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UCODE I2C Getting started guide

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Application note
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Document information

Info	Content
Keywords	UCODE, RFID, I2C
Abstract	This document describes the necessary steps to install and configure the UCODE I2C demo kit hardware (I2C bird) and software to evaluate NXP UCODE I2C.

Revision history

Rev	Date	Description
1.1	20130304	Update driver info
1.0	20120910	First version

Contact information

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1. Introduction

This document describes the necessary steps to install and configure the UCODE I2C demo kit hardware and software to evaluate NXP UCODE I2C.

The document will guide you through the following steps:

1. Installing the *I2C Bird driver*
2. Installing the demo program *I2cWin32*
3. Starting and using the demo program *I2cWin32*
4. Reading and writing via I²C bus with *I2cWin32*

2. Content and demo package information

2.1 Package content

This UCODE I²C kit contains the following sample tags:

- 1 UCODE I²C tag with small antenna
- 1 UCODE I²C tag with medium PCB antenna
- 1 UCODE I²C tag with large PCB antenna
- 1 UCODE I²C to "I²C–Bird" interface board

  Note: The I²C interface board is necessary to connect the I²C interface of the UCODE I²C IC with the I²C-Bird.

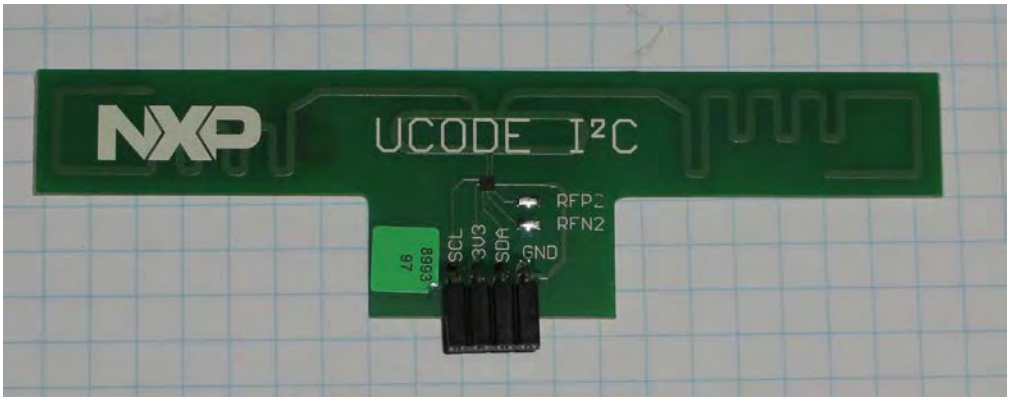

Fig 1. PCB RFID antenna with I2C connection

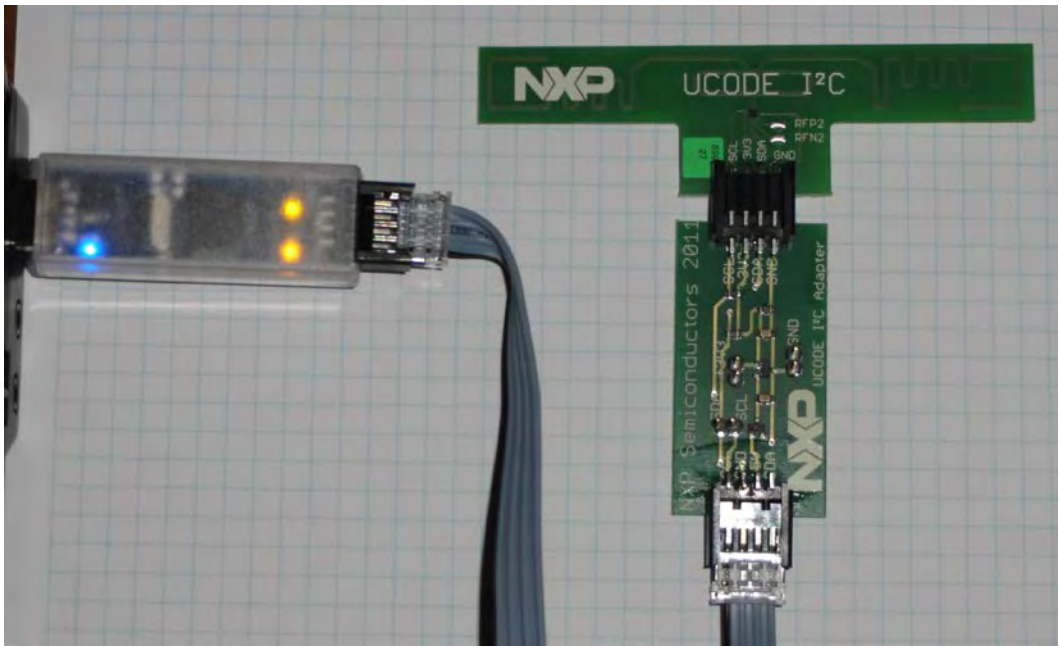

Fig 2. I2C bird / adapter board / PCB antenna

2.2 Software Download:

The Software can be downloaded

Link: http://www.nxp-rfid.com/download

2.3 Software Installation Info

It is recommended to install the Software as administrator or in the compatibility mode. Before you start (double-click) your exe file press the right mouse button and choose in the menu *Run as administrator* or *Troubleshooting Compatibility*.

3. Driver Installation I2cBird

After downloading the Driver package for the I2C the package needs to be unzipped. Please choose the 32 bit or 64 bit windows folder and after this the driver according to your operating system. This 32 bit / 64 bit info can be verified with System folder (Start / Control Panel /System and Security / System).

Fig 3. Driver Setup Start Window

Press *Next* button to proceed.

