



ST19XS04

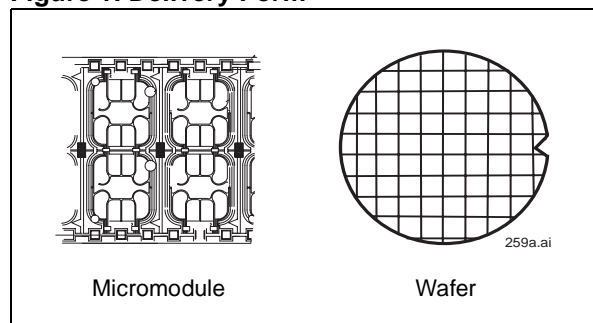
Smartcard MCU With 4 Kbytes EEPROM

DATA BRIEF

PRODUCT FEATURES

- ENHANCED 8 BIT CPU WITH EXTENDED ADDRESSING MODES
- 48 KBYTES USER ROM WITH PARTITIONING
- 1.5 KBYTES USER RAM WITH PARTITIONING
- 4 KBYTES USER EEPROM WITH PARTITIONING plus 128 BYTES USER and ST OTP AREA:
 - Highly reliable CMOS EEPROM submicron technology
 - Error Correction Code for single bit fail correction within a byte
 - 10 year data retention
 - 500,000 Erase/Write cycles endurance
 - 1 to 32 bytes Erase or Program in 2 ms
- SECURITY FIREWALLS FOR MEMORIES, and DES ACCELERATOR.
- VERY HIGH SECURITY FEATURES INCLUDING EEPROM FLASH PROGRAMMING AND CLOCK MANAGEMENT.
- 2x8 BIT TIMERS WITH INTERRUPT CAPABILITY
- HARDWARE DES ACCELERATOR WITH LIBRARY SUPPORT FOR SYMMETRICAL ALGORITHMS:
 - DES, triple DES, DESX computations and CBC chaining mode...
- ISO 3309 CRC CALCULATION BLOCK
- FIPS 140-2 COMPLIANT RANDOM NUMBER GENERATOR WITH TWO GUN REGISTERS (Generators of Unpredictable Number)
- 2.7 V TO 5.5 V SUPPLY VOLTAGE WITH 10MHz INTERNAL OPERATING FREQUENCY
- UNIQUE SERIAL NUMBER ON EACH DIE
- POWER SAVING STANDBY MODE
- CONTACT ASSIGNMENT COMPATIBLE ISO 7816-2
- SERIAL ACCESS I/O, ISO 7816-3 COMPATIBLE
- ESD PROTECTION GREATER THAN 5000 V

Figure 1. Delivery Form



Function	Speed (1)
Triple DES (with keys loaded)	24 μ s
Single DES (with keys loaded)	15 μ s

(1) Typical values, independent from external clock frequency and supply voltage.

HARDWARE DESCRIPTION

The product, member of the ST19X platform, is a serial access microcontroller specially designed for cost effective secure portable applications.

It is manufactured using an advanced highly reliable ST CMOS EEPROM technology.

It is based on a STMicroelectronics 8 bit CPU and includes on-chip memories: User ROM, User RAM and EEPROM with state of the art security features. ROM, RAM and EEPROM memories can be configured into partitions with customized access rules.

An additional ST ROM contains all ST provided functions and libraries.

