

4395A software



5/21/22

Excellent work. Wondering if you found out how the calibration constants are stored?

More

Rico Sonderegger
Hi Sergey,

5/21/22

I found a way to upgrade the options to 1D6, 010, 001

This is the reference:

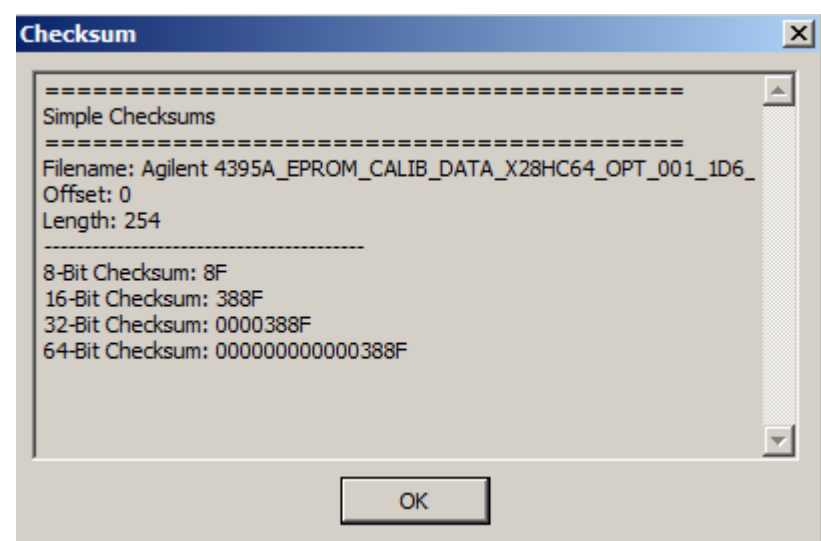
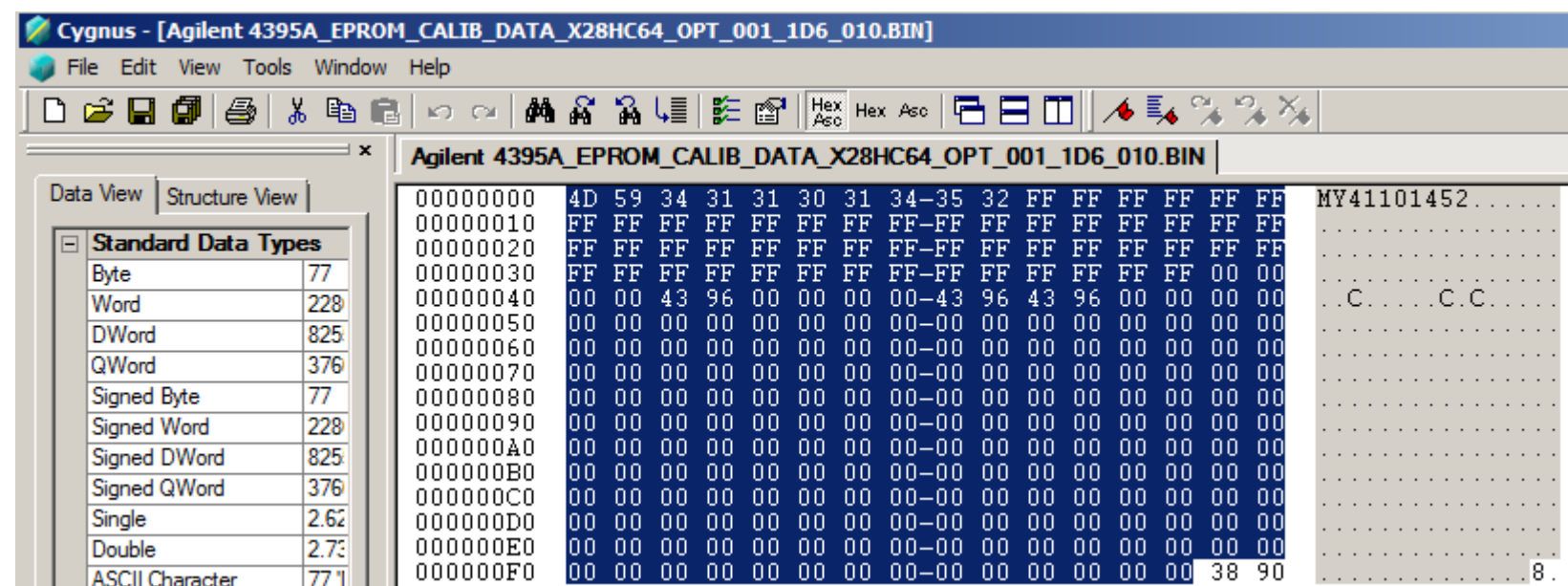
```
00000040 00 00 43 96 00 00 00 00-43 96 43 96 00 00 00 00
00000050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00000060 00 00 OPT: 1D6 00 00 OPT: 010 00 00 OPT: 001 00 00
00000070 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
00000080 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
00000090 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
000000A0 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
000000B0 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
000000C0 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
```