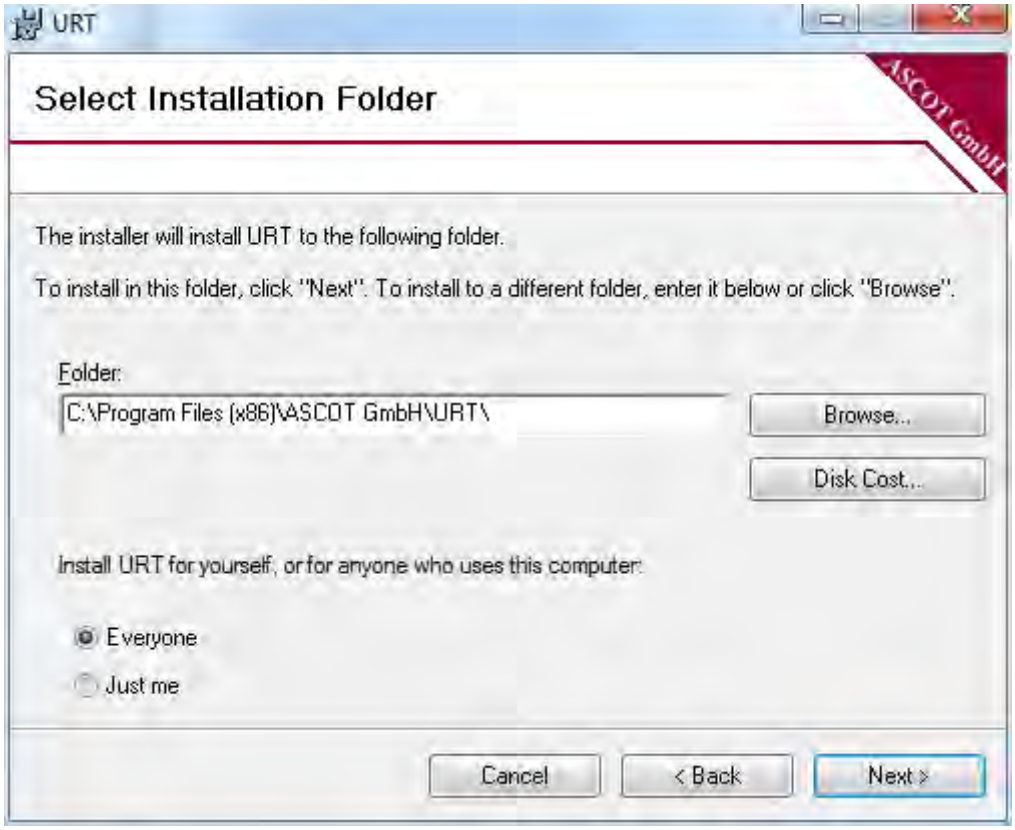

Fig 4. Driver Setup Destination folder

Press *Next* button to proceed.

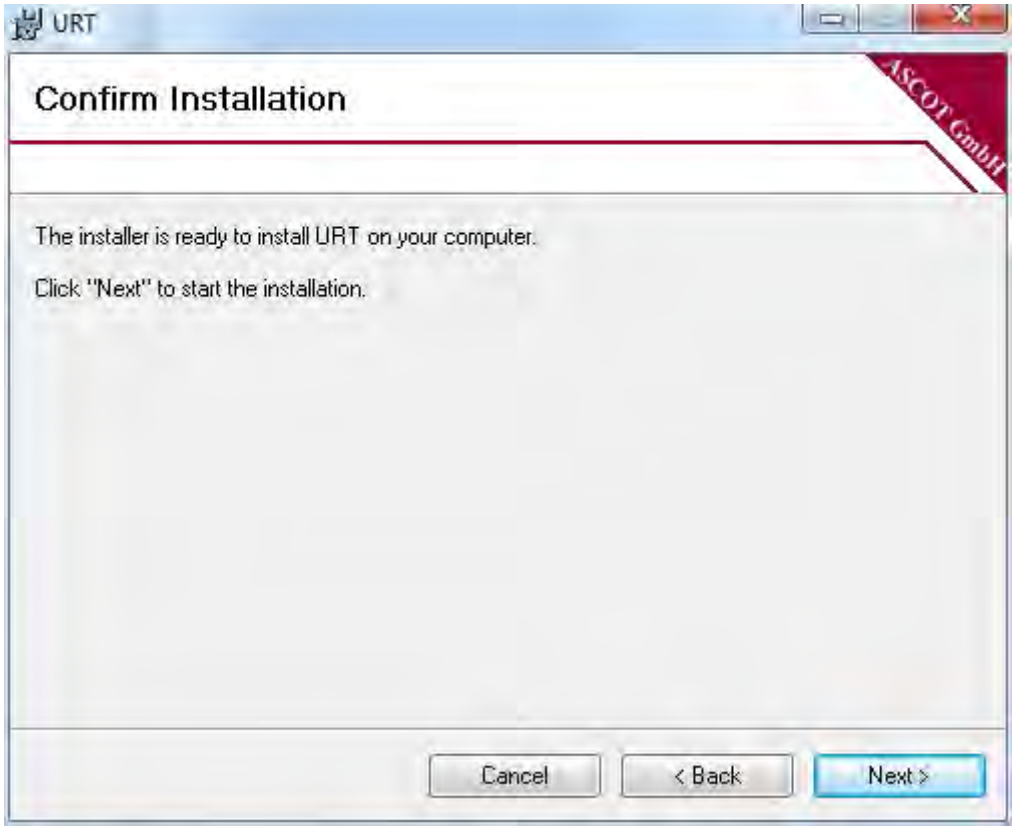

Fig 5. Driver Setup Start Installation Confirmation

Press *Next* button to proceed.

Fig 6. Driver Setup Installation Wizard

Press *Next* button to proceed.

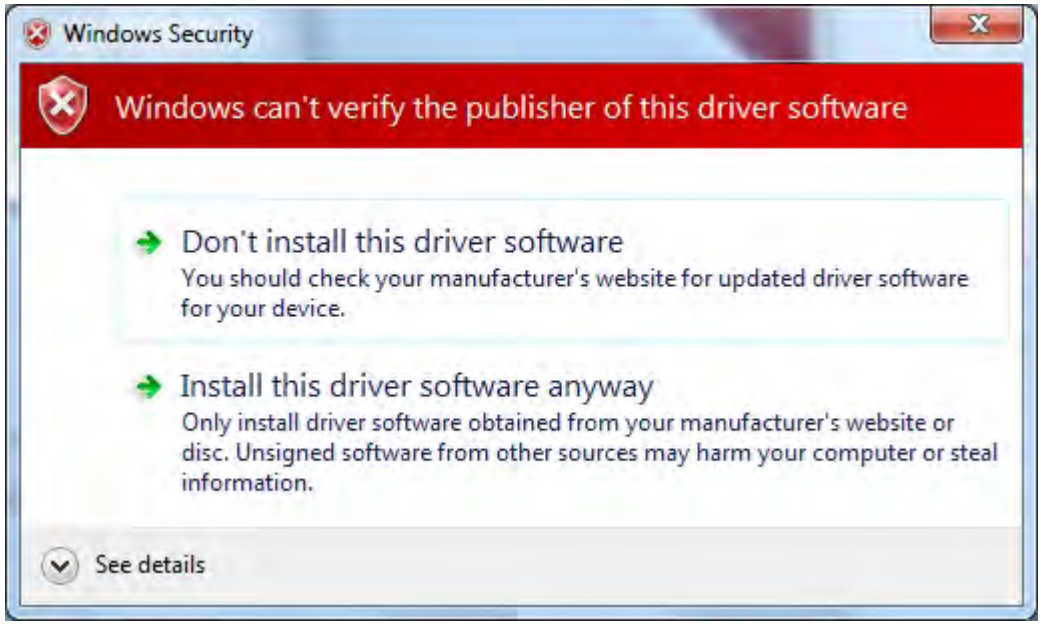

Fig 7. Driver Setup Windows Security Info

Choose the driver installation for an unsigned driver (*Install driver software anyway*).

