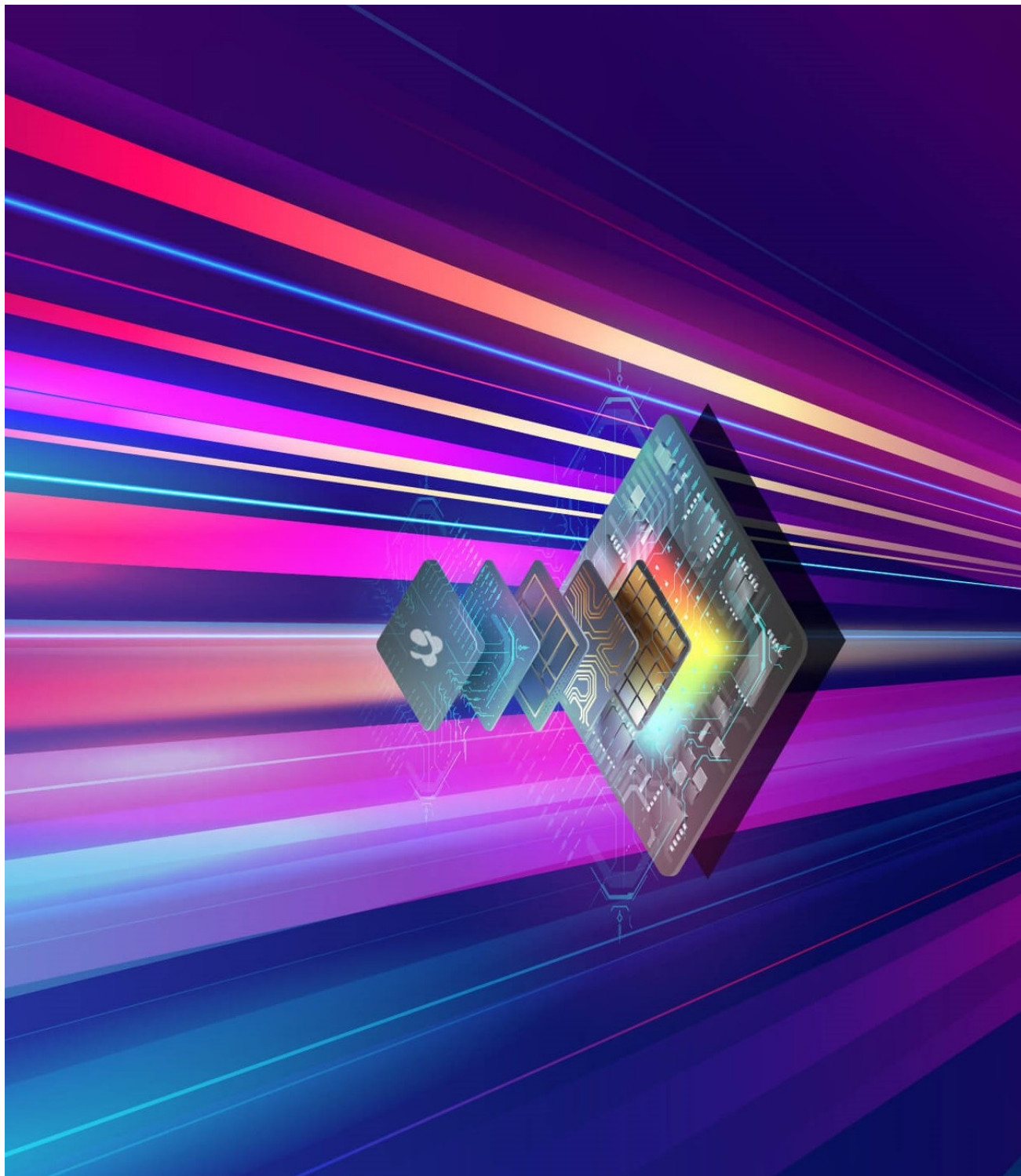
