T-String™ Guide

Table of Contents

Introduction

This manual is a guide to "decoding" a T-String's EEPROM. A T-String™ is a 1-Wire slave which contains a set of sensors and an EEPROM which provides information about the sensors. The EEPROM lists the 1-Wire serial numbers of the sensors that are part of the string in order starting at the sensor closest to the RJ-45 plug.

Copyright Notices

Contact Information

iButtonLink, LLC
1221 Innovation Drive STE 117
Whitewater, WI 53190

Phone: (262) 662-4029
Fax: (262) 436-2403
Email: info@ibuttonlink.com
Website URL: www.ibuttonlink.com

Decoding EEPROM

The following steps show how to decode a T-String™ EEPROM. The following examples use the free 1-Wire® Viewer package available from Maxim Integrated. To download, please follow this link.

Materials needed

- 1-Wire® Viewer or similar software
- Any 1-Wire® master (such as a LinkUSB, etc)
- A T-String
- A computer

Instructions

1. Plug the Master into the computer and configure 1-Wire® Viewer

2. Plug the T-String™ in to the 1-Wire® master. Your 1-Wire® Viewer should now look similar to this:
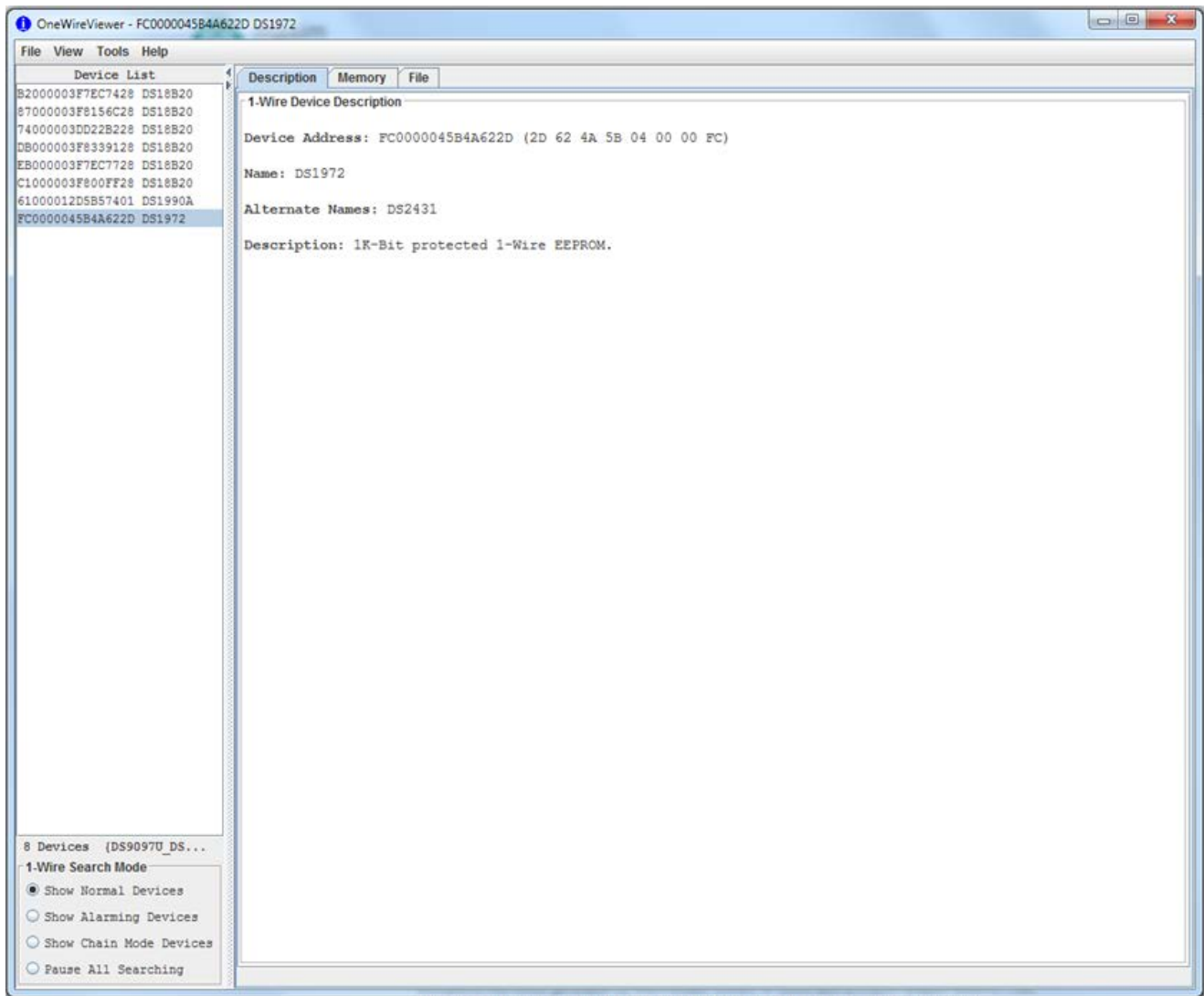
3. .On the left-hand side of the screen, you will see a series of 1-Wire® serial numbers. These serial numbers should be:

