APPLICATION NOTE

Using ATARFID-EK1 with ATA5577M3

ATAN0001

Overview of Atmel ATA5577M3 (Q5)

The Atmel® ATA5577M3 is the latest version of the long running Q5 device used widely in the access control market. There are a few differences that are key to understanding how this device differs from the standard Atmel ATA5577M1 and M2 devices.

The main difference is how the Atmel Traceability data is stored and returned. Typically this information is stored in Page 1 of EEPROM and returned in the same configuration as the normal operation. This means that the settings of Block 0 on Page 0 also set the mode of operation for the traceability data. In the M3 version, this is not what happens. The traceability data will always be returned in RF/64, Manchester, 64-bits independent of the configuration set in Block 0. Also the data is formatted according to the Unique Format. This insures that any reader can access this data by providing the proper command (11) to the tag.

Another difference is in how the configuration register is structured. It is crucial that the reader be able to correctly set the proper bits in the configuration register by understanding the difference between these versions of Atmel ATA5577. The GiS reader is able to correctly set the configuration Block 0 of the M3 version. Attempting to program a configuration register setting from Atmel ATA5577M1 or M2 will cause the M3 version to enter an unknown state. This may not be recoverable so extreme care should be taken to insure the correct tag type is selected on the reader.

There are two main Access Control Formats that we will cover in the following sections. We will show how to use the GiS reader to configure and program for these common formats. The first is Unique Format which is quite common in many area of the world. Settings for this are RF/64, Manchester, 64-bits. The other is a well know format used by FSK readers. This typically uses FSK2a, RF/50, 96-bits for the settings.

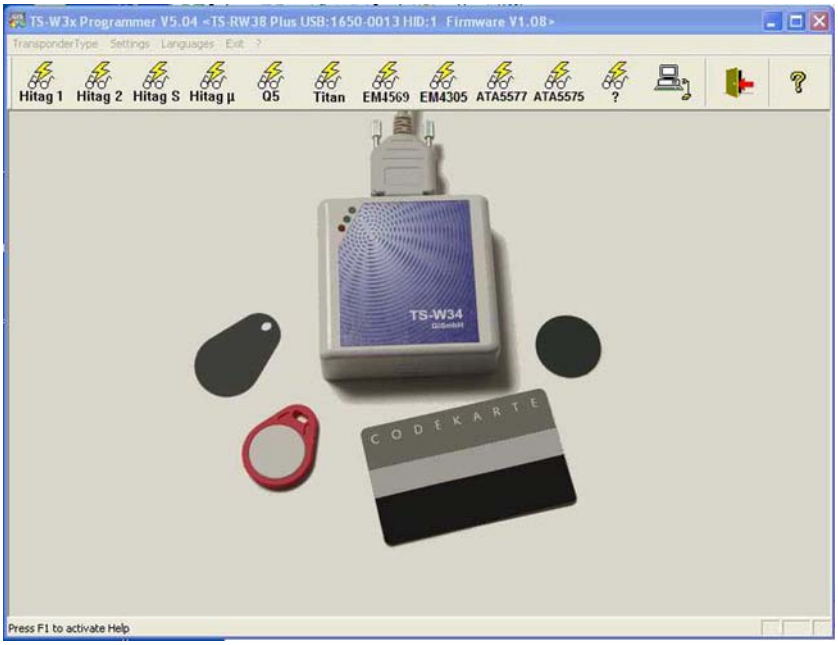
1. Using the GiS Reader

The GiS TS-RW38Plus reader requires a PC GUI be downloaded from their website:

http://www.gis-net.de/rfid/english/Software-125kHz.htm

Once this is installed the screen shown in Figure 1-1 will provide the starting point for using the reader. Select the “Q5” menu option to begin working with the Atmel ATA5577M3 device.

