



Starter kit User Guide

SK-FM3-80PMC-MB9BF524M

SK-FM3-80PMC-9BF524M-JL

Hardware V1.1 / Documentation V1.1

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- 6. The contents of this document are subject to change by SPANSION without a prior notice, thus contact SPANSION about the latest one.
- This board and its deliverables must only be used for test applications in an evaluation laboratory environment.



- For your convenience this user guide includes external links that simplify installing of drivers, software utilities, and quick jumps to documentation.
- Some PDF viewer do not allow access to external content by links because of security reasons.
- A viewer called “PDF XChange” is provided in the software package of this starter kit. It’s use is free of charge and no additional installation is required.
- Launching “start.bat” opens this user guide in the PDF XChange viewer.
- Please ensure you have copied the complete software package related to this starter kit in order to use and run the links and examples given on the next pages.
- Please contact the [Spancion Support](#) in case of any question.

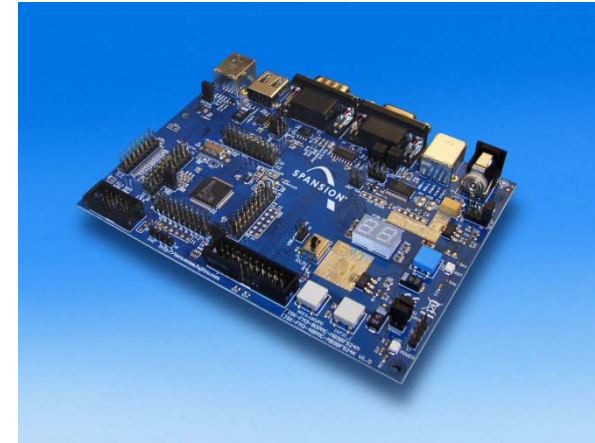
■ Introduction

- [About the SK-FM3-80PMC-MB9BF524M](#)
- [SK-FM3-80PMC-MB9BF524M content](#)
- [SK-FM3-80PMC-9BF524M-JL content](#)
- [Test it](#)
- [The Hardware](#)
- [The Software](#)

■ Try yourself

- [Software examples](#)
- [Program download](#)
- [IAR-Embedded Workbench](#)
- [KEIL µVision](#)
- [Solutions](#)

■ [Workshops](#), [Contacts](#) & [More](#)



■ [Additional documents](#)

- [Schematic](#)
- [Factsheet](#)
- [Data sheet MB9B520M Series](#)
- [Peripheral Manual](#) and [Errata](#)
- [Peripheral Manual \(Timer Part\)](#) and [Errata](#)
- [Peripheral Manual \(Analog Part\)](#) and [Errata](#)
- [Peripheral Manual \(Communication Part\)](#) and [Errata](#)
- [Cortex M3 Technical Reference Manual](#)
- [Flash Programming Manual](#)

Please visit www.spansion.com to find latest releases of the above mentioned documents.



The SK-FM3-80PMC-MB9BF524M is available in two versions:

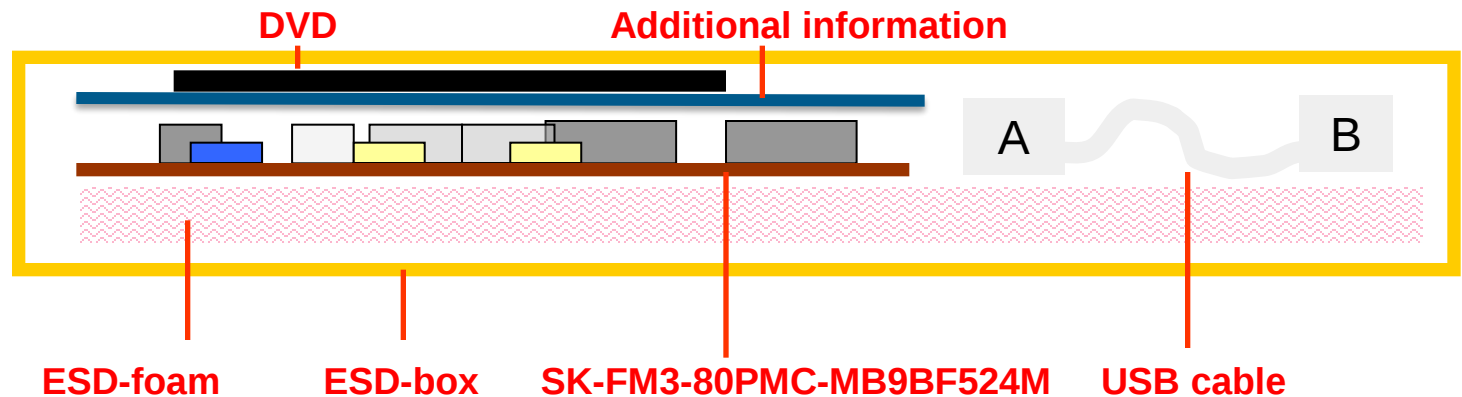
- The SK-FM3-80PMC-MB9BF524M includes a low-cost evaluation board based on the Spansion FM3 microcontroller MB9B520M Series
- SK-FM3-80PMC-9BF524M-JL includes a low-cost evaluation board based on the Spansion FM3 microcontroller MB9B520M Series and the JTAG adapter J-Link
- The MB9B520M Series includes the following features:
 - Up to 288 KByte Dual Operation Flash Memory
 - Up to 64 KByte RAM
 - Up to 2 CAN controller 2.0A/B
 - Up to 8 LIN-USART-I²C interfaces
 - USB-Host/-Device interface
 - Timers (ICUs, OCUs, PPGs, others)
 - Two 12 Bit ADCs, up to 26 channels
 - External interrupts