- 1 DS18B20 for each temperature sensor on the T-String
- 1 DS1972 EEPROM
- If you are using a master with an embedded ID chip: 1 DS1990A (this can be ignored)

4. Click on the DS1972 in the left-hand box so that it is highlighted.

5. Click on the "Memory" tab at the top of the right-hand box.
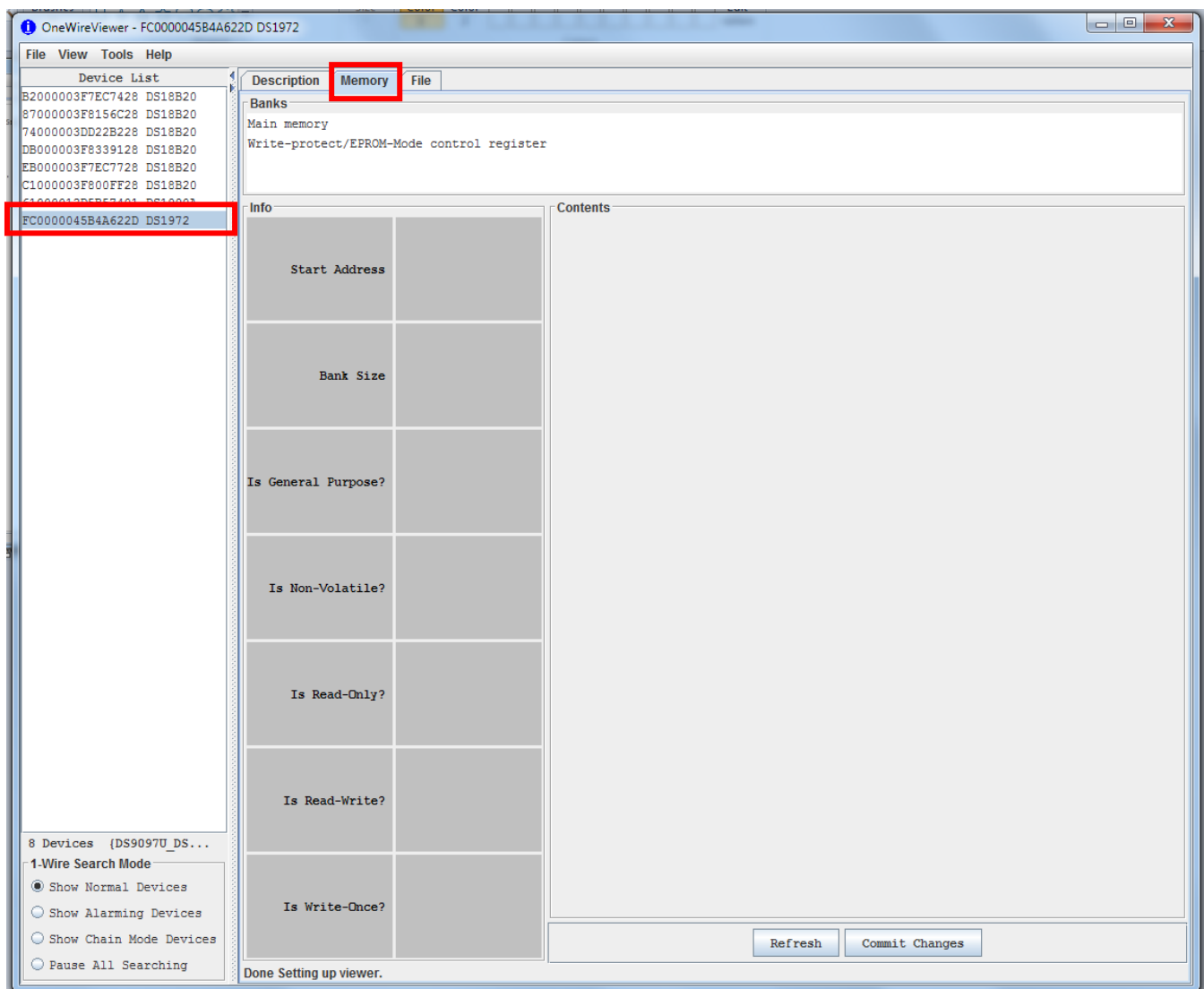
6. Click on the words "Main Memory" in box labeled "Banks" in the right-hand pane.

