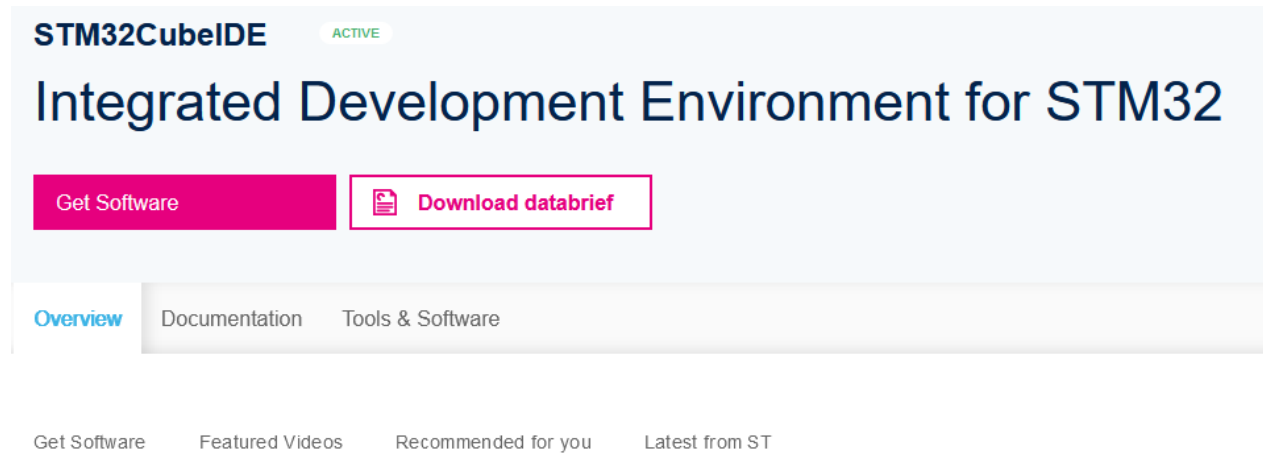


Getting Started STM32CubeIDE

Mit STM32F103RBT



Getting Started STM32CubeIDE mit STM32F103RBT



STM32CubeIDE is an all-in-one multi-OS development tool, which is part of the STM32Cube software ecosystem.



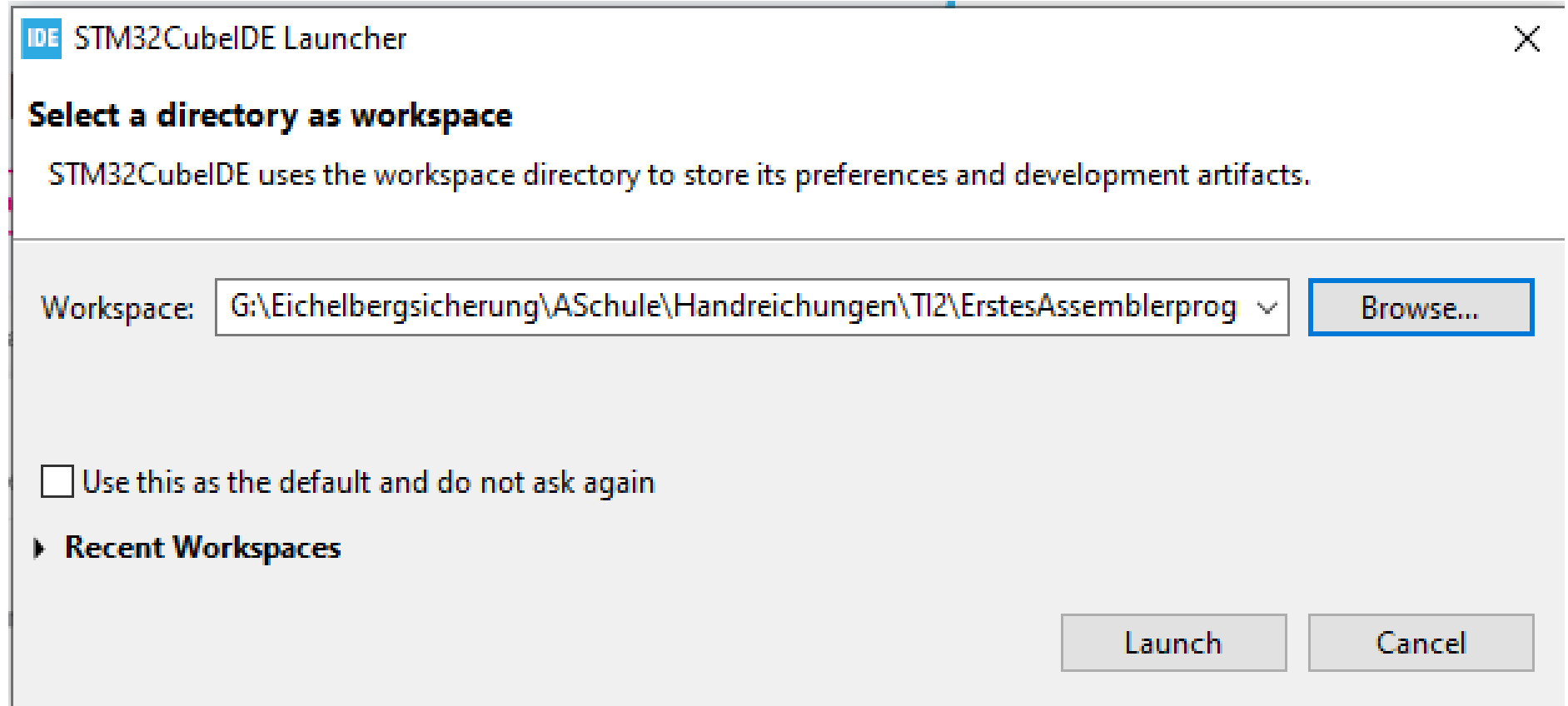
STM32CubeIDE is an advanced C/C++ development platform with peripheral configuration, code generation, code compilation, and debug features for STM32 microcontrollers and microprocessors. It is based on the Eclipse®/CDT framework and GCC toolchain for the development, and GDB for the debugging. It allows the integration of the hundreds of existing plugins that complete the features of the Eclipse® IDE. STM32CubeIDE integrates STM32 configuration and



Die Entwicklungsumgebung kann bei ST kostenlos heruntergeladen werden



Getting Started STM32CubeIDE mit STM32F103RBT

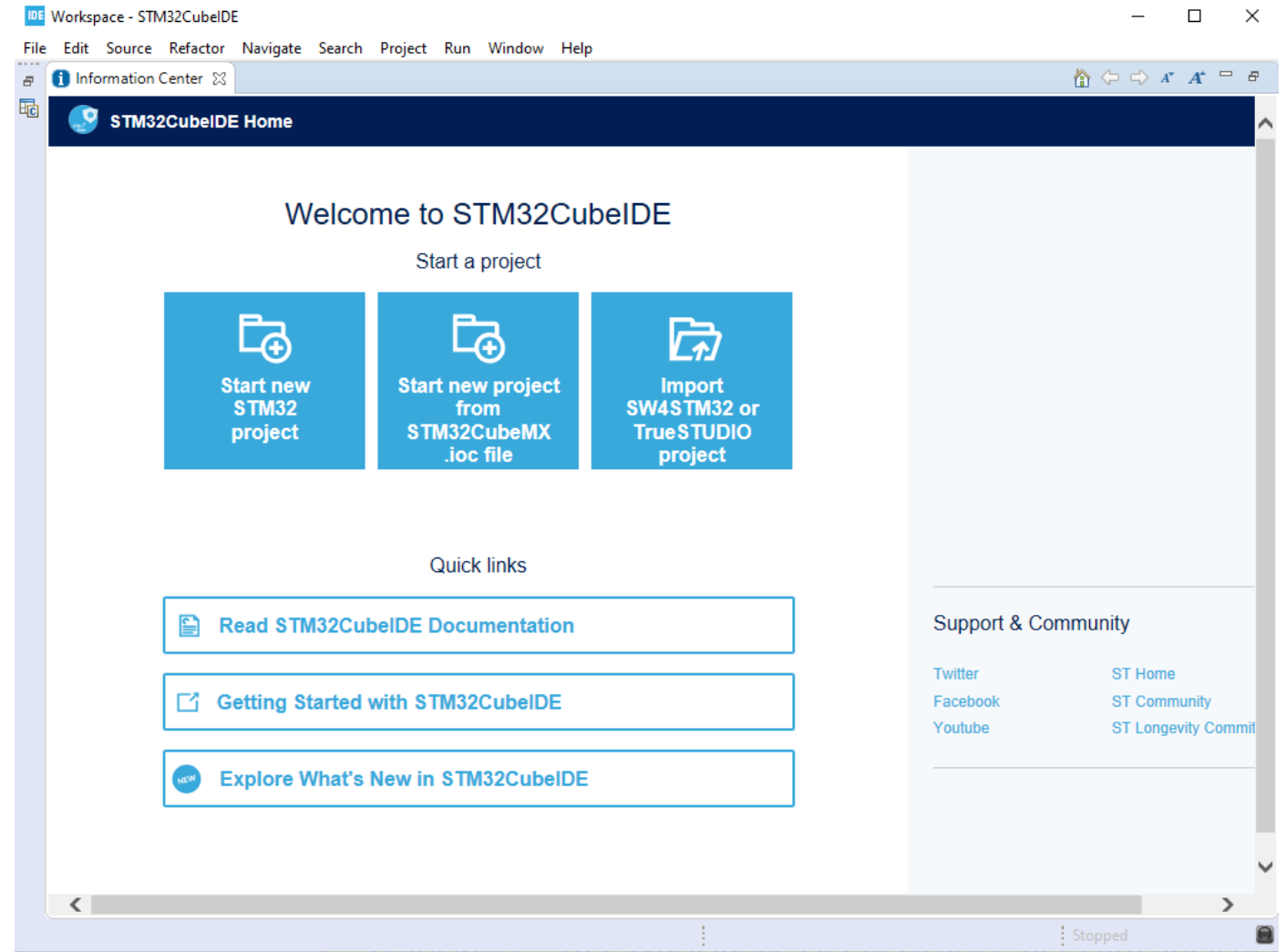


Nach der Installation fragt die Entwicklungsumgebung nach einem „Workspace“. Der Workspace ist ein Ordner, der zum Speichern der Projekte verwendet wird. Mit „Browse...“ kann ein gewünschter Ordner erstellt und angegeben werden. Dann Launch ...



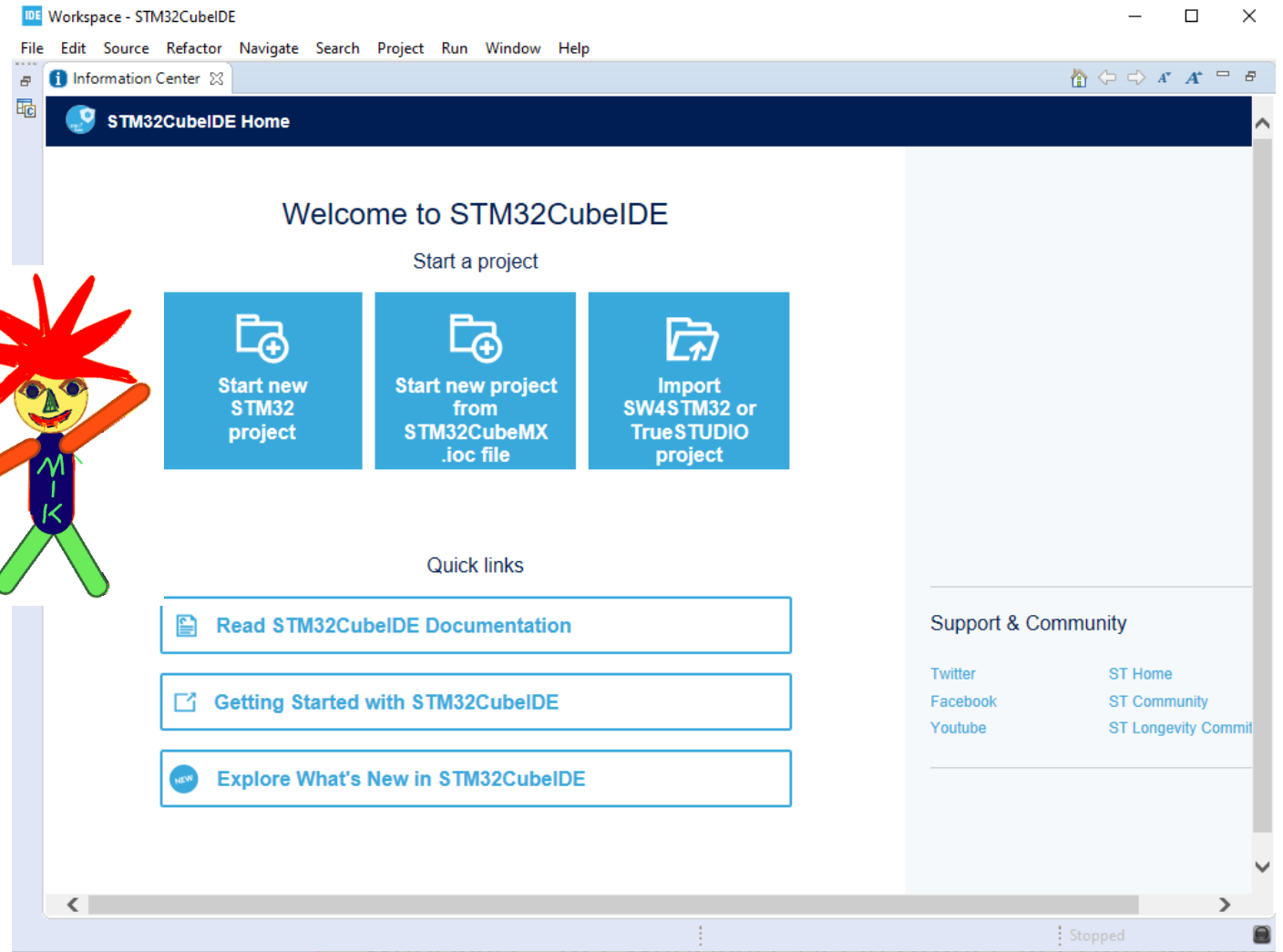
Getting Started STM32CubeIDE mit STM32F103RBT

Wer weitere
Informationen
braucht klickt auf die
Quick-Links

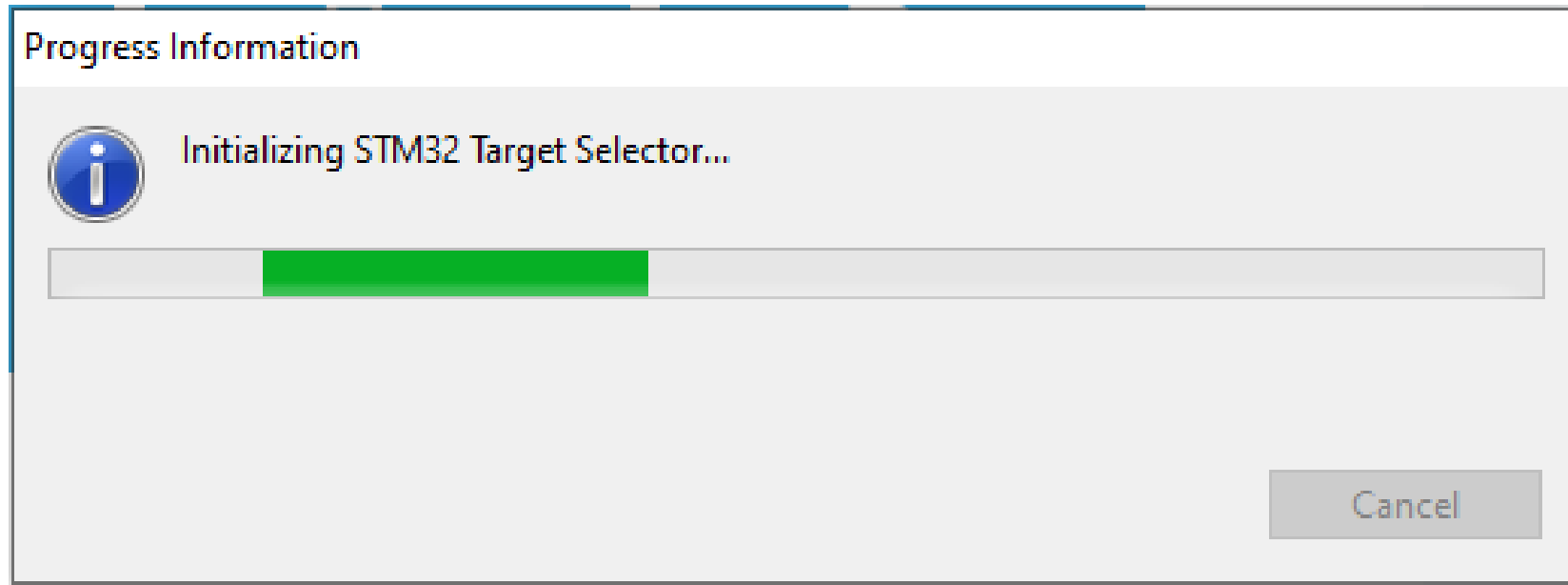


Getting Started STM32CubeIDE mit STM32F103RBT

Wir starten ein neues
STM32 Projekt




Getting Started STM32CubeIDE mit STM32F103RBT



Der Target Selector
wird initialisiert
Das dauert etwas.



Getting Started STM32CubeIDE mit STM32F103RBT



Board Selector | Cross Selector


Core
Series
Line
Package
Other

Price: 0.0 to 9.54
IO: 11 to 176
Eeprom: 0 to 16384 (Bytes)
Flash: 0 to 2048 (kBytes)
Ram: 0 to 1184 (kBytes)
Freq.: 24 to 800 (MHz)

Peripheral
ADC 12-bit: 0 to 42
ADC 16-bit: 0 to 36

IDE

Features | Block Diagram | Docs & Resources | Datasheet | Buy



ST MCU Finder
All STM32 & STM8 MCUs in one place

MCUs/MPUs List: 1698 items | Display similar items | Export

	Part No	Reference	Marketing Status	Unit Price for 10kU (US\$)	Board	Package	Flash	RAM	ID	Freq.
☆	STM32F030C6	STM32F030C6Tx	Active	0.597		LQFP48	32 kBytes	4 kBytes	39	48 MHz
☆	STM32F030C8	STM32F030C8Tx	Active	0.722		LQFP48	64 kBytes	8 kBytes	39	48 MHz
☆	STM32F030CC	STM32F030CCTx	Active	1.1		LQFP48	256 kBytes	32 kBytes	37	48 MHz
☆	STM32F030F4	STM32F030F4Px	Active	0.424		TSSOP20	16 kBytes	4 kBytes	15	48 MHz
☆	STM32F030K6	STM32F030K6Tx	Active	0.518		LQFP32	32 kBytes	4 kBytes	25	48 MHz
☆	STM32F030R8	STM32F030R8Tx	Active	0.754	N... 32	LQFP64	64 kBytes	8 kBytes	55	48 MHz
☆	STM32F030RC	STM32F030RCTx	Active	1.21		LQFP64	256 kBytes	32 kBytes	51	48 MHz
☆	STM32F031C4	STM32F031C4Tx	Active	0.97		LQFP48	16 kBytes	4 kBytes	39	48 MHz
☆	STM32F031C6	STM32F031C6Tx	Active	1.013		LQFP48	32 kBytes	4 kBytes	39	48 MHz
☆	STM32F031E6	STM32F031E6Yx	Active	0.776		WLCSP25	32 kBytes	4 kBytes	20	48 MHz
☆	STM32F031F4	STM32F031F4Px	Active	0.711		TSSOP20	16 kBytes	4 kBytes	15	48 MHz
☆	STM32F031F6	STM32F031F6Px	Active	0.755		TSSOP20	32 kBytes	4 kBytes	15	48 MHz
☆	STM32F031G4	STM32F031G4Ux	Active	0.733		UFQFPN28	16 kBytes	4 kBytes	23	48 MHz

Wir wählen: **Board Selector** für unser Board

Getting Started STM32CubeIDE mit STM32F103RBT

Wir geben die
Bezeichnung unseres
Boards:
NUCLEO-F103RB
ein



MCU/MPU Selector Board Selector Cross Selector

Board Filters

Part Number Search

NUCLEO-F103RB

Vendor

Type

MCU/MPU Series

Other

Price From 13.0 to 13.0

Oscillator Freq. = 0 (MHz)

Peripheral

Accelerometer	0	0
Analog I/O	0	0
Arduino Form Factor	0	0
Audio Line In	0	0

Features Large Picture

Boards List: 1 item

*	Overview	Part No
☆		NUCLEO-F103RB



Getting Started STM32CubeIDE mit STM32F103RBT

In der Board List ist nur
noch unser Board
aufgeführt

MCU/MPU Selector Board Selector Cross Selector

Board Filters

★ [Icons]

Part Number Search

🔍 NUCLEO-F103RB

Vendor >

Type >

MCU/MPU Series >

Other

Price From 13.0 to 13.0
13.0

Oscillator Freq. = 0 (MHz)

Peripheral

- ⊗ Accelerometer
- ⊗ Analog I/O
- ⊗ Arduino Form Factor
- ⊗ Audio Line In

Features Large Picture

★ [Image]

Boards List: 1 item



*	Overview	Part No
★		NUCLEO-F103RB

MIK

[Speaker Icon]

Getting Started STM32CubeIDE mit STM32F103RBT

Boards List: 1 item

*	Overview	Part No	Type	Marketing Status	Unit Price (US
		NUCLEO-F103RB	Nucleo64	Active	13.0

Back Next >

Markieren und auf
Next klicken



Getting Started STM32CubeIDE mit STM32F103RBT

Projektname angeben



IDE STM32 Project

Setup STM32 project

Project

Project Name:

☒ Use default location

Location:

Options

Targeted Language

☒ C ☐ C++

Targeted Binary Type

☒ Executable ☐ Static Library

Targeted Project Type

☒ STM32Cube ☐ Empty



Getting Started STM32CubeIDE mit STM32F103RBT

Target Language: C
(geht auch mit
Assembler)



STM32 Project

Setup STM32 project

Project

Project Name:

☒ Use default location

Location:

Options

Targeted Language
☒ C ☐ C++

Targeted Binary Type
☒ Executable ☐ Static Library

Targeted Project Type
☒ STM32Cube ☐ Empty



Getting Started STM32CubeIDE mit STM32F103RBT

Binary Type:
Executable



STM32 Project

Setup STM32 project

Project

Project Name:

☒ Use default location

Location:

Options

Targeted Language

☒ C ☐ C++

Targeted Binary Type

☒ Executable ☐ Static Library

Targeted Project Type

☒ STM32Cube ☐ Empty



Getting Started STM32CubeIDE mit STM32F103RBT

Target Project Type:
STM32Cube



STM32 Project

Setup STM32 project

Project

Project Name:

☒ Use default location

Location:

Options

Targeted Language

☒ C ☐ C++

Targeted Binary Type

☒ Executable ☐ Static Library

Targeted Project Type

☒ STM32Cube ☐ Empty



Getting Started STM32CubeIDE mit STM32F103RBT

STM32 Project

Setup STM32 project

Project

Project Name:

☒ Use default location

Location:

Options

Targeted Language

☒ C ☐ C++

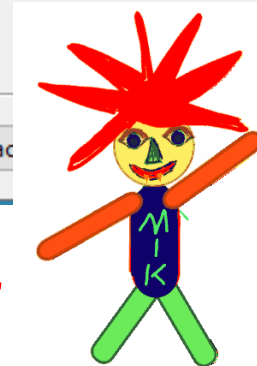
Targeted Binary Type

☒ Executable ☐ Static Library

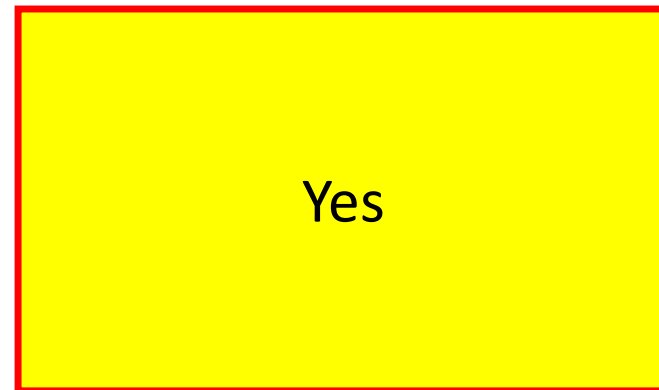
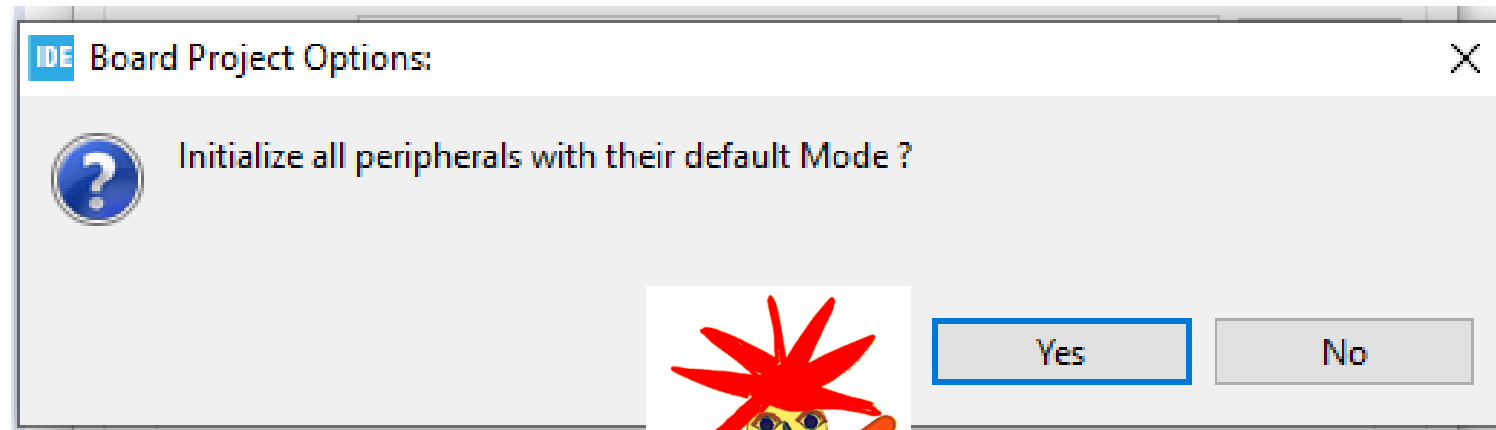
Targeted Project Type