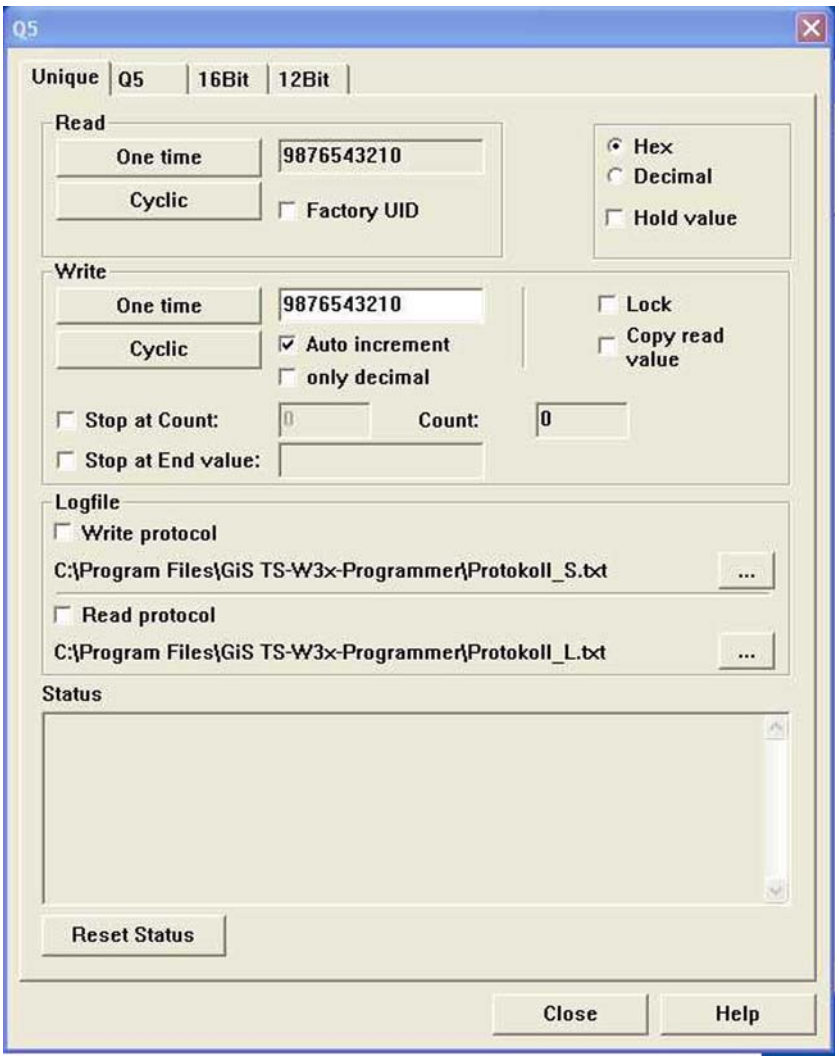
Figure 1-1. Starting Screen



1.1 Unique Format

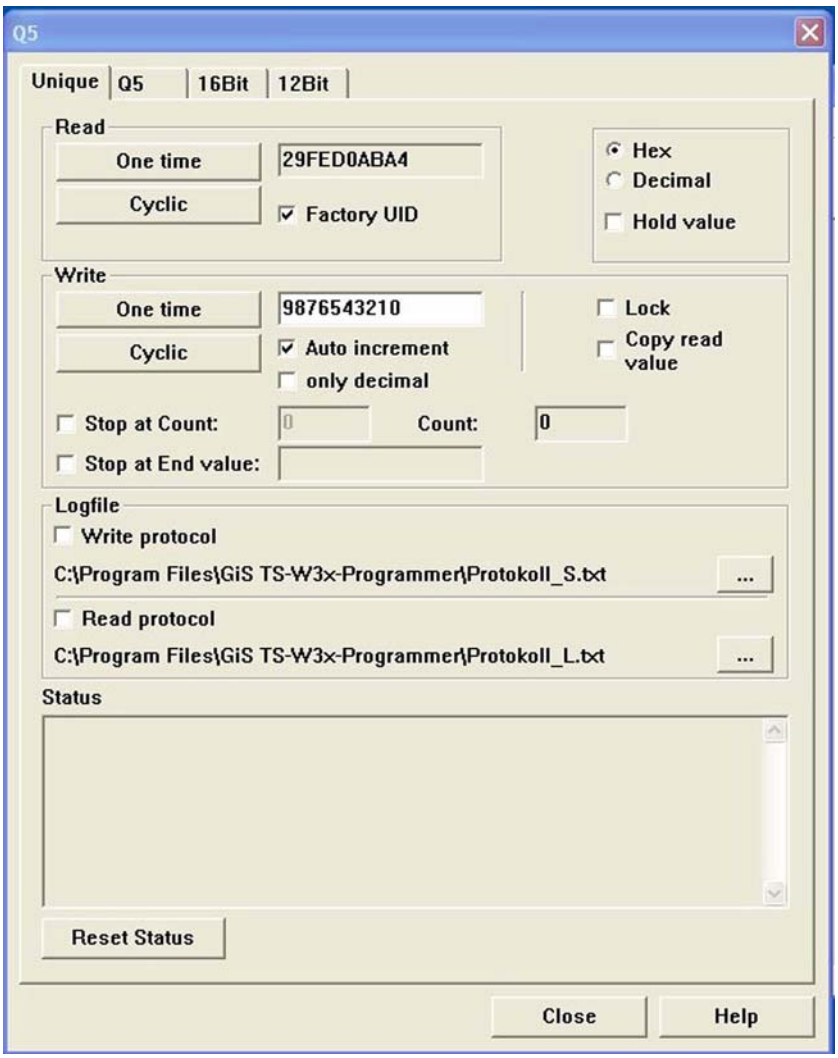
Selecting Q5 opens a second window as shown in Figure 1-2. There are a few tabs but the first one is the Unique format operation. You can read the general block data using the “One time” or “Cyclic” buttons under the Read section. This reads Block 1 and 2 of the Page 0 memory of EEPROM as long as that data is correctly formatted for Unique mode and the Configuration register in Block 0 is set properly. Writing to a tag is handled under the Write section of the window. There are many possible ways and options to write data including “Auto increment”. Please refer to the user guide to get a better understanding of how these different options work. NOTE: there is an option to lock the blocks of data after writing them. This is highly recommended for production of tags unless there is a strong need to change the data in the future.