- Features of the SK-FM3-80PMC-MB9BF524M board:
 - Microcontroller MB9BF524M
 - 1x UART-Transceiver (SUB-D9 connector)
 - 1x USB to serial converter (Type-B connector)
 - 1x High-speed CAN-Transceiver (SUB-D9 connector)
 - 1x USB-Host (Type-A connector)
 - 1x USB-Device (Type-B connector)
 - 2x LED-Display (7-Segment)
 - 2x 'User'-button
 - 1x 'Reset'-button, 'Reset'-LED
 - JTAG-Interface on a 20 pin-header
 - FMTouch connector interface for [software touch solutions](#)
 - TSC-Interface to connect for example the Spansion SK-TSC-1127S-SB
 - All 80 pins routed to pin-header
 - On-board 5V and 3V voltage regulators, 'Power'-LED
 - Power supply via USB (UART'B'), USB-Device, JTAG or external with a 8V to 12V power connector

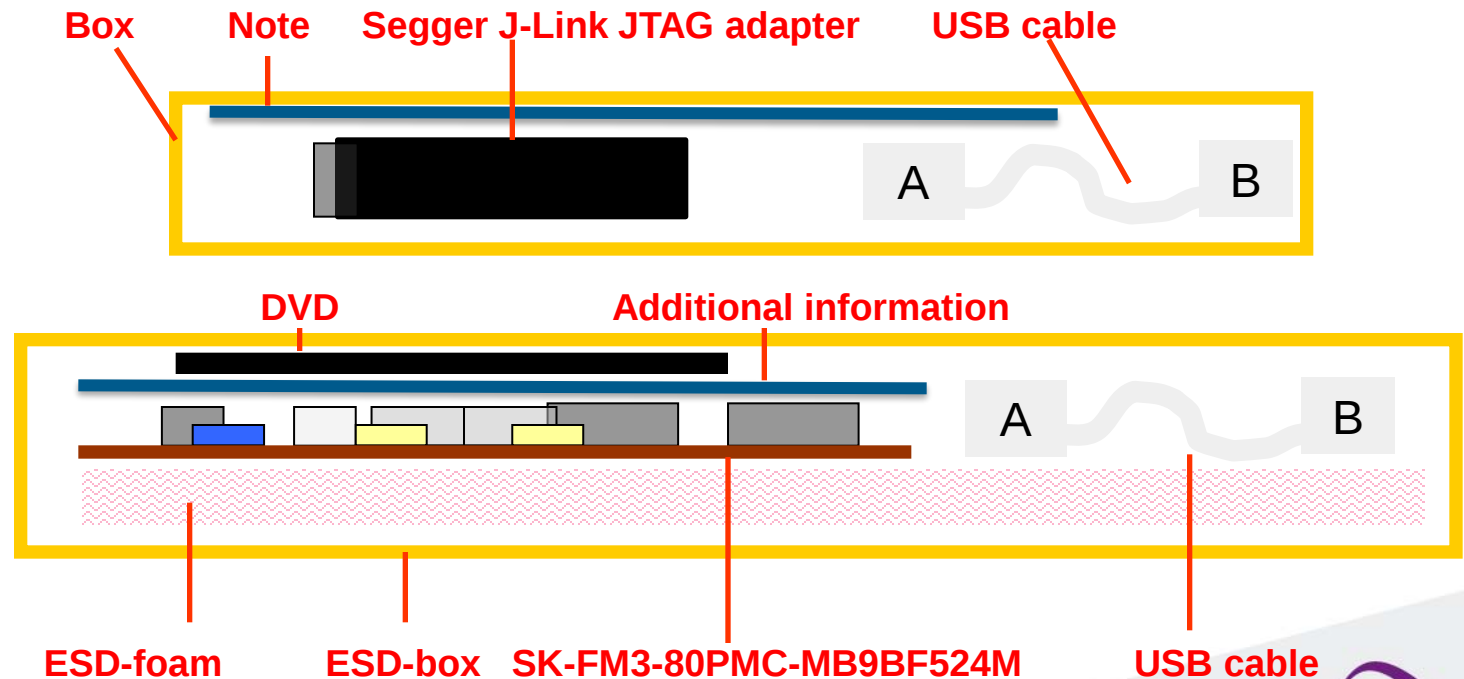
SK-FM3-80PMC-MB9BF524M content

- The SK-FM3-80PMC-MB9BF524M contains
 - SK-FM3-80PMC-MB9BF524M evaluation board with MB9BF524M
 - USB cable
 - DVD: Documentation, USB driver, Software examples, Programmer