☒ STM32Cube ☐ Empty

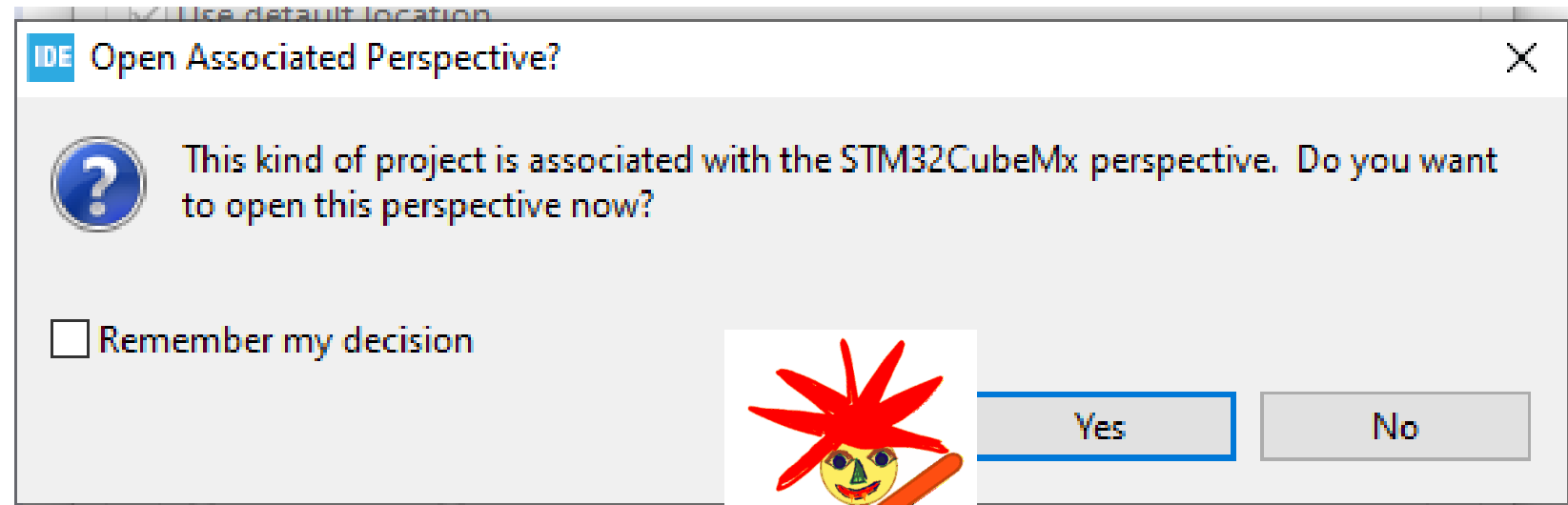
Finish anklicken



Getting Started STM32CubeIDE mit STM32F103RBT



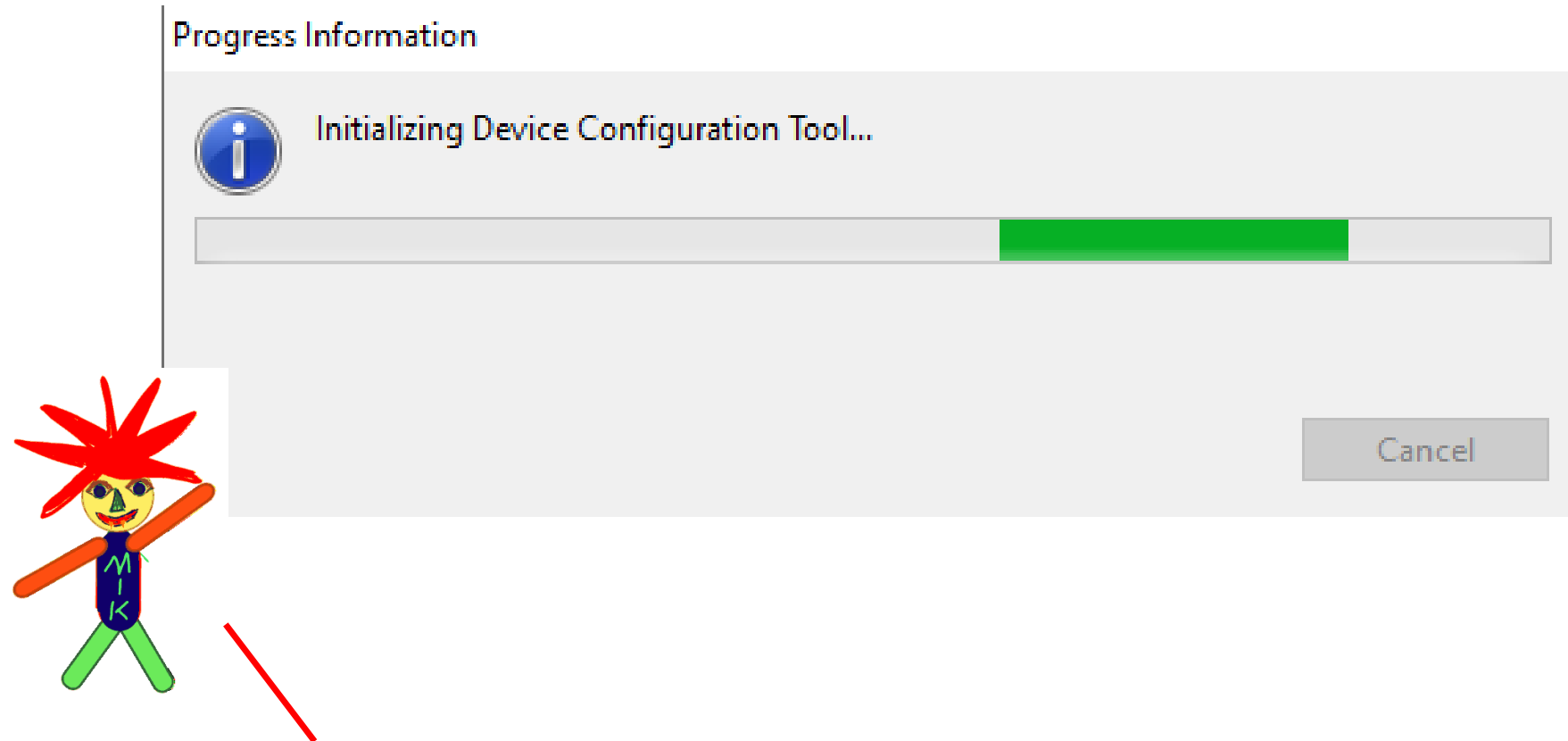
Getting Started STM32CubeIDE mit STM32F103RBT



Yes
Ansicht zur
Konfiguration des
Mikrocontrollers



Getting Started STM32CubeIDE mit STM32F103RBT



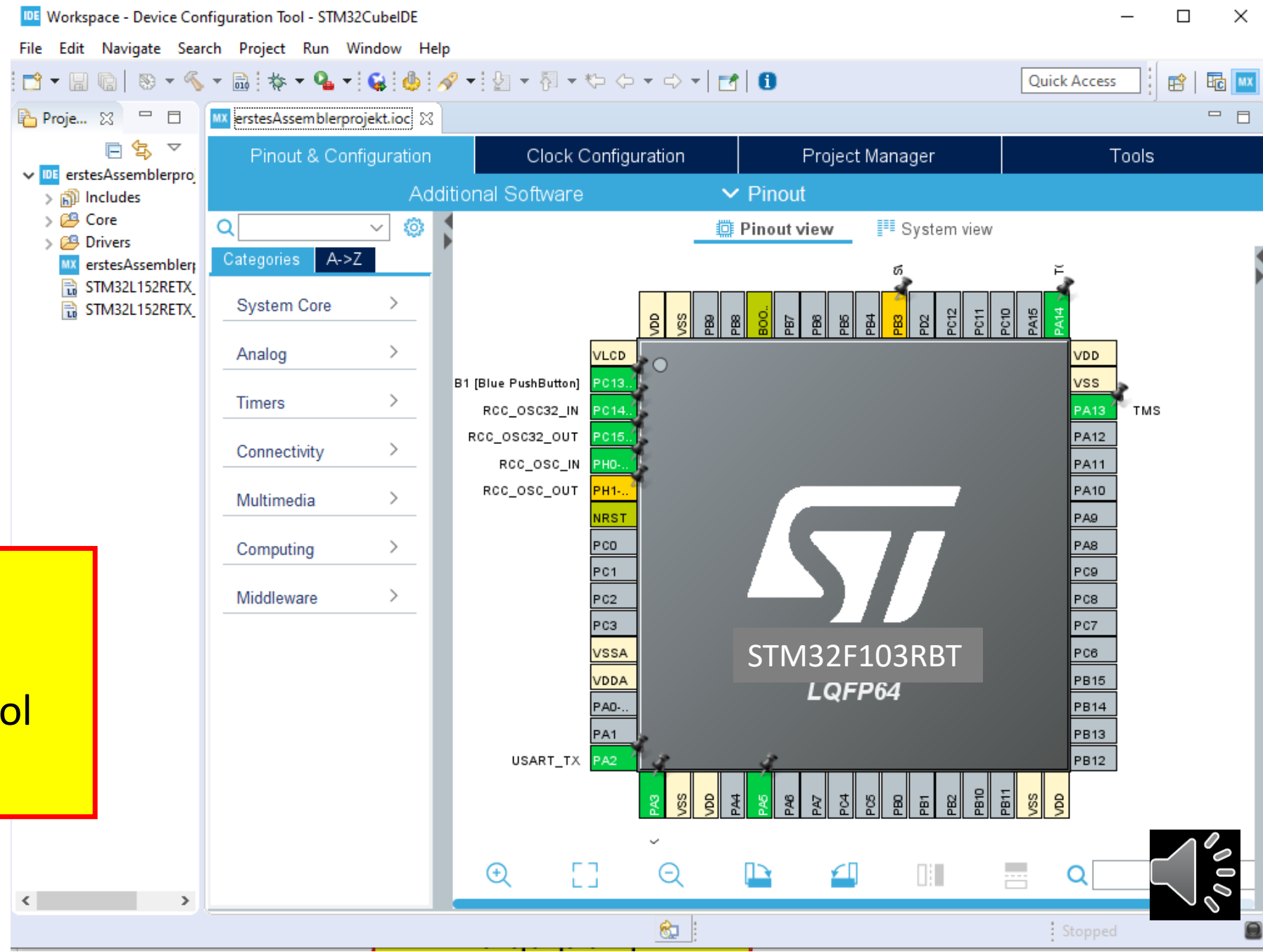
Das Device
Configuration Tool wird
initialisiert



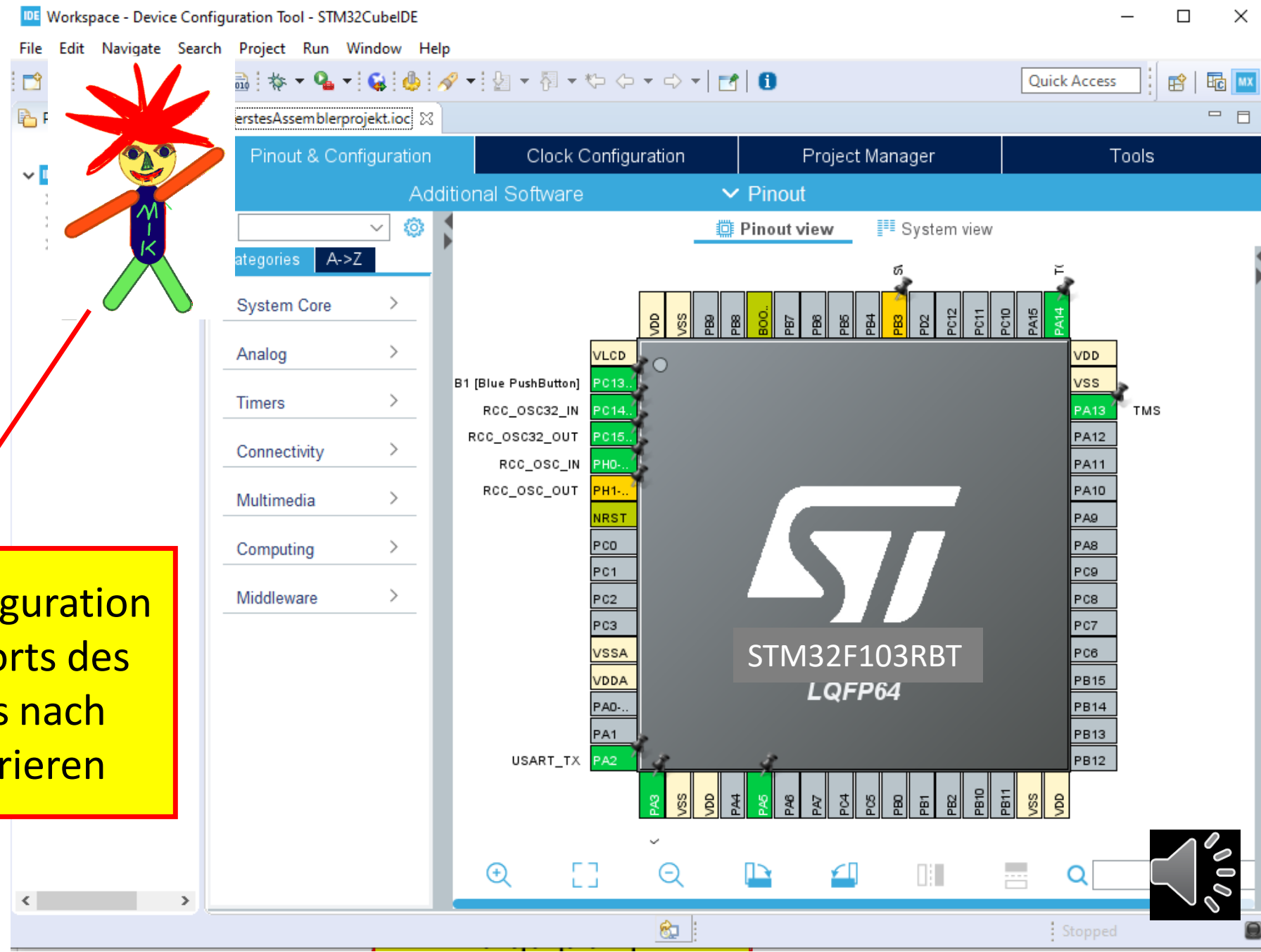
Getting Started STM32CubeIDE mit STM32F103RBT



Das Device
Configuration Tool

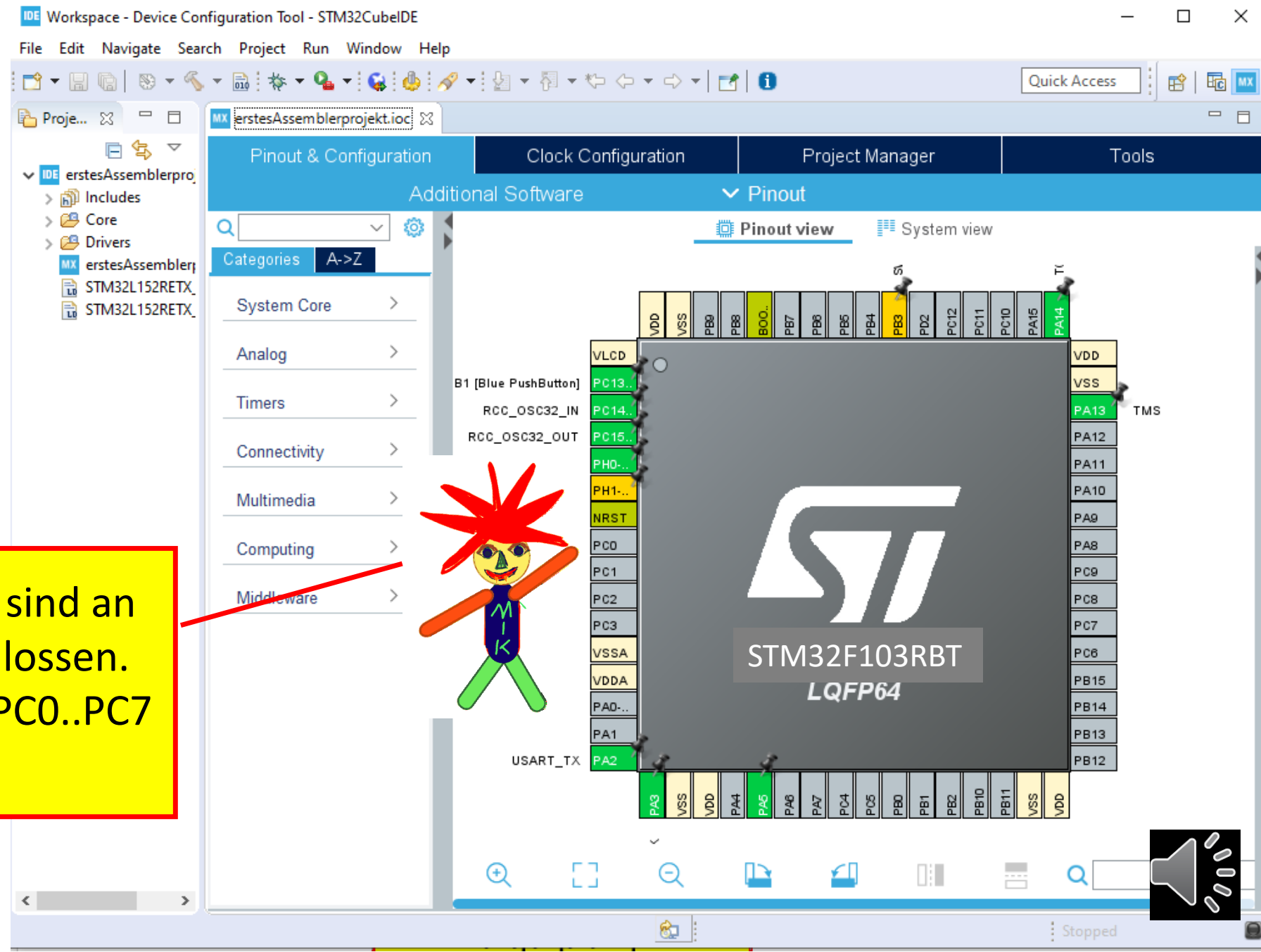


Getting Started STM32CubeIDE mit STM32F103RBT



Mit Pinout & Configuration
können wir die Ports des
Mikrokontrollers nach
Wunsch konfigurieren

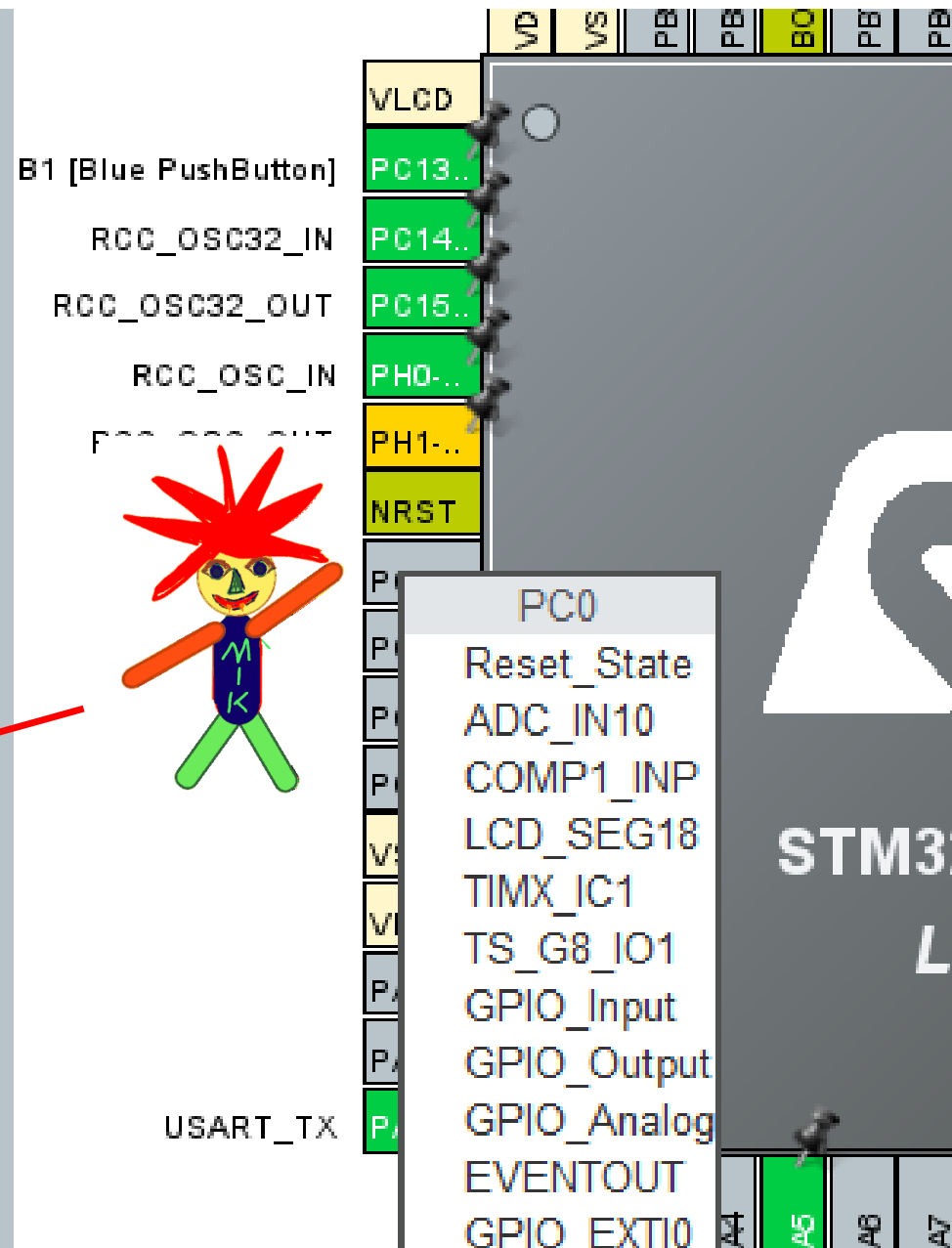
Getting Started STM32CubeIDE mit STM32F103RBT



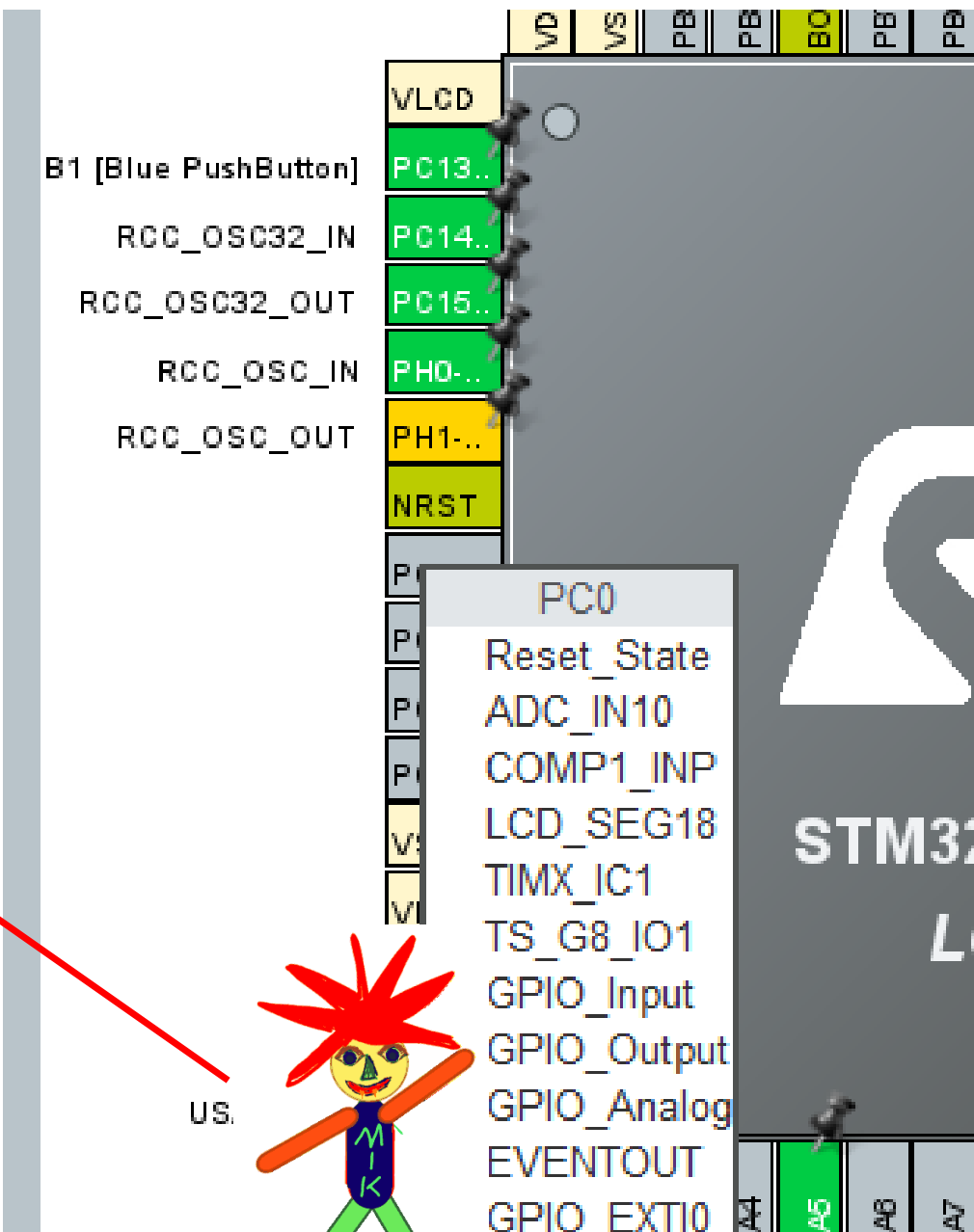
Die Leuchtdioden sind an
PC0..PC7 angeschlossen.
Wir konfigurieren PC0..PC7
als Output

Getting Started STM32CubeIDE mit STM32F103RBT

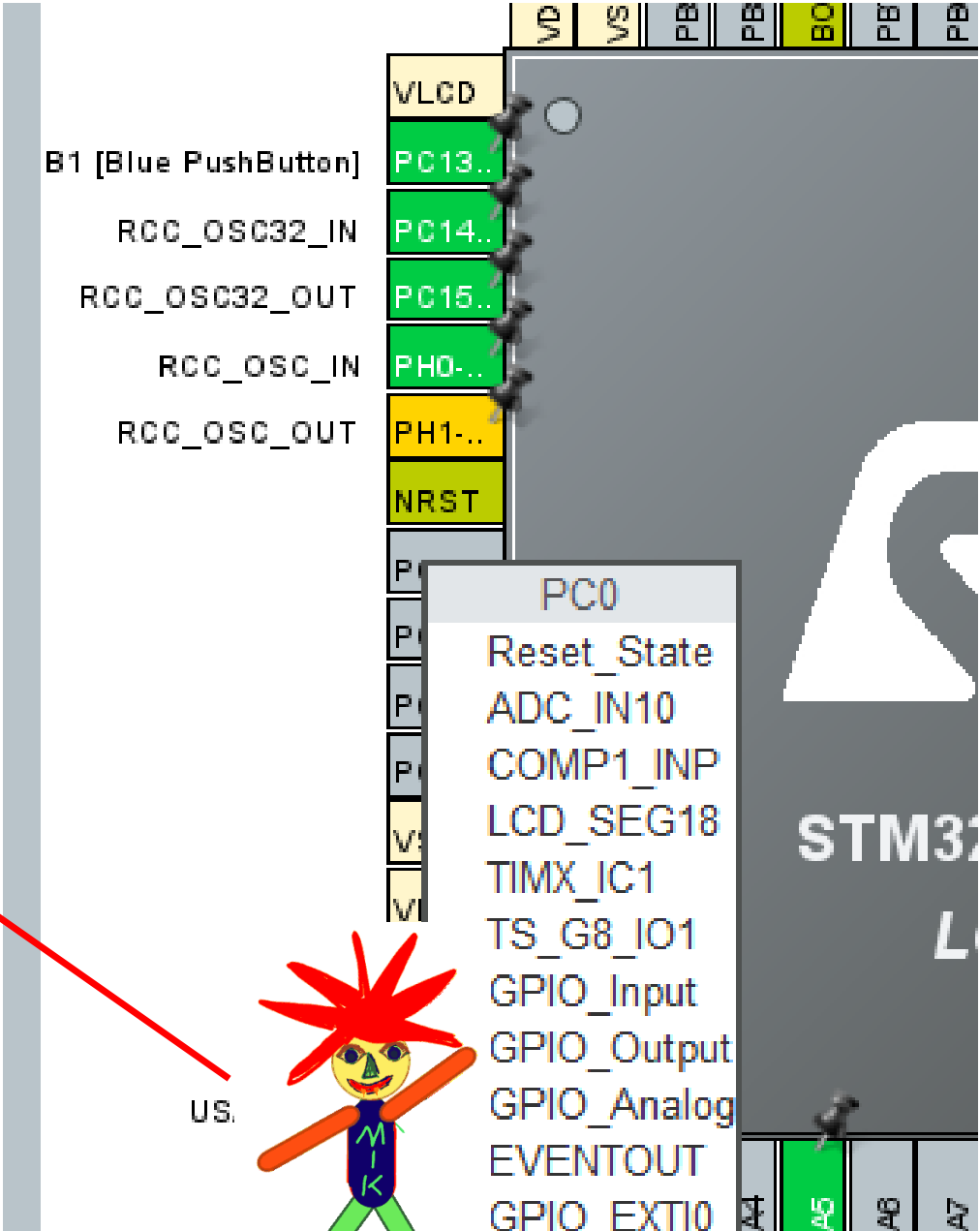
Das Anschlussbeinchen PC0 anklicken und ...