7. You will not see the contents of the DS1972 memory. The memory is divided into pages with location zero of each page in the upper left-hand corner. In the image below, page zero, location zero contains the hex value E1.
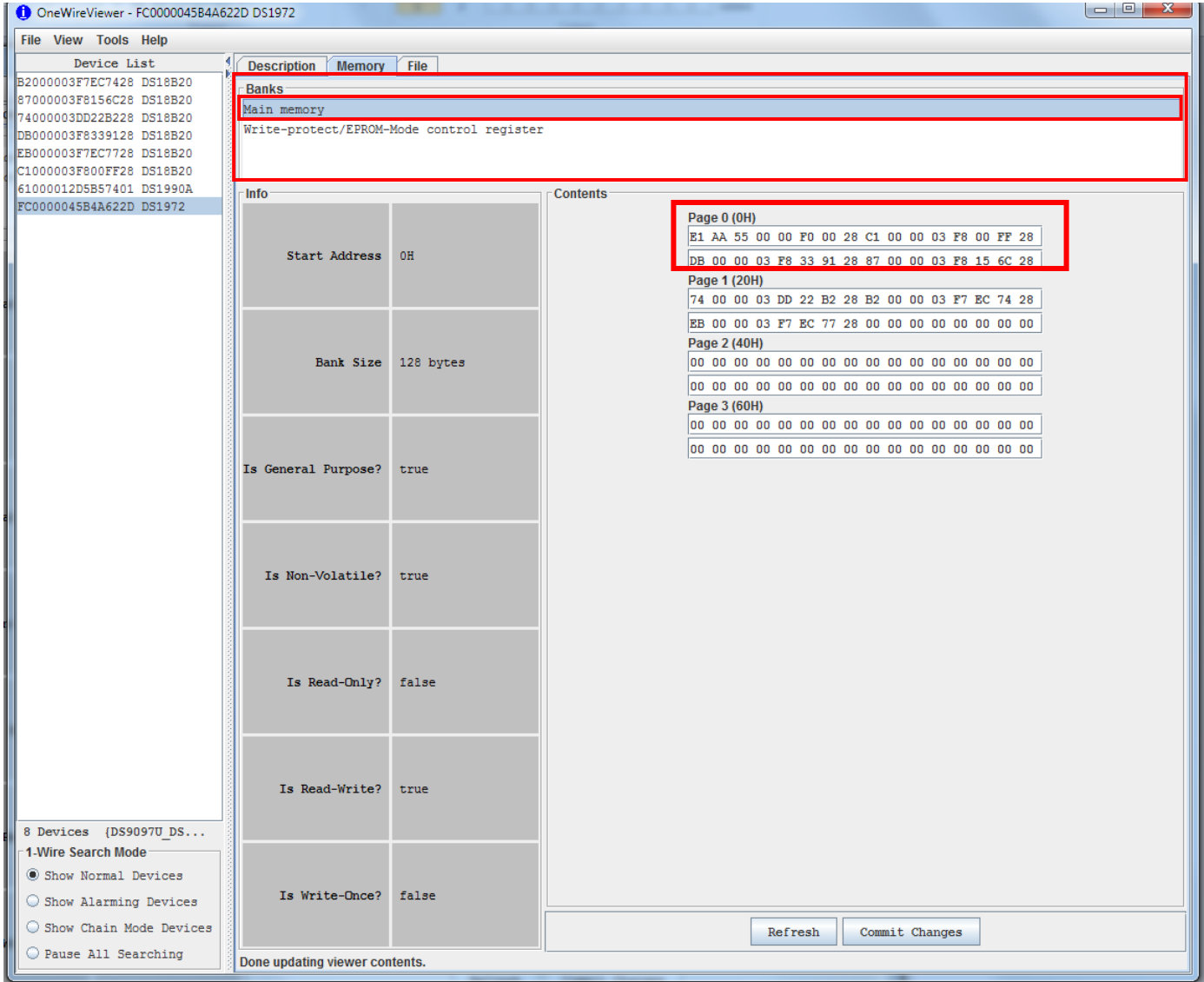
8. The serial numbers of each DS18B20 are listed as follows:
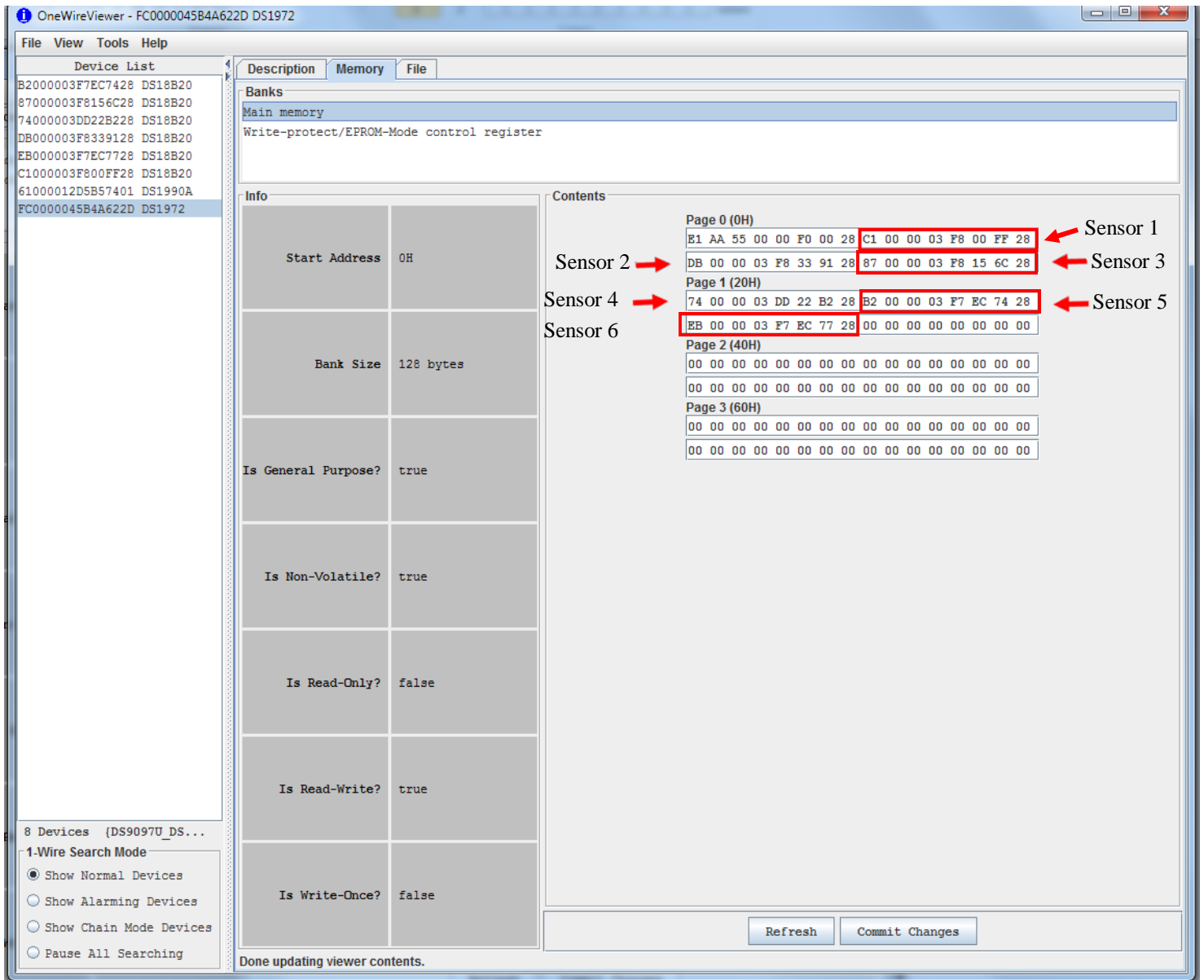
The first 8 bytes of the EEPROM are as follows:

- The first eight bytes contain a T-String™ signature consisting of a checksum, a fixed part, and a random byte.
- Byte 1 is the checksum
- Bytes 2-7 are fixed (AA 55 00 00 F0 00)
- Byte 8 is randomly generated for uniqueness among T-Strings™

The checksum is calculated using the same algorithm as the 1-Wire device ID checksum. See the DS1990A datasheet for details.

The sensors on the T-String™ are laid out as follows:

Sensor location (lower numbers closer to RJ-45 plug)	Sensor number	Page	Memory locations
0 – Closest to RJ-45	This bump contains DS1972 EEPROM. No sensor present.		
1	1	0	8-15
2	2	0	16-23
3	3	0	24-31
4	4	1	0-7
5	5	1	8-15
6 – Furthest from RJ-45	6	1	16-23

Custom T-String™ products may have more, or fewer temperature sensors. The same pattern is used until the memory in the DS1972 is filled.