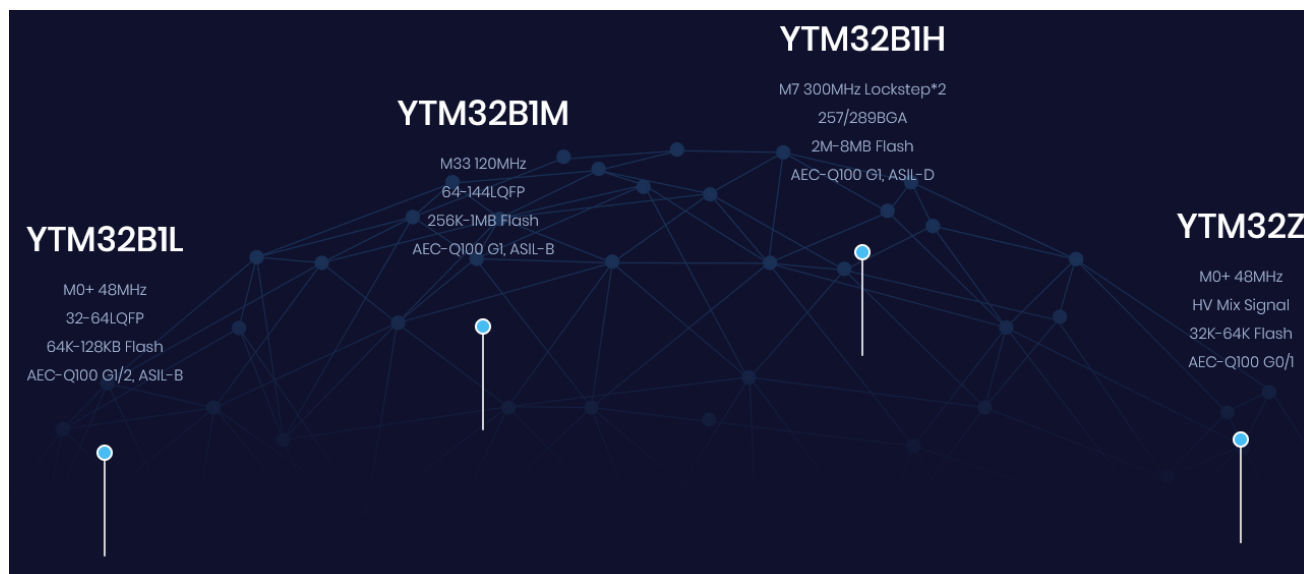