GPIO_Output auswählen



Ebenso mit PC1 .. PC7



Getting Started STM32CubeIDE mit STM32F103RBT

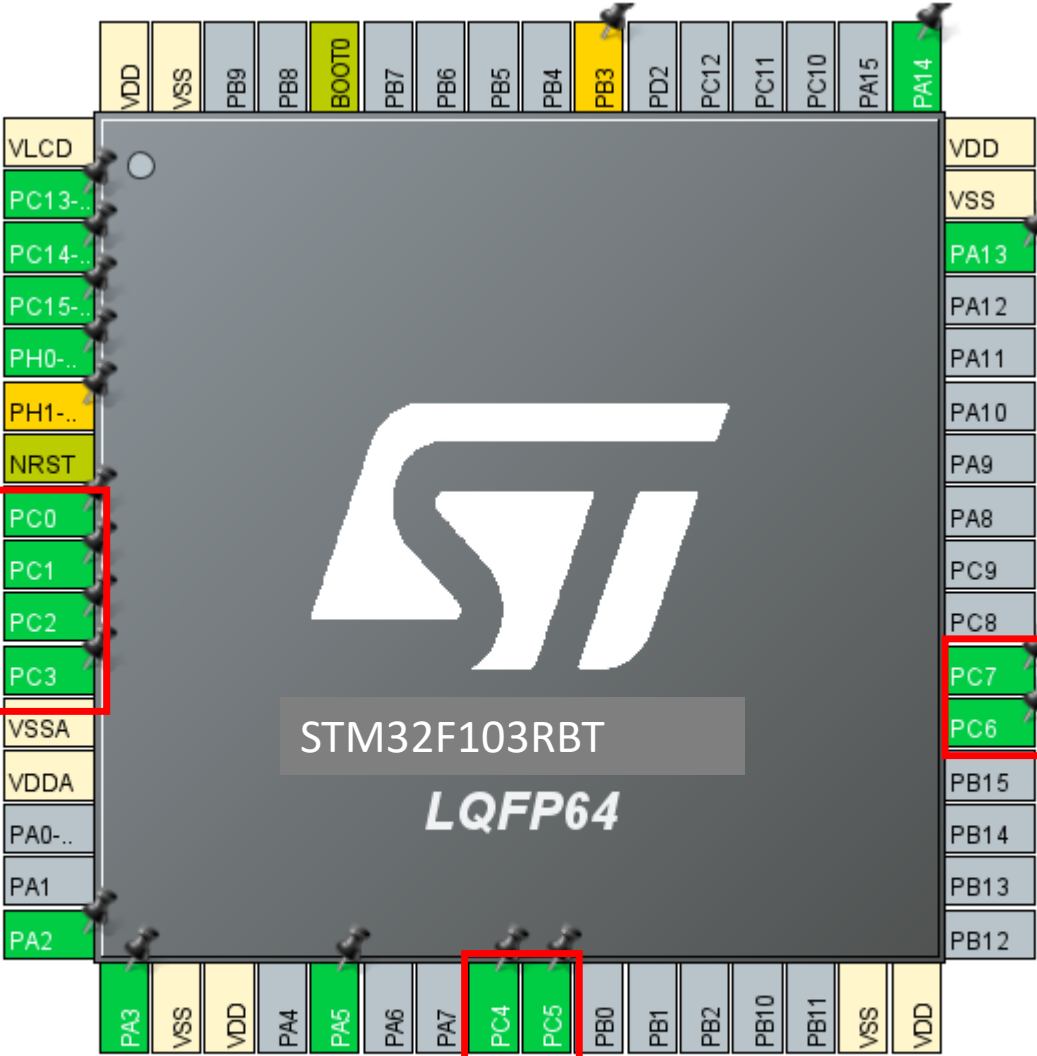
Hier



B1 [Blue PushButton]
RCC_OSC32_IN
RCC_OSC32_OUT
RCC_OSC_IN
RCC_OSC_OUT

GPIO_Output PC0
GPIO_Output PC1
GPIO_Output PC2
GPIO_Output PC3

USART_TX

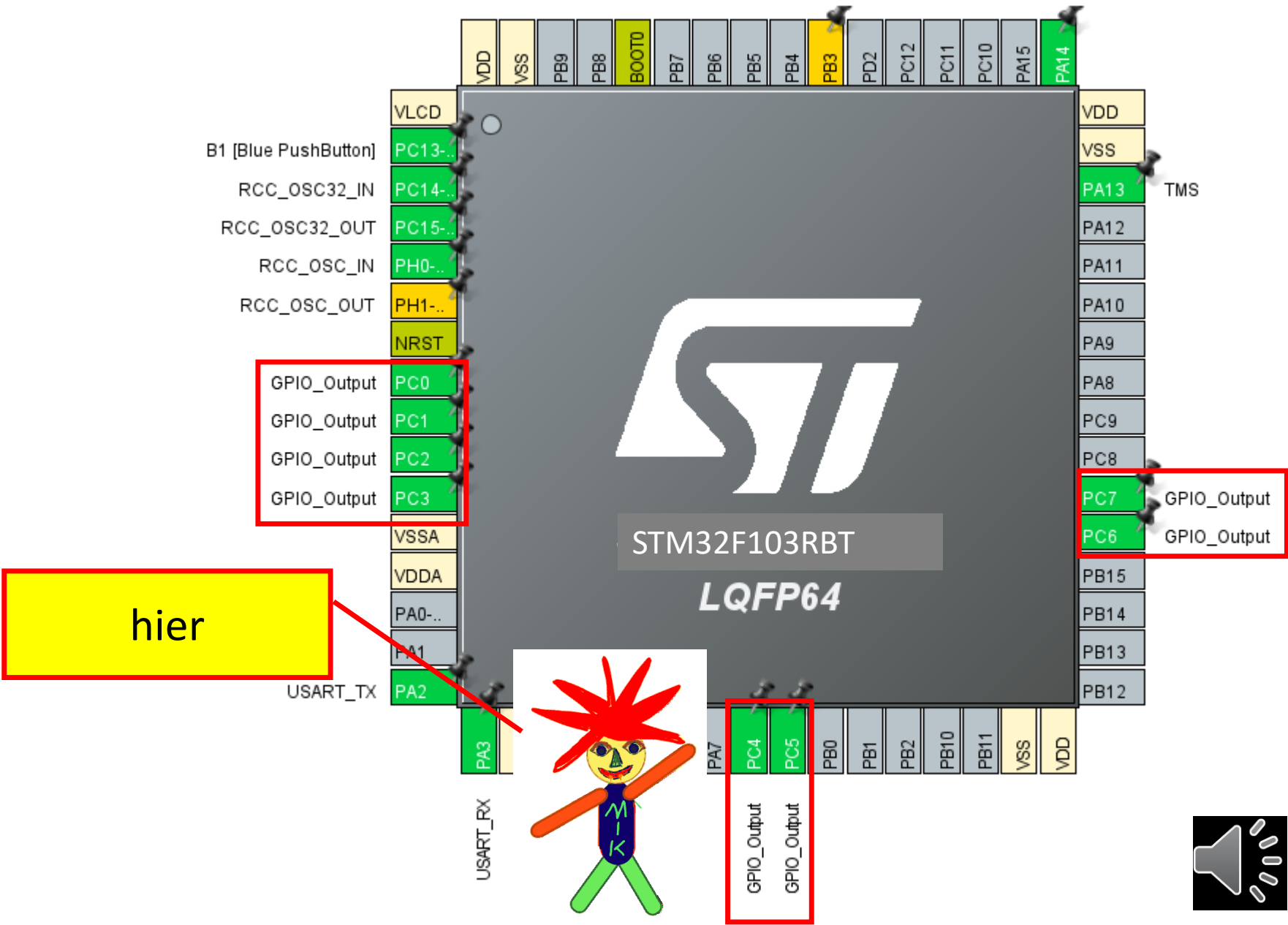


GPIO_Output PC7
GPIO_Output PC6

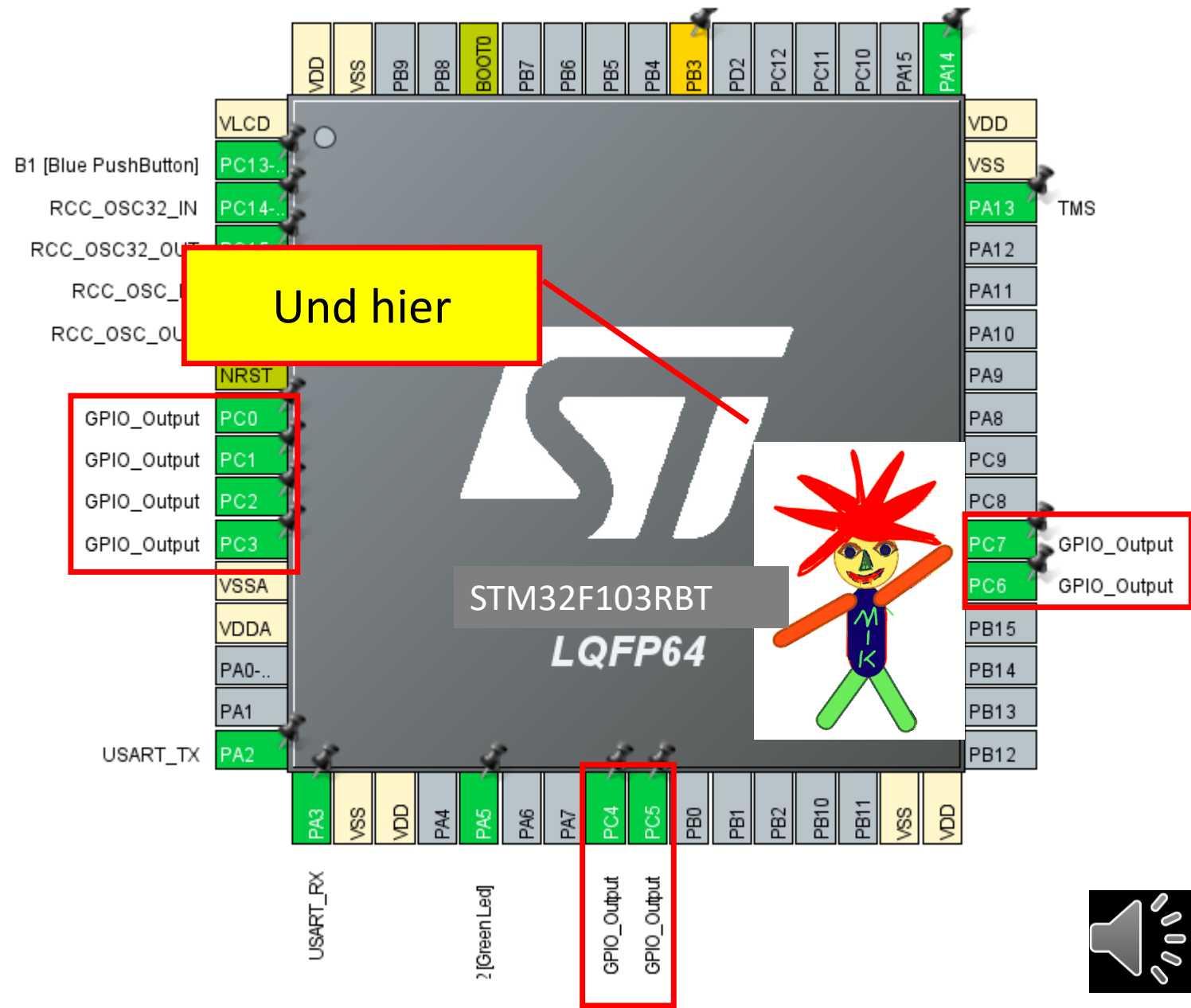
GPIO_Output PC4
GPIO_Output PC5



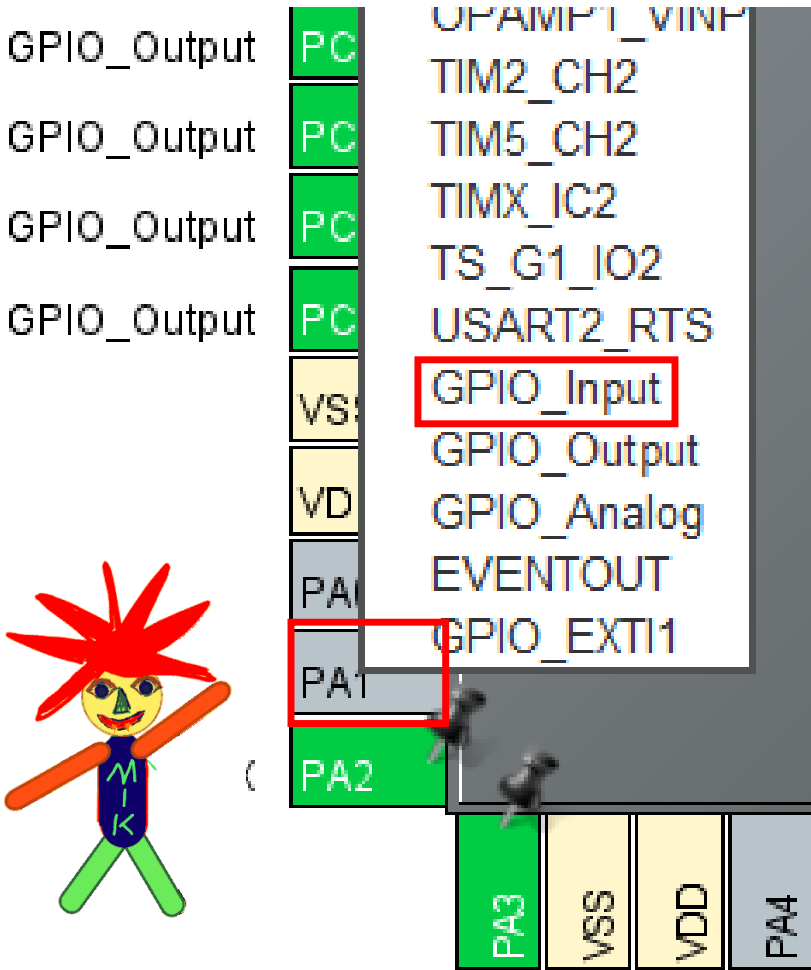
Getting Started STM32CubeIDE mit STM32F103RBT



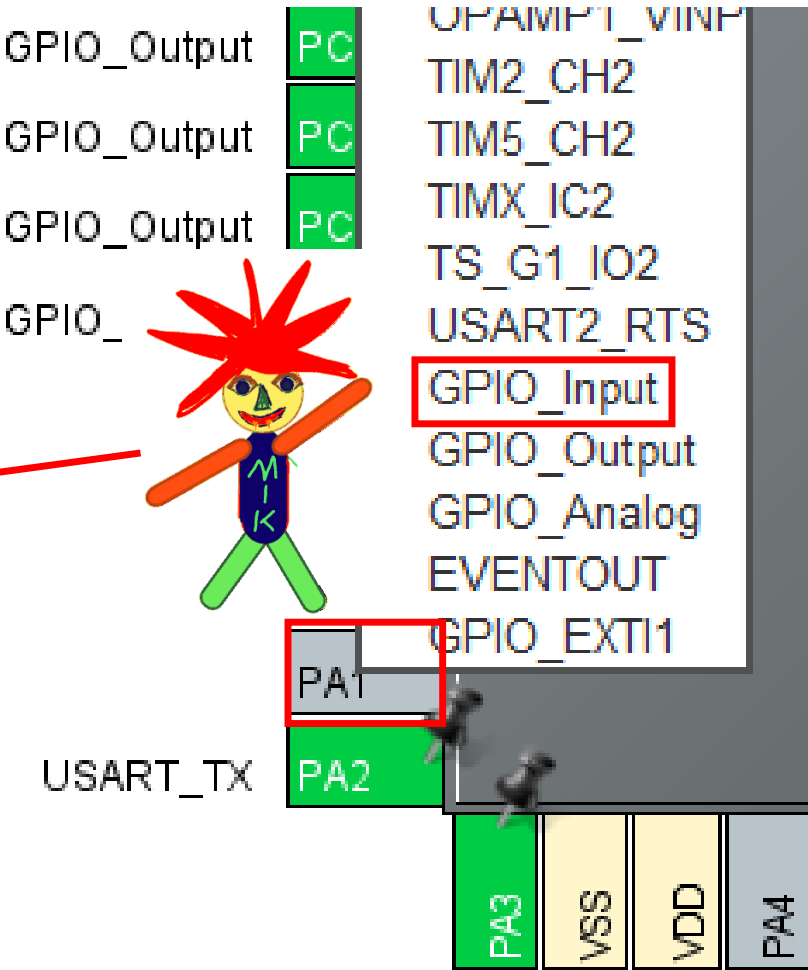
Getting Started STM32CubeIDE mit STM32F103RBT



Tasten sind an
PA1, PA6 und PA10
angeschlossen

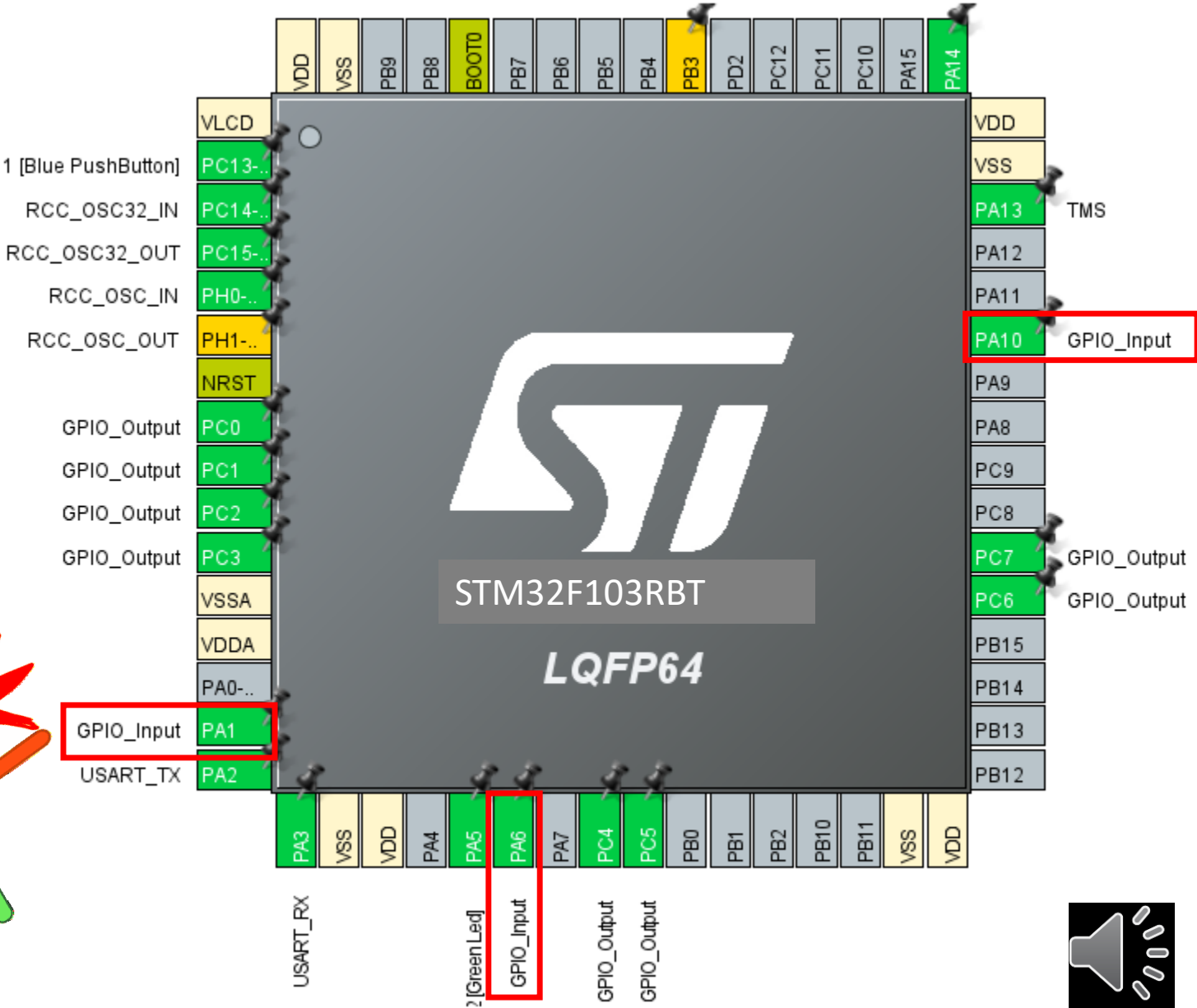


Alle als GPIO_Input
einstellen
(Eingabetaster)