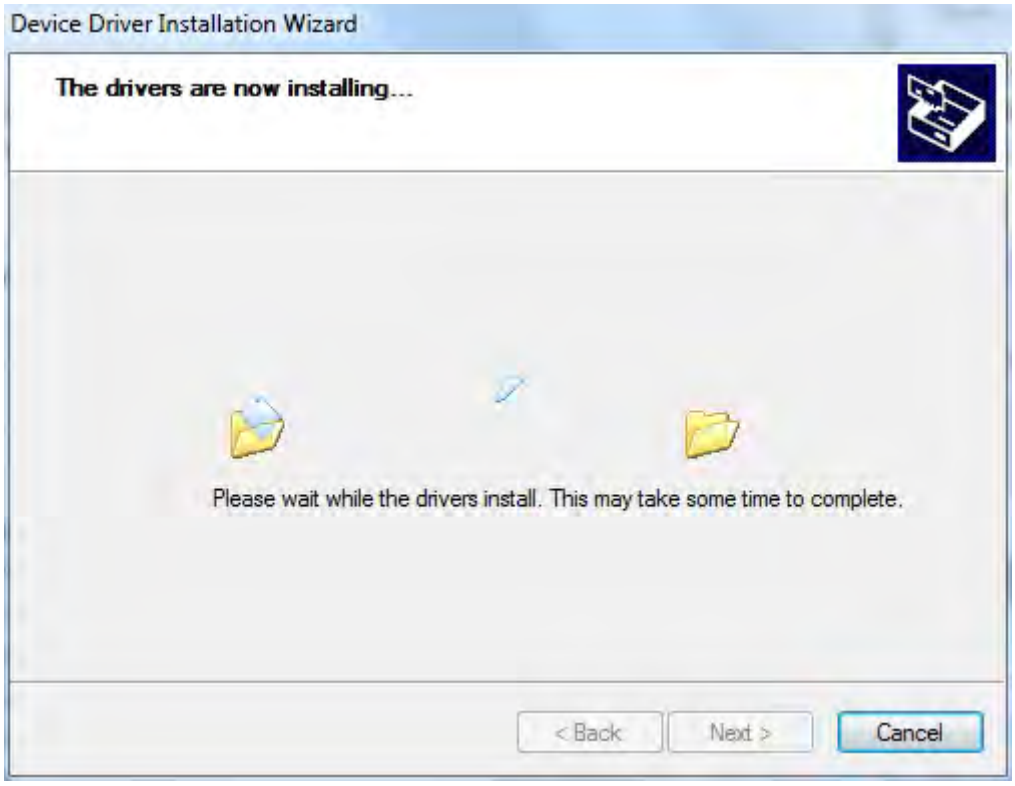

Fig 8. Driver Setup Installation Process

Press *Next* button to proceed.

Fig 9. Driver Setup Installation Wizard Completed

Press *Finish* to complete the installation.

4. Software Installation *I2cwin32*

Before you start (double-click) your SETUP.EXE file press the right mouse button and choose in the menu *Run as administrator* or *Troubleshooting Compatibility*. After the start of the setup a window with the license agreement will appear (Fig 10). Accept the license agreement and press the *Next* button.

