MTU
Memory Test Unit

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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.

- **Memory Initialization**
  - Fill the memories with a pre-defined data value for initialization

- **Memory Built-In-Self-Test (MBIST)**
  - Verification of integrity of the internal SRAMs realized in hardware
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
MTU
Memory Built-In-Self-Test (MBIST)

› 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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