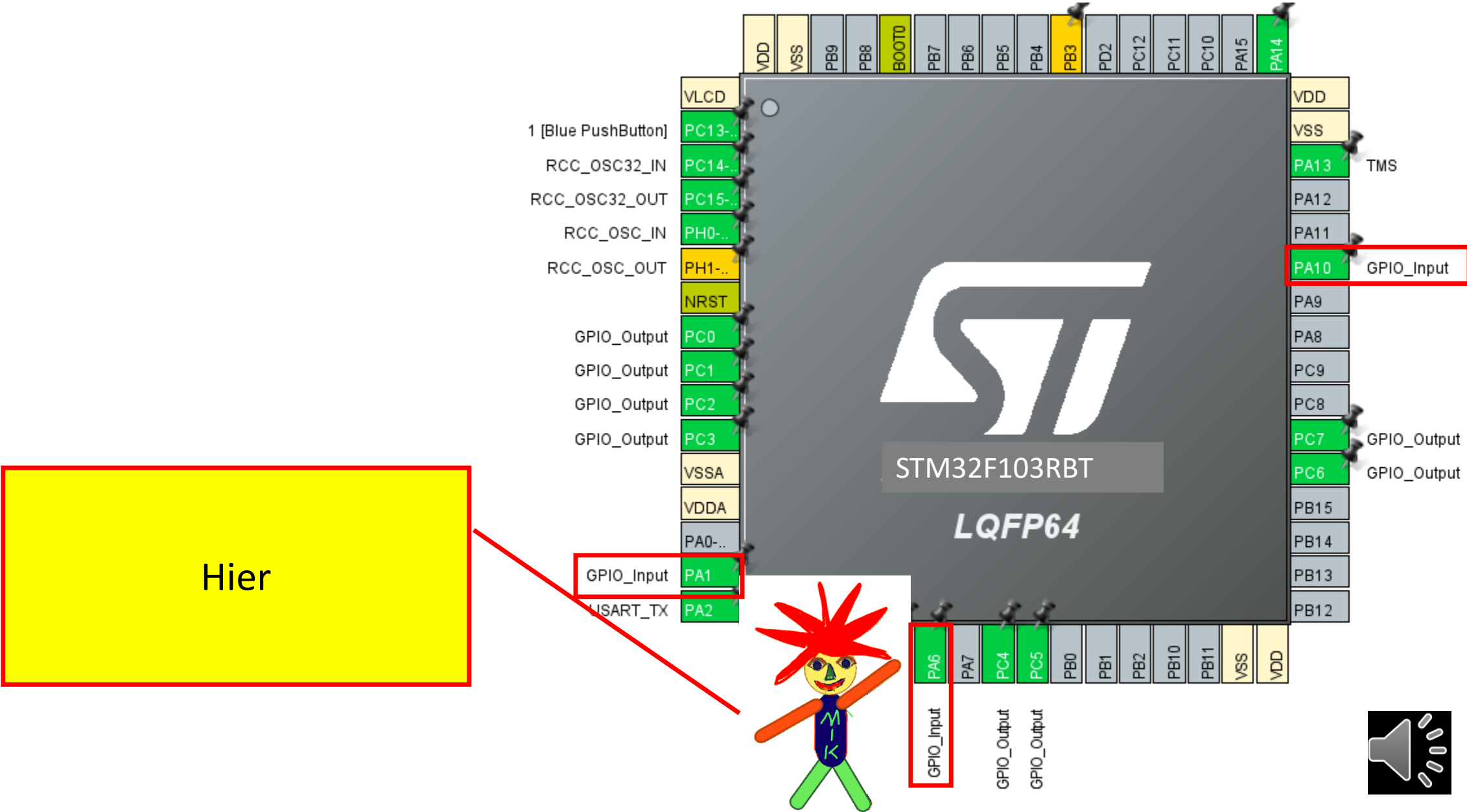


Getting Started STM32CubeIDE mit STM32F103RBT

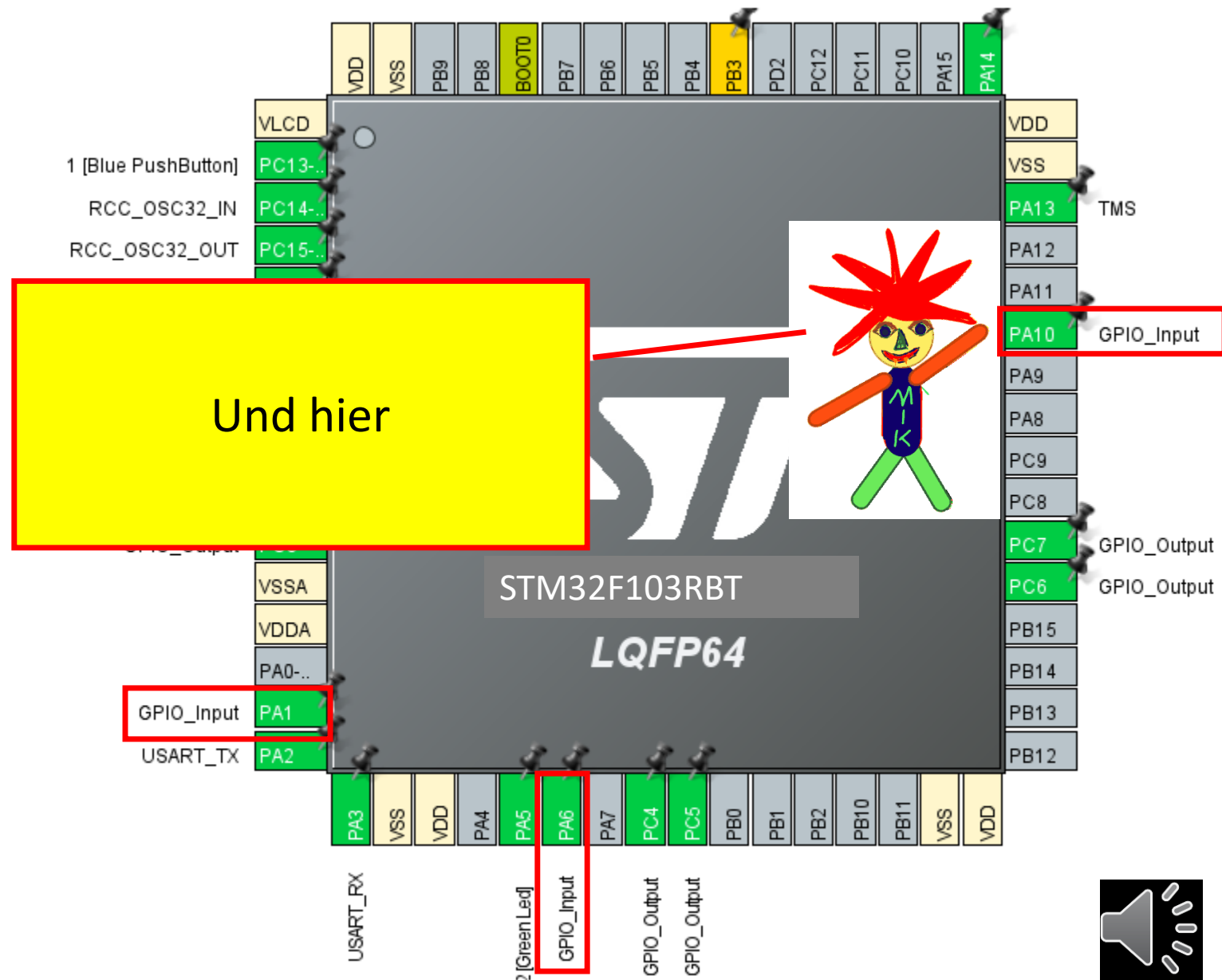
Hier



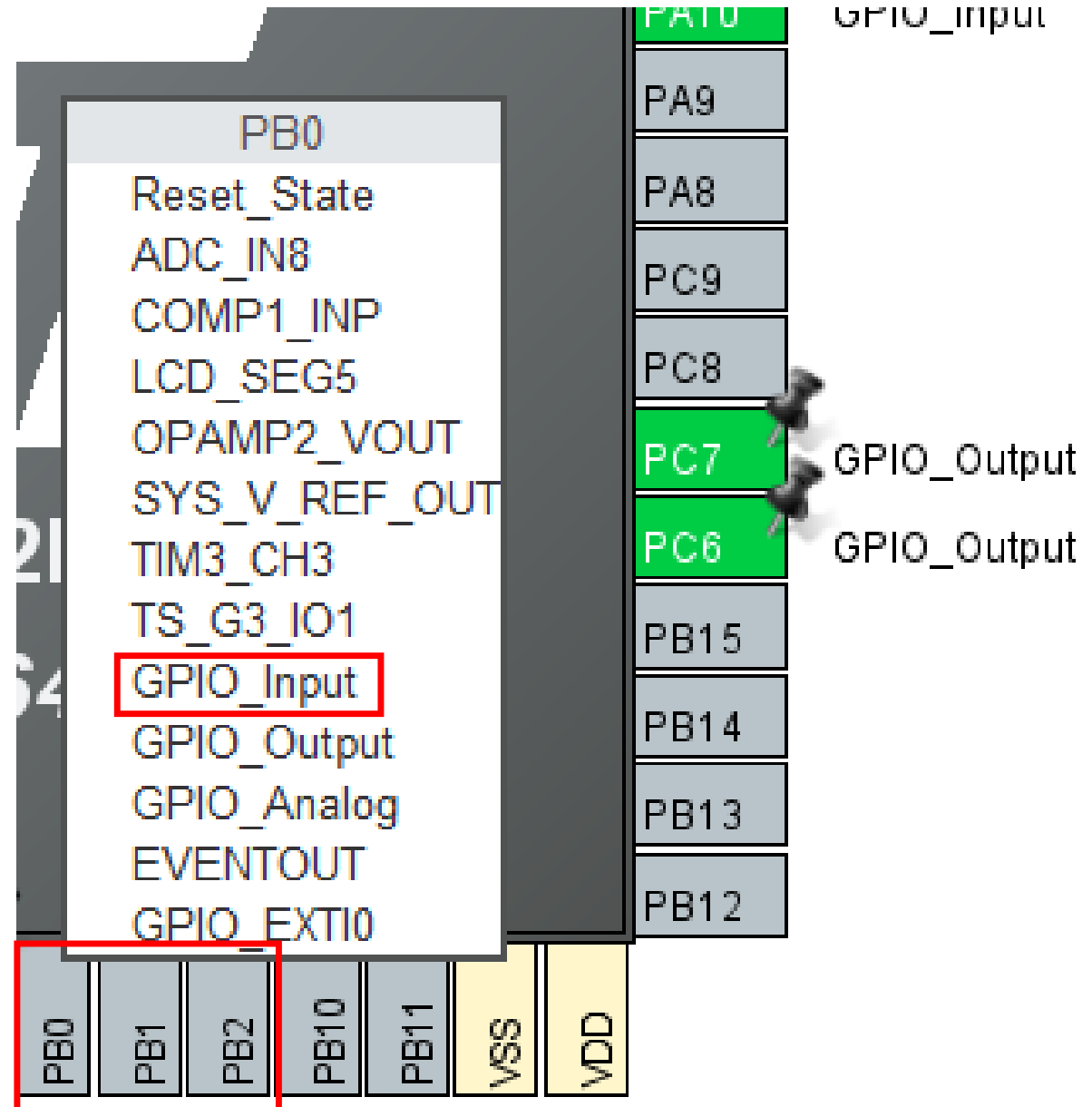
Getting Started STM32CubeIDE mit STM32F103RBT



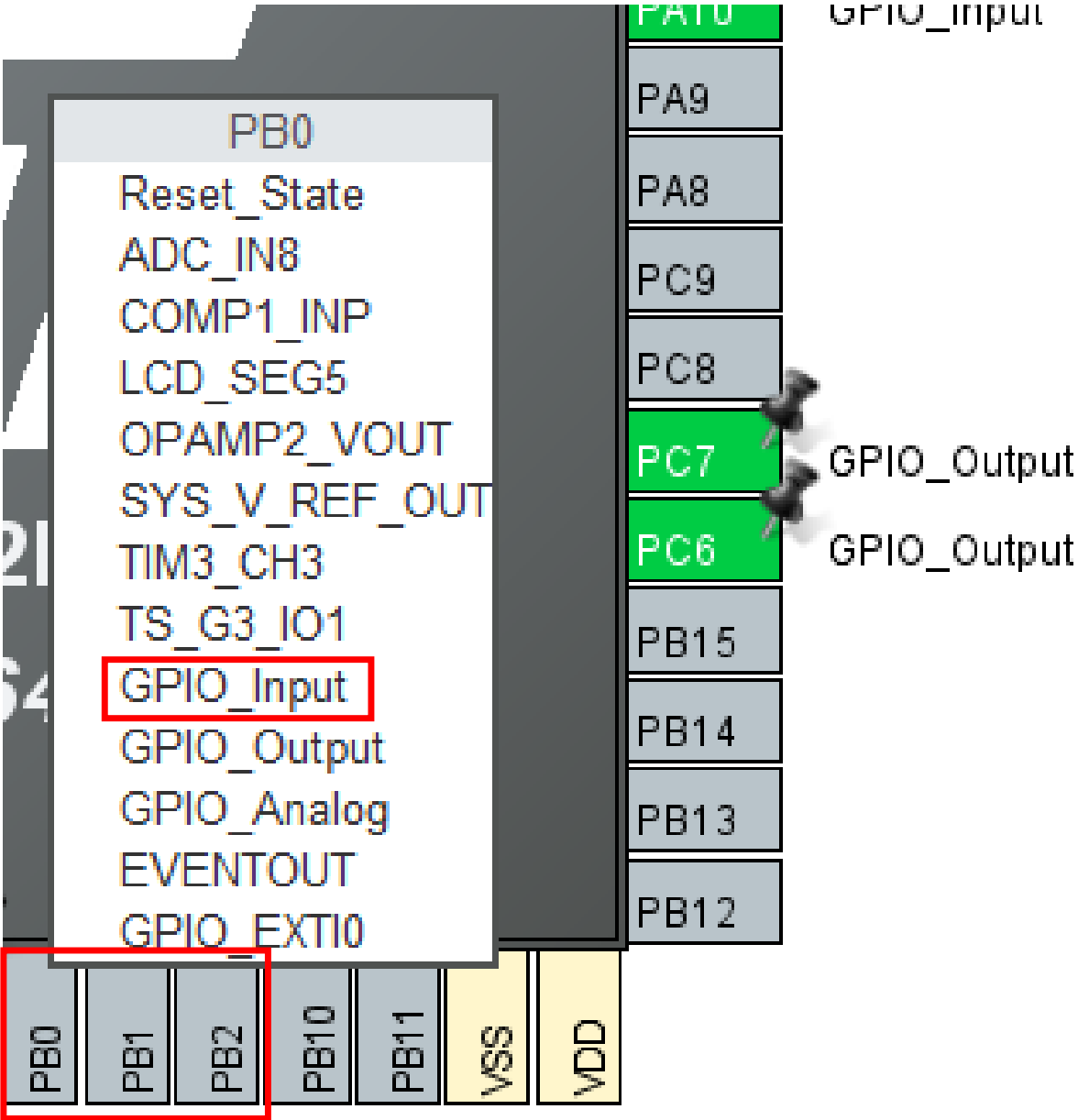
Getting Started STM32CubeIDE mit STM32F103RBT



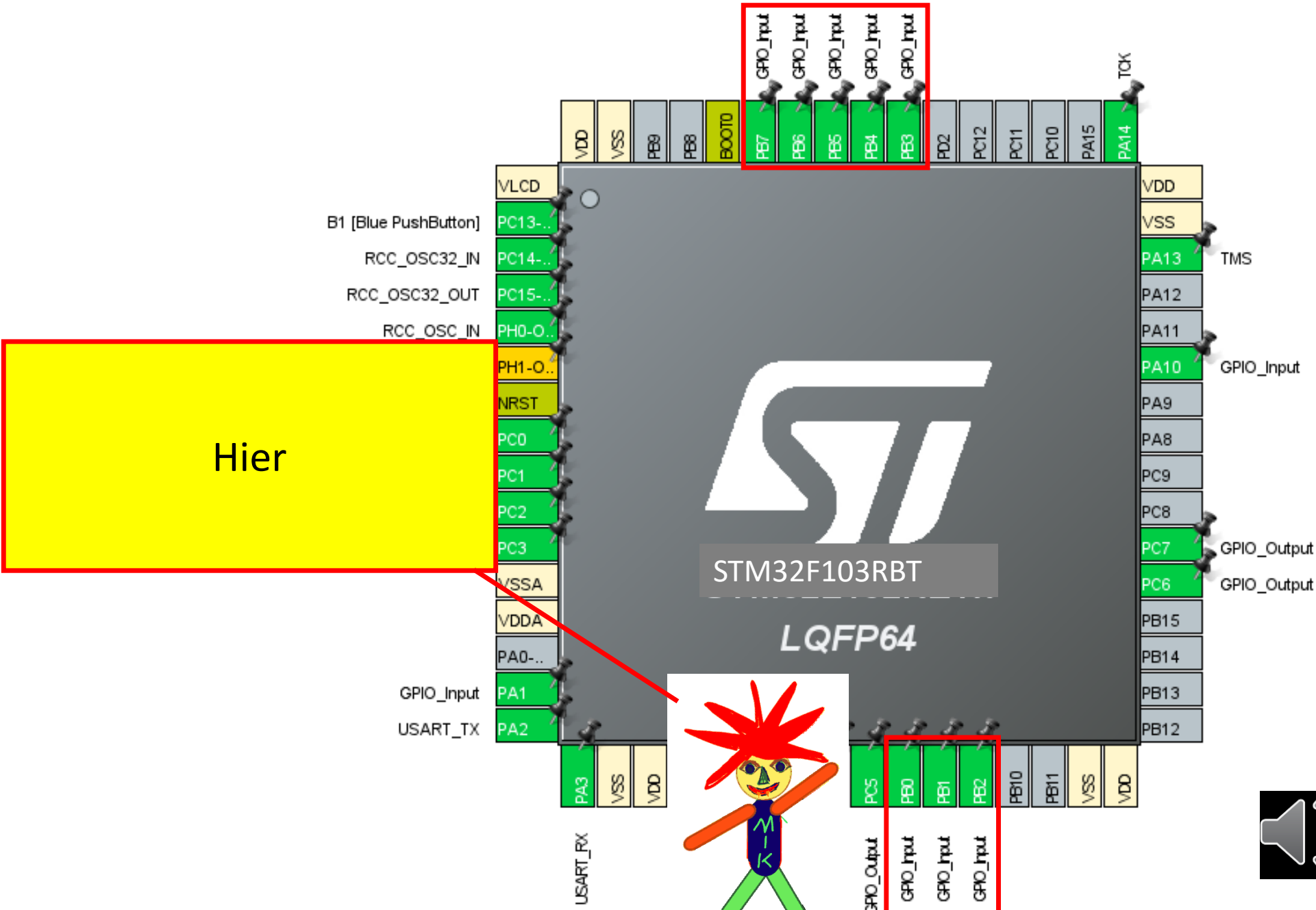
Die Eingabeschalterchen
sind an PB0..PB7
angeschlossen



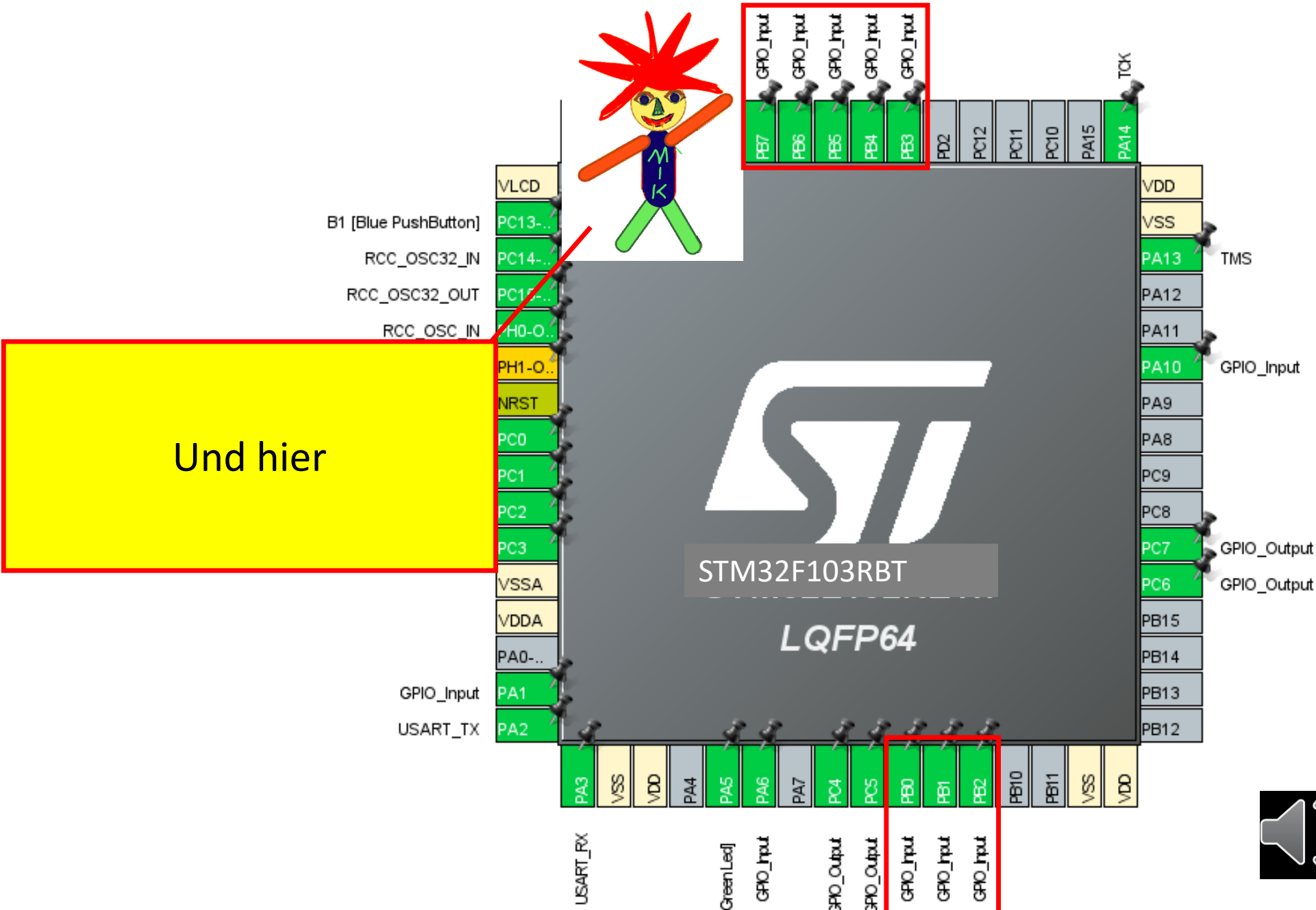
Alle als GPIO_Input konfigurieren



Getting Started STM32CubeIDE mit STM32F103RBT



Getting Started STM32CubeIDE mit STM32F103RBT

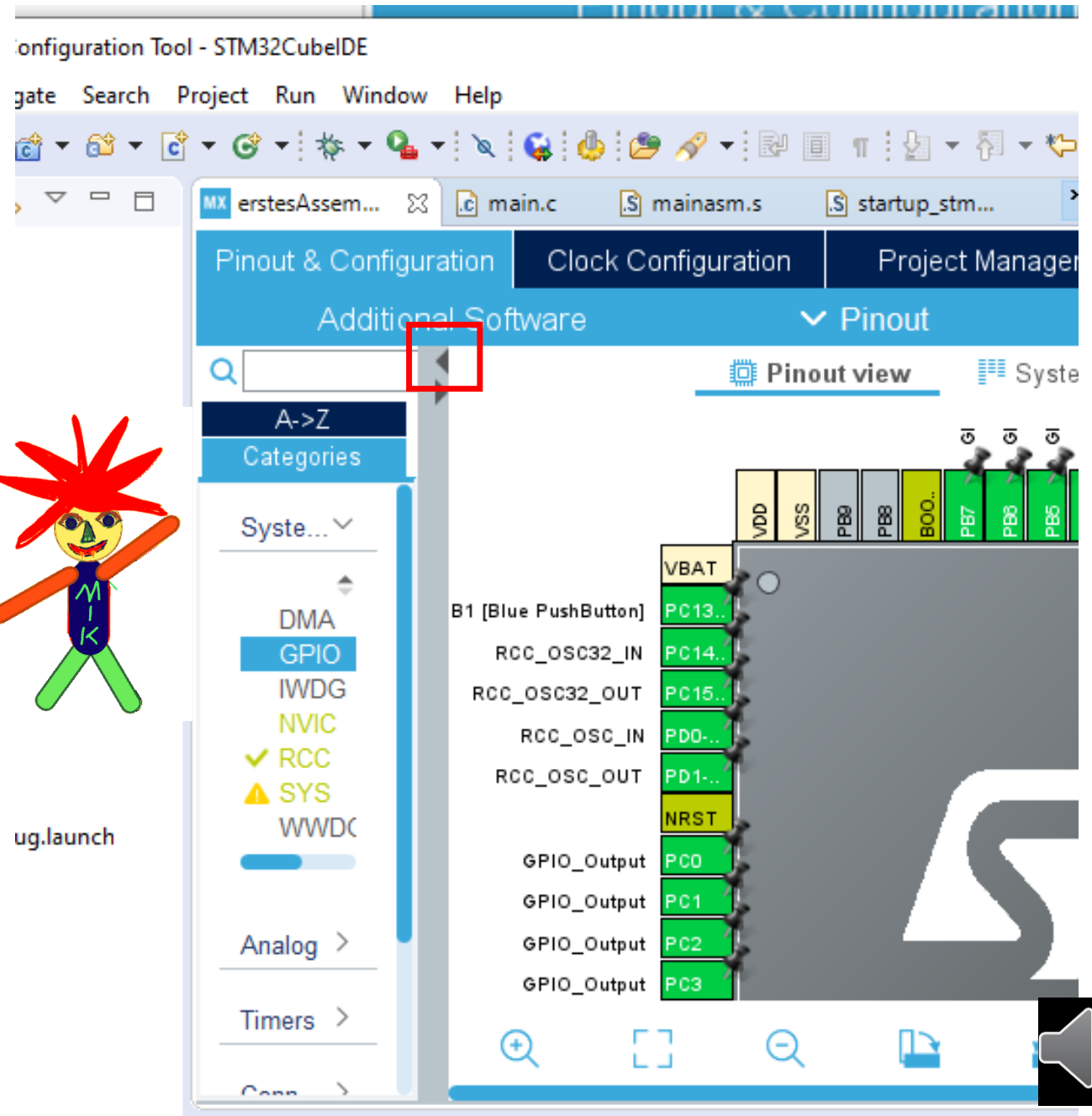


Getting Started STM32CubeIDE mit STM32F103RBT

System -> GPIO
auswählen



ug.launch



Pinout & Configuration

Clock Configur

Additional Software

Categories

A->Z

Timers

Connectivity

Multimedia

B1 [Blue PushButton]

RCC_OSC32_IN

RCC_OSC32_OUT

RCC_OSC_IN

RCC_OSC_OUT

VLCD

PC13-..

PC14-..

PC15-..

PH0-O..


PH1-O..

VDD

VSS

PG

Die Pinout Mode Configuration aufklappen



Getting Started STM32CubeIDE mit STM32F103RBT

Unsere Taster und
Schalter liefern bei
Betätigung eine „1“

Pinout & Configuration

Clock Configuration

Additional Software

GPIO Mode and Configuration

Configuration

Group By Peripherals

RCC SYS USART NVIC


GPIO Single Mapped Signals

Search Signals

Search (Ctrl+F) ☐ Show only Modified Pins

	Sig	GPI	GPI	GPI	Ma	Use	Mo
PA1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC4	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC5	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC6	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC7	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC...	n/a	n/a	Ext...	No ...	n/a	B1 [...]	<input checked="" type="checkbox"/>

B1



Getting Started STM32CubeIDE mit STM32F103RBT

Und bei Nichtbetätigung

Pinout & Configuration

Clock Configuration

Additional Software

GPIO Mode and Configuration

Configuration

Group By Peripherals

RCC

SYS

USART

NVIC

GPIO

Single Mapped Signals

Search Signals

Search (Ctrl+F)

☐ Show only Modified Pins

	Sig	GPI	GPI	GPI	Ma	Use	Mo
PA1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC4	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC5	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC6	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC7	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC...	n/a	n/a	Ext...	No ...	n/a	B1 [...]	<input checked="" type="checkbox"/>

Categories

A->Z

System Core

Analog

Timers

Connectivity

Multimedia

Computing

Middleware

B1



Getting Started STM32CubeIDE mit STM32F103RBT

Und bei Nichtbetätigung
leider nichts!!

Pinout & Configuration

Clock Configuration

Additional Software

GPIO Mode and Configuration

Configuration

Group By Peripherals

☒ RCC

☒ SYS

☒ USART

☒ NVIC

☒ GPIO

☒ Single Mapped Signals

Search Signals

Search (Ctrl+F)

☐ Show only Modified Pins

	Sig	GPI	GPI	GPI	Ma	Use	Mo
PA1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC4	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC5	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC6	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC7	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC...	n/a	n/a	Ext...	No ...	n/a	B1 [...]	<input checked="" type="checkbox"/>

B1



Getting Started STM32CubeIDE mit STM32F103RBT

Zum Glück können wir festlegen, was „**nichts**“ sein soll

Pinout & Configuration

Clock Configuration

Additional Software

GPIO Mode and Configuration

Configuration

Group By Peripherals

☒ RCC

☒ SYS

☒ USART

☒ NVIC

☒ GPIO

☒ Single Mapped Signals

Search Signals

Search (Ctrl+F)

☐ Show only Modified Pins

	Sig	GPI	GPI	GPI	Ma	Use	Mo
PA1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inpu...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC4	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC5	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC6	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC7	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC...	n/a	n/a	Ext...	No ...	n/a	B1 [...]	<input checked="" type="checkbox"/>

B1

PA1 (ist eine Taste)
markieren




...
PA1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>

PA1 Configuration :

GPIO mode Input mode

GPIO Pull-up/Pul... No pull-up and no pul...

User Label



Bei GPIO Pull-up/Pul...



...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>

PA1 Configuration :

GPIO mode

GPIO Pull-up/Pul...

User Label

Pull-down auswählen




...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>

PA1 Configuration :

GPIO mode

GPIO Pull-up/Pul...

User Label



Getting Started STM32CubeIDE mit STM32F103RBT

...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low		No ...	Ver...		<input type="checkbox"/>

Pull-down auswählen

PA1 Config

GPIO

mode

GPIO Pull

Pull-down



...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	...	No ...	Ver...		<input type="checkbox"/>

Pull-down: **Nichts** = „0“
(Pull-up wäre „1“)

PA1 Config

GPIO

mode

GPIO Pull

Pull-down



Ebenso bei:
PA6, PA10, PB0..PB7



...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PA10	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB0	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB1	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB2	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB3	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB4	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB5	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB6	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PB7	n/a	n/a	Inp...	No ...	n/a		<input type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>

PA1 Configuration :

GPIO mode

Input mode

GPIO Pull-up/Pul...

Pull-down

Ebenso bei:
PA6, PA10, PB0..PB7



☐ Show only modified Pins

...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA10	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB0	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB2	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB3	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB4	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB5	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB6	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB7	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>

PB7 Configuration :

GPIO mode

Input mode

GPIO Pull-up/Pul...

Pull-down

Was bleibt noch zu tun?