Interfacing FlashRunner 2.0 with YUNTU YTM32

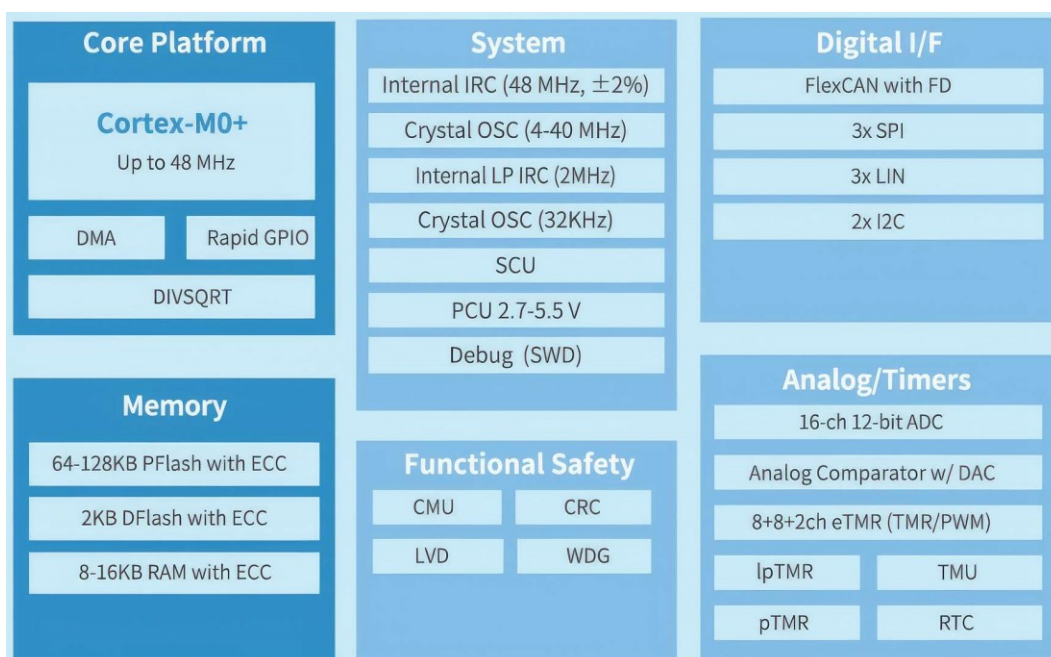


YUNTU YTM32 Introduction

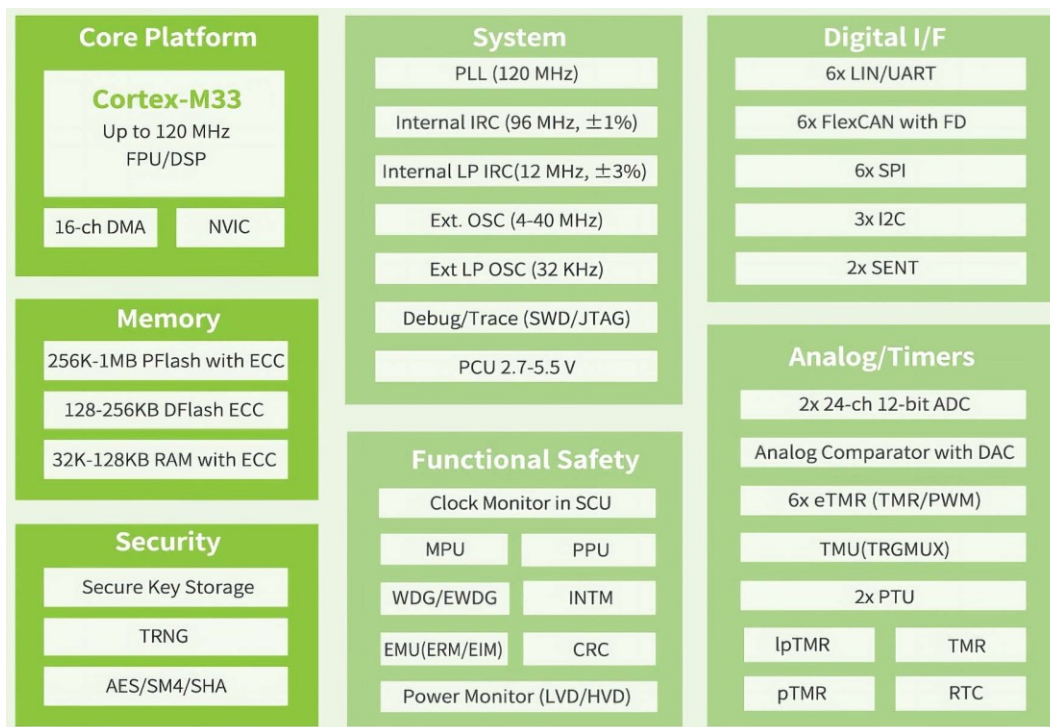
YUNTU YTM32 Arm® Cortex® Microcontroller