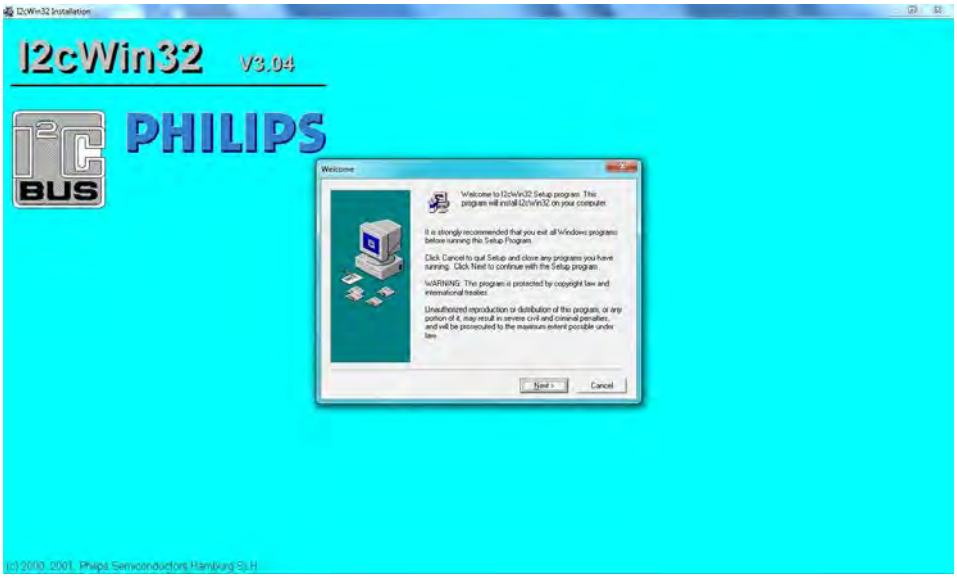

Fig 10. *I2cWin32* Installation: License Agreement Window

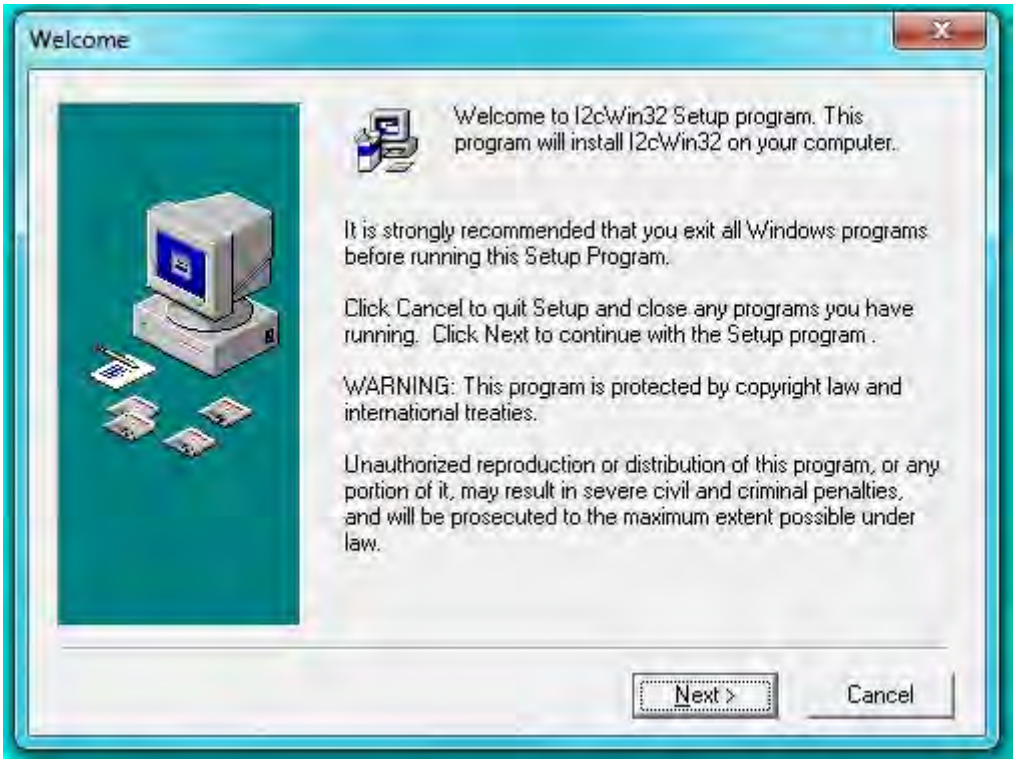

Fig 11. *I2cWin32* Installation: License Agreement Window (detail)

Press *Next* button to proceed.

In the next window let you *Choose Destination Location*.

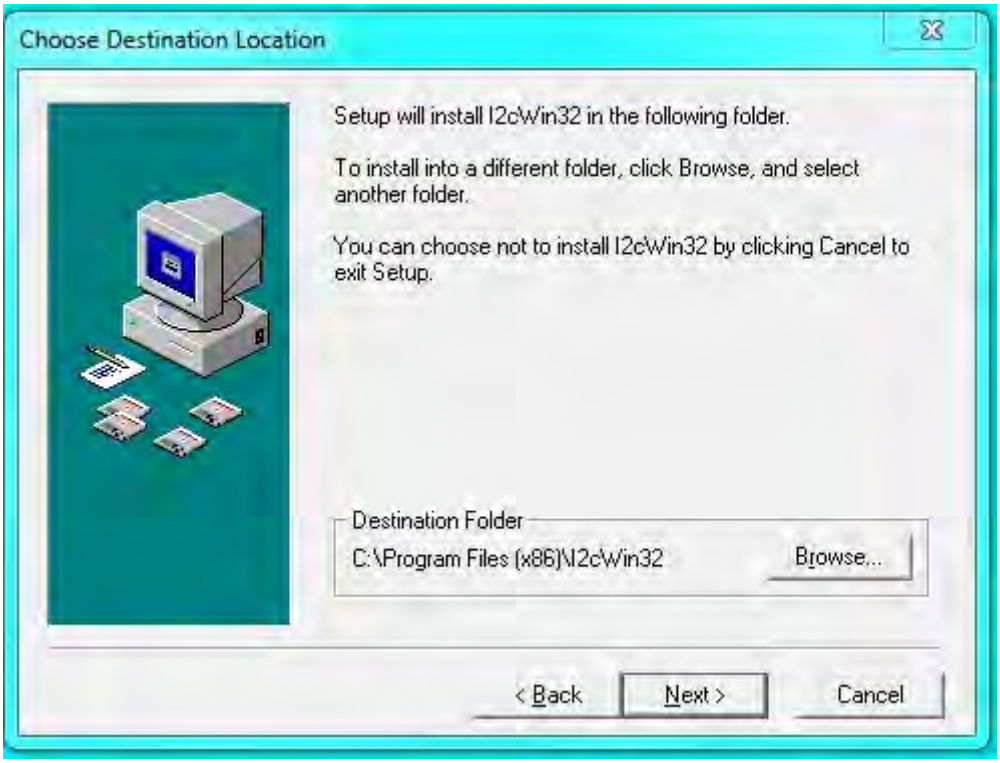

Fig 12. *I2cWin32* Installation: Destination folder

Press *Next* button to proceed.

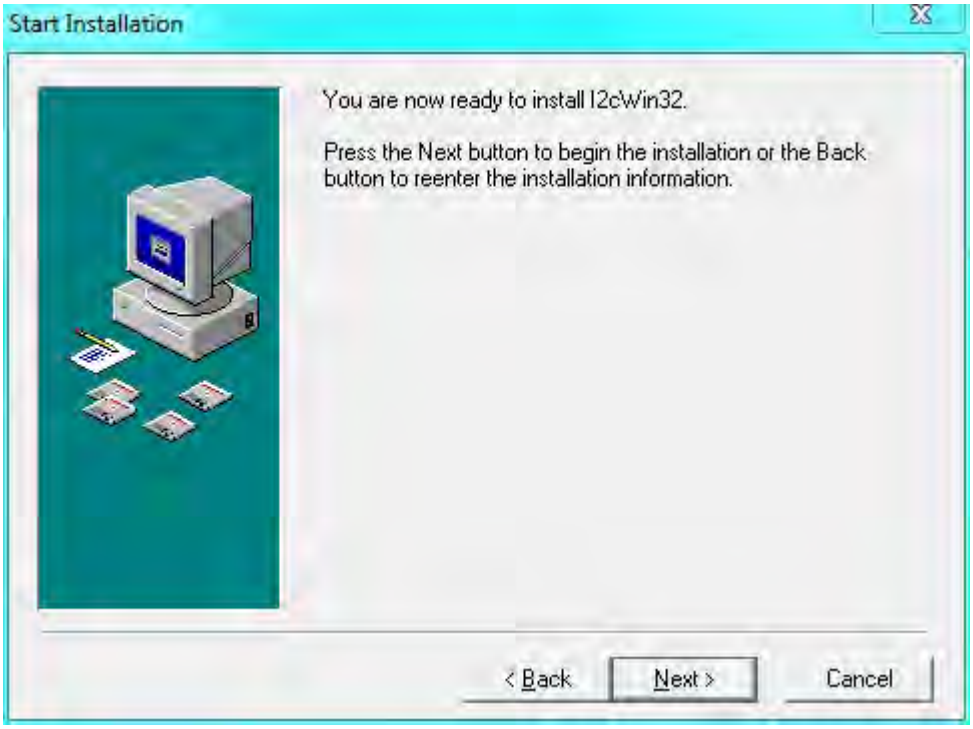

Fig 13. *I2cWin32* Installation: Start Installation

Press *Next* button to proceed.