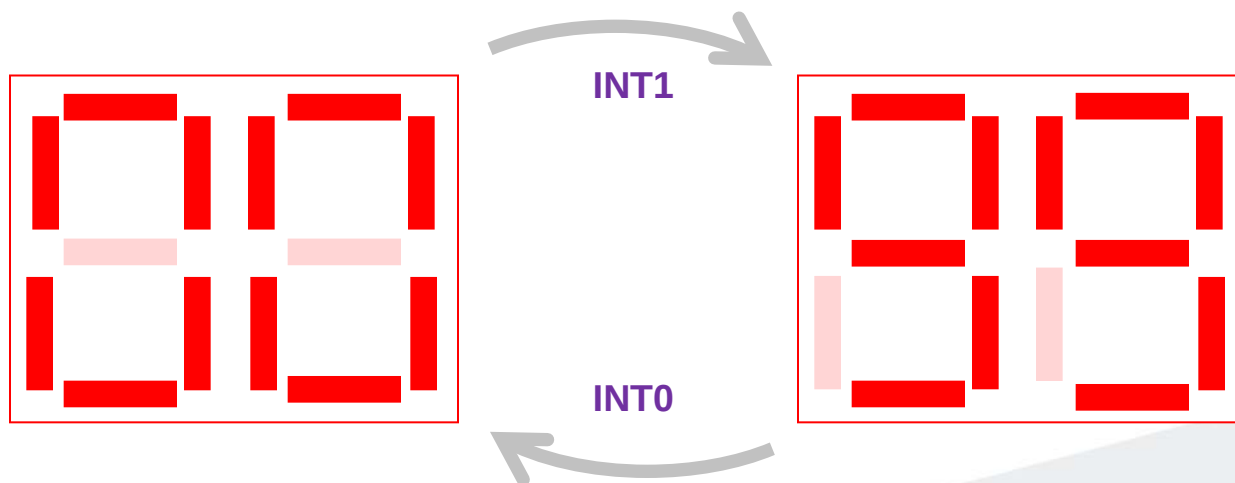


SK-FM3-80PMC-9BF524M-JL content

- The SK-FM3-80PMC-9BF524M-JL contains
 - SK-FM3-80PMC-MB9BF524M evaluation board with MB9BF524M
 - USB cable
 - DVD: Documentation, USB driver, Software examples, Programmer
 - Segger J-Link JTAG adapter incl. USB cable



- The microcontroller on the SK-FM3-80PMC-MB9BF524M is already preprogrammed with a simple application.
 - Connect the SK-FM3-80PMC-MB9BF524M via USB (X5) with the PC
 - [Install the USB driver from the DVD](#)
 - Press the ‚Reset‘- Button
 - The SK-FM3-80PMC-MB9BF524M will automatically start counting
 - The count direction can be changed by pressing the key buttons



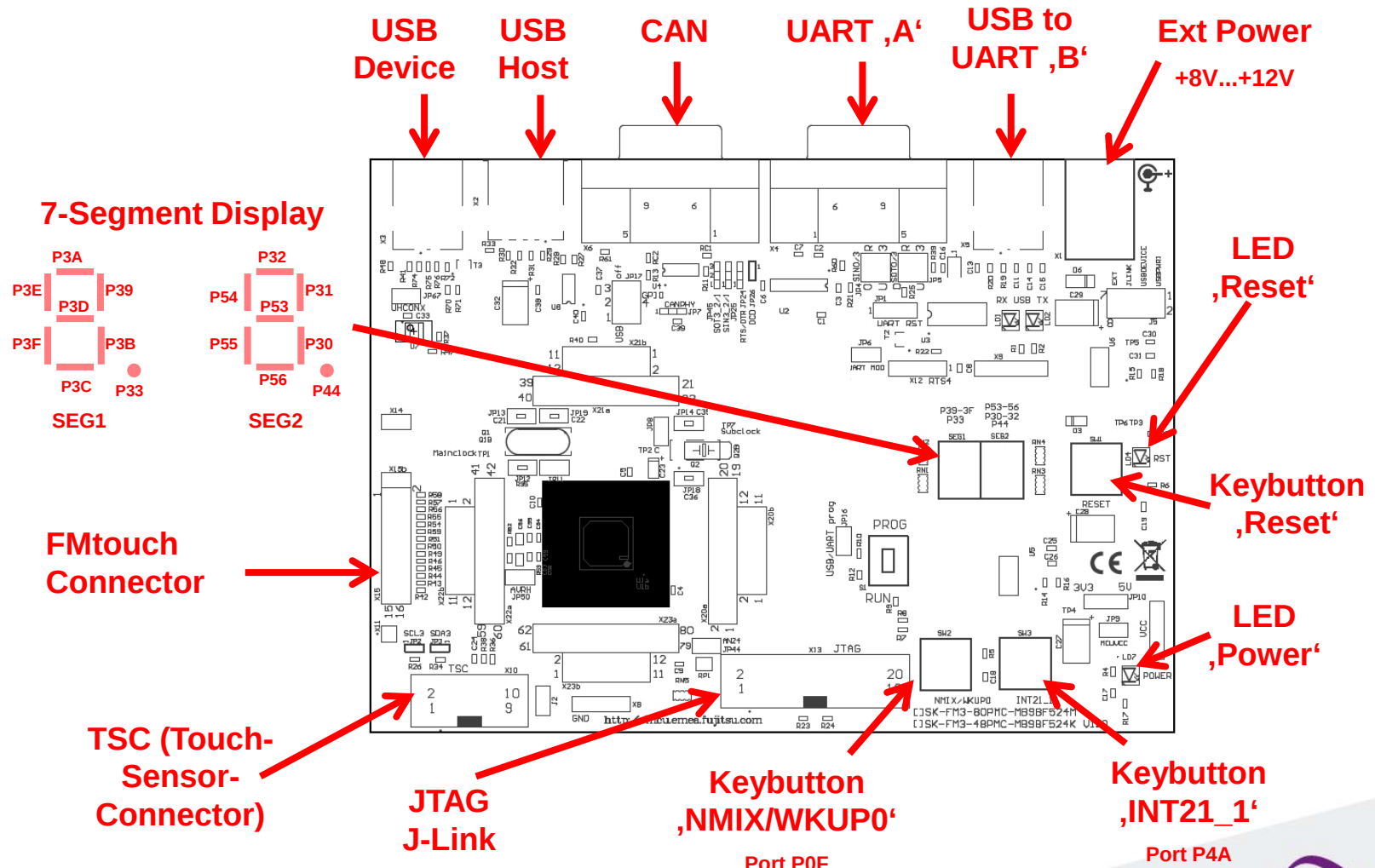


Congratulations!

