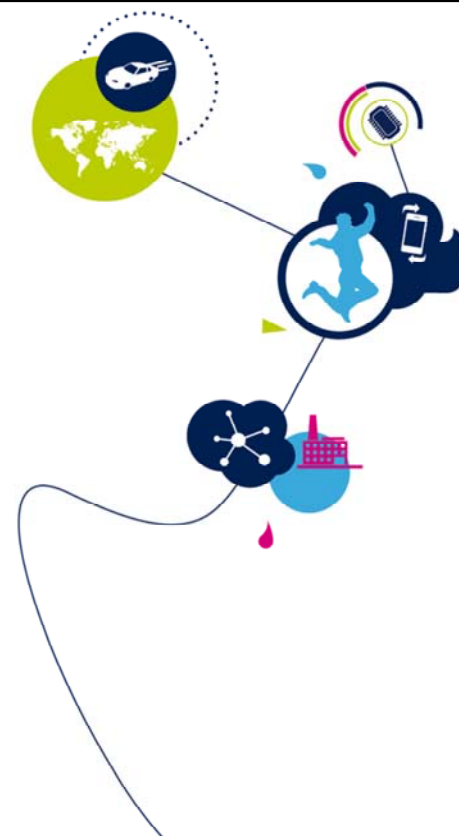
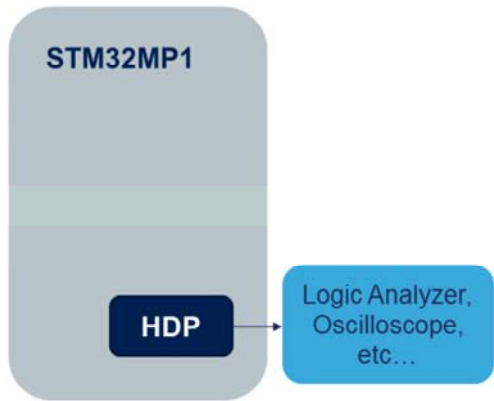


# STM32MP1 - HDP

Hardware Debug Port  
Revision 1.0



Hello, and welcome to this presentation of the STM32MP1 Series Hardware Debug Port Module.



- Provides low-level HW debugging
  - Pin access for up to 120 internal signals
  - Supports 8 general-purpose SW outputs
  - Allow SW readout of internal signals
  - To maintain security, could be disabled by OTP

### Application benefits

- Helps debug tricky issues
- Only few pins needed, multiplexed with Trace port
- Simple to use, can be easily controlled directly under debugger

The Hardware Debug Port provides a handy way to visualize critical internal signals like Core interrupt or power states on system pins.

The Hardware Debug Port also provides a software output to allow simple code instrumentation.

It is designed for debugging tricky issues which are hard to find using classic debugging techniques (Debugger and Trace).

- 8 output signals
  - Could be multiplexed with Trace output to share same HW board connector during debug phase
- Each output can provide one of 15 internal signals
- 8 software-programmable signals for pinout agnostic code debugging
- Software read back of output signal
  - Usable even if alternate function is not selected on output pins
- Output disabling by security signal

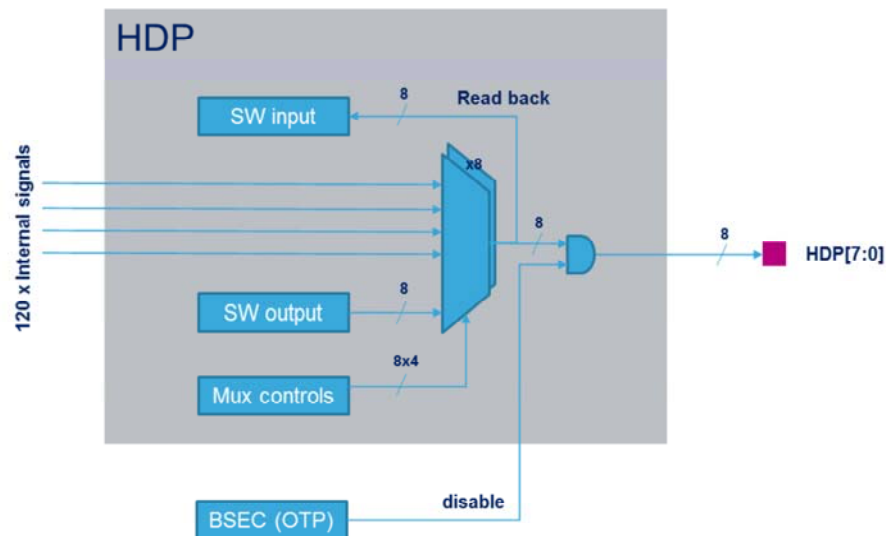


The eight Hardware Debug Port outputs can be multiplexed with Trace Port in order to reuse the same debug connector (e.g. Mictor 38 pins).

Each of the eight outputs can be set to either provide one of the fifteen hardware internal signals (examples: Processor Core interrupts, System power modes, Ethernet state, or Graphic core debug signals) or a bit value set in a register. Eight software programmable signals can be used to easily add an external tool trigger point in the user software using a single write command which is not linked to the hardware board pinout nor multiplexing choices.

Even if not provided to the pin, the selected output signals can also be read in software to allow quasi static debugging in pure software (example: check interrupt state in a deadlock situation).

All outputs can be permanently disabled by OTP programming in the BSEC block.



The Hardware debug port is mostly a static multiplexor between input signals or registers and output pins. Note that the internal signals may toggle at a higher rate than the pads can support, then their observability may be compromised. This is a limitation that should be taken into account when using the Hardware Debug Port.