MikroElektronika
DEVELOPMENT TOOLS | COMPILERS | BOOKS

iButton™ Serial Number

PID: MIKROE-3047

DS1990A is a unique serial number identification iButton™. The iButton is a technology based on the one-wire communication protocol, and a chip packed in a robust stainless steel casing. This button shaped device has two contacts - the lid and the base. These contacts carry the necessary connections down to a sensitive silicone chip, embedded inside the metal button. When the iButton touches the reader probe on the Click board™, it establishes the communication with the host MCU, via the one-wire interface. The communication is almost instant, so it is enough to press the iButton lightly to the probe contacts.

Due to its robustness, the iButton can withstand much more stress than similar devices used to carry an information: tags, cards, and other such devices are prone to damage, while a chip packed inside a 16mm thick stainless steel can be highly resilient. It can be mounted on any object, such as keychains, pallets, bags, and similar. It can be used as an electronic registration number for automatic identification applications, and similar security type applications.

How does it work?

DS1990A is a serial number iButton™ device, from Maxim Integrated. This device is programmed by the guaranteed unique 64-bit registration number that allows for absolute traceability. The thick stainless steel casing of the iButton ensures resistance against dirt, dust, moisture, shock and other environmental hazards. The button shape helps to establish a proper alignment with the probe, such the one found on the iButton click and ensures reliable communication with a speed of 16.3kbps.

The device is capable of powering itself up through the data line by employing the so-called parasite power supply. Parasite PSU contains an internal capacitor, which provides enough current for the proper operation, once it has been charged by the data line. To allow proper functioning of the parasitic PSU, the idle state of the data line is HIGH, while the data line of the DS1990A is in an open-drain configuration, pulling the data line to a LOW logic level when asserted.

The factory programmed serial number is read through the standard 1-Wire communication protocol. The first 8 bytes represent a 1-Wire family code, while the following 48 bits contain the unique serial number. The last 8 bits contain the CRC of the previous data, ensuring data integrity. The host MCU initiates the communication by sending a reset signal, responded by the presence signal from the attached devices. More information about the 1-Wire signaling can be found in the DS1990A datasheet.

MikroElektronika offers a library which contains functions for reading the content of this iButton via the iButton click. This library is compatible with the MikroElektronika line of compilers and supported MCUs. The serial number information stored on this iButton can also be extracted by any iButton reader, compatible with the Maxim Integrated iButton devices.

iButton™ Serial Number characteristics

- IO Voltage Range to GND: -0.5V to +6.0V
- IO Sink Current: 20mA
- Height: 5,89mm
- Diameter: 19,90mm
- Package/Case: F5 MicroCan

Specifications

Type	1-wire
Applications	An ideal solution for a robust and resilient identification that can be attached to many different objects that require tracking: pallets, bags, keychains, and similar. It can also be used for the workshop tools tracking systems
Key Features	A unique serial number that guarantees an absolute traceability, a stainless steel casing protects it against environmental hazards, fast and reliable 1-Wire communication up to 16.3kB/s, easy mounting on any object
Interface	1-wire
Expandability	iButton click