RadarBaseboardMCU7

1 Overview

The firmware on a RadarBaseboardMCU7 board can be programmed and the radar shields can be initialized from a Windows PC without the need of a programmer or other special equipment.

1.1 Updating the firmware

To update the firmware on your RadarBasebiardMCU7 board, connect the board via USB to your computer and double click on the file "UpdateFirmware.bat". Choose a firmware file (for example the latest version "firmware_vXXX.bin" and click "open".

The script will update the firmware on the first RadarBaseboardMCU7 board found. Please make sure that only one RadarBaseboardMCU7 board is connected to your computer.

The following steps will be performed:

1. Finding the COM port of the RadarBaseboardMCU7 board and if necessary activating the bootloader
2. Finding the COM port of the bootloader
3. Erasing the flash
4. Writing the firmware
5. Verifying the firmware
6. Resetting the device

The progress and the result are shown in a command window. Upon success the output will look similar to this:

```
BOOTLOADER: 0 Activating the bootloader
BOOTLOADER: 100 Activating the bootloader
SEARCH: 0 Searching for com port
SEARCH: 100 Searching for com port
CONNECT: 0 Connecting to COM5
CONNECT: 100 Connecting to COM5
ERASE: 0 Erasing memory
ERASE: 100 Erasing memory
WRITE: 0 Writing firmware
WRITE: 1 Writing firmware
WRITE: 2 Writing firmware
[...]
WRITE: 99 Writing firmware
WRITE: 100 Writing firmware
VERIFY: 0 Verifying firmware
VERIFY: 1 Verifying firmware
[...]
VERIFY: 99 Verifying firmware
VERIFY: 100 Verifying firmware
RESET: 0 Resetting device
RESET: 100 Resetting device
EXIT: 0 successful
```

After that the firmware has been successfully updated

1.2 Initializing the EEPROM of the radar shield

The radar shield allows to store radar shield specific information on a non-volatile memory chip (EEPROM). In order to initialize the shield correctly, the EEPROM must be updated after production by the help of an EEPROM

programming tool. For each type of radar shield (BGT60TR13, BGT60ATR24, BGT60LTR11) a specific batch file InizializeBGT60XXX.bat is provided. You can execute the batch file by double-clicking on it. Upon success the batch file will output a message similar to:

```
Board type: BGT60LTR11
New UUID has been written: 4a725f28-166c-49d0-1a32-0876f56f0e9c
Press any key to continue . . .
```

1.3 LED Status

The LED on the RadarBaseboardMCU7 board indicates the board's status:

LED	Status	Description
slow green flashing	ok	
fast red-green flashing	not detected	No RF shield is connected
fast red flashing	shield mirrored	Shield is connected mirrored within the connector
fast yellow-red flashing	not supported	Unknown shield (shield may be broken or not properly connected)
fast yellow, slow red	internal error	Error during initialization/detection (this may indicate a HW or FW problem)

1.4 Troubleshooting

In case that a RadarbaseBoardMCU7 board cannot be flashed, disconnect the board from the computer, re-connect it, and follow the steps in section "Updating the firmware on RadarBaseboardMCU7 boards". If this also does not work, try another USB port.
In case that updating the firmware still fails, connect the test point TP1/Erase with 3.3V while you plug the board into the USB port, see Figure 1. TP1/Erase is a test point above the Atmel microcontroller, see the red circle in Figure 1. The pin marked by the red circle in the top left of Figure 1 is 3.3V, see also the label on the backside of the board. Connect the two pins marked by the red circles in Figure 1 while you connect the board via USB to your computer. Once the board is connected via USB, the pins TP1/Erase and 3.3V do not need to be connected anymore. You should now be able to update the firmware on the board as described in the section "Updating the firmware".

Figure 1 Connect TP1/Erase with 3.3V.

2 Third party code

The flashing tool flashtool.exe contains following third party code:

Project	Description	License
BOSSA[1]	flash programming utility (version 1.9.1)	BSD3

You can find the respective licenses in the directory "licenses".

1 https://github.com/shumatech/BOSSA

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