☐ Show only modified files

...	Sig...	GPI...	GPI...	GPI...	Ma...	Use...	Mo...
PA1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA5	n/a	Low	Out...	No ...	Ver...	LD2...	<input checked="" type="checkbox"/>
PA6	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PA10	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB0	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB1	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB2	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB3	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB4	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB5	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB6	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PB7	n/a	n/a	Inp...	Pull...	n/a		<input checked="" type="checkbox"/>
PC0	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC1	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC2	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>
PC3	n/a	Low	Out...	No ...	Ver...		<input type="checkbox"/>

PB7 Configuration :

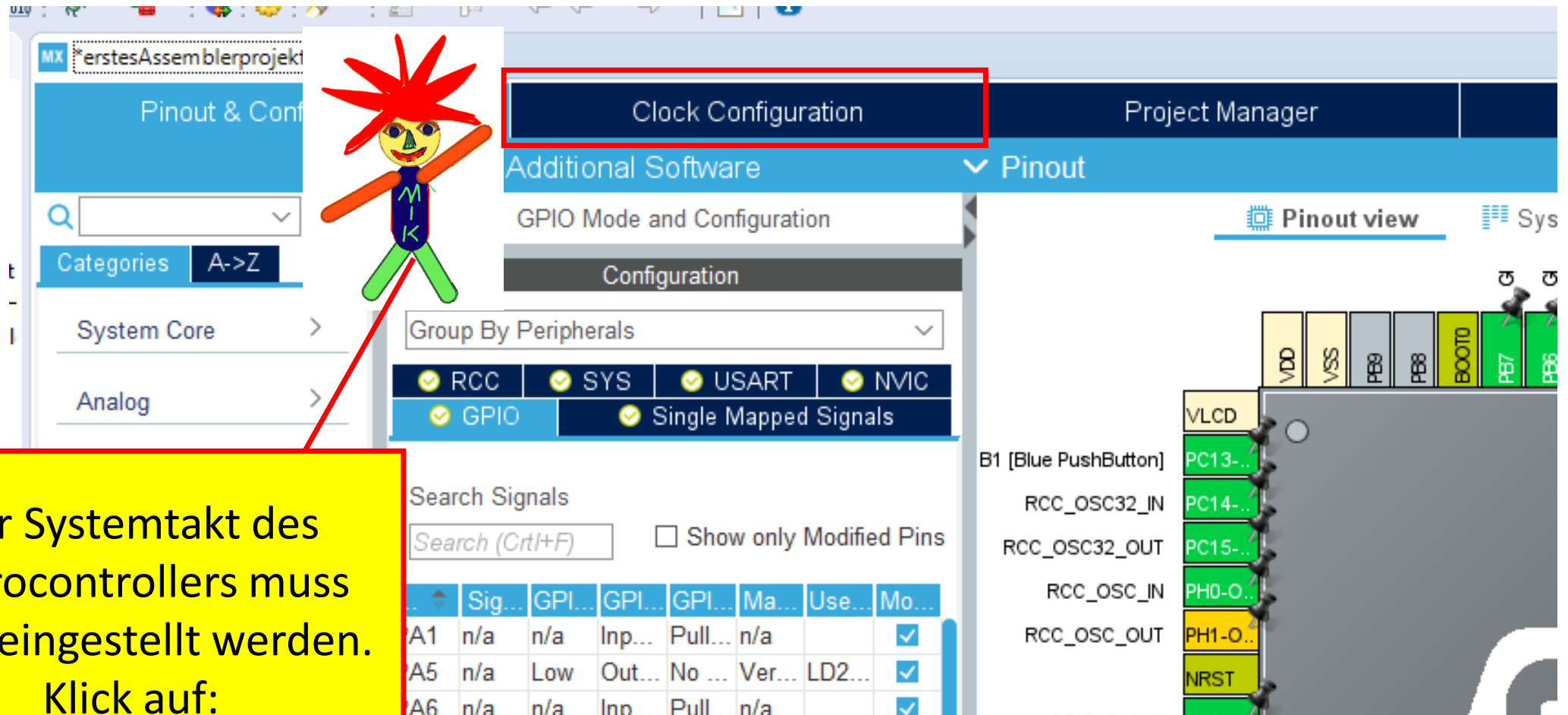
GPIO mode

Input mode

GPIO Pull-up/Pul...

Pull-down

Getting Started STM32CubeIDE mit STM32F103RBT

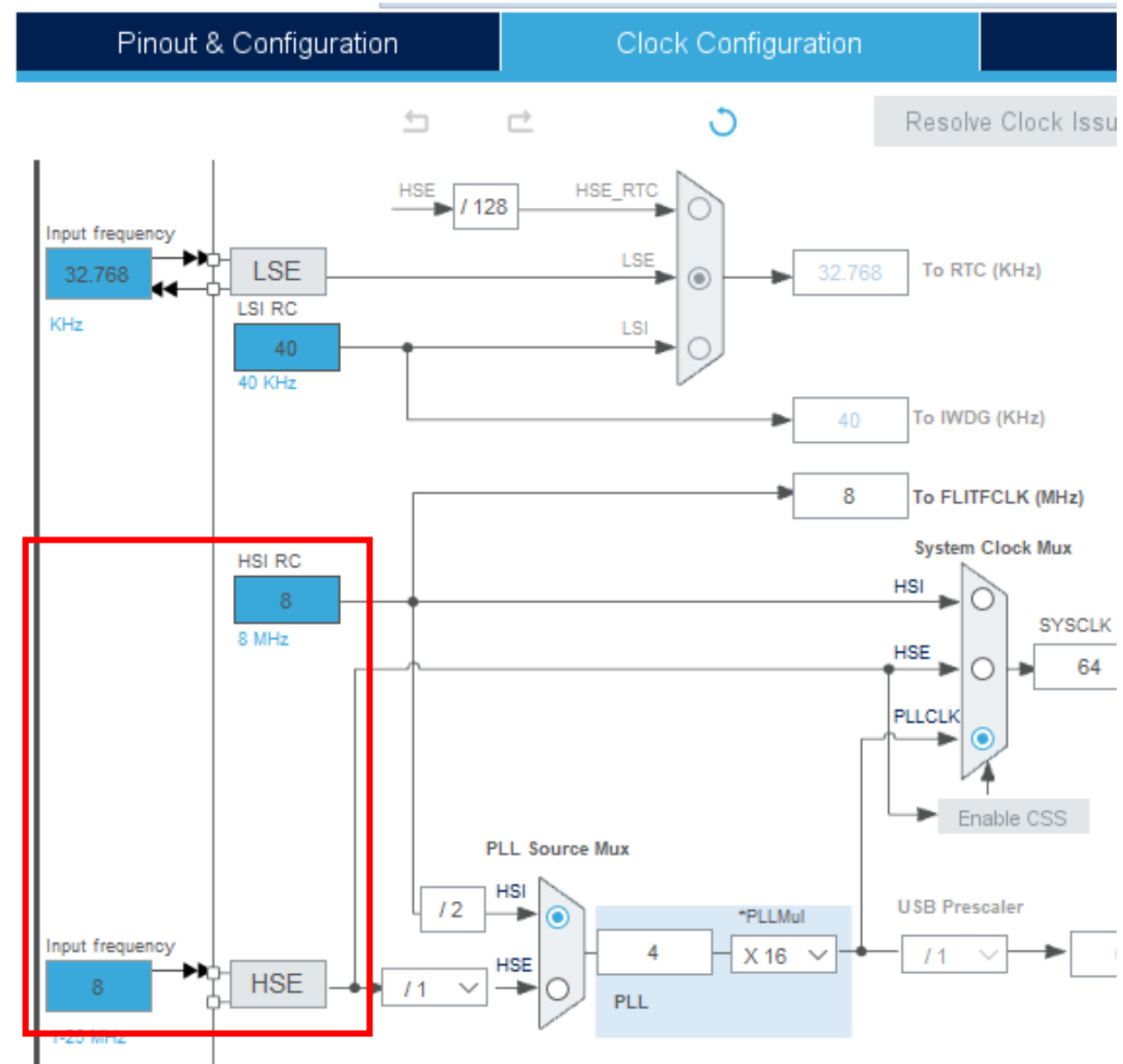


Der Systemtakt des
Mikrocontrollers muss
noch eingestellt werden.
Klick auf:
Clock Configuration



Getting Started STM32CubeIDE mit STM32F103RBT

Der Mikrocontroller hat viele Möglichkeiten den Systemtakt ein zu stellen



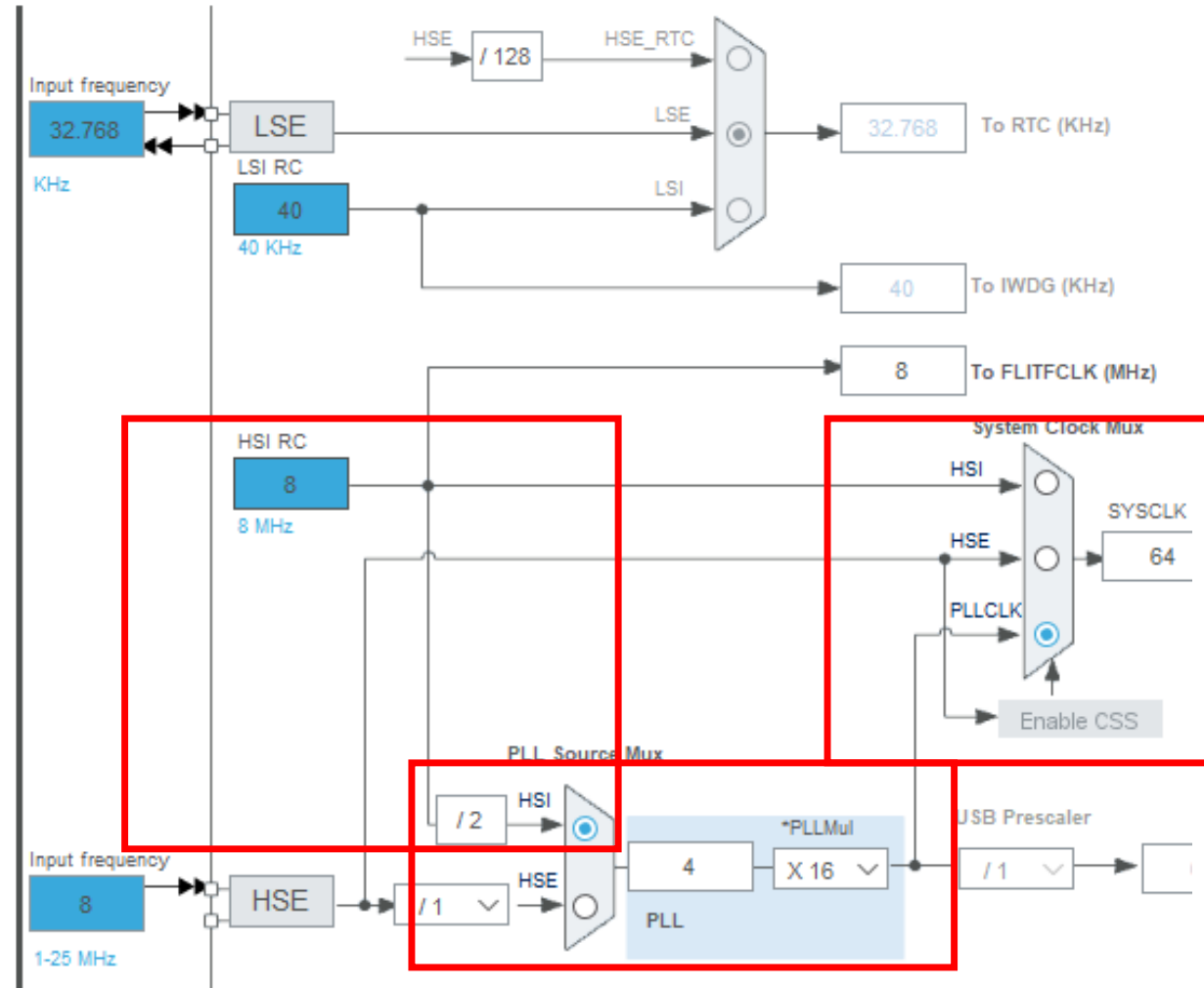
Getting Started STM32CubeIDE mit STM32F103RBT

Pinout & Configuration

Clock Configuration

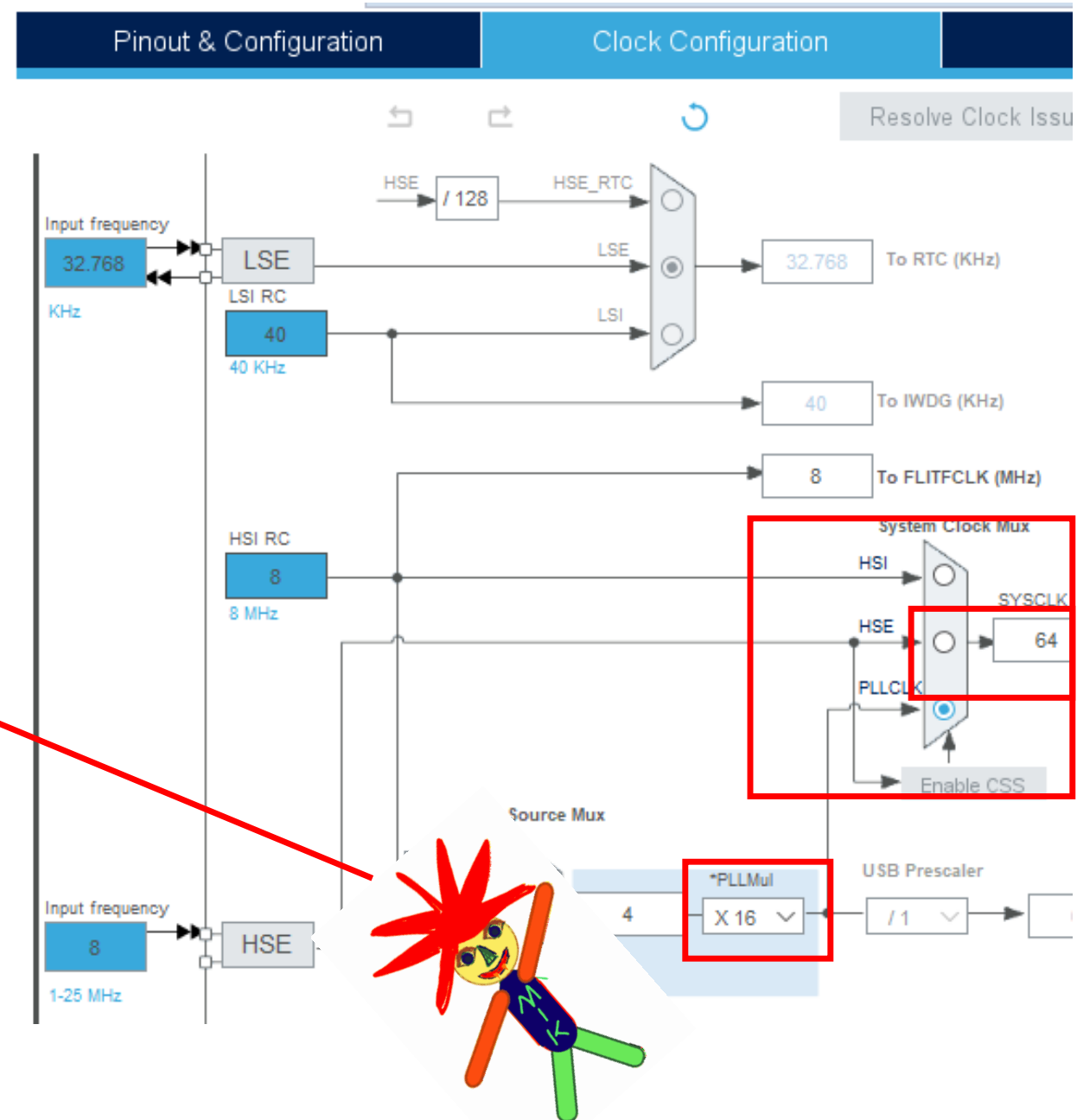
Resolve Clock Issue

Ausgewählt wurde der 8 MHz
interne Taktgenerator
(HSI High Speed Internal)



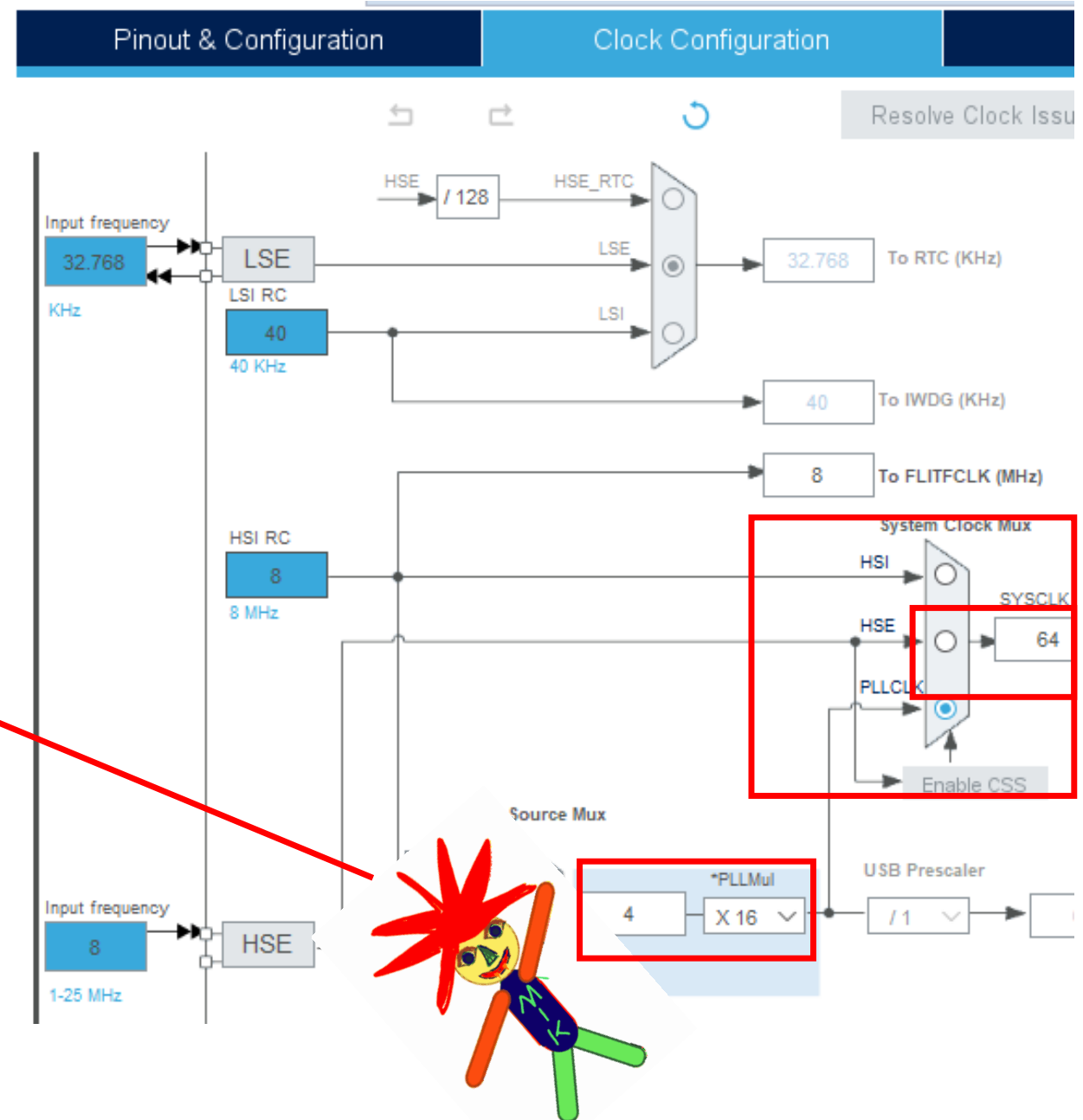
Getting Started STM32CubeIDE mit STM32F103RBT

Mal 16 geteilt durch 2 ergibt
den Systemtakt 64MHz



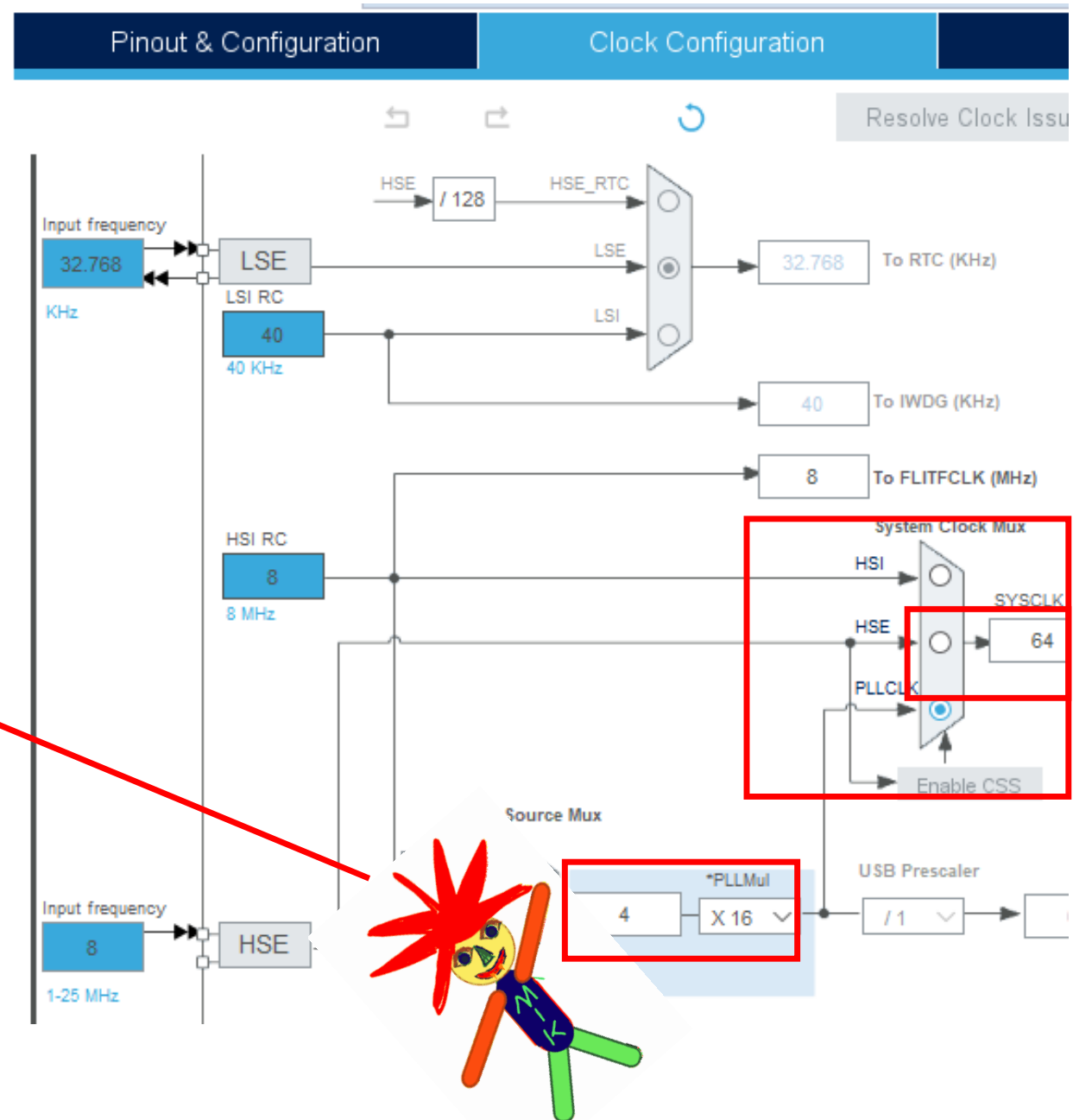
Getting Started STM32CubeIDE mit STM32F103RBT

allerdings



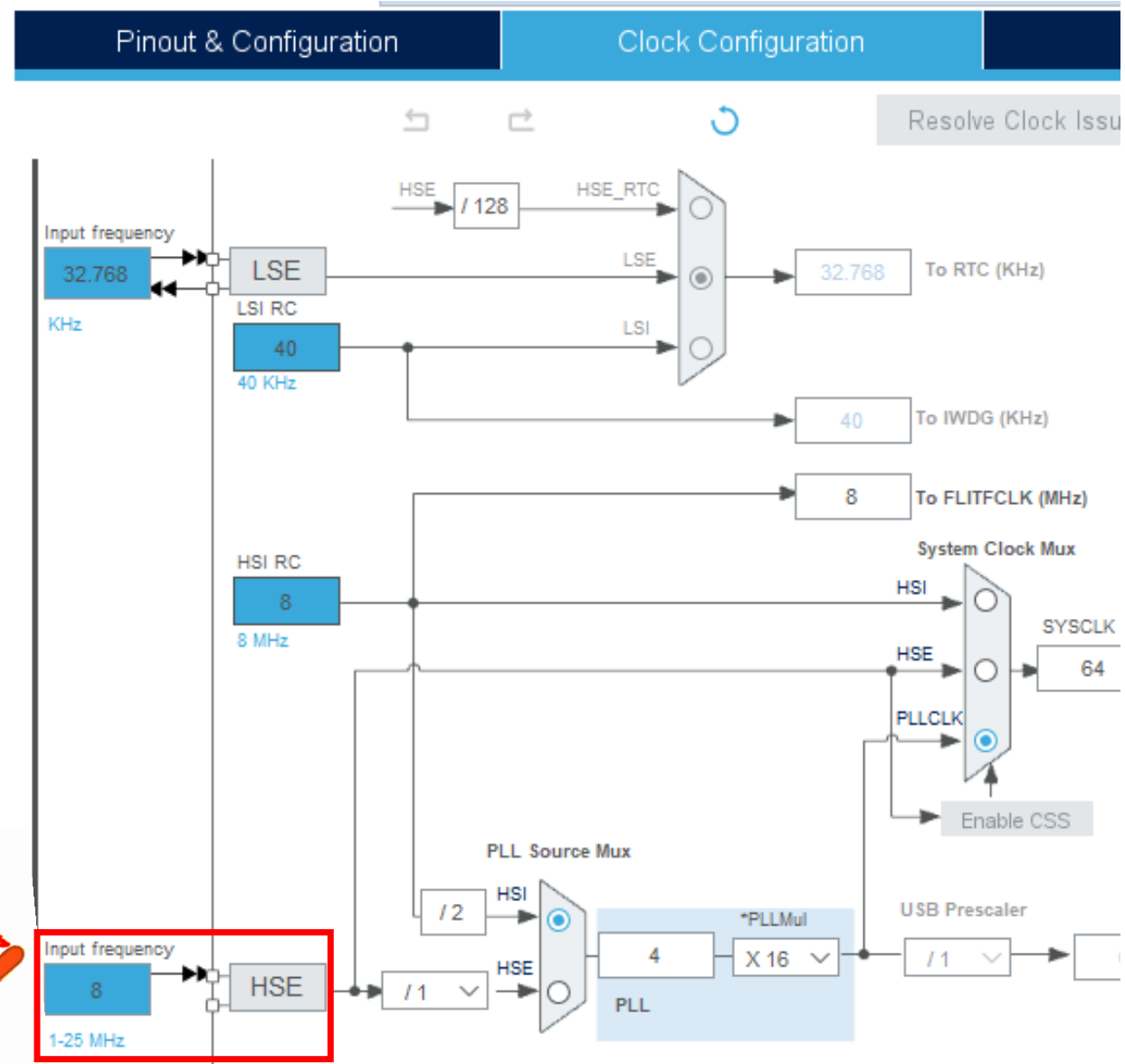
Getting Started STM32CubeIDE mit STM32F103RBT

Ist der sehr ungenau.
Außerdem sind 72 MHz
möglich. Geht aber.