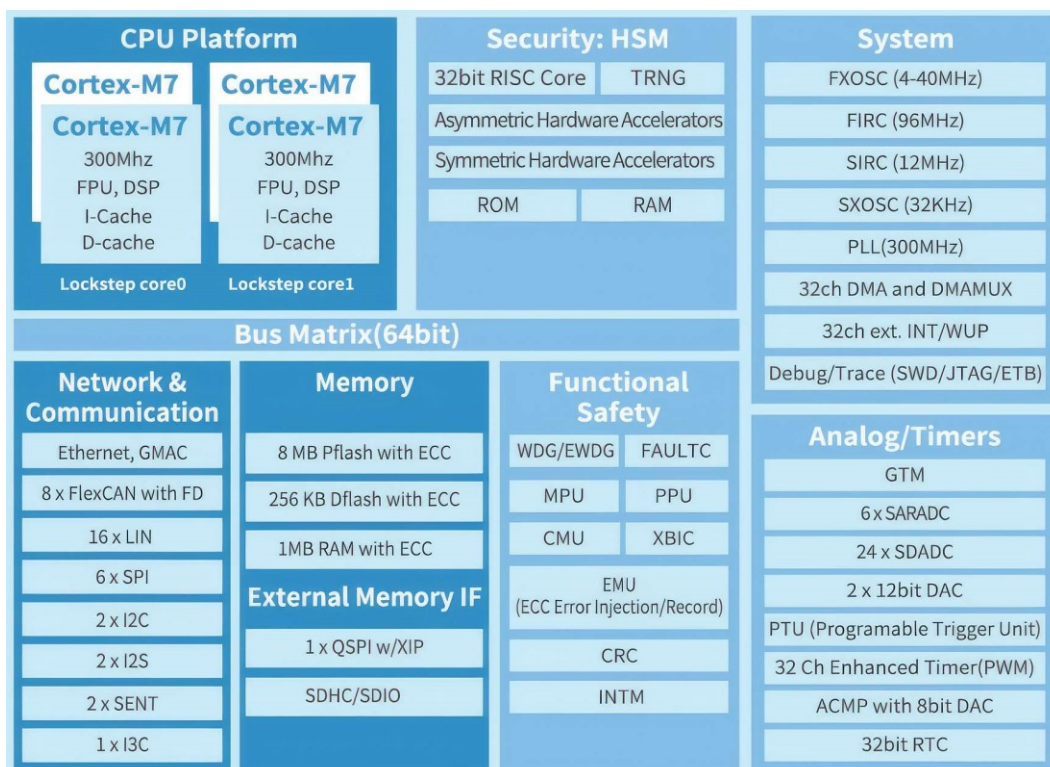
YUNTU YTM32B1L Family



YUNTU YTM32B1M Family



YUNTU YTM32B1H Family

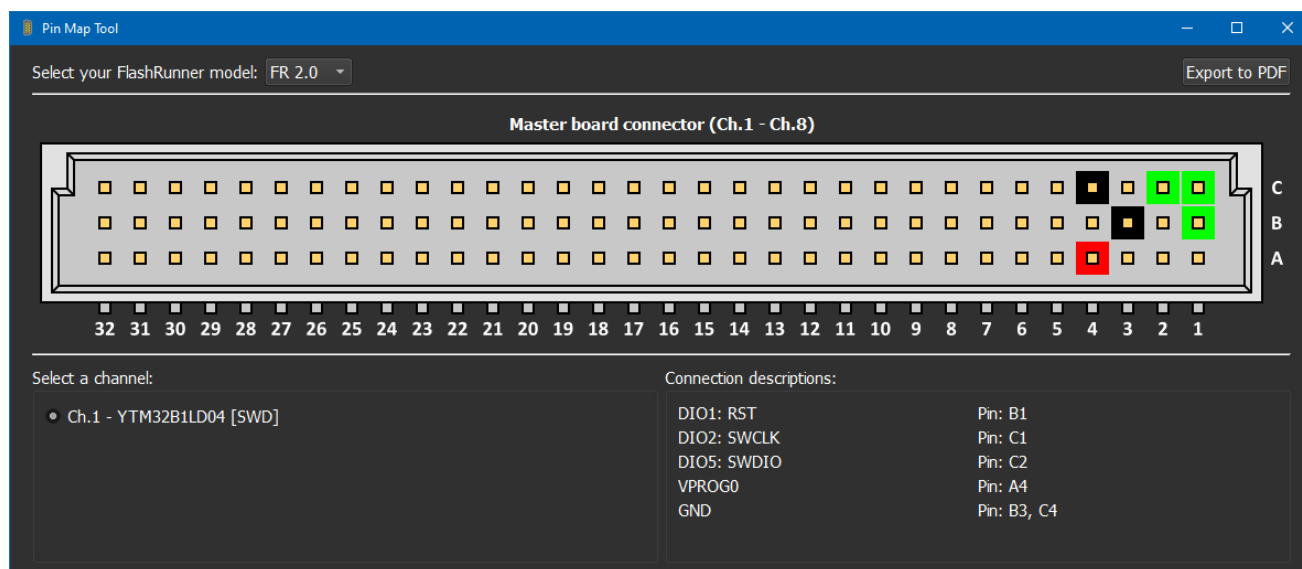


YUNTU YTM32 Protocol and PIN map

YTM32 devices support the SWD protocol.

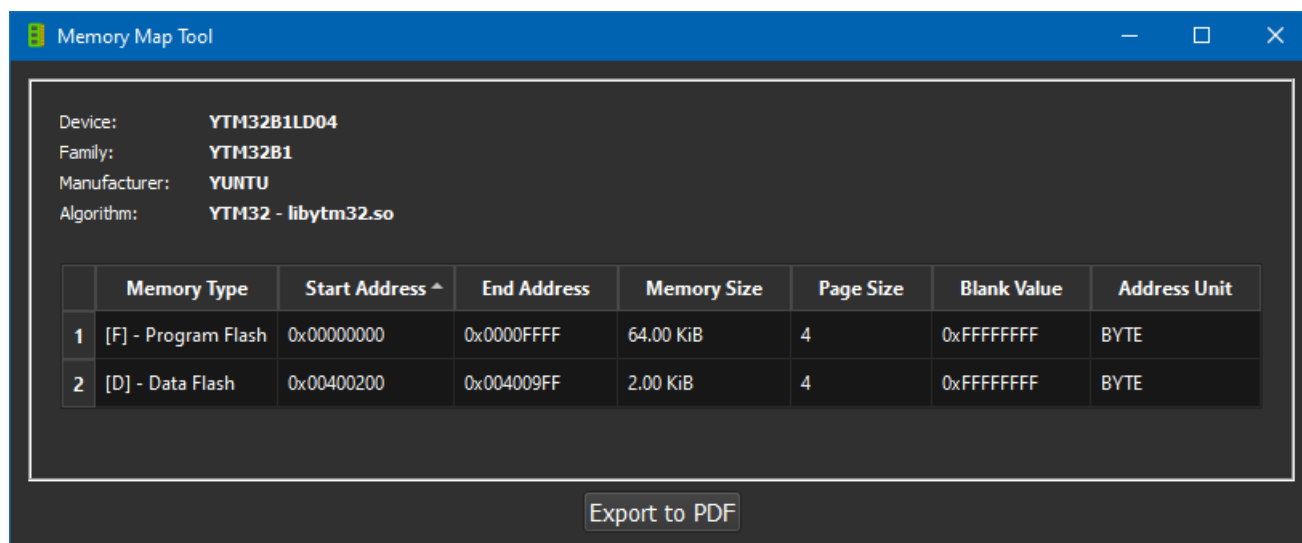
#TCSETPAR CMODE <SWD>

YUNTU YTM32 PIN MAP



YUNTU YTM32 Memory Map

Memory Type	Start Address	End Address	Memory Size	Page Size	Blank Value	Address Unit
[F] - Program Flash	0x00000000	0x0000FFFF	64.00 KiB	4	0xFF	BYTE
[D] - Data Flash	0x00400200	0x004009FF	2.00 KiB	4	0xFF	BYTE



YUNTU YTM32 Driver Parameters

The standard parameters are used to configure some specific options inside YTM32 driver.

