

# MTU

## Memory Test Unit

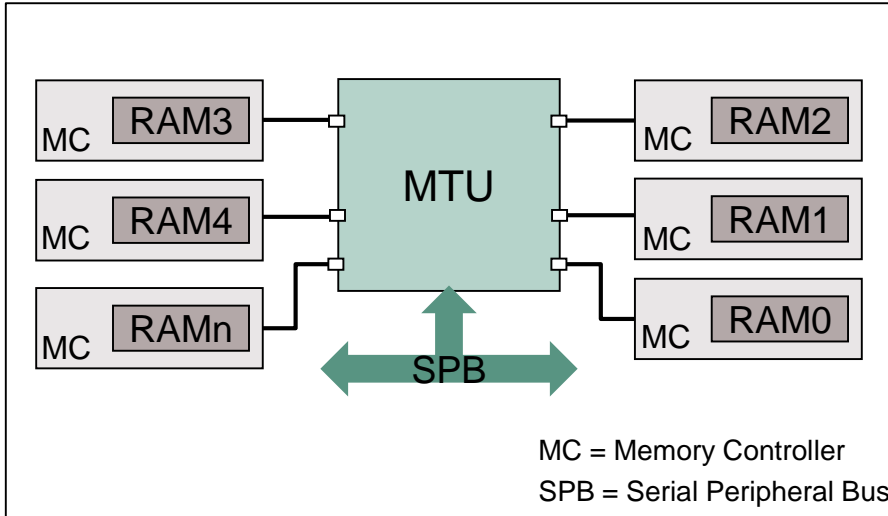
AURIX™ Microcontroller Training  
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# MTU

## Memory Test Unit



### Highlights

- > The Memory Test Unit (MTU) integrates a unified interface for the control of Error Correction (ECC), Built-in-Self-Test (BIST) and redundancy features on the internal SRAMs within the AURIX™ family of microcontrollers.

### Key Features

Memory Initialization

Memory Built-In-Self-Test (MBIST)

### Customer Benefits

- > Fill the memories with a pre-defined data value for initialization
- > Verification of integrity of the internal SRAMs realized in hardware

## Memory Initialization

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- › Each SRAM in the system can be individually initialized via the MTU
- › The MTU offers two initialization options:
  - Clear a SRAM by writing “0” to all memory locations
    - User only needs to set one bit in a register to have a cleared SRAM
    - Rest is done in HW
    - CPU not used to access the SRAM
  - Fill up a SRAM with a defined pattern chosen by the user
    - User needs to provide the pattern to be written in the SRAM and start the write operation
    - CPU not used to access the SRAM

## Memory Built-In-Self-Test (MBIST)

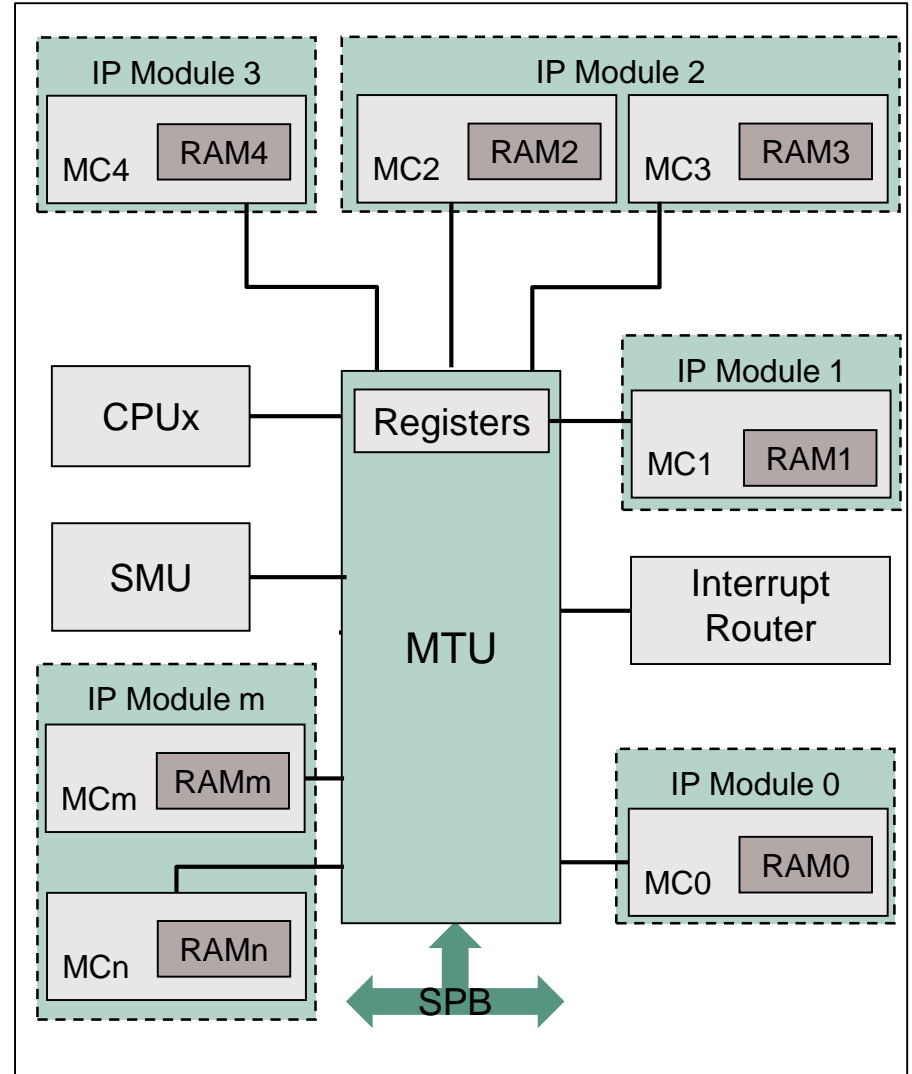
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- › The MTU enables the user to perform various Memory Built-in Self Tests (MBIST) on the memory and obtains the test results
- › The MTU MBIST relies on an Error Correction Code which has the following characteristics:
  - Single Bit Error Correction
  - Double Bit Error Detection
- › The MTU also sends alarm notification to Safety Management Unit (SMU):
  - The MTU sends SRAM specific alarms to the SMU
  - Correctable Error alarm
  - Uncorrectable Error alarm
  - Address Error
  - Error Buffer Overflow

# MTU

## System Integration

- › The MTU is a unified interface for the control of MBIST, ECC and memory initialization
- › Different IP modules in the system (E.g. CPU, LMU, CAN etc.) may have one or more than one SRAM inside them
- › Surrounding every SRAM is its own SRAM Memory Controller (MC) wrapper, with its own registers and MBIST logic.
- › The advantage of using the MTU is that it provides direct access to the memories without using the CPU
- › Even small memories that are not directly accessible via the CPU can be tested using MBIST



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