- You finished successfully the first test
- Now you will get more details about the SK-FM3-80PMC-MB9BF524M board
- You will learn more about
 - The on-board features
 - How to program the Flash
 - How to start with IAR-Embedded-Workbench and KEIL μ Vision

The Hardware

■ Main features



The Hardware

■ The jumpers

JP1: UART-Reset

1-2: DTR-Signal of the UART connector is connected to the MCU reset-pin.

2-3: DTR-Signal of the USB connector is connected to the MCU reset-pin.

Some terminal-programs, e.g. Spansion's Skwizard, allow to reset the evaluation board by using the DTR-Signal.

JP6: MD0 selection

Close this jumper to control the MD0 level by the RTS signal of the USB interface

S1: Mode selection

PROG: Program-mode

RUN: Run-mode

JP10: 5V / 3.3V

1-2: 5V supply is used

2-3: 3.3V supply is used

JP4: UART RX select

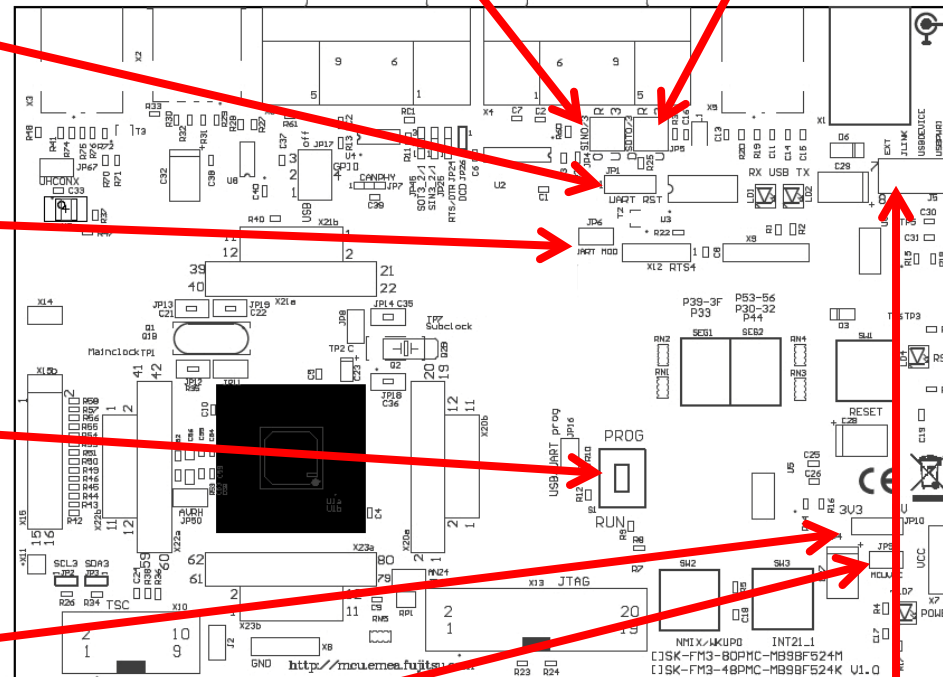
R-0: UART0=UART'A' / U-4: UART4=UART'B' (USB)

R-3: UART3=UART'A' / U-0: UART0=UART'B' (USB)

JP5: UART TX select

R-0: UART0=UART'A' / U-4: UART4=UART'B' (USB)

R-3: UART3=UART'A' / U-0: UART0=UART'B' (USB)