#TCSETPAR ENTRY_CLOCK

Syntax: `#TCSETPAR ENTRY_CLOCK <Frequency>`

`<Frequency>` Accepted parameters 4000000, 2000000, 1000000, 500000, 100000 Hz

Description: Set the JTAG/SWD frequency used in the Connect procedure before raising the PLL of the device, if the device PLL is available

Note: Default value 4.00 MHz

#TCSETPAR SAMPLING_POINT

Syntax: `#TCSETPAR SAMPLING_POINT <Value>`

`<Value>` Accepted values are in the range 1-16

Description: Use this parameter to permanently set the sampling point of the FPGA
It is recommended to leave this parameter with the default value

Note: Default value 17

YUNTU YTM32 Driver Commands

Here you can find the complete list of all available commands for YTM32 driver.

F → Program Flash
D → Data 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.
Here you see can the log of a standard connect:

```
---#TPCMD CONNECT
Protocol selected SWD.
Entry Clock is 4.00 MHz.
Trying Hot Plug connect procedure.
IDCODE: 0x0BC11477.
Designer: 0x23B, Part Number: 0xBC11, Version: 0x0.
ID-Code read correctly at 4.00 MHz.
JTAG-SWD Debug Port enabled.
Scanning AP map to find all APs.
AP[0] IDR: 0x04770031, Type: AMBA AHB3 bus.
AP[0] ROM table base address 0xE00FF000.
CPUID: 0x410CC601.
Implementer Code: 0x41 - [ARM].
Found Cortex M0+ revision r0p1.
Cortex M0+ Core halted [0.012 s].
Requested Clock is 37.50 MHz.
Generated Clock is 37.50 MHz.
Good samples: 2 [Range 7-8].
IDCODE: 0x0BC11477.
Designer: 0x23B, Part Number: 0xBC11, Version: 0x0.
ID-Code read correctly at 37.50 MHz.
Time for Connect: 0.114 s.
>|
```

#TPCMD MASSERASE

#TPCMD MASSERASE <F|D>

This function performs a masserase for Program Flash or Data Flash memory.

#TPCMD ERASE

#TPCMD ERASE <F|D>

This function performs a sector erase for all the Program Flash or Data Flash memory.

#TPCMD ERASE <F|D> <start address> <size>

This function performs a sector erase for selected part of Program Flash or Data Flash memory.
Enter the Start Address and Size in hexadecimal format.

#TPCMD BLANKCHECK

#TPCMD BLANKCHECK <F|D>

Blankcheck is only available for Program Flash and Data Flash memory.
Verify if all memory is erased.

#TPCMD BLANKCHECK <F|D> <start address> <size>

Blankcheck is only available for Program Flash and Data Flash memory.
Verify if selected part of memory is erased.
Enter the Start Address and Size in hexadecimal format.

#TPCMD PROGRAM

#TPCMD PROGRAM <F|D>

Program available for Program Flash and Data Flash memory.
Programs all memory of the selected type based on the data in the FRB file.

#TPCMD PROGRAM <F|D> <start address> <size>

Program available for Program Flash and Data Flash memory.
Programs selected part of memory of the selected type based on the data in the FRB file.
Enter the Start Address and Size in hexadecimal format.

#TPCMD VERIFY

#TPCMD VERIFY <F|D> <R>

R: Readout Mode.
Verify Readout available for Program Flash and Data Flash memory.
Verify all memory of the selected type based on the data in the FRB file.

#TPCMD VERIFY <F|D> <R> <start address> <size>

R: Readout Mode.
Verify Readout available for Program Flash and Data Flash memory.
Verify selected part of memory of the selected type based on the data in the FRB file.
Enter the Start Address and Size in hexadecimal format.

#TPCMD VERIFY <F|D> <S>

S: Checksum 32 Bit Mode.
Verify Checksum available for Program Flash and Data Flash memory.
Verify all memory of the selected type based on the data in the FRB file.

#TPCMD VERIFY <F|D> <S> <start address> <size>

S: Checksum 32 Bit Mode.
Verify Checksum available for Program Flash and Data Flash memory.
Verify selected part of memory based on the data in the FRB file.

Enter the Start Address and Size in hexadecimal format.

#TPCMD READ

#TPCMD READ <F|D>

Read function available for Program Flash and Data Flash memory.
Read all memory of the selected type.
The result of the read command will be visible into the Terminal.