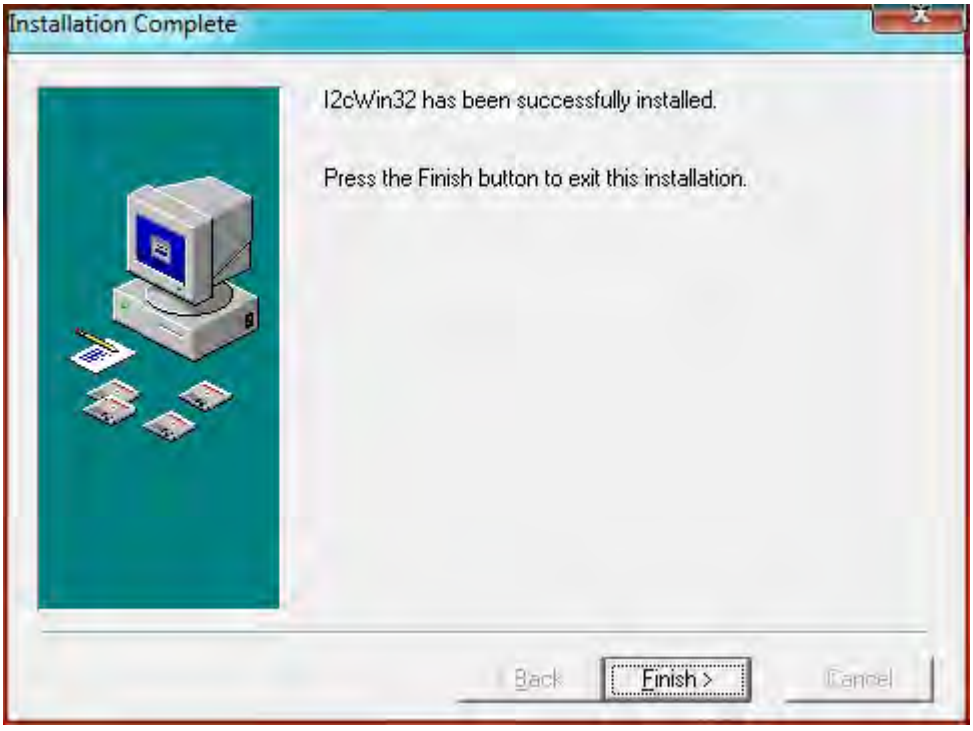

Fig 14. *I2cWin32* Installation: Installation Completed

Press *Finish* to complete the installation.

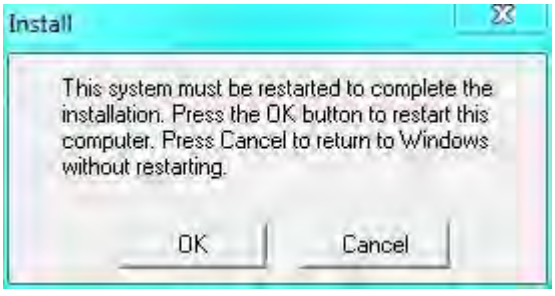

Fig 15. *I2cWin32* Installation: Restart info after installation

Press *OK* button to restart the system.

5. Start with *I2cWin32*

Connect I2C PCB antenna with the interface board.

Connect the interface board with the grey cable to the I2C bird.

Connect the I2C bird with the computer

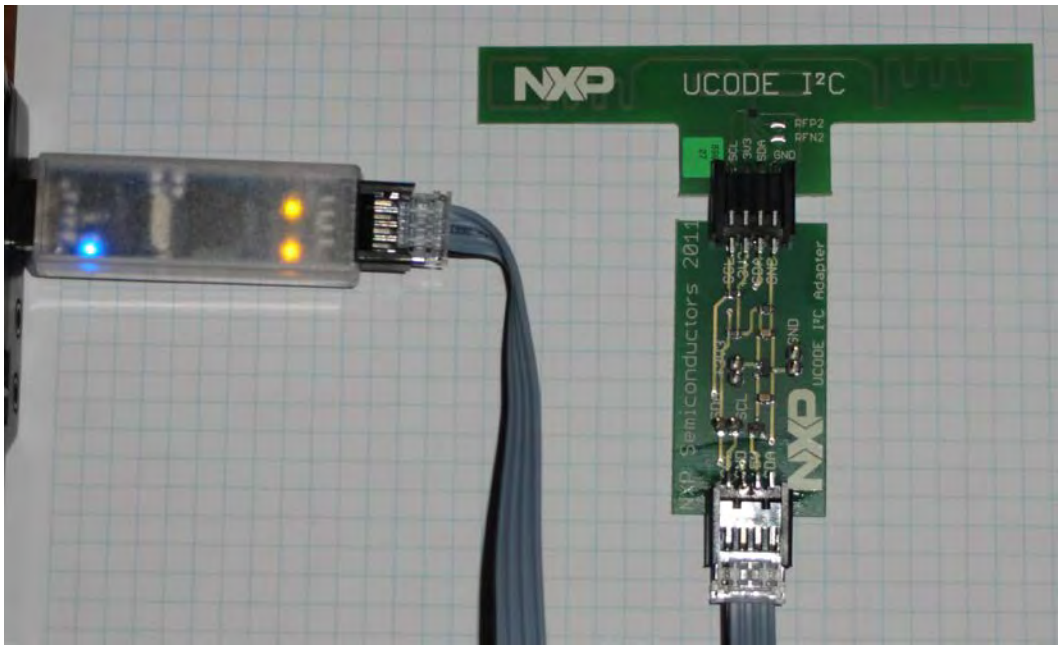

Fig 16. I2C bird / adapter board / PCB antenna

Start the *I2cWin32* Software.

Fig 17. *I2cWin32*: Starting window

Click on the Properties symbol  .

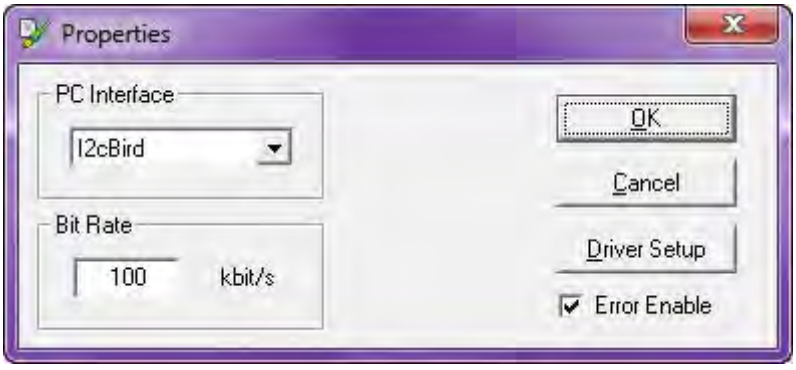

Fig 18. *I2cWin32* : Properties

Choose for the PC interface the I2cBird. (If you cannot find the I2cBird the I2cBird driver installation was not successful.) Press *Driver Setup* to enter the I2cBird Properties.