Figure 1-2. Unique Format



Reading the traceability data from an Atmel® ATA5577M3 (Q5) tag is always possible on this Unique Format window. This is a good option if you are not sure what mode the tag is currently set for. Simply check the “Factory UID” button and press the “One time” read button. This is shown in Figure 1-3. This will work even if the tag is configured into the FSK mode.

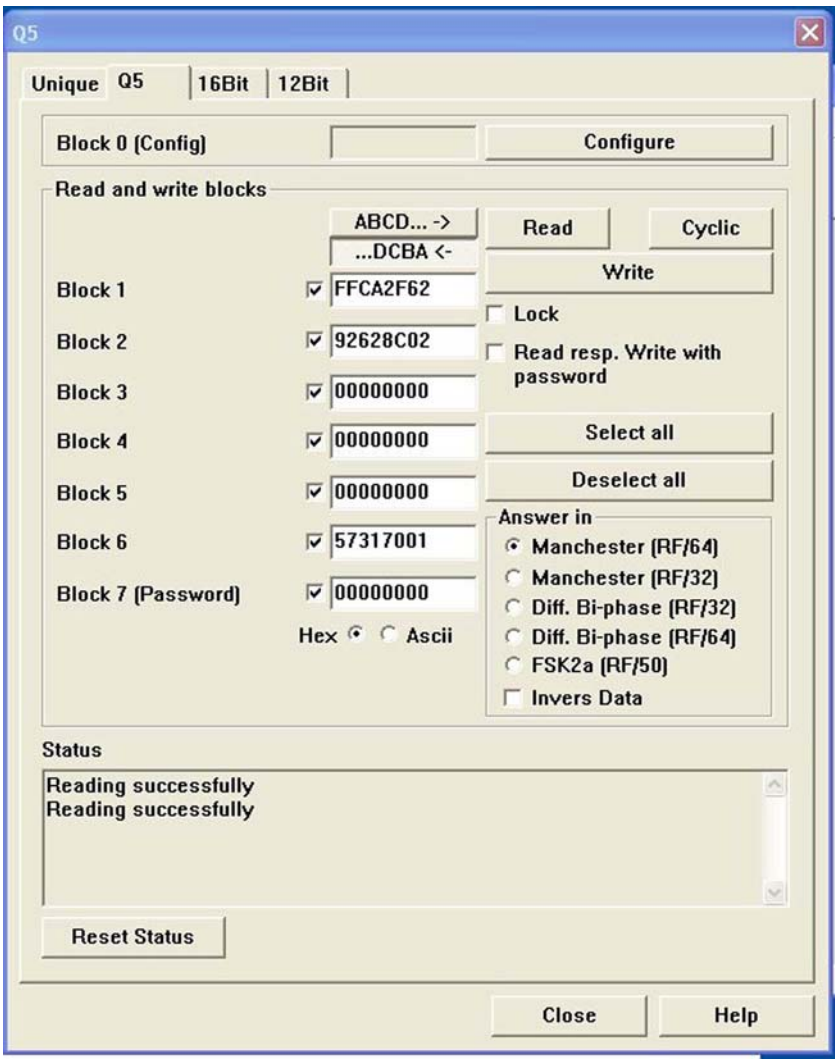
Figure 1-3. Factory UID



1.2 FSK Format

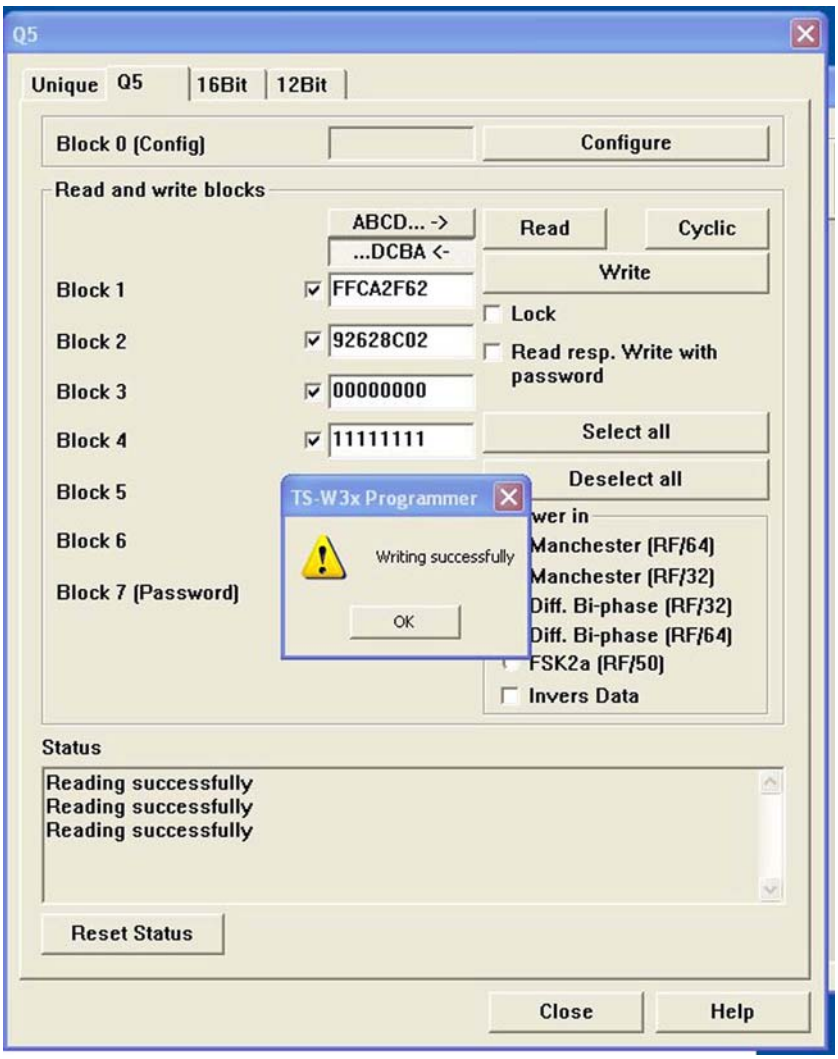
The next mode requires selecting the Q5 tab at the top of the window. This brings up the main Q5 page where all of the User data block can be accessed. It is possible to read these by first selecting which ones you want using the check mark next to the block number and pressing “Read” or “Cyclic” as shown in Figure 1-4. In this case, the data in Block 1 and 2 is correct for Unique Format. Also you can see that the reader is still using Manchester (RF/64) in the “Answer in” section of the page.