JP9: MCU Vcc

This jumper can be used to measure the current consumption of the MCU

J5: Power Supply

1-2: USB (UART ,B') supply

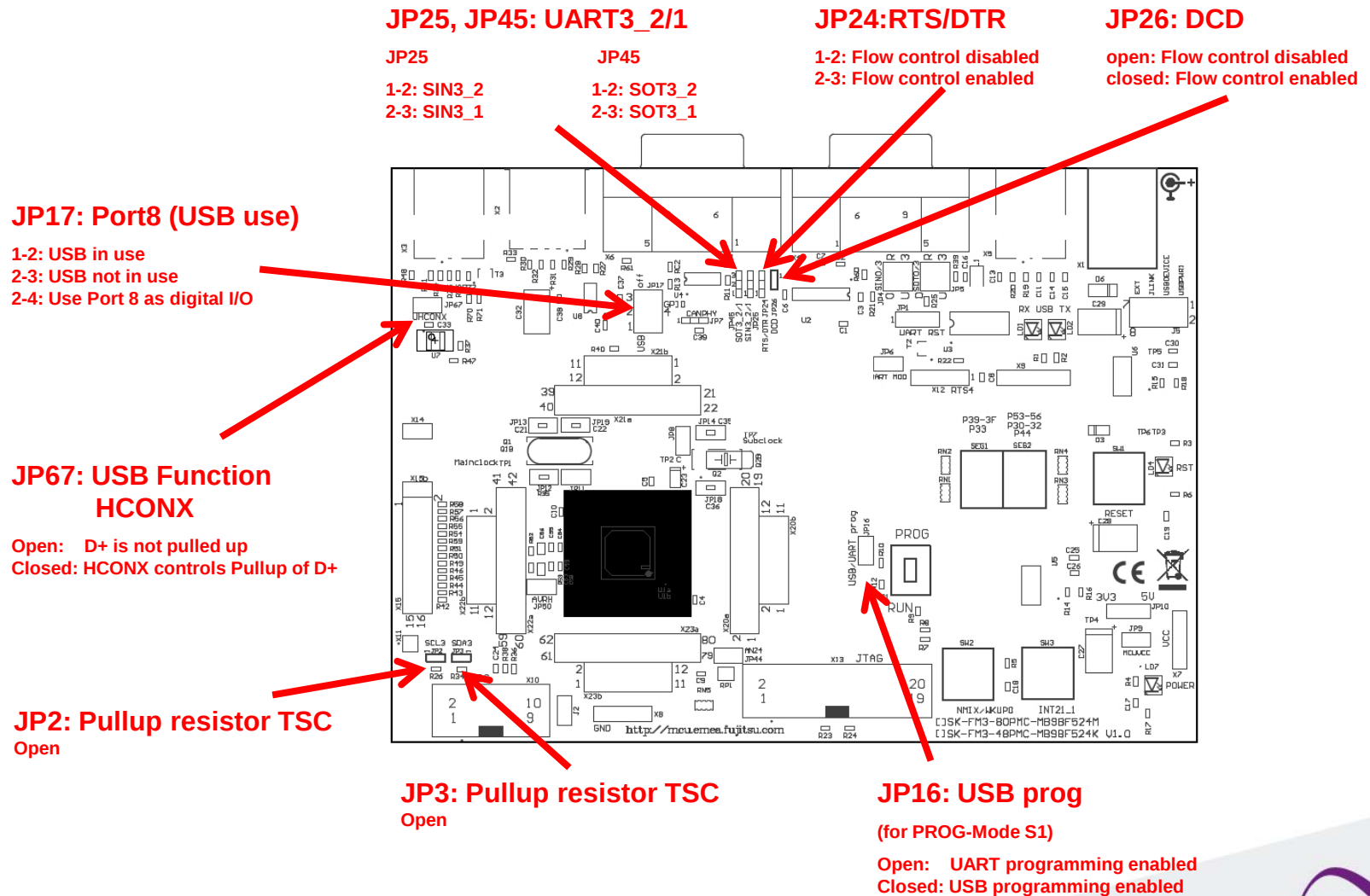
3-4: USB Device supply

5-6: JLINK supply

7-8: External supply

The Hardware

■ The jumpers



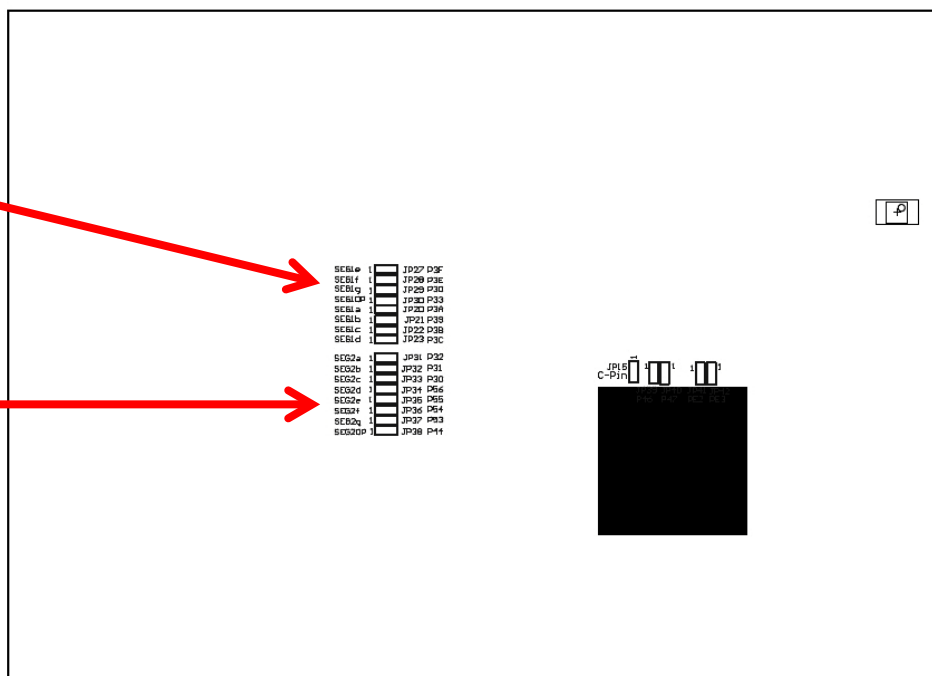
- The jumpers(back)

JP20-JP23, JP27-JP30: SEG1

Closed: SEG1a- SEG1DP active

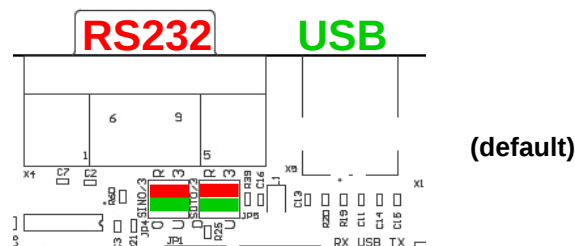
JP31-JP38: SEG2

Closed: SEG2a- SEG2DP active

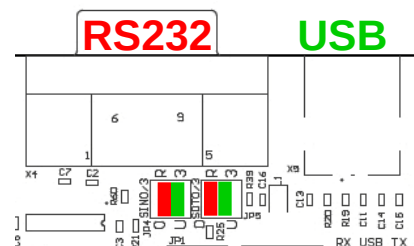


- JP4, JP5 : UART selection

- UART0 and UART3 of the microcontroller can be used together with a typical RS232 SUB-D9 connector and a serial/USB converter
- The jumpers JP4 and JP5 routes the channel to the connector
- UART0 = USB-connector (X5), UART3 = Sub-D9 (X4) (default)
 - ◆ Setting of Jumper JP4 and JP5: U-0 / R-3