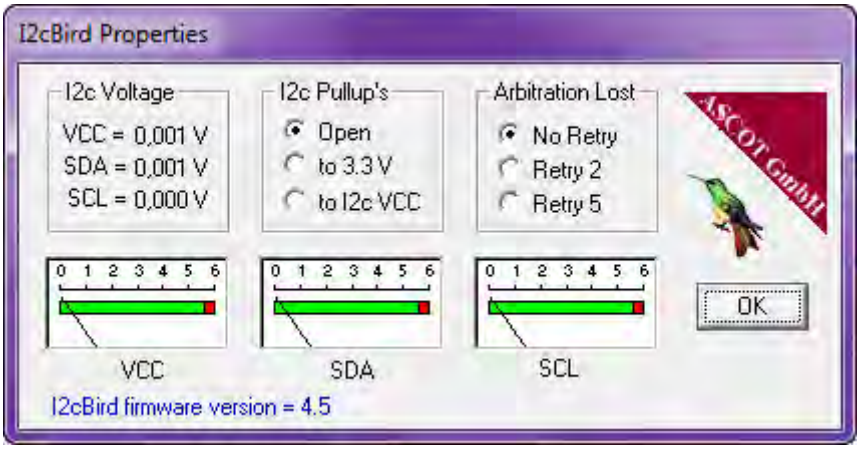

Fig 19. *I2cWin32* : Properties I2cBird

For the advanced Properties double-click on VCC (above the I2cBird firmware version) and press1 (keyboard) [fast]. Now the advanced properties can be seen.

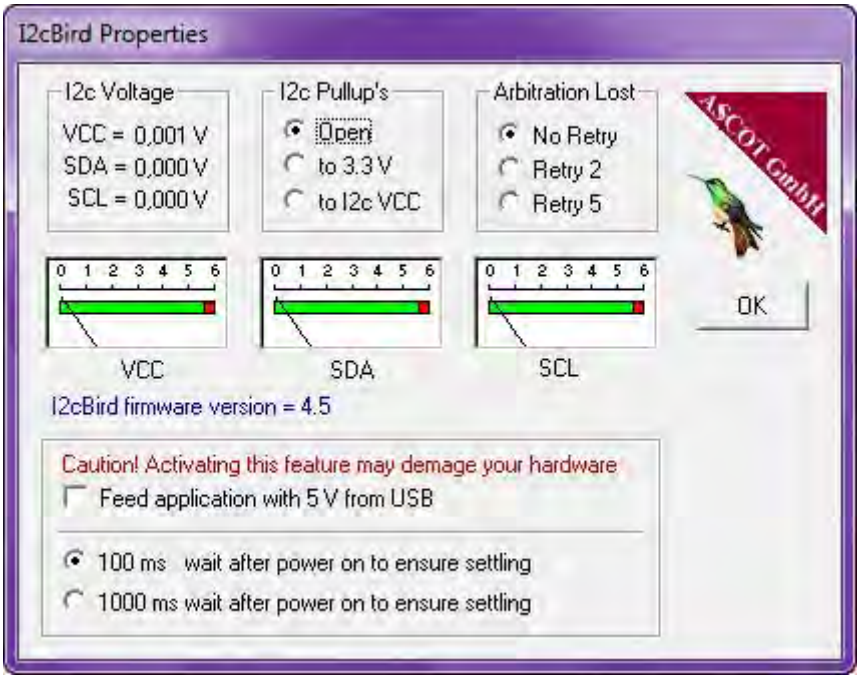

Fig 20. *I2cWin32* : Properties I2cBird advanced settings

Choose Feed application with 5 V from USB.

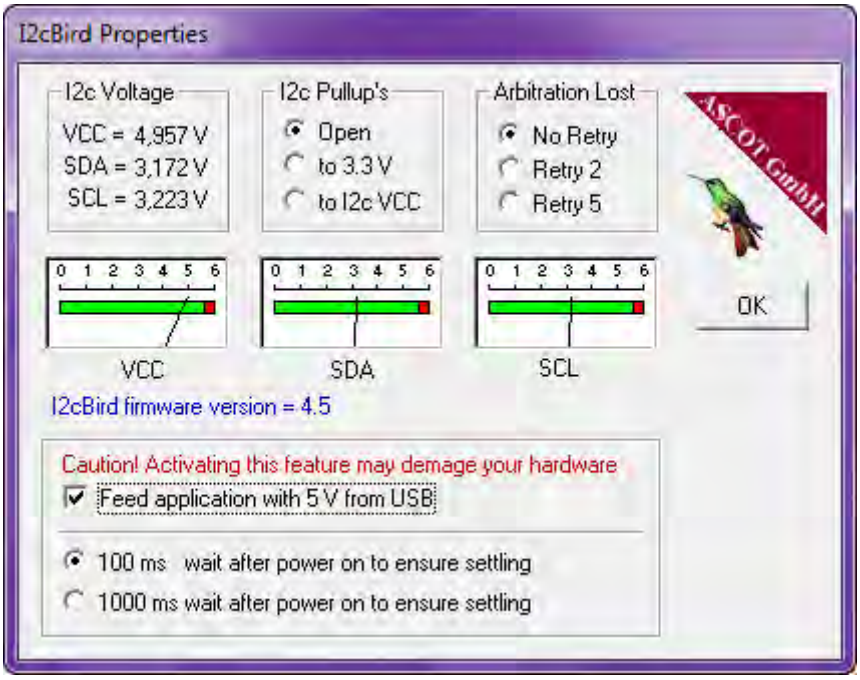

Fig 21. *I2cWin32* : Properties I2cBird advanced settings

Press *OK* button to go back to the starting window.

6. Read and Write commands with the *I2c Win32* Software

The UCODE I^2C address can be changed with three bits in the ConfigWord via RF. The possible Slave Address for the UCODED I^2C used via I2Cbird can be seen in 7 Bit address column.

	A3 (204h)	A2 (205h)	A1 (206h)	I2C adress	ConfigWord content	Remark	7 Bit address
0	0	0	0	A0	4000		50
1	0	0	1	A2	4200	default	51
2	0	1	0	A4	4400		52
3	0	1	1	A6	4600		53
4	1	0	0	A8	4800		54
5	1	0	1	AA	4A00		55
6	1	1	0	AC	4C00		56
7	1	1	1	AF	4E00		57

Fig 22. Addressing UCODE I2C

The default value is 51 for the 7 Bit address.