Figure 1-4. Q5 Main Screen



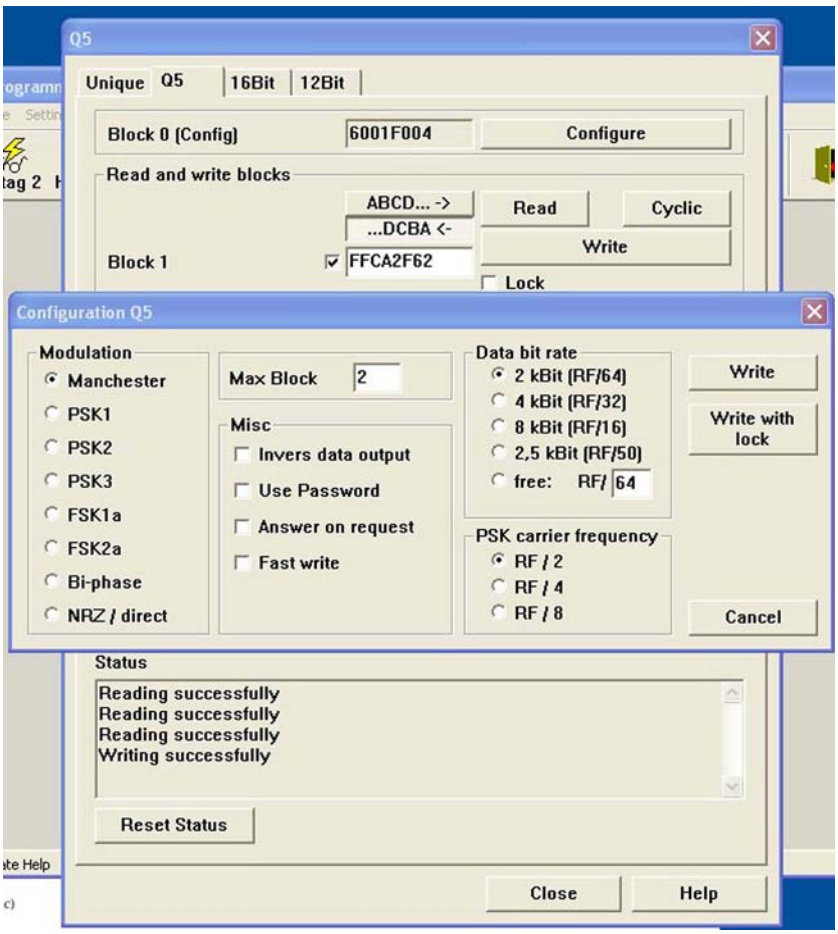
Writing new data to the blocks is done by selecting the check mark next to the block that you wish to change. You then type in the desired value and press the “Write” button. You should receive a message that showing success. In Figure 1-5 I have changed the data in Block 4 to all ones.

Figure 1-5. Writing Data



Next we discuss changing the configuration to FSK mode. The first step is to change the configuration register. This is done by pressing the “Configure” button in the Block 0 (Config) section. Figure 1-6 shows the current configuration which is correct for Unique Format.

Figure 1-6. Unique Format Configuration



To change to FSK format the following changes must be made:

- Modulation = FSK2a
- Max Block = 3
- Data bit rate = 2.5kBit (RF/50)

Figure 1-7 shows the proper settings for FSK format.

Once these setting are selected, press the “Write” or the “Write with lock” button. Again it is suggested that the lock be used for production tags. A warning message (Figure 1-8) will appear to make sure that you are aware that attempting to program this configuration into a tag that does not accept the Atmel® ATA5577M3 (Q5) data structure could render that device inoperable.