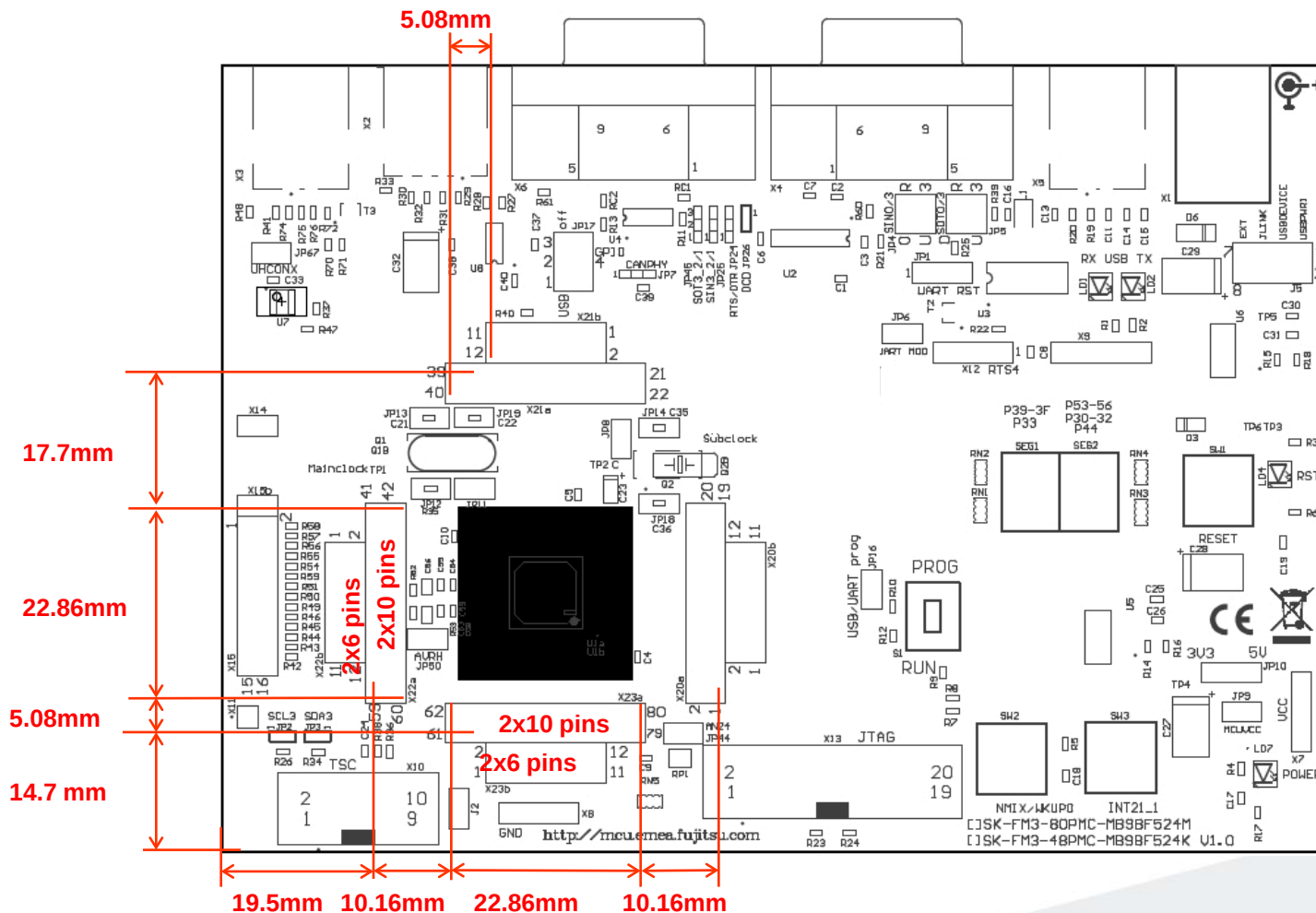


- UART0 = Sub-D9 (X4), UART3 = USB-connector (X5)
 - ◆ Setting of Jumper JP4 and JP5: U-3 / R-0



■ Extension headers X20-X23

- Standard 0.1" / 2.54mm grid for use with prototype boards



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
MCUVCC	VCC	1
(SW-Touch_4 , Connector X15)/ (TSC_7, Connector X10)/ UART3_1	P50/INT00_0 /AIN0_2/SIN3_1/AN22	2
(SW-Touch_3, Connector X15)/ (TSC_2, Connector X10) / UART3_1	INT01_0/BIN0_2/SOT3_1/AN23	3
(SW-Touch_2, Connector X15)/ (TSC_4, Connector X10)	P52/INT02_0/ZIN0_2/SCK3_1/AN24	4
SEG2g	P53/SIN6_0/TIOA1_2/INT07_2	5
SEG2f	P54/SOT6_0/TIOB1_2/INT18_1	6
SEG2e	P55/SCK6_0/ADTG_1/INT19_1	7
SEG2d	P56/INT08_2	8
SEG2c	P30/AIN0_0/TIOB0_1/INT03_2/AN25	9
SEG2b	P31/BIN0_0/TIOB1_1/SCK6_1/INT04_2/AN26	10