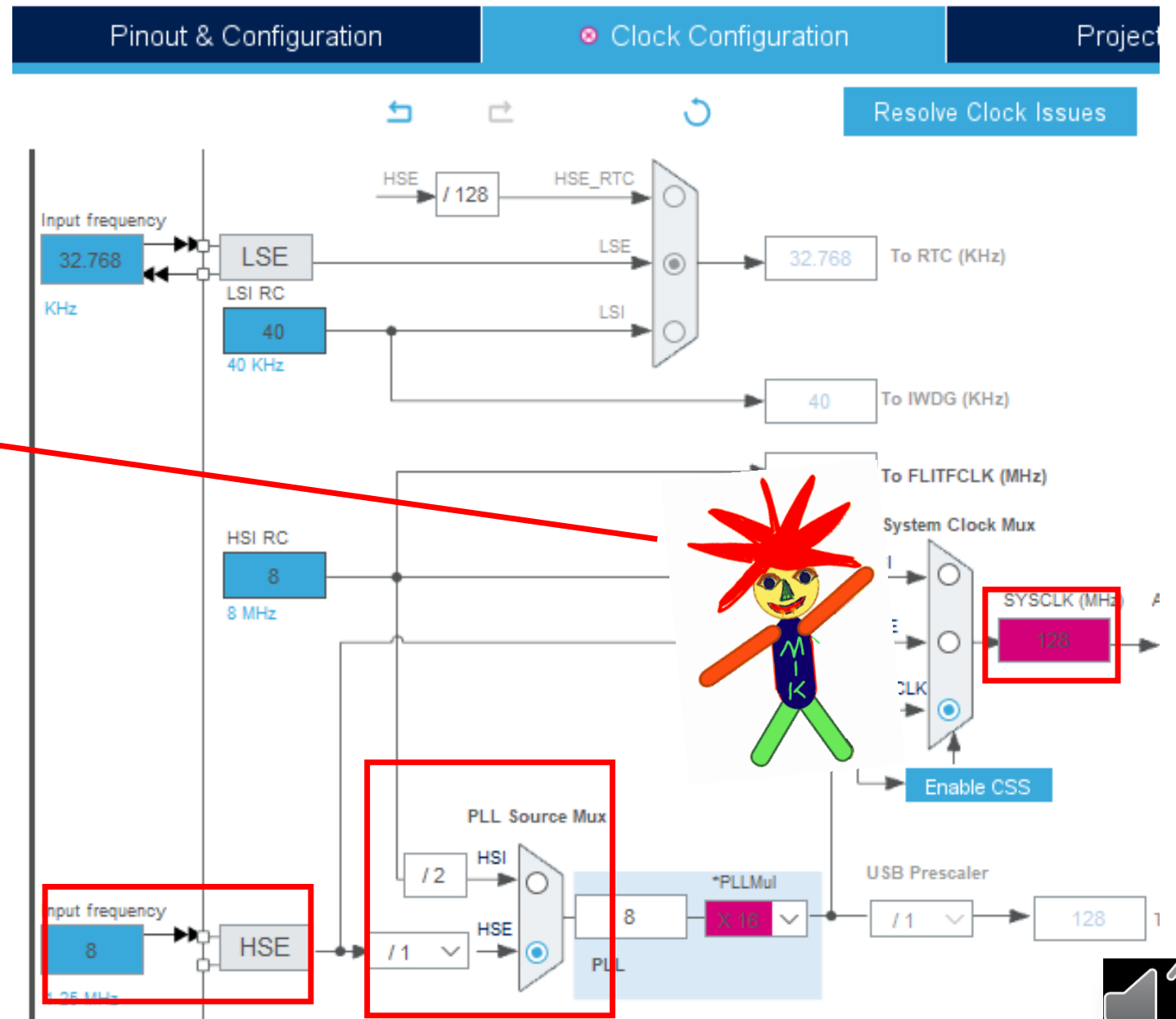
Getting Started STM32CubeIDE mit STM32F103RBT

Besser ist der extern
Eingespeiste Takt von 8 MHz
(HSE High Speed External



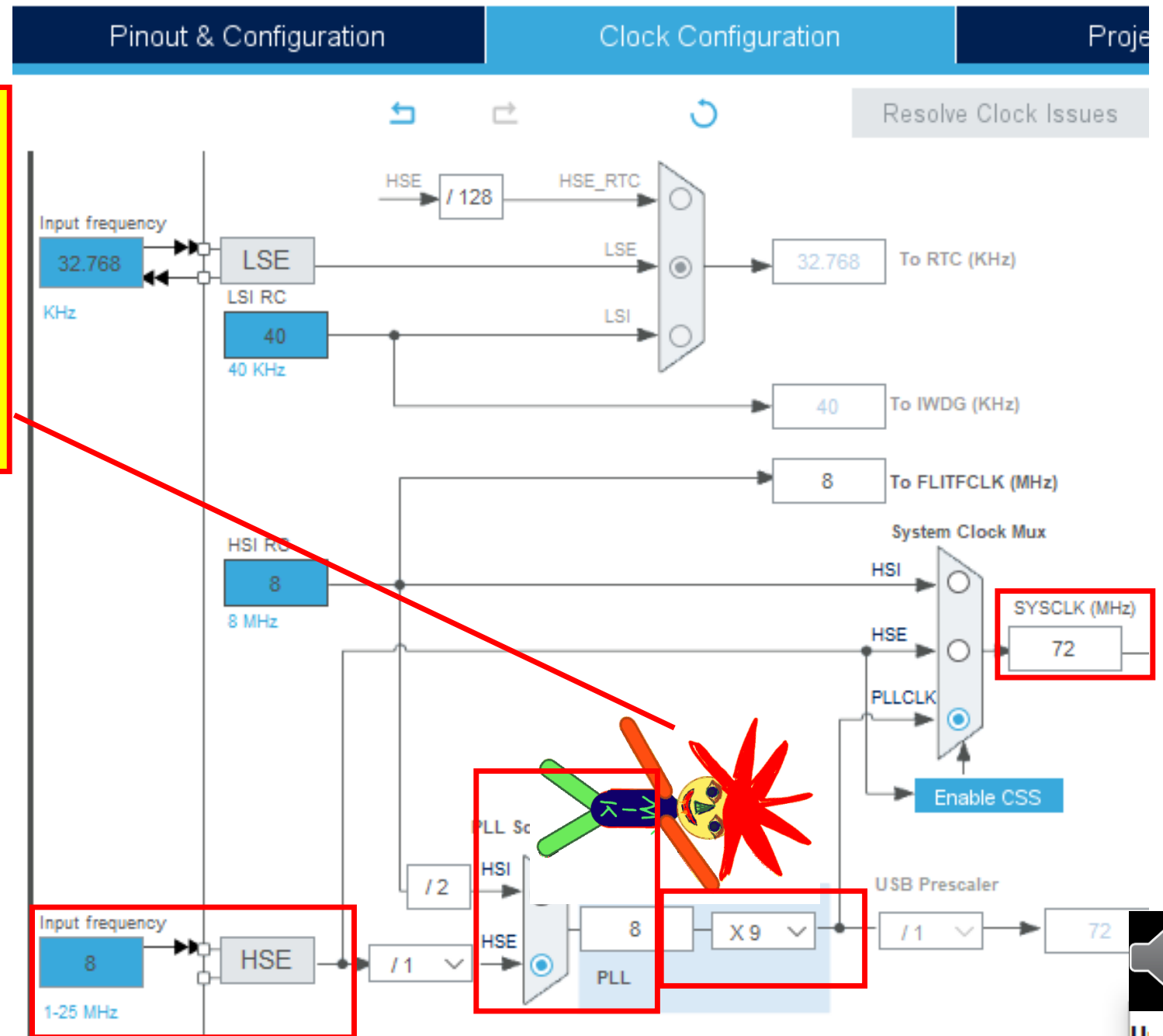
Getting Started STM32CubeIDE mit STM32F103RBT

Jetzt stimmt der Systemtakt
nicht mehr (128 statt 64 MHz)
Das ist zu viel!!



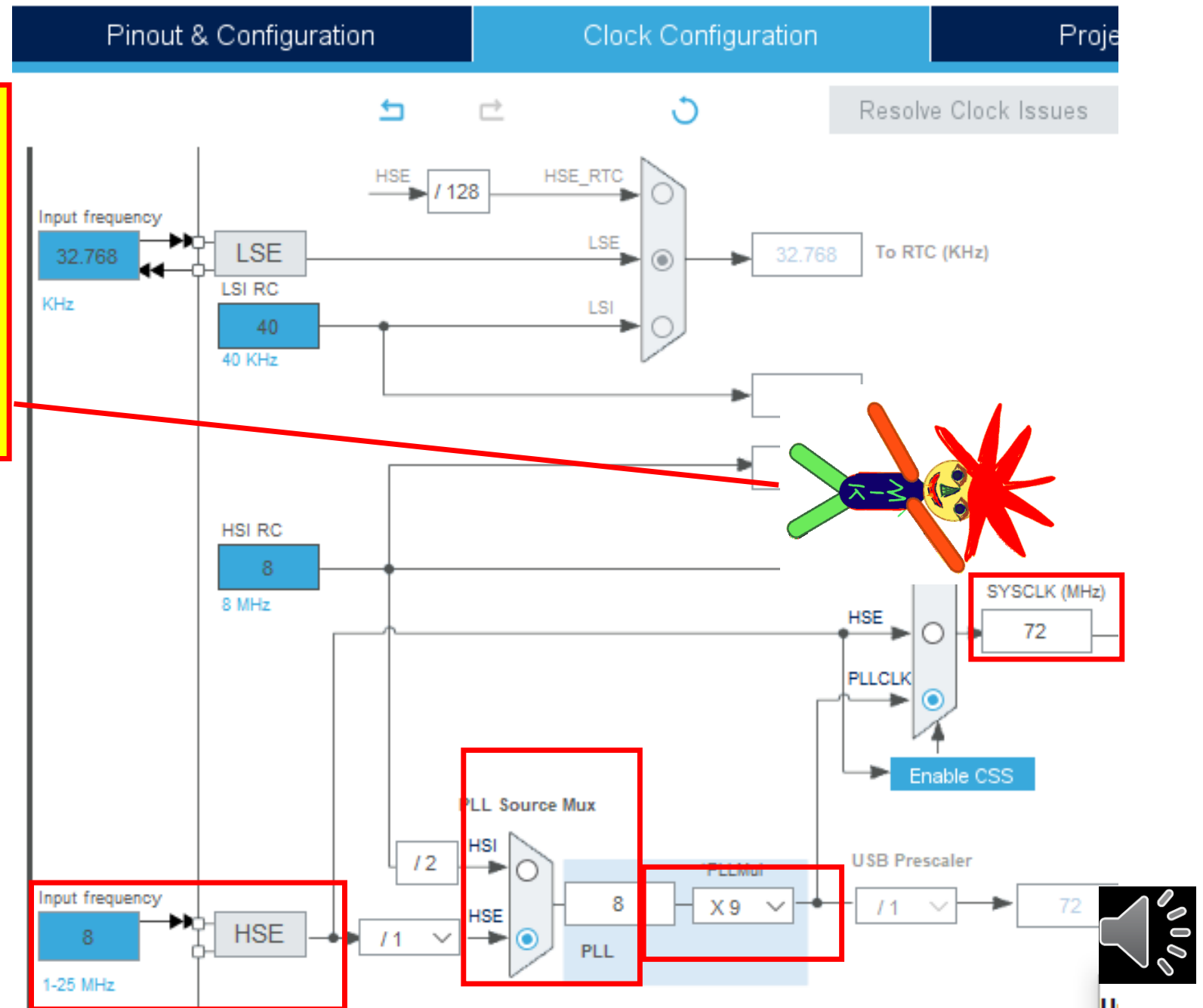
Getting Started STM32CubeIDE mit STM32F103RBT

Also ändern auf x9:
8MHz x 9=72MHz



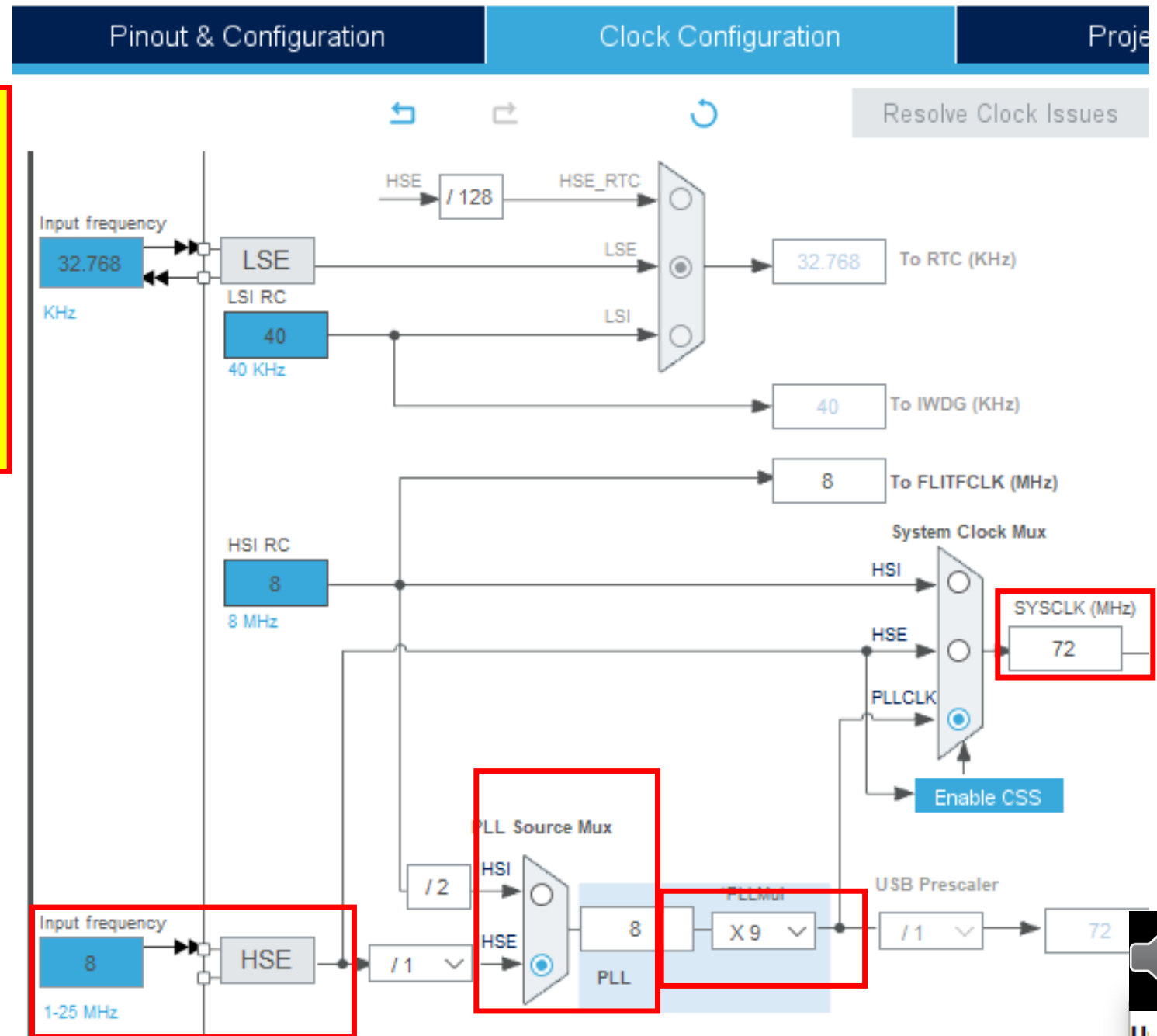
Getting Started STM32CubeIDE mit STM32F103RBT

Also ändern auf x9:
8MHz x 9=72MHz



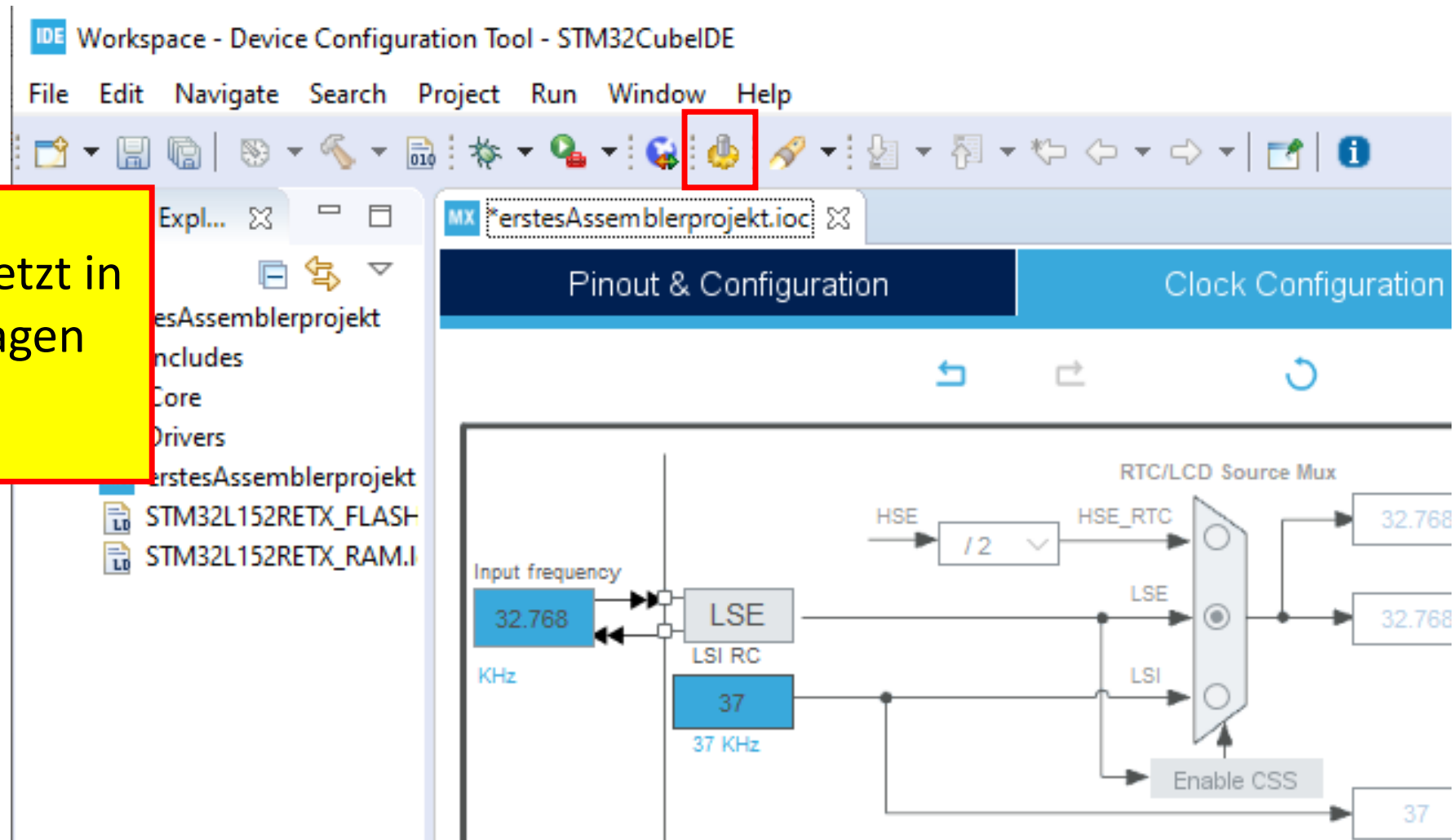
Getting Started STM32CubeIDE mit STM32F103RBT

Alles erledigt.
Diese Einstellungen sind nur einmal erforderlich und sind im File .ioc gespeichert.



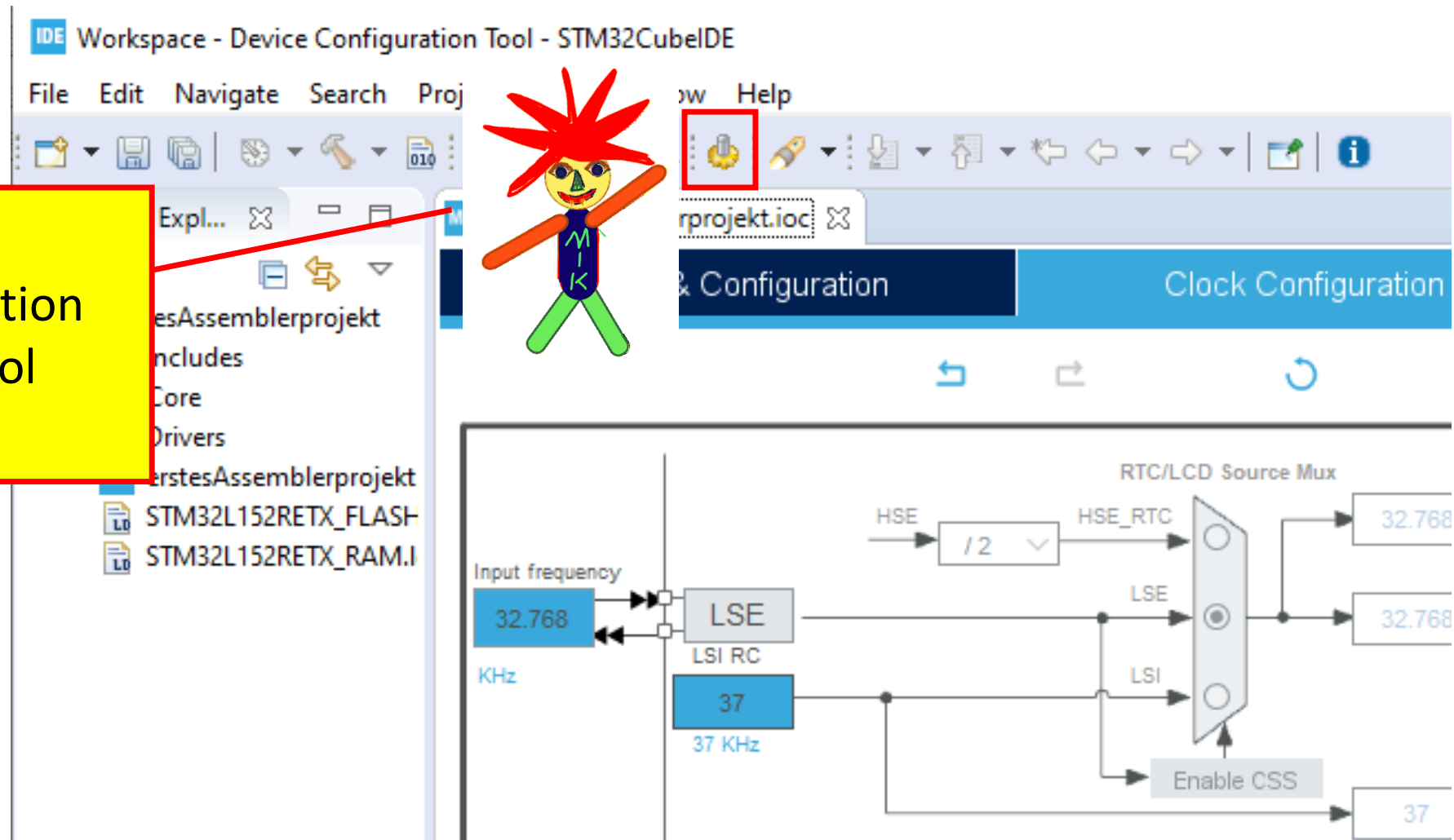
Getting Started STM32CubeIDE mit STM32F103RBT

Die Konfiguration wird jetzt in
das Programm übertragen
mit...



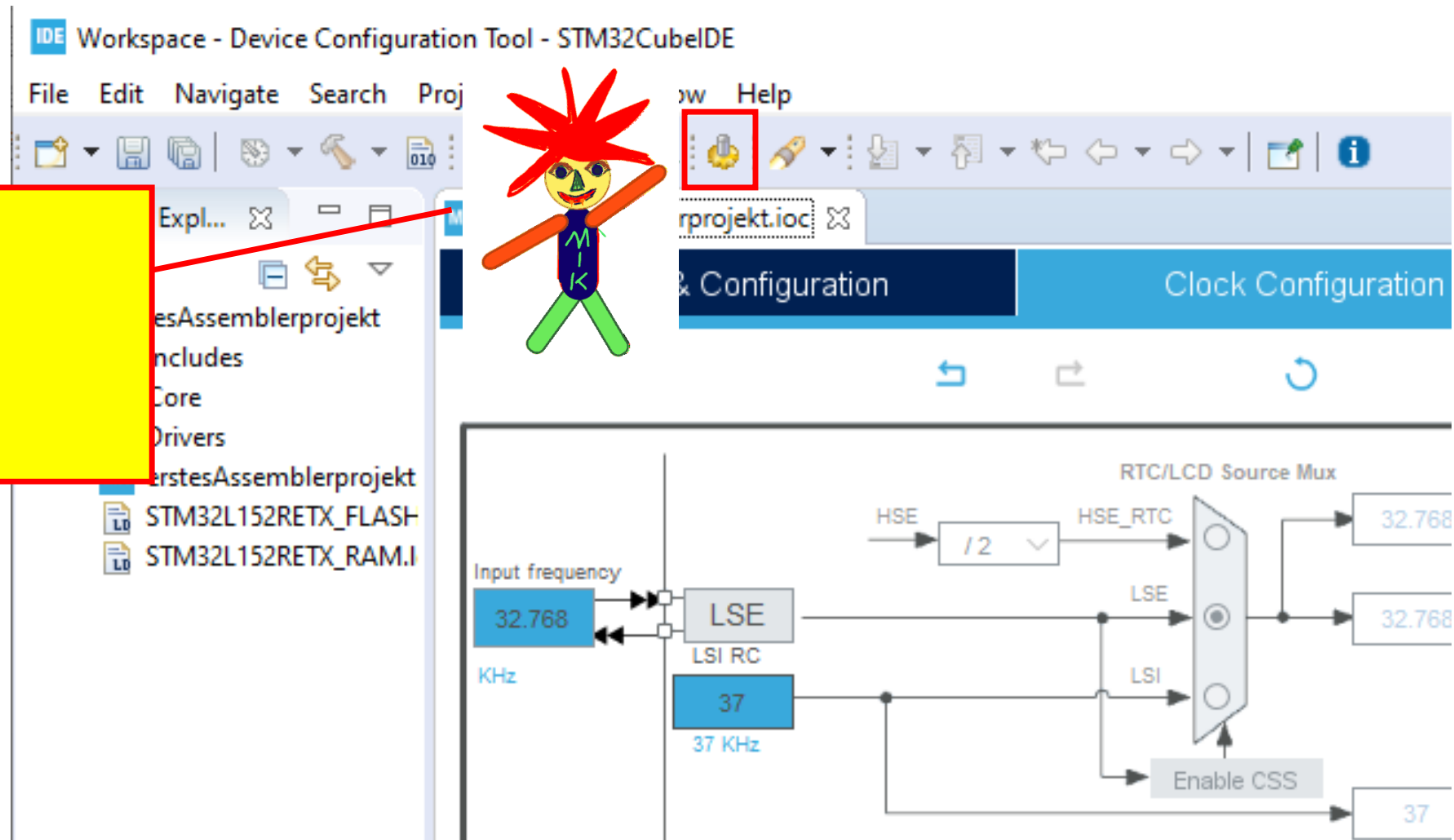
Getting Started STM32CubeIDE mit STM32F103RBT

Dem Device Configuration
Code Generation Tool



Getting Started STM32CubeIDE mit STM32F103RBT

Einfach anklicken



Getting Started STM32CubeIDE mit STM32F103RBT

Der Code wird erzeugt

Progress Information



Device Configuration Tool Updating Code...