Figure 1-7. FSK Configuration

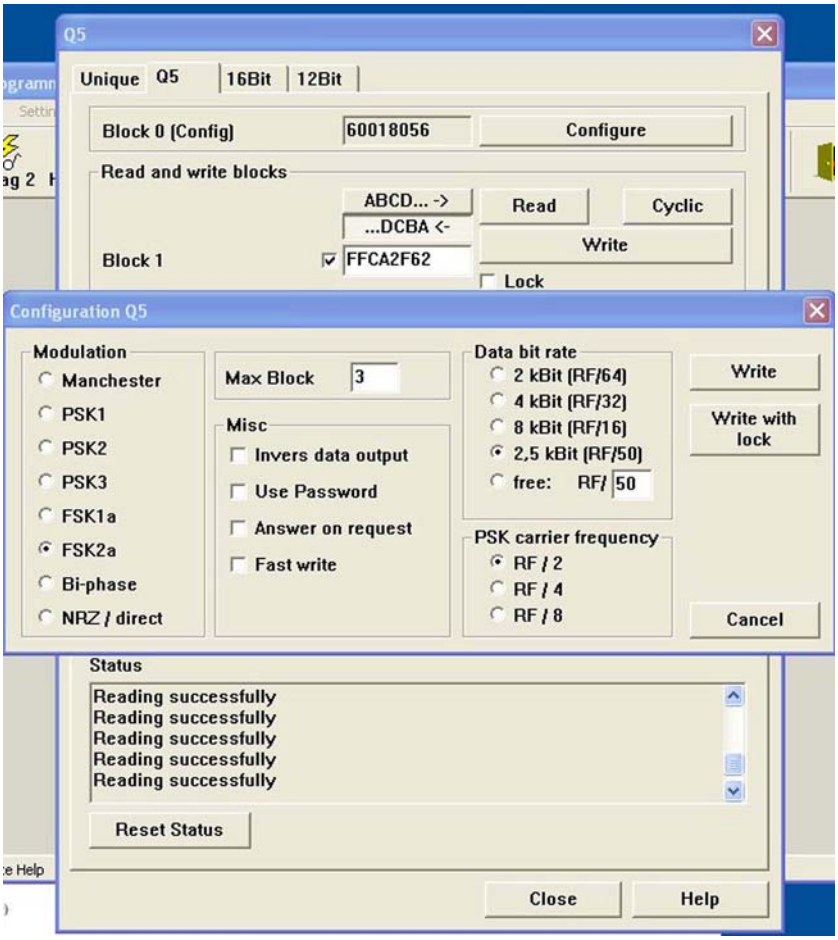
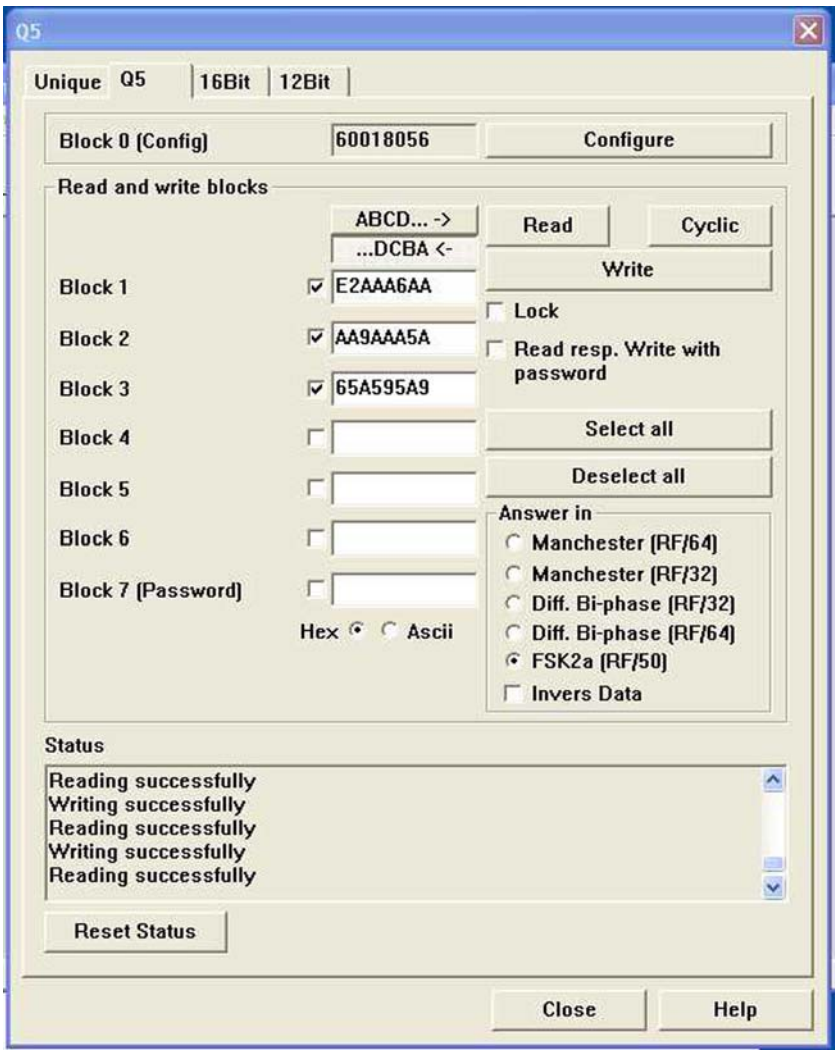


Figure 1-8. Configuration Warning

The second step is to change the data Blocks. Figure 1-9 shows an example of valid data used to make an FSK card. It is possible to read the data back out or to read an FSK card by selecting the FSK2a (RF/50) option in the “Answer in” section of the page and pressing the “Read” or “Cyclic” button.

Figure 1-9. Example of a Valid Data Set



2. Revision History

Please note that the following page numbers referred to in this section refer to the specific revision mentioned, not to this document.

Revision No.	History
9247B-AUTO-07/15	• Put document in the latest template

Atmel Corporation 1600 Technology Drive, San Jose, CA 95110 USA **T:** (+1)(408) 441.0311 **F:** (+1)(408) 436.4200 | **www.atmel.com**