How to upgrade:

1. Change this line to this values:

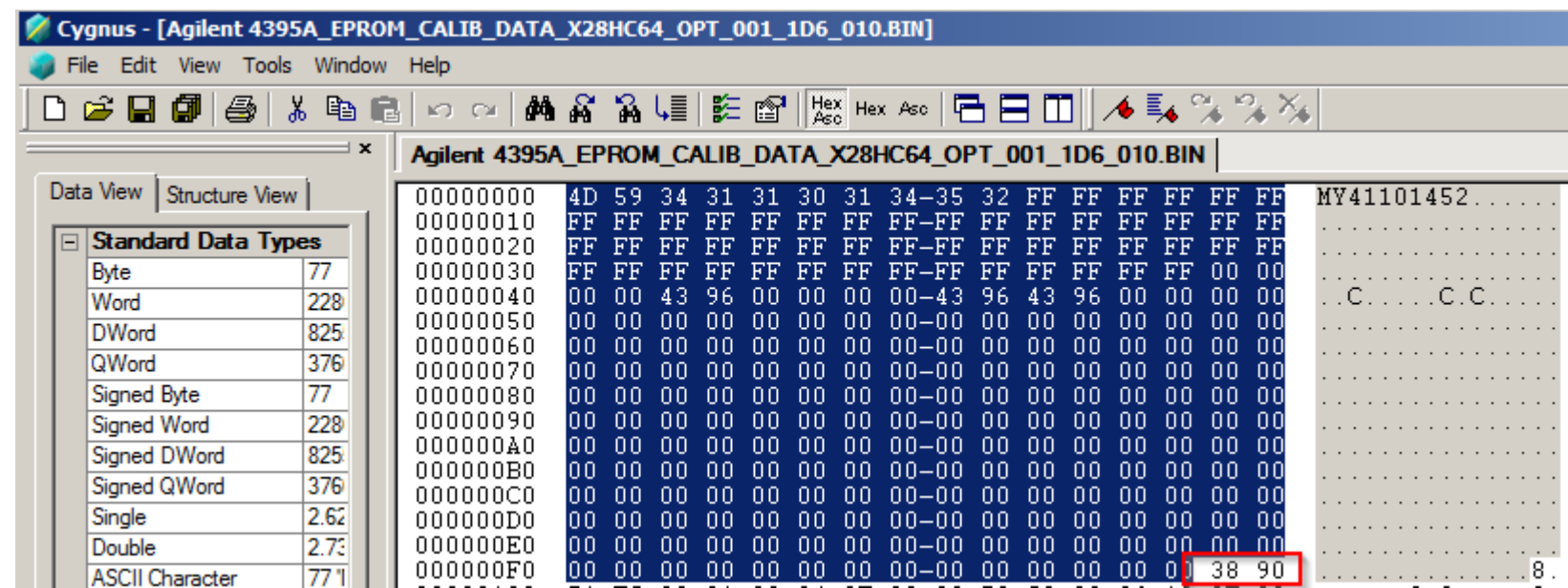
```
00000030 FF FF FF FF FF FF FF FF-FF FF FF FF FF FF 00 00
00000040 00 00 43 96 00 00 00 00-43 96 43 96 00 00 00 00
00000050 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
00000060 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
```

2. Calculate the Checksum over this area:



3. Add +1 = 0x3890

4. Write the new Checksum to data file:



5. Programm the EEPROM

And now the Device response with OPTIONS : 1D6,010,001
Internal test: 1 A1 CPU PASS

Best regards
Rico

More



Sergey Kubushyn

On Fri, 11 Jun 2021, ROMDUMP wrote:

I have been looking for it myself for some time.