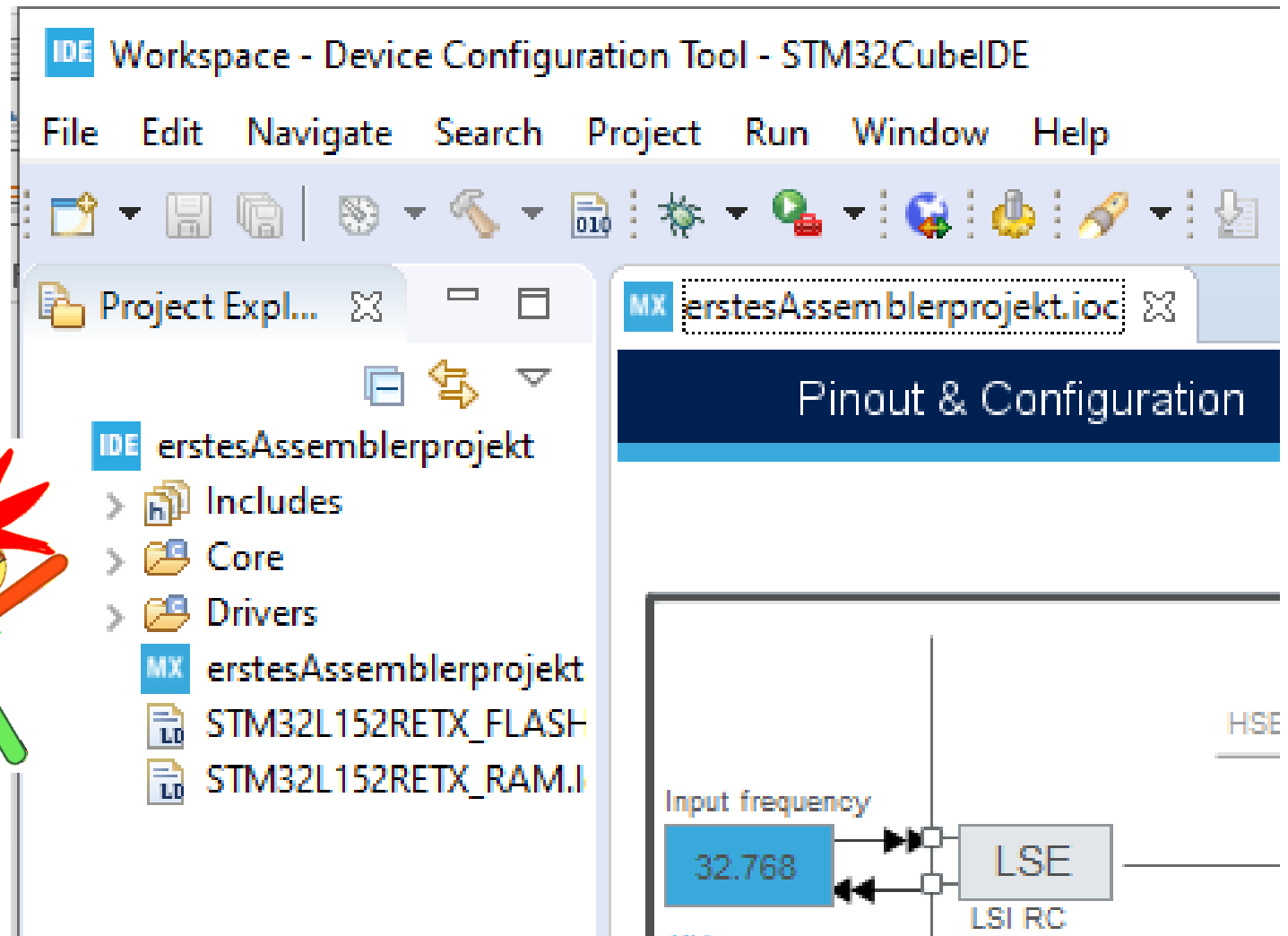


Cancel



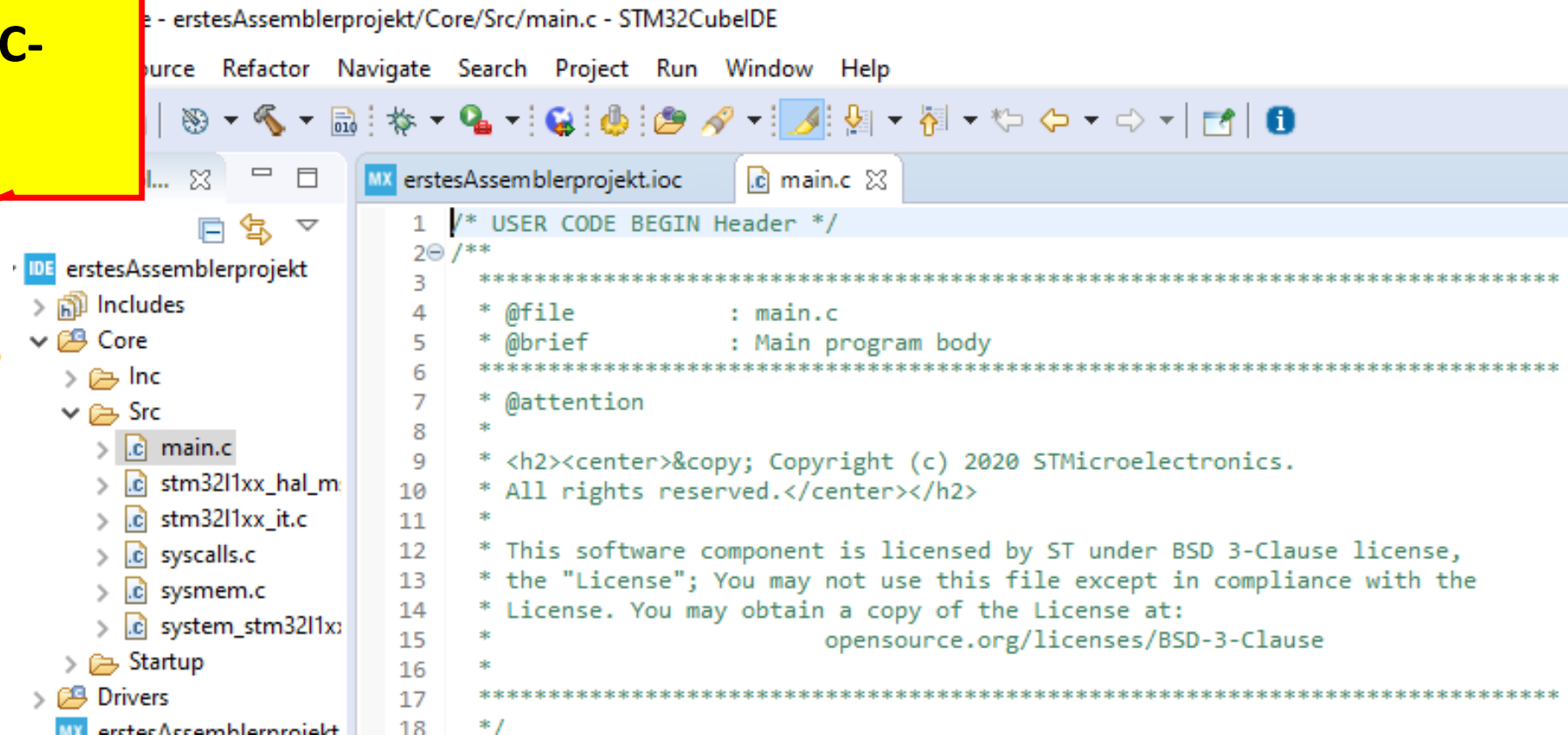
Getting Started STM32CubeIDE mit STM32F103RBT

Aber wo ist er zu finden?



Getting Started STM32CubeIDE mit STM32F103RBT

Unter Core/Src
**Main.c ist das Haupt-C-
Programm**



The screenshot shows the STM32CubeIDE interface. The project tree on the left shows the 'erstesAssemblerprojekt' with folders 'Includes', 'Core', and 'Drivers'. Under 'Core', there is a 'Src' folder containing 'main.c', 'stm32l1xx_hal_m', 'stm32l1xx_it.c', 'syscalls.c', 'sysmem.c', and 'system_stm32l1x'. The 'main.c' file is selected. The main editor shows the content of 'main.c', which is a header file for user code. The code includes a copyright notice for 2020 STMicroelectronics and a license notice for BSD 3-Clause.

```
1 /* USER CODE BEGIN Header */
2 /**
3  *
4  * @file      : main.c
5  * @brief     : Main program body
6  *
7  * @attention
8  *
9  * <h2><center>&copy; Copyright (c) 2020 STMicroelectronics.
10 * All rights reserved.</center></h2>
11 *
12 * This software component is licensed by ST under BSD 3-Clause license,
13 * the "License"; You may not use this file except in compliance with the
14 * License. You may obtain a copy of the License at:
15 *      opensource.org/licenses/BSD-3-Clause
16 *
17 *
18 */
```



Vorlagedateien für Assembler
finden sich in Moodle:

- ait2019
- AIT20/21
- ARM
- CT_E1ME_19
- E1MECt
- E1ME_B_Ct
- E4ME2020
- FBT
- FEEFAntriebstechnik1921
- Mehr ...
- ▼ Kurse
 - ▼ Unterricht
 - ▼ Kursbereiche_I
 - > Unterricht_A
 - > Unterricht_A
 - ch

Änderungen in der main.c
mit:

- STM32L152RET
 - Bildschirmvideo Video Getting Started
 - Powerpointvideo Getting Started
 - .pptx
 - .pdf
- Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s

oder mit

- STM32F103RBT
 - Bildschirmvideo Video Getting Started
 - Powerpointvideo Getting Started
 - .pptx
 - .pdf
 - Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s





Konfiguration.ioc: Die Konfiguration von eben

- ait2019
- AIT20/21
- ARM
- CT_E1ME_19
- E1MECt
- E1ME_B_Ct
- E4ME2020
- FBT
- FEETAntriebstechnik192
- 1
- Mehr ...
- ▼ Kurse
- ▼ Unterricht
- ▼
- Kursbereiche_Lehrer
- >
- Unterricht_Arnold
- >
- Unterricht_Auer...
- ch

Änderungen in der main.c

mit:

- STM32L152RET
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 - .pdf
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 - .pptx
 - .pdf
- Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s





mainasm.s:

Das Hauptprogramm in Assembler

- 019
- 20/21
- M
- E1ME_19
- IECt
- IE_B_Ct
- E4ME2020
- FBT
- FEETAntriebstechnik192
- 1
- Mehr ...
- ✓ Kurse
 - ✓ Unterricht
 - ✓ Kursbereiche_Lehrer
 - > Unterricht_Arnold
 - > Unterricht_Auerch

Änderungen in der main.c

mit:

- STM32L152RET
 - Bildschirmvideo Video Getting Started
 - Powerpointvideo Getting Started
 - .pptx
 - .pdf
- Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s

oder mit

- STM32F103RBT
 - Bildschirmvideo Video Getting Started
 - Powerpointvideo Getting Started
 - .pptx
 - .pdf
 - Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s





regs.s: Registerdefinitionen für Assembler

- it2019
- NT20/21
- ARM
- CT_E1ME_19
- 1MECt
- 1ME_B_Ct
- E4ME2020
- FBT
- FEETAntriebstechnik192
- 1
- Mehr ...
- ▼ Kurse
- ▼ Unterricht
- ▼
- Kursbereiche_Lehrer
- >
- Unterricht_A.
- >
- Unterricht_Auerk
- ch

Änderungen in der main.c

mit:

- STM32L152RET
 - Bildschirmvideo Video Getting Started
 - Powerpointvideo Getting Started
 - .pptx
 - .pdf
- Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s

oder mit

- STM32F103RBT
 - Bildschirmvideo Video Getting Started
 - Powerpointvideo Getting Started
 - .pptx
 - .pdf
- Vorlagedateien
 - Vorlage Konfiguration .ioc
 - Vorlage mainasm.s
 - Vorlage regs.s





regs.s und mainasm.s
herunterladen und in den src-
Ordner des Projekts kopieren

it2019
IT20/21
ARM
CT_E1ME_19
1MECt
1ME_B_Ct
E4ME2020
FBT
FEETAntriebstechnik192
1
Mehr ...
Kurse
Unterricht
Kursbereiche_Lehrer
>
Unterricht_A.
>
Unterricht_Auerl
ch

Änderungen in der main.c

mit:

- STM32L152RET
 - [Bildschirmvideo Video Getting Started](#)
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 - Vorlage [Konfiguration .ioc](#)
 - Vorlage [mainasm.s](#)
 - Vorlage [regs.s](#)



Getting Started STM32CubeIDE mit STM32F103RBT

mainasm als C-Operation
deklarieren bei USER CODE
BEGIN Includes



```
*****
*/
/* USER CODE END Header */

/* Includes -----
#include "main.h"

/* Private includes -----
/* USER CODE BEGIN Includes */
void mainasm(void) asm("mainasm");
/* USER CODE END Includes */

...

int main(void)
{
    //verschiedene Inits
    /* USER CODE BEGIN 2 */
    mainasm();
    /* USER CODE END 2 */

    /* Infinite loop */
    /* USER CODE BEGIN WHILE */
    while (1)
    {
        /* USER CODE END WHILE */

        /* USER CODE BEGIN 3 */
    }
    /* USER CODE END 3 */
}
```



Getting Started STM32CubeIDE mit STM32F103RBT

mainasm() aufrufen in USER
CODE BEGIN 2



```
*****
*/
/* USER CODE END Header */

/* Includes -----
#include "main.h"

/* Private includes -----
/* USER CODE BEGIN Includes */
void mainasm(void) asm("mainasm");
/* USER CODE END Includes */

...

int main(void)
{
    //verschiedene Inits
    /* USER CODE BEGIN 2 */
    mainasm();
    /* USER CODE END 2 */

    /* Infinite loop */
    /* USER CODE BEGIN WHILE */
    while (1)
    {
        /* USER CODE END WHILE */

        /* USER CODE BEGIN 3 */
    }
    /* USER CODE END 3 */
}
```



Getting Started STM32CubeIDE mit STM32F103RBT

Das erste
Assemblerprogramm:
Blinkt LED an PC0



Workspace - erstesAssemblerprojekt/Core/Src/mainasm.s - STM32CubeIDE

File Edit Navigate Search Project Run Window Help

Project Explorer

- erstesAssemblerprojekt
 - Includes
 - Core
 - Inc
 - Src
 - main.c
 - mainasm.s**
 - regs.s
 - stm32l1xx_hal_m
 - stm32l1xx_it.c
 - syscalls.c
 - systemem.c
 - system_stm32l1x
 - Startup
 - Drivers

erstesAssemblerprojekt.ioc

*main.c

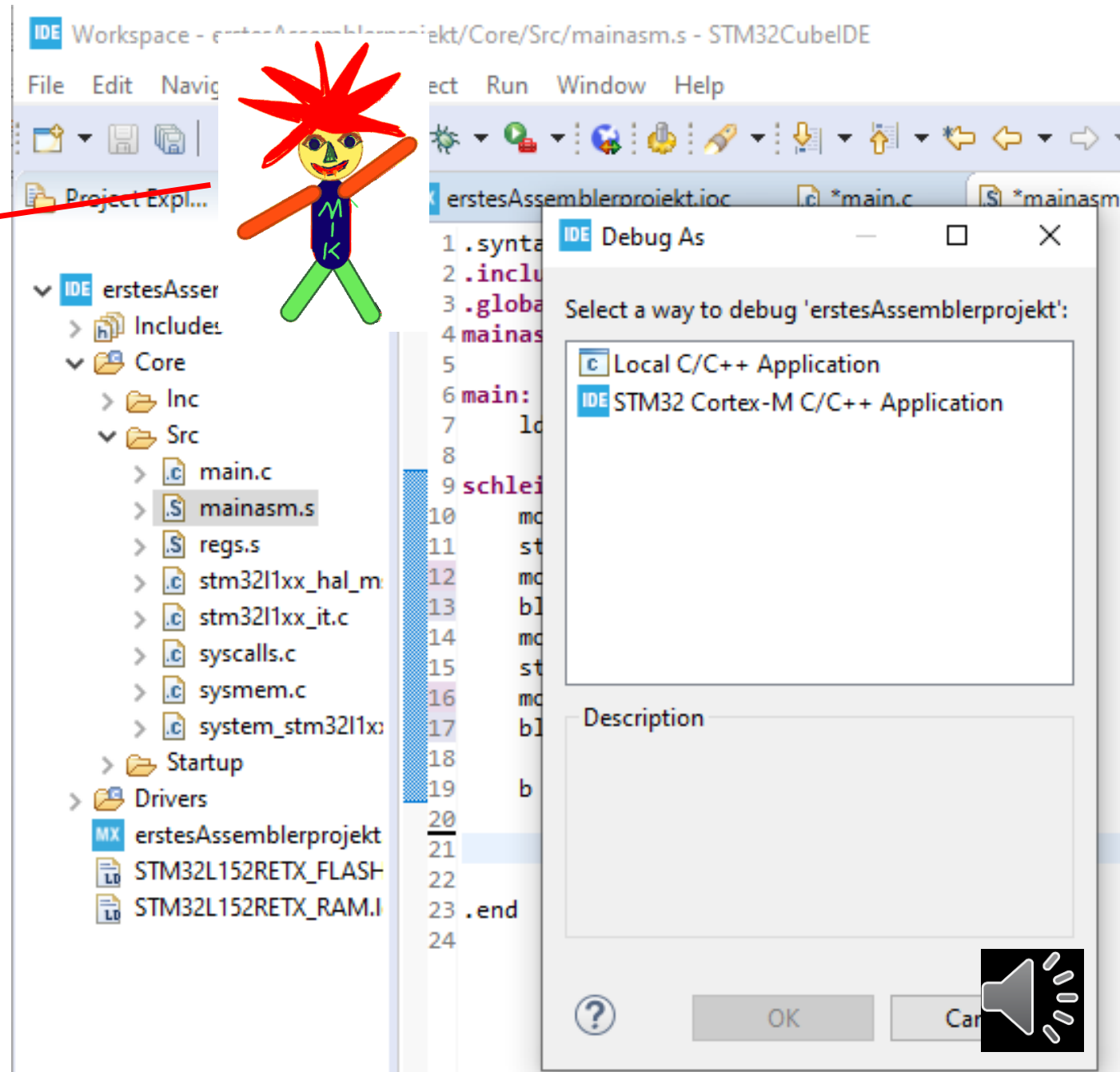
*mainasm.s

```
1 .syntax unified
2 .include "../Core/src/regs.s"
3 .global mainasm
4 mainasm:
5
6 main:
7     ldr    R1,=GPIOC
8
9     schleife:
10    mov     R0,#Bit0
11    strb    R0,[R1,ODR]
12    mov     R0,#1000
13    bl      wait_ms
14    mov     R0,#0
15    strb    R0,[R1,ODR]
16    mov     R0,#1000
17    bl      wait_ms
18
19    b       schleife
20
21
22
23 .end
24
```



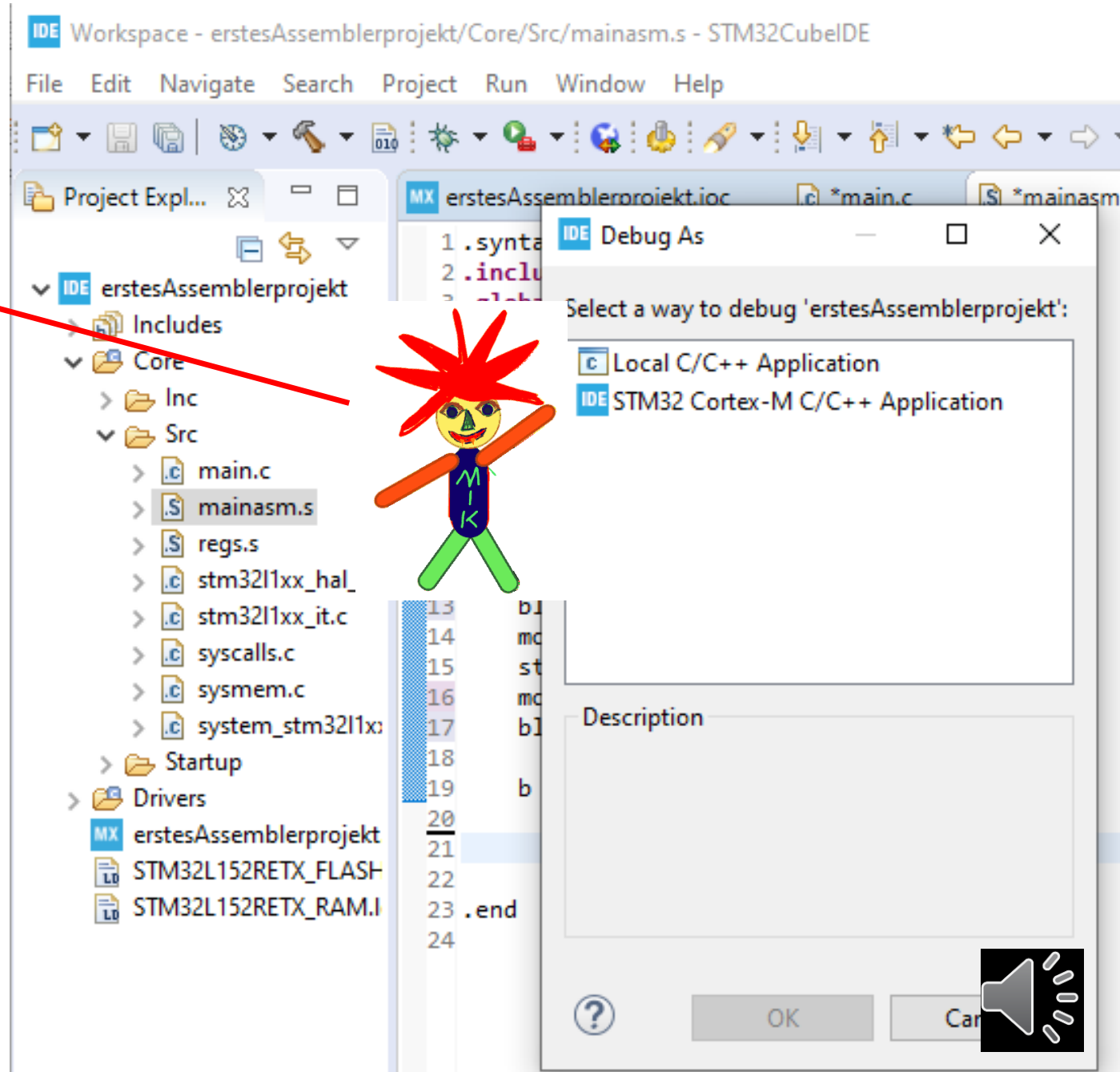
Getting Started STM32CubeIDE mit STM32F103RBT

Debug-Button klicken um das Programm zu übersetzen und auf den Mikrocontroller zu laden