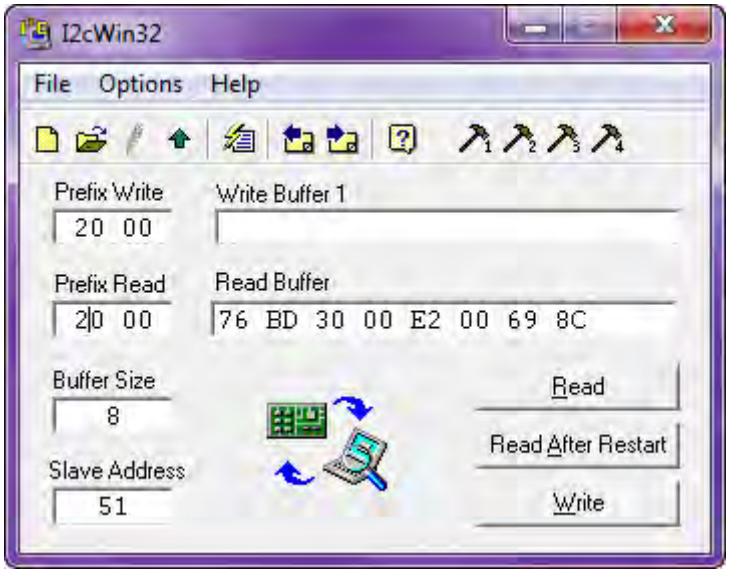

Fig 23. READ EPC Memory Bank

Prefix READ 20 00 means EPC Memory bank

Buffer Size 8 Bytes -> 4 words -> 64 Bits content in the **READ Buffer**

READ After Restart reading is starting at the **Prefix READ** address

READ is using the actual pointer position (x times **Buffer Size**)

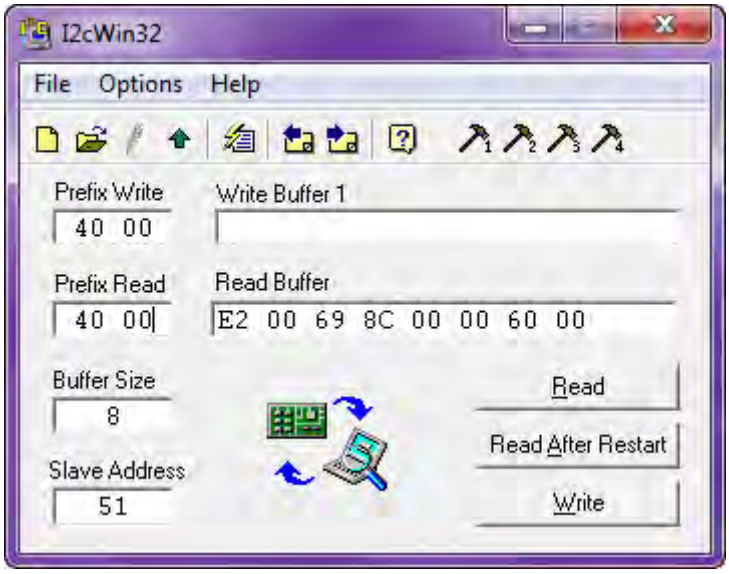

Fig 24. READ TID Memory Bank

Prefix READ 40 00 means TID Memory bank

Buffer Size 8 Bytes -> 4 words -> 64 Bits content in the **READ Buffer**

READ After Restart reading is starting at the **Prefix READ** address

READ is using the actual pointer position (x times **Buffer Size**)

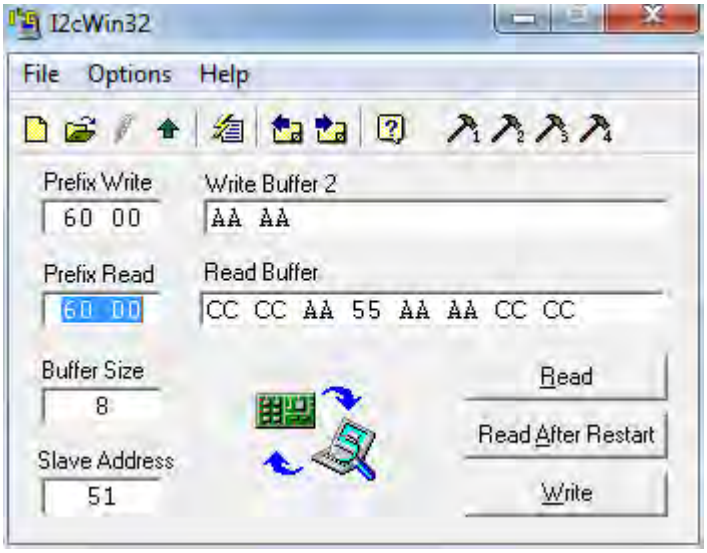

Fig 25. READ USER Memory Bank

Prefix READ 60 00 means USER Memory bank

Buffer Size 8 Bytes -> 4 words -> 64 Bits content in the **READ Buffer**

READ After Restart reading is starting at the **Prefix READ** address

READ is using the actual pointer position (x times **Buffer Size**)

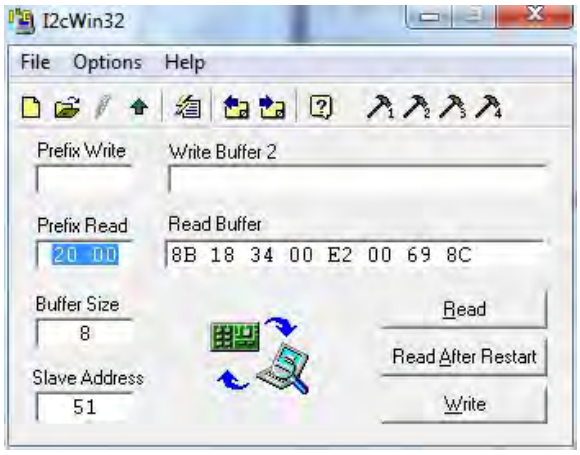

Fig 26. WRITE EPC Memory Bank

Read actual content

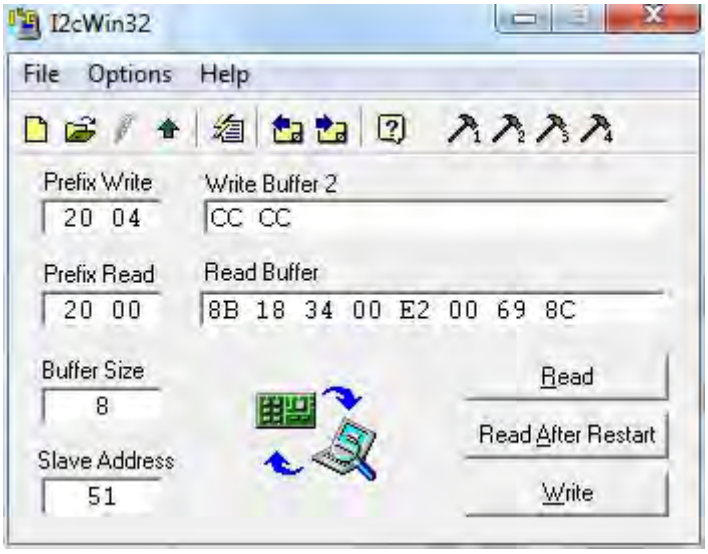

Fig 27. WRITE EPC Memory Bank

Prefix WRITE 20 04 means begin of the EPC number

(Before CRC and Protocol word)