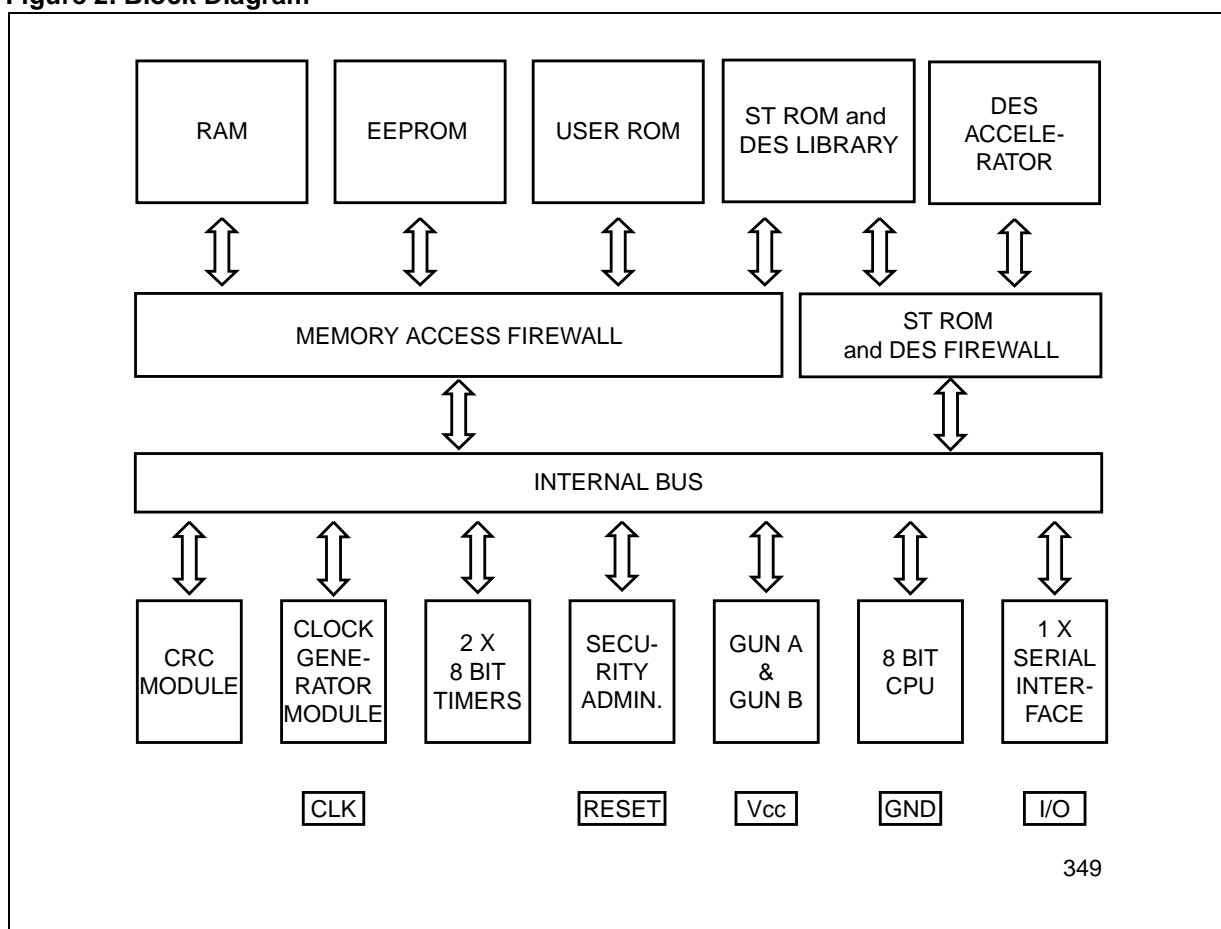
Access from any memory area to another are protected by hardware FIREWALLS. Access rules are User defined and can be selected by mask options.

The chip includes a DES accelerator which is accessible via cryptographic software libraries located in ST ROM.

As with all the other ST19X products, a serial interface fully compatible with the ISO7816 standard for Smartcard applications is available.

A CRC calculation block is also available and is directly accessible by the User.

Figure 2. Block Diagram

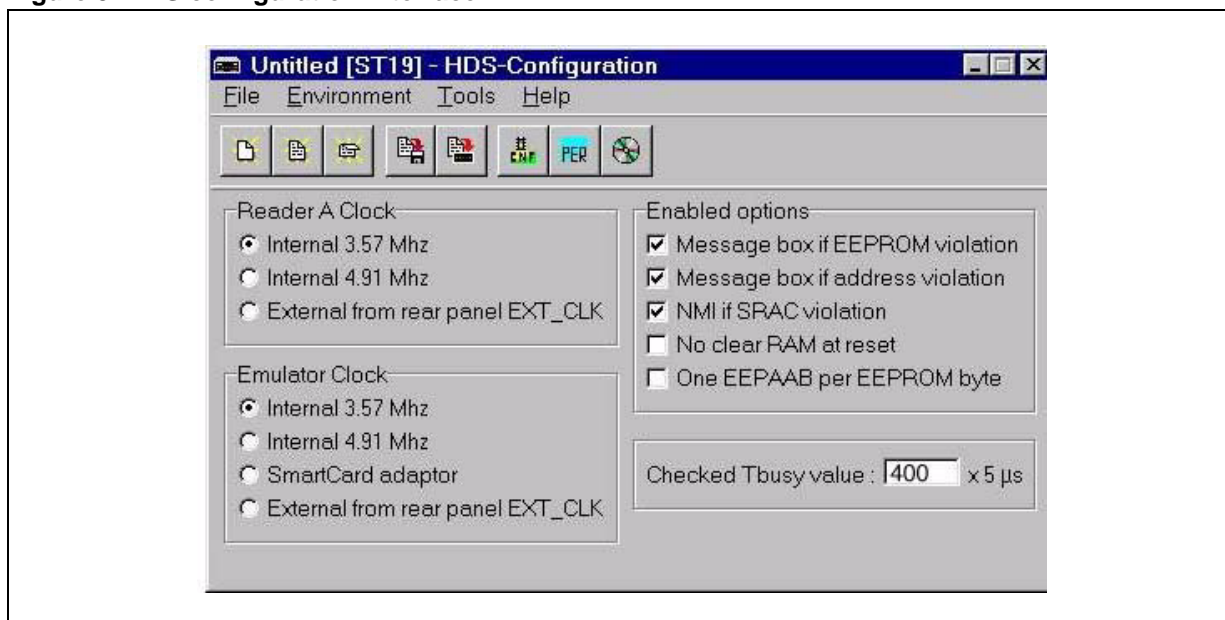


SOFTWARE DEVELOPMENT

Software development and firmware (ROM code/options) generation are done with the ST19-HDSX development system on Windows NT, Windows 98 and Windows 2000.

Powerful C/C++ compiler, debugger and simulator are also available.

Figure 3. HDS configuration interface



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