

DALLAS
SEMICONDUCTOR

DS1427
Time iButton

FEATURES

- Provides a unique 64-bit serial number, 4K bits of RAM
- No external power required
- Uses inexpensive 1-Wire™ protocol
- Universally portable across platforms
- Programmable secure real time clock with alarm and elapsed timer.

DESCRIPTION

Authorization iButtons are sophisticated microelectronics, sealed into miniature stainless steel cans, creating a low cost, portable medium for storing and controlling access to sensitive information.

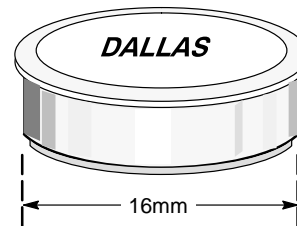
iButtons are used with port adapters as a hardware based protection system for software. iButtons help protect the right to copy software by actually protecting the right to execute it. Software can now be locked to a user, a machine, or an application with a complete audit trail and guaranteed uniqueness.

The DS1427 provides a 64-bit unique ID number, 4K bits of RAM, and a programmable real time clock. The DS1427 is used in leasing and rental applications, software metering, and to vary valid protection keys by time. Ability to distribute demonstration software that expire on a date controlled by the deliverer.

Hardware communication with the iButtons is conducted via a 1-wire interface. The conversion from a PC I/O port to the 1-wire interface is the responsibility of the port adapter.

Software applications communicate with the iButton using Dallas' Access System, which is contained in any of the port adapter Developer's kits. The Access Sys-

PACKAGE OUTLINE



tem provides easy to use commands which are embedded into the application in order to utilize the iButton resources during run time.

Each Dallas iButton is uniquely serialized with a 64-bit code that is laser-etched in the silicon. This unique ID provides a basic level of security, is traceable in the field, and makes it possible to identify the specific iButton in a field of many.

The serial number is divided into three parts (see Figure 1). The 8-bit family code tells the Access System (and consequently the developer) what type of iButton is being used. The next 48 bits are lasered sequentially with no two numbers the same. The last 8 bits contain a Cyclic Redundancy Check (CRC) value that has been calculated across the family code and the 48-bit serial number. The CRC ensures that iButton communication is error free.

The DS1427 tracks elapsed time from either initial programming or from first access by the application software. All timers and alarms can be locked from reprogramming, so that the time base is not compromised in any way.

Memory is organized into 16 pages of 256 bits each. An additional scratch page is provided to validate data before it is written into storage areas.

There are four function commands to address the memory. Three commands are used to read, write, or copy data to or from the scratch page and the storage areas accordingly. All data is written to the scratch page first, verified, and then copied to the appropriate storage locations. The fourth command is used to read the contents of the storage locations, the clock, elapsed timer, alarm registers, or the configuration/status registers.

The real time clock keeps time in 1/256 second increments. This can be translated into seconds, minutes, days, months or years. A read of the clock will return the number of seconds after the reference date. The elapsed timer can be stopped or started based on the contents of the configuration registers.

The configuration and status registers control the operating mode of the DS1427. Setting alarms and controlling interrupts for the clock and elapsed timer are user selectable. Additional registers are used to control the clock oscillator, elapsed timer triggers, and to provide write protection for various memory locations.

DS1427 TIME iButton ORGANIZATION Figure 1

		FAMILY CODE
8-BIT CRC CODE	48-BIT SERIAL NUMBER	10000100
MSB 0000h 01FFh	512 Bytes NV SRAM 16 Pages 32 Bytes per Page	
0200h 0201h	Configuration and Status Registers	
0202h 0206h	Real Time Clock	
0207h 020Bh	Elapsed Timer	
020Ch 020Fh	Reserved	
0210h 0214h	RTC Alarm	
0215h 0219h	Elapsed Time Alarm	
021Ah 021Dh	Reserved	