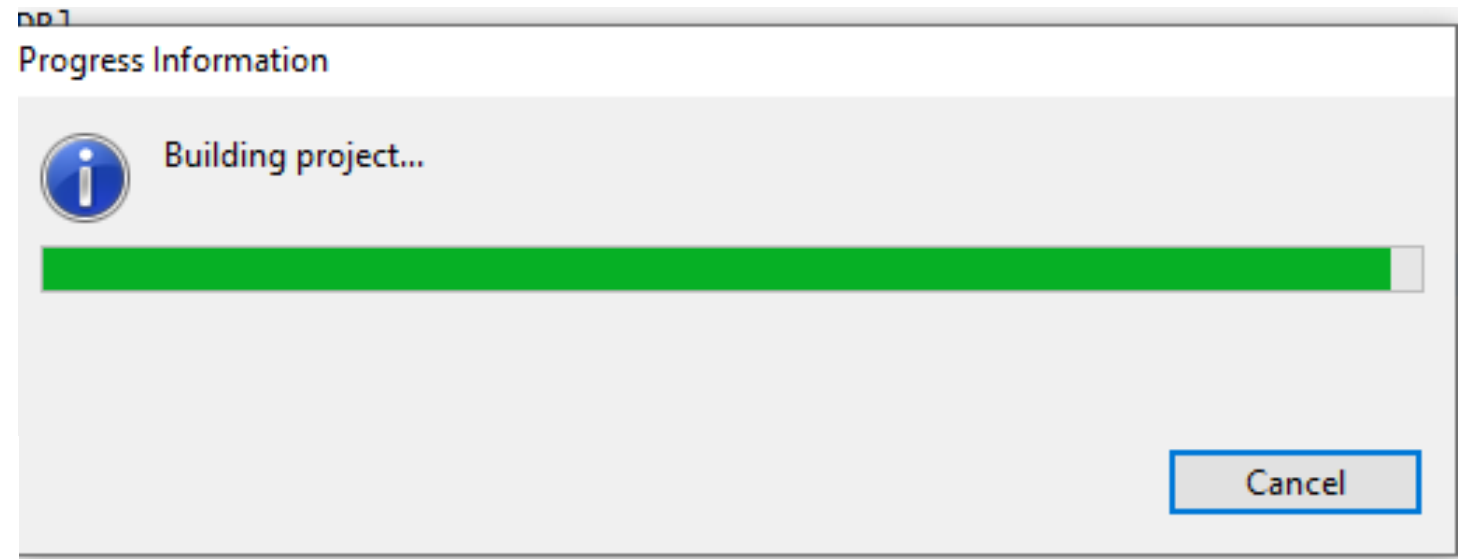


Getting Started STM32CubeIDE mit STM32F103RBT

Wir wählen STM32 Cortex-M
C/C++ Application

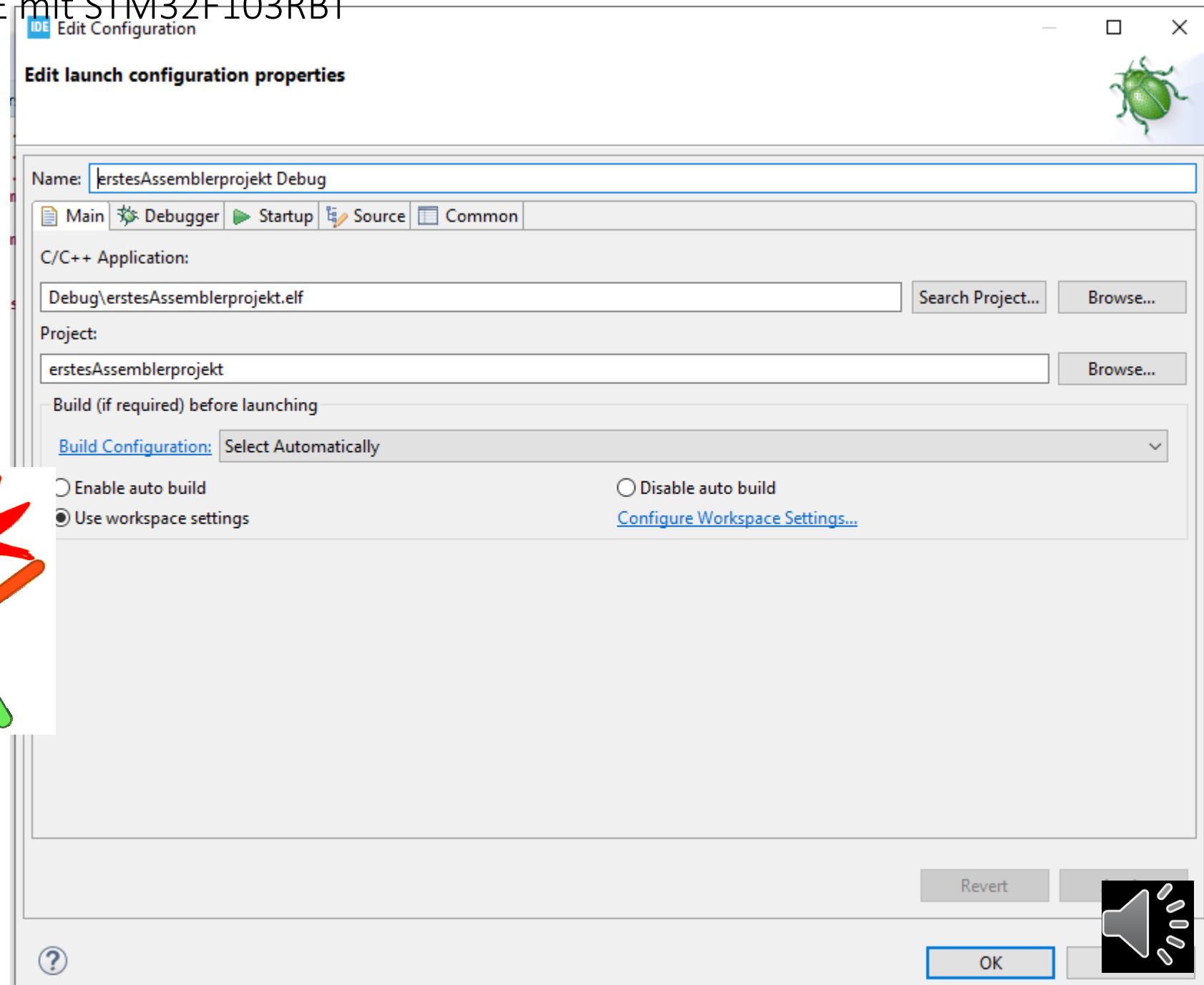


Das Projekt wird übersetzt



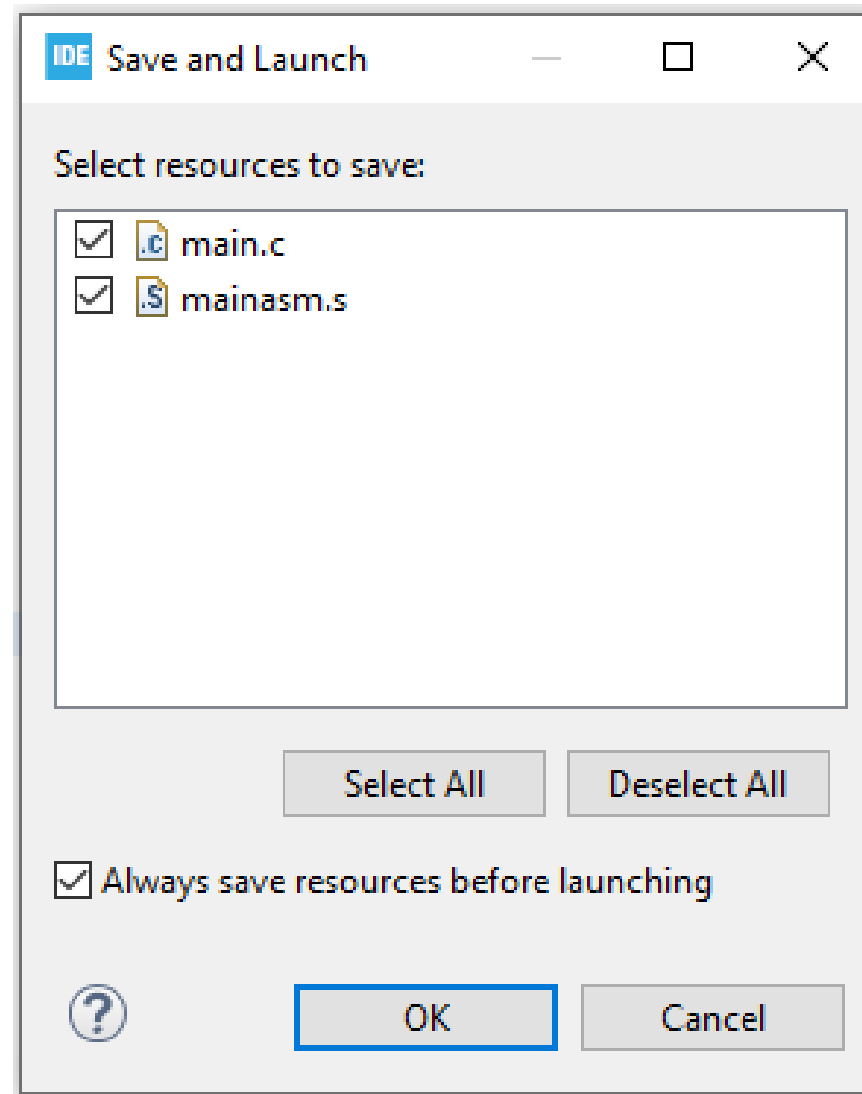
Getting Started STM32CubeIDE mit STM32F103RBT

Die launch configuration
stimmt so, also weiter mit
OK

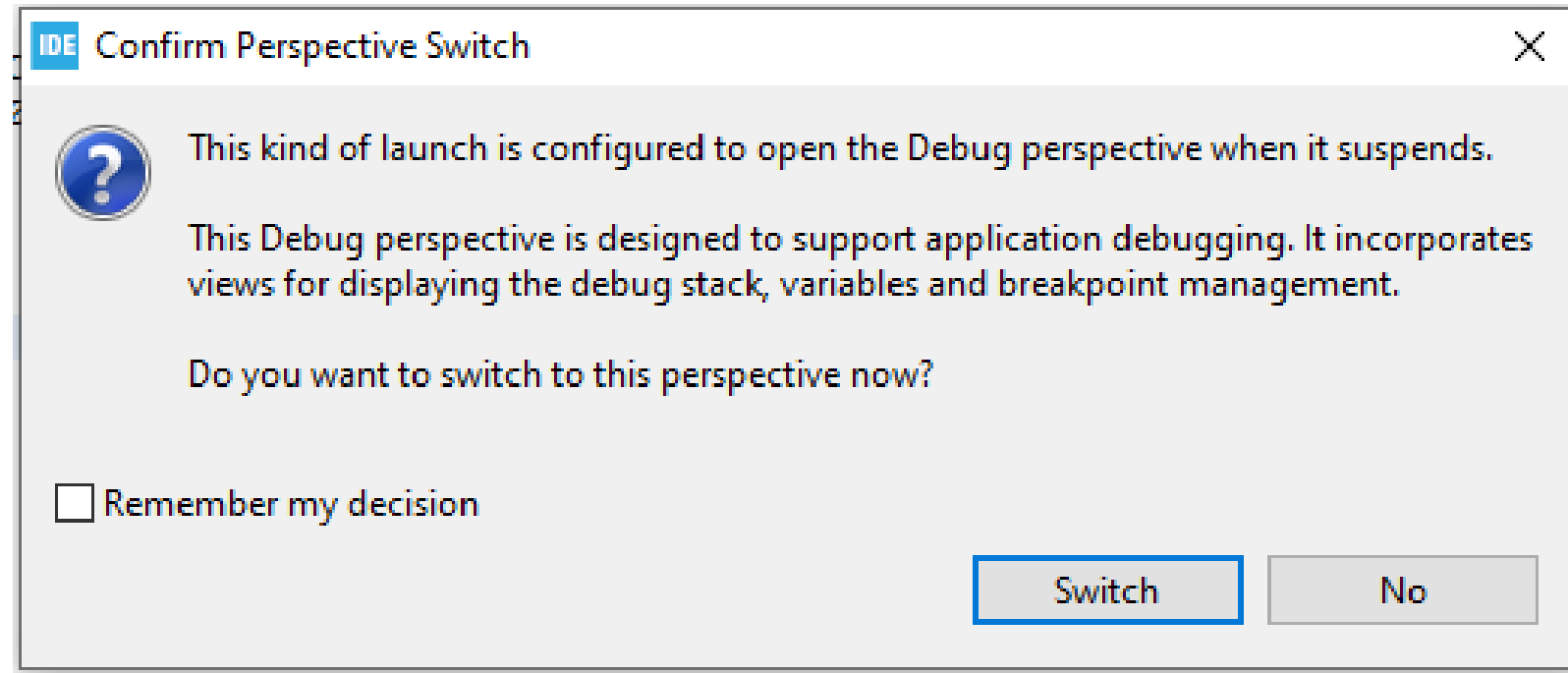


Getting Started STM32CubeIDE mit STM32F103RBT

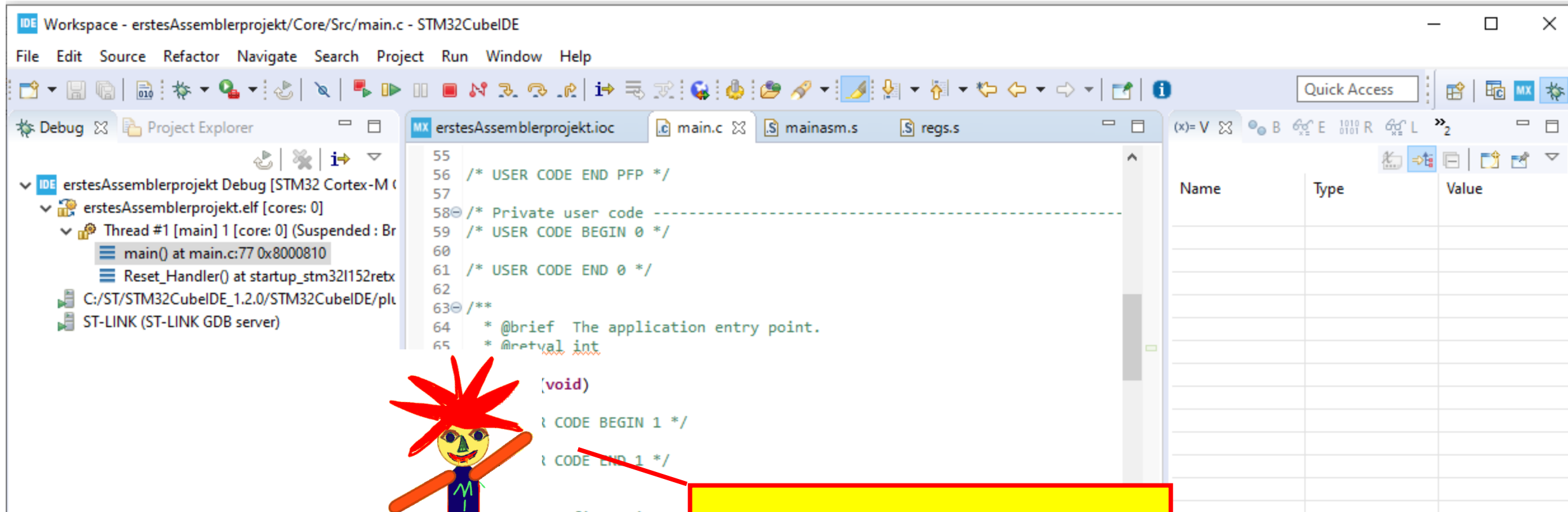
Alle Files speichern: OK



Eclipse wechselt in die
Debug-Perspektive
Switch



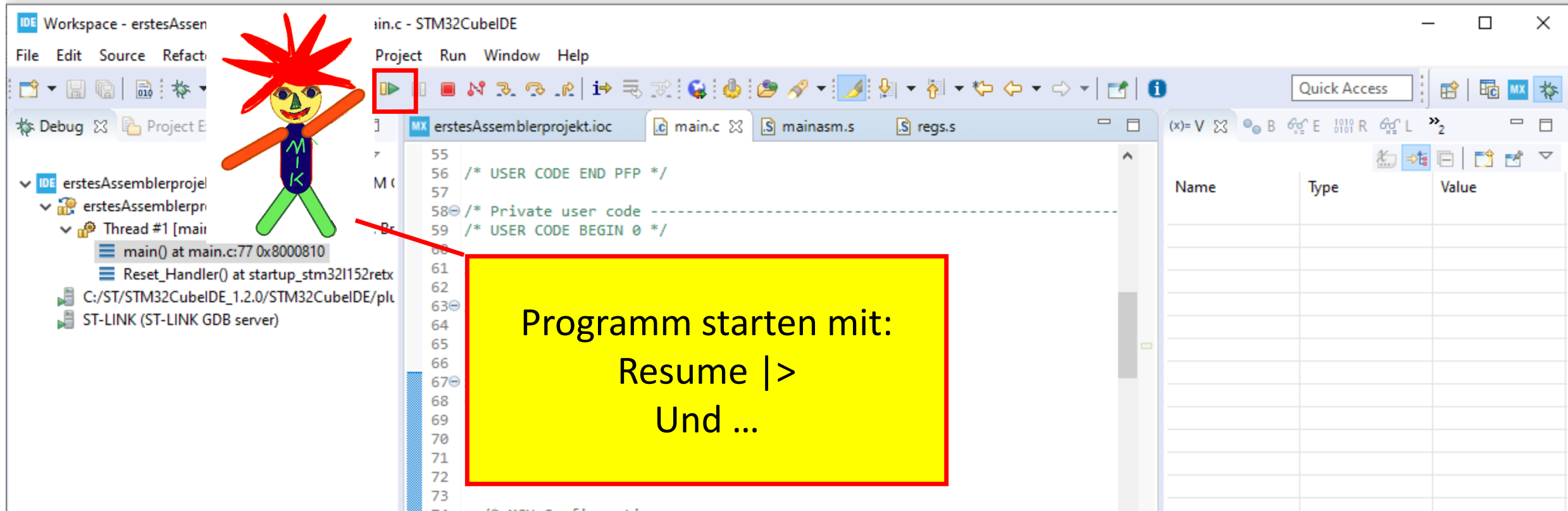
Getting Started STM32CubeIDE mit STM32F103RBT



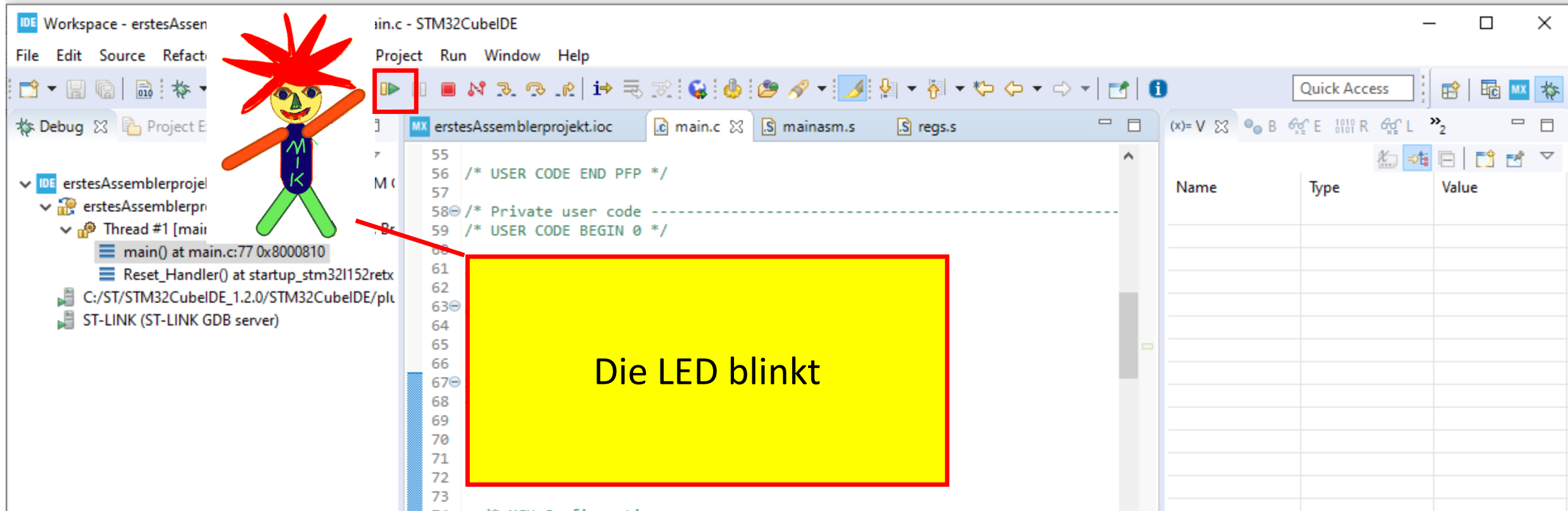
Die Debug-Perspektive



Getting Started STM32CubeIDE mit STM32F103RBT



Getting Started STM32CubeIDE mit STM32F103RBT



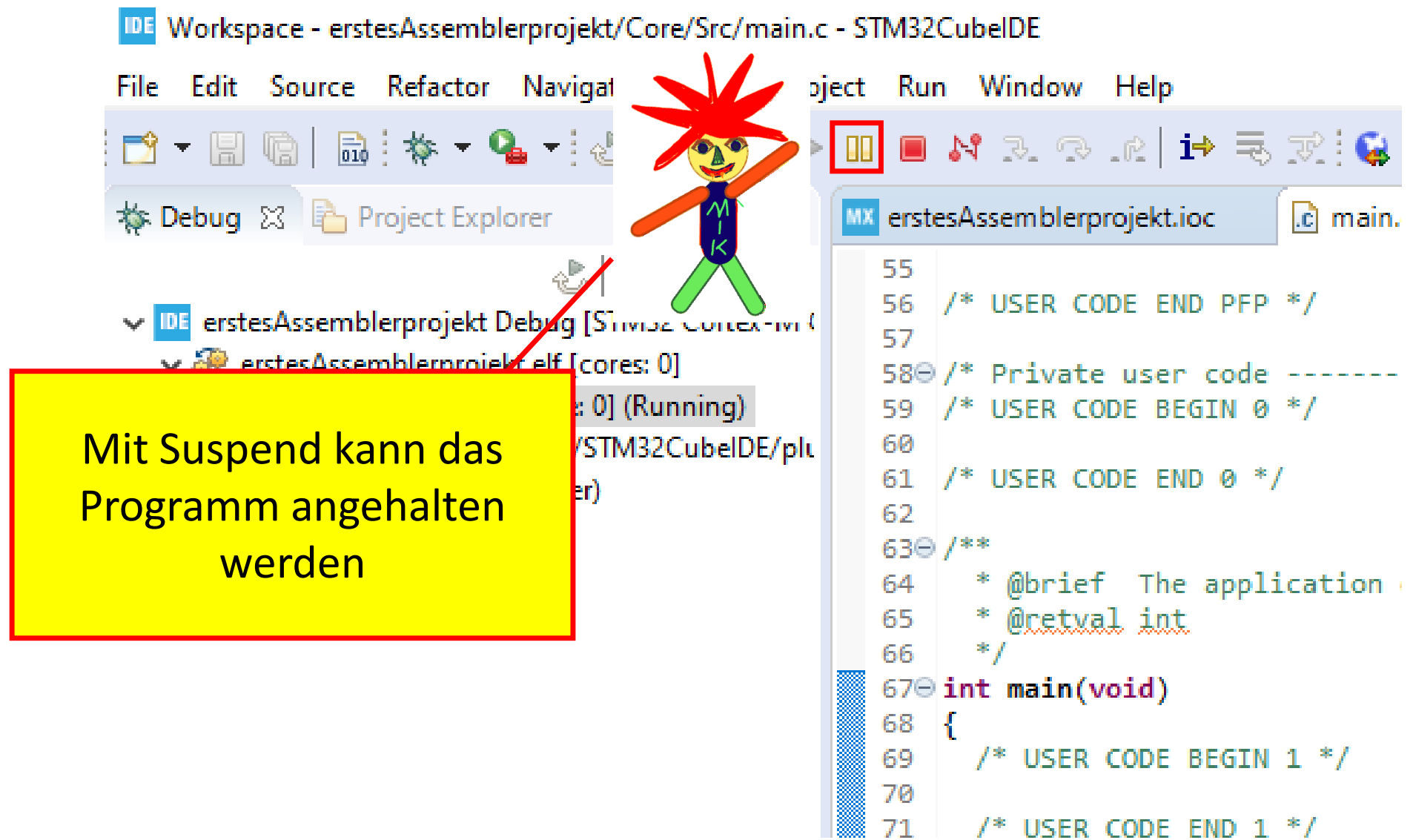
The screenshot shows the STM32CubeIDE interface. On the left, the 'Workspace - erstesAssen' panel displays the project structure: 'erstesAssemblerprojel' > 'erstesAssemblerprn' > 'Thread #1 [mai' > 'main()' at main.c:77 0x8000810. A red starburst icon is placed over the 'main()' entry. In the center, the 'Project Run Window Help' menu bar is visible, with the 'Run' button (a green play icon) highlighted by a red rectangle. A red arrow points from the 'main()' entry in the left panel to the 'Run' button. The main editor window shows the 'main.c' file with the following code:

```
55 /* USER CODE END PFP */
56
57
58 /* Private user code -----
59 /* USER CODE BEGIN 0 */
60
61
62
63
64
65
66
67
68
69
70
71
72
73
```

A large yellow rectangle with a red border is overlaid on the code, containing the text 'Die LED blinkt'. On the right, the 'Variable View' panel is empty, showing columns for 'Name', 'Type', and 'Value'.



Getting Started STM32CubeIDE mit STM32F103RBT



The screenshot shows the STM32CubeIDE interface. The title bar reads "Workspace - erstesAssemblerprojekt/Core/Src/main.c - STM32CubeIDE". The menu bar includes File, Edit, Source, Refactor, Navigat, object, Run, Window, and Help. The toolbar contains icons for file operations, a debug icon, and a suspend icon (two vertical bars) which is highlighted with a red rectangle. Below the toolbar, the "Debug" button and "Project Explorer" are visible. The Project Explorer shows the project structure, including "erstesAssemblerprojekt Debug [STM32CubeIDE/plu...]" and "erstesAssemblerprojekt elf [cores: 0]". A yellow callout box with a red border contains the text: "Mit Suspend kann das Programm angehalten werden". The main editor displays the C code for "main.c", with line 67 highlighted. A cartoon character with a red starburst head is positioned in the center of the interface.

IDE Workspace - erstesAssemblerprojekt/Core/Src/main.c - STM32CubeIDE

File Edit Source Refactor Navigat object Run Window Help

Debug Project Explorer

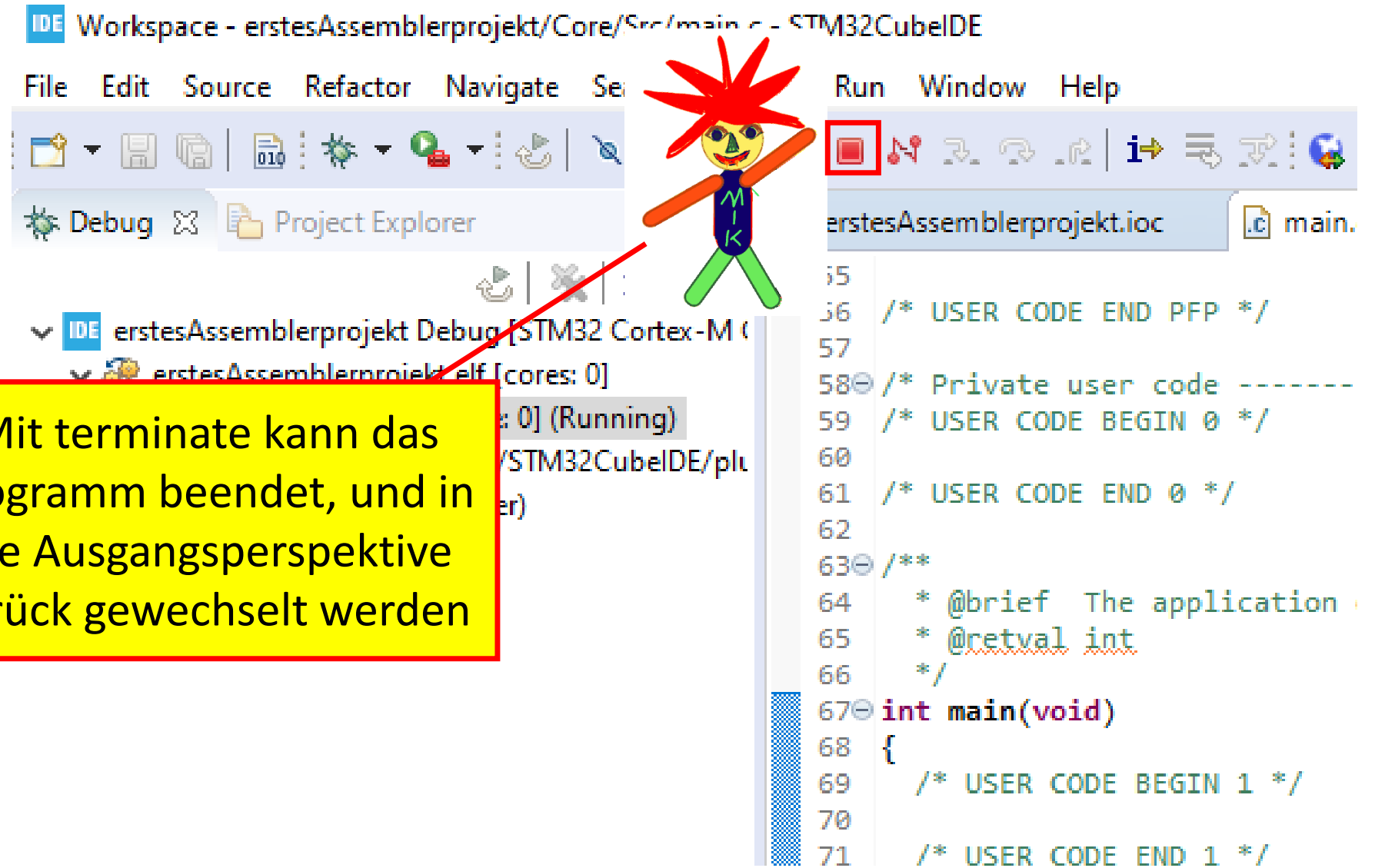
erstesAssemblerprojekt Debug [STM32CubeIDE/plu...]
erstesAssemblerprojekt elf [cores: 0]

Mit Suspend kann das Programm angehalten werden

```
55  
56 /* USER CODE END PFP */  
57  
58 /* Private user code -----  
59 /* USER CODE BEGIN 0 */  
60  
61 /* USER CODE END 0 */  
62  
63 /**  
64  * @brief The application  
65  * @retval int  
66  */  
67 int main(void)  
68 {  
69     /* USER CODE BEGIN 1 */  
70  
71     /* USER CODE END 1 */
```



Getting Started STM32CubeIDE mit STM32F103RBT



Mit terminate kann das Programm beendet, und in die Ausgangsperspektive zurück gewechselt werden