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
SEG2a	P32/ZIN0_0/TIOB2_1/SOT6_1/INT05_2	11
SEG1DP	P33/INT04_0/TIOB3_1/SIN6_1/ADTG_6	12
SEG1b	P39/DTTIOX_0/INT06_0/ADTG_2	13
SEG1a	P3A/RTO00_0/TIOA0_1/INT07_0/SUBOUT_2/RTCCO_2	14
SEG1c	P3B/RTO01_0/TIOA1_1	15
SEG1d	P3C/RTO02_0/TIOA2_1/INT18_2	16
SEG1g	P3D/RTO03_0/TIOA3_1	17
SEG1f	P3E/RTO04_0/TIOA4_1/INT19_2	18
SEG1e	P3F/RTO05_0/TIOA5_1	19
GND	VSS	20



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
SEG2DP	P44/TIOA4_0/INT10_0	21
	P45/TIOA5_0/INT11_0	22
C-Pin	C	23
GND	VSS	24
MCUVCC	VCC	25
(32.768KHz Crystal)	P46/X0A	26
(32.768KHz Crystal)	P47/X1A	27
Key button- 'Reset'	INITX	28
UART3_2 (RXD)	P48/INT14_1/SIN3_2	29
UART3_2 (TXD)	P49/TIOB0_0/INT20_1/DA0_0/SOT3_2/AIN0_1	30



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
Key button ,INT'	P4A/TIOB1_0/INT21_1/DA1_0/SCK3_2/BIN0_1	31
	P4B/TIOB2_0/INT22_1/IGTRG_0/ZIN0_1	32
	P4C/TIOB3_0/SCK7_1/INT12_0/AIN1_2	33
	P4D/TIOB4_0/SOT7_1/INT13_0/BIN1_2	34
	P4E/TIOB5_0/INT06_2/SIN7_1/ZIN1_2	35
GND	MD1/PE0	36
Mode-Switch ,S1'	MD0	37
4MHz Crystal	X0/PE2	38
4MHz Crystal	X1/PE3	39
GND	VSS	40



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
MCUVCC	VCC	41
USB Switch Device/Host	P10/AN00	42
CAN RX	P11/AN01/SIN1_1/INT02_1/RX1_2/FRCK0_2/WKUP1	43
CAN TX	P12/AN02/SOT1_1/TX1_2/IC00_2	44
GND	AVSS	45
USB Power Enable	AN04/INT03_1/IC02_2/SIN0_1	46
Current limitation enable	P15/AN05/IC03_2/SOT0_1/INT14_0	47
(SW-Touch_9, Connector X15)	P16/AN06/SCK0_1/INT15_0	48
(SW-Touch_10, Connector X15)	P17/AN07/SIN2_2/INT04_1	49
AVCC	AVCC	50



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
AVRH	AVRH	51
GND	AVRL	52
(SW-Touch _12, Connector X15)	P18/AN08/SOT2_2	53
(SW-Touch _11, Connector X15)	P19/AN09/SCK2_2	54
(SW-Touch _14, Connector X15)	AN10/SIN4_1/INT05_1/IC00_1	55
(SW-Touch _15, Connector X15)	P1B/AN11/SOT4_1/IC01_1/INT20_2	56
(SW-Touch _13, Connector X15)	SCK0_0/TIOA7_1/AN12	57
UART0 TX	P22/SOT0_0/TIOB7_1/ZIN1_1/AN13	58
UART0 RX	P21/SIN0_0/INT06_1/WKUP2/BIN1_1/AN14	59
	P20/INT05_0/CROUT_0/AIN1_1	60



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
(JTAG TRSTX, Connector X13)	P00/TRSTX	61
(JTAG TCK, Connector X13)	P01/TCK/SWCLK	62
(JTAG TDI, Connector X13)	P02/TDI	63
(JTAG TMS, Connector X13)	P03/TMS/SWDIO	64
(JTAG TDO, Connector X13)	P04/TDO/SWO	65
	P07/ADTG_0/INT23_1	66
(SW-Touch_8, Connector X15)	P0A/SIN4_0/INT00_2/AN15	67
(SW-Touch_7, Connector X15)	P0B/SOT4_0/TIOB6_1/AN16/INT18_0	68
(SW-Touch_6, Connector X15)	P0C/SCK4_0/TIOA6_1/INT19_0/AN17	69
(TSC- TINT, Connector X10)	P0D/RTS4_0/TIOA3_2/INT20_0	70



- The microcontroller pins

Board Function	Pin Function	MB9BF524M
(TSC- GINT, Connector X10)	P0E/CTS4_0/TIOB3_2/INT21_0	71
NMIX/ WKUP	P0F/NMIX/SUBOUT_0/CROUT_1/RTCCO_0/WKUP0/AN18	72
(TSC- Reset, Connector X10)	P63/INT03_0	73
(SW-Touch_5, Connector X15)	P62/SCK5_0/ADTG_3/AN19	74
USB UHCONX	P61/SOT5_0/TIOB2_2/UHCONX/DTTI0X_2/AN20	75
Mode Switch ,S1'	P60/SIN5_0/TIOA2_2/INT15_1/WKUP3/IGTRG_1/AN21	76
USB-power supply	USBVCC	77
USB Data -	P80/UDM0/INT16_1	78
USB Data +	P81/UDP0/INT17_1	79
GND	VSS	80