My calibration level constants for MDAC appears to be corrupted and appears to be a common thing. Don't know if the EEPROM is just deteriorating.

EEPROM is just 8 kBytes. First 256 bytes contain serial number in pure ASCII starting at address zero. Then it is padded with FFs to 62 bytes. Then there is an interesting part, almost certainly installed options. Each option is marked with 2 very interesting :) bytes, 43 96. Installed options are marked with those bytes, not installed have zeroes instead. I have TWO 4395As here, one with options 001/1D6/010, the other one doesn't have 001. That allows for finding out how Opt.001 is marked in EEPROM.

Here is 16 bytes starting at address 0x40 for the one WITHOUT Opt.001:

```
00000040 00 00 43 96 | 00 00 00 00 | 43 96 00 00 | 00 00 00 00
```

This one is for the unit WITH Opt.001:

```
00000040 00 00 43 96 | 00 00 00 00 | 43 96 43 96 | 00 00 00 00
```

It is quite obvious how the installed options are marked. I bet a 4395A without 001/1D6/010 will have those 16 bytes as all zeroes. Dunno which one is 1D6 and which is 010 but it should be possible to find out using several EEPROM dumps from several 4395As with different sets of options.

BTW, Opt.1D5 is NOT an option at all in 8751A/4395A/4396A and probably many more. It is not shown in the list of installed options, not marked in EEPROM and it is NOT connected to the actual instrument in any way other than getting power from it. It is nothing more than a totally independent standalone ovenized 10MHz oscillator. It is powered from the system and there are no signals going from it to the instrument. The only signal, 10MHz output is routed to a BNC connector on the rear panel. You can use it as your EXTERNAL reference or not, it doesn't matter. It can be used as a reference for other instruments and you can use 10MHz reference fed from some other place.

Most of the EEPROM is empty. The first 256 bytes seem to be used for serial number and installed options, nothing more. The last 2 bytes in that portion seem to be some kind of a CRC for that portion. Don't have time to check if it is true and what kind of CRC is it if it is true.

Then there are several blocks of some data, almost certainly one block per board.

It is not incredibly difficult to decipher most of that stuff. The very first thing is to find out how CRC[s] is/are generated so it would allow playing with those constants without causing CRC failures so the 4395A would boot and accept the changed values.

Might be interesting project for a bored hacker kid knowledgeable in electronics. I don't have time for this, rather would pay \$940 to Keysight ONCE for calibration and then just keep that EEPROM backup.

I can't figure the reason they don't want to release the software because the 4395A is now considered obsolete.

The reason is simple -- they charge \$940 for most basic calibration with more advanced one reaching \$2K+ or so. The ONLY reason they can charge arm and leg and there are no alternatives is that they have that utility and don't release any information on calibration. If that "Adjustment Program" was available almost anybody could be able to calibrate those instruments himself without paying them a single cent. It is called GREED.

They turned even worse -- newer instruments don't have ANY calibration information at all and you have to send them to Keysight for calibration. There are NO third party calibration labs that could do it. Well, there are some who claim to be able to calibrate 4395A for \$400 but I wouldn't believe they are able to actually do it other than messing with a few trimpots and one trimcap that don't require that proprietary utility and that even a child could do himself after reading a service manual.

I do have their B2987A Electrometer/High Resistance Meter that is like that. No calibration info whatsoever and you have to send it to Keysight for that. I have a 3 year contract with them for that one, we'll see how it behaved these 3 years so it might be time to stop calibrating it.

I won't even start on all those super-duper LCR meters, be those Keysight, Hioki, BK Precision (which is rebadged Chinese Tonghui), GW Instek or whatever -- they don't even mention anything like service manual or calibration. Tried to get calibration manual from Hioki when thinking about purchasing their IM3636. Thanks the higher beings I didn't make that stupid mistake -- besides mediocre performance even at their golden spot where they put their "Basic Accuracy" there is absolutely no way to calibrate it other than sending to Hioki. Dunno how much they charge for that but almost 100% sure it is not cheap...

```
*****
* KSI@home KOI8 Net <> The impossible we do immediately. *
* Las Vegas NV, USA <> Miracles require 24-hour notice. *
*****
```

[More](#)

ROMDUMP

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