#TPCMD READ <F|D> <start address> <size>

Read function available for Program Flash and Data Flash memory.
Read selected part of memory based on the data in the FRB file.
The result of the read command will be visible into the Terminal.
Enter the Start Address and Size in hexadecimal format.

#TPCMD DUMP

#TPCMD DUMP <F|D>

Dump function available for Program Flash and Data Flash memory.
Dump all memory of the selected type.
The result of the dump command will be stored in the FlashRunner 2.0 internal memory.

#TPCMD DUMP <F|D> <start address> <size>

Dump function available for Program Flash and Data Flash memory.
Dump selected part of memory based on the data in the FRB file.
The result of the dump command will be stored in the FlashRunner 2.0 internal memory.
Enter the Start Address and Size in hexadecimal format.

#TPCMD RUN

Syntax: **#TPCMD RUN <Time [s]>**

<Time [s]>

Time in seconds (i.e., 2 s). This time is an optional parameter.

Prerequisites: none

Description: Move the Reset line up and down quickly if no parameter **<Time [s]>** is inserted.
#TPCMD RUN <Time [s]> instead moves the Reset line down and high, waits for the entered time.
This command typically can be used to execute the firmware programmed in the device.

#TPCMD READ_MEM8

Syntax: **#TPCMD READ_MEM8 <Address> <Byte Count>**

<Address>

Address in HEX format (i.e., 0x52002020)

<Byte Count>

Byte count in decimal format (i.e., 8 -> eight bytes)

Prerequisites: none

Description: Read memory byte per byte from target YTM32 device

Note: This command prints into Terminal and Real Time Log

Examples: Correct command execution: 😊

```
---#TPCMD READ_MEM8 0x52002020 8
Read[0x52002020]: 0xF0
Read[0x52002021]: 0xAA
Read[0x52002022]: 0x16
Read[0x52002023]: 0x14
```

```
Read[0x52002024]: 0x00
Read[0x52002025]: 0x00
Read[0x52002026]: 0x00
Read[0x52002027]: 0x00
Time for Read Mem: 0.002 s
```

#TPCMD READ_MEM16

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

`<Address>` Address in HEX format (i.e., 0x52002020)
`<16-bit Word Count>` 16-bit Word count in decimal format (i.e., 4 -> four 16-bit words)

Prerequisites: none

Description: Read memory 16-bit word per 16-bit word from target YTM32 device

Note: This command prints into Terminal and Real Time Log

Examples: Correct command execution: 😊

```
---#TPCMD READ_MEM16 0x52002020 4
Read[0x52002020]: 0xAAF0
Read[0x52002022]: 0x1416
Read[0x52002024]: 0x0000
Read[0x52002026]: 0x0000
Time for Read Mem: 0.002 s
```

#TPCMD READ_MEM32

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

`<Address>` Address in HEX format (i.e., 0x52002020)
`<32-bit Word Count>` 32-bit Word count in decimal format (i.e., 2 -> two 32-bit words)

Prerequisites: none

Description: Read memory 32-bit word per 32-bit word from target YTM32 device

Note: This command prints into Terminal and Real Time Log

Examples: Correct command execution: 😊

```
---#TPCMD READ_MEM32 0x52002020 2
Read[0x52002020]: 0x1416AAF0
Read[0x52002024]: 0x00000000
Time for Read Mem: 0.002 s
```

#TPCMD DISCONNECT

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

YUNTU YTM32 Driver Examples

Here you can see a complete example of a YUNTU YTM32B1LD04 project.

