count>
```


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It reads [16-bit Word Count] 16-bit words from the memory at the selected [Address] address and prints the data read in the Terminal and in the Real Time Log.
Available for all AB32 Devices.

#TPCMD READ_MEM32

```
#TPCMD READ_MEM32 <Address> <32-bit Word Count>
```

It reads [32-bit Word Count] 32-bit words from the memory at the selected [Address] address and prints the data read in the Terminal and in the Real Time Log.
Available for all AB32 Devices.

#TPCMD RUN

```
#TPCMD RUN
```

Available for all AB32 Devices.

#TPCMD DISCONNECT

```
#TPCMD DISCONNECT
```

Disconnect function. Power off and exit.
Available for all AB32 Devices.

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