WRITE writes the **WRITE Buffer** content to the tag

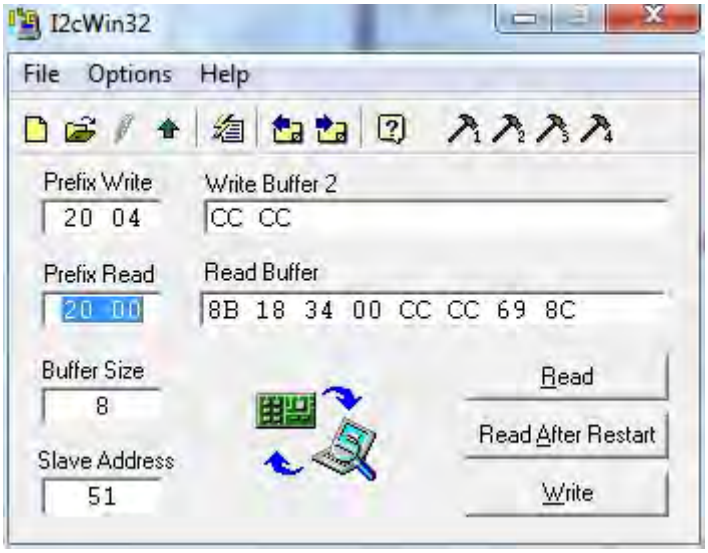

Fig 28. WRITE EPC Memory Bank

Checking with **READ** / **READ after Restart** depends on the **WRITE PREFIX**

Write was successful.

The TID number cannot be written via RF or I²C bus.

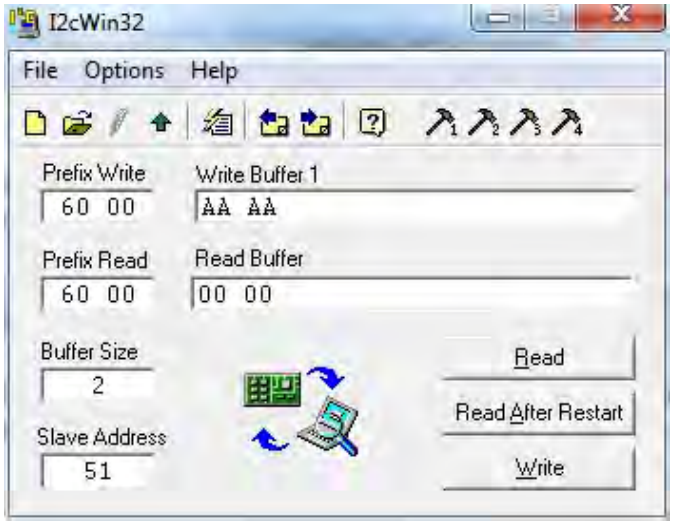

Fig 29. WRITE USER Memory Bank

Prefix WRITE 60 00 means begin of the USER memory

WRITE writes the **WRITE Buffer** content to the tag

Fig 30. WRITE USER Memory Bank

Prefix WRITE 60 02 means second word of the USER memory

WRITE writes the **WRITE Buffer** content to the tag

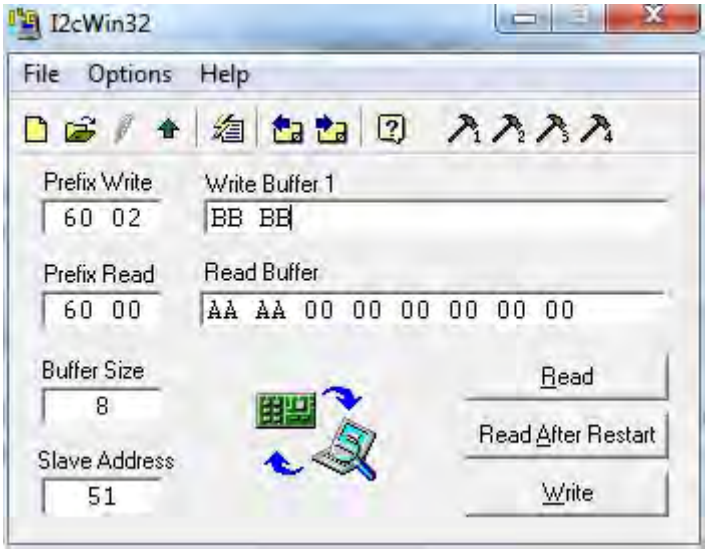

Fig 31. WRITE USER Memory Bank

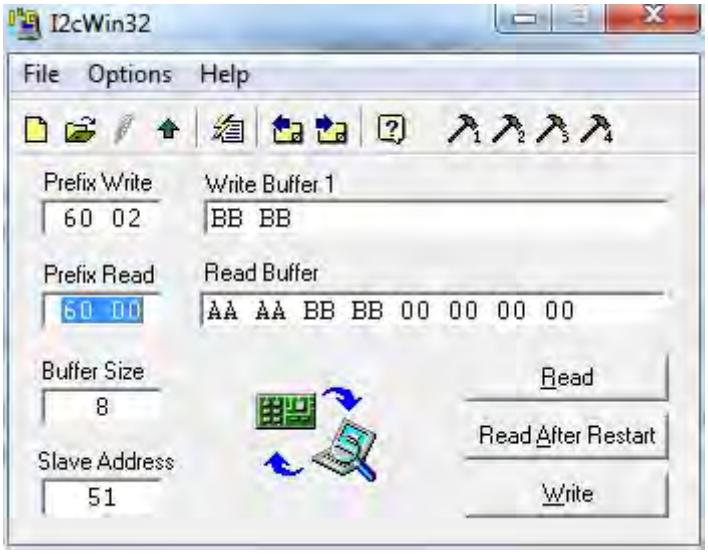

Fig 32. WRITE USER Memory Bank

Checking with **READ** / **READ after Restart** depends on the **WRITE PREFIX**

Write was successful.

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8. Contents

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