1 – YUNTU YTM32 64.00 KB example Commands

```
#TCSETPAR ENTRY_CLOCK 4000000
#TCSETPAR PROTOCOL 37500000
#TCSETPAR PWDOWN 100
#TCSETPAR PWUP 100
#TCSETPAR RSTDOWN 100
#TCSETPAR RSTDRV OPENDRAIN
#TCSETPAR RSTUP 100
#TCSETPAR VPROG0 3300
#TCSETPAR CMODE SWD
#TPSETSRC 64KB_ProgramFlash_2KB_DataFlash.frb
#TPSTART
#TPCMD CONNECT
#TPCMD MASSERASE F
#TPCMD BLANKCHECK F
#TPCMD PROGRAM F
#TPCMD VERIFY F R
#TPCMD VERIFY F S
#TPCMD MASSERASE D
#TPCMD BLANKCHECK D
#TPCMD PROGRAM D
#TPCMD VERIFY D R
#TPCMD VERIFY D S
#TPCMD DISCONNECT
#TPEND
```

1 – YUNTU YTM32 64.00 KB example Real Time Log

```
---#TPSTART
Load SWD FPGA version 0x00001215.
>|
---#TPCMD CONNECT
Protocol selected SWD.
Entry Clock is 4.00 MHz.
Trying Hot Plug connect procedure.
IDCODE: 0x0BC11477.
Designer: 0x23B, Part Number: 0xBC11, Version: 0x0.
ID-Code read correctly at 4.00 MHz.
JTAG-SWD Debug Port enabled.
Scanning AP map to find all APs.
AP[0] IDR: 0x04770031, Type: AMBA AHB3 bus.
AP[0] ROM table base address 0xE00FF000.
CPUID: 0x410CC601.
Implementer Code: 0x41 - [ARM].
Found Cortex M0+ revision r0p1.
Cortex M0+ Core halted [0.012 s].
Requested Clock is 37.50 MHz.
Generated Clock is 37.50 MHz.
Good samples: 2 [Range 6-7].
IDCODE: 0x0BC11477.
Designer: 0x23B, Part Number: 0xBC11, Version: 0x0.
ID-Code read correctly at 37.50 MHz.
Time for Connect: 0.115 s.
>|
---#TPCMD MASSERASE F
Time for Masserase F: 0.036 s.
>|
---#TPCMD BLANKCHECK F
Time for Blankcheck F: 0.007 s.
>|
---#TPCMD PROGRAM F
Time for Program F: 0.782 s.
>|
---#TPCMD VERIFY F R
Time for Verify Readout F: 0.039 s.
>|
---#TPCMD VERIFY F S
```

```

Time for Verify Checksum 32bit F: 0.014 s.
>|
---#TPCMD MASSERASE D
Time for Masserase D: 0.017 s.
>|
---#TPCMD BLANKCHECK D
Time for Blankcheck D: 0.001 s.
>|
---#TPCMD PROGRAM D
Time for Program D: 0.026 s.
>|
---#TPCMD VERIFY D R
Time for Verify Readout D: 0.003 s.
>|
---#TPCMD VERIFY D S
Time for Verify Checksum 32bit D: 0.002 s.
>|
---#TPCMD DISCONNECT
>|

```

1 – YUNTU 64.00 KB example Programming Times

Operation	Timings FlashRunner 2.0
Time for Connect	0.125 s
Masserase Flash	0.036 s
Blankcheck Flash	0.007 s
Program Flash	0.782 s
Verify Readout Flash	0.039 s
Verify Checksum Flash	0.014 s
Masserase Data Flash	0.017 s
Blankcheck Data Flash	0.001 s
Program Data Flash	0.026 s
Verify Readout Data Flash	0.003 s
Verify Checksum Data Flash	0.002 s
Cycle Time	00:01.095 s

YUNTU YTM32 Driver Changelog

Info about driver versions prior to 5.00

All driver versions prior to 5.00 are to be considered obsolete, please update your driver to the latest version.

Info about driver version 5.00 - 25/10/2022

Supported YTM32B1LD04 device.

Info about driver version 5.01 - 15/03/2023

Supported YTM32B1LD01, YTM32B1LD02 and YTM32B1LD03.

Info about driver version 5.02 - 18/01/2024

Internal driver upgrade.

Info about driver version 5.03 - 06/06/2024

Supported YTM32B1LE04, YTM32B1LE05, YTM32B1MC03, YTM32B1MD14, YTM32B1ME05, YTM32B1HA01.