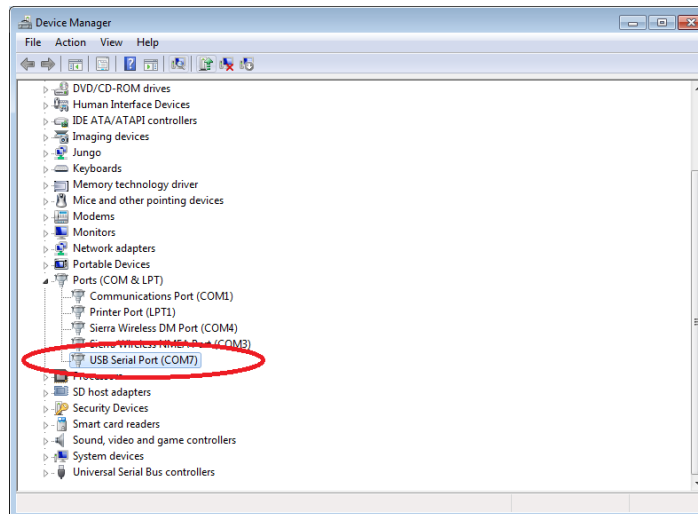
- The SK-FM3-80PMC-MB9BF524M DVD includes the following software:
 - MCU Flash programming tools
 - FLASH MCU Programmer for FM3
 - FLASH USB DIRECT Programmer
 - USB driver for on-board USB-to-RS232 converter
 - The terminal program ,Serial Port Viewer‘
 - The USB configuration tool ,USB Wizard‘
 - Software examples for the SK-FM3-80PMC-MB9BF524M
- Please check our dedicated microcontroller website:

www.spansion.com

- for updates of the Flash programmer tool, utilities and examples
- for data sheets, hardware manuals, application notes, etc.

Installation of the USB-driver

- Install the USB driver from the [DVD](#) with administrator privileges
- Start the Device Manager of the Windows Control Panel
 - START -> Settings -> Control Panel
 - Control Panel -> System -> Hardware -> Device Manager
- Check 'Ports' for the assigned virtual COM-port number
 - USB Serial Port (e.g.: COM7)



- Ready!



- Serial Port Viewer
 - Free of charge terminal program, [Start installation](#)
- USB Wizard
 - Free of charge USB configuration tool, [Start installation](#)
- Following examples are provided with SK-FM3-80PMC-MB9BF524N for IAR Embedded Workbench V6 and KEIL μ Vision4:
 - [mb9bf52xm_template](#) ,Empty' project as base for user applications
 - [mb9bf52xm_adc_dvm](#) Digital Voltage Meter based on the A/D-converter
 - [mb9bf52xm_can_uart_terminal](#) Simple CAN example (CAN0)
 - [mb9bf52xm_ioport_counter](#) Counts from 0 to 99 on the 7-segment Display
 - Further examples on [DVD](#) and on our website

Note: **Please copy the examples to your local drive!**

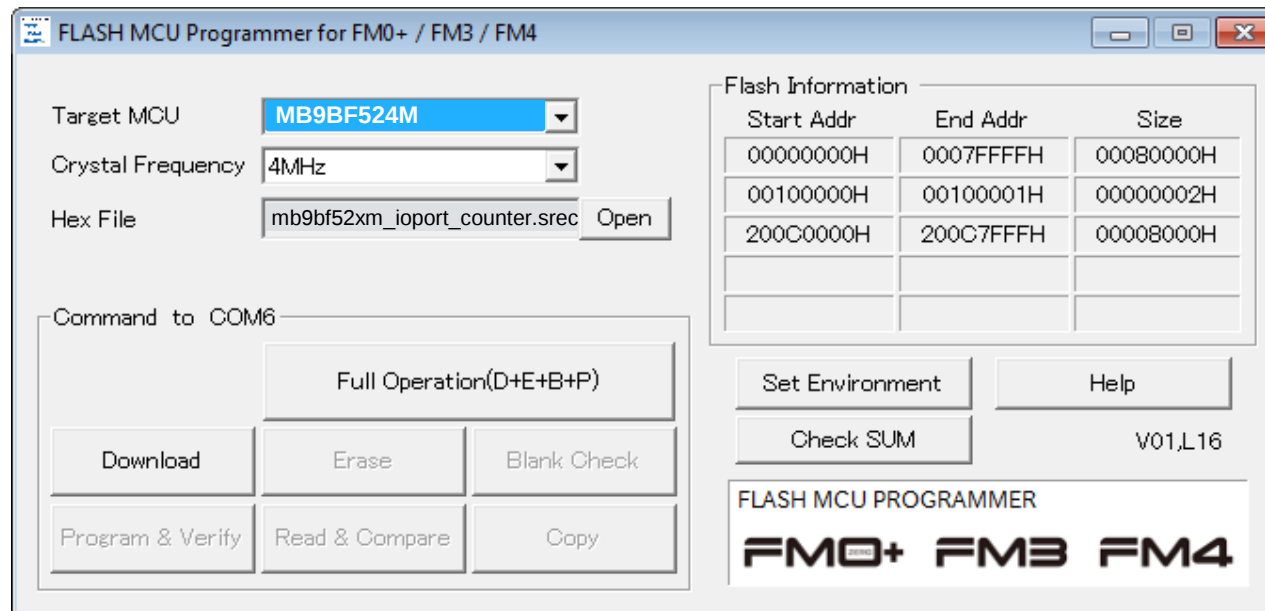


- There are three options to program the flash:
 - UART Programming (X4, X5)
 - ◆ Check jumper JP16 is opened
 - ◆ Connect UART0 of the board to the USB-Port of the PC
 - via USB (JP4,JP5: U-0, R-4)
 - via RS232 (JP4,JP5: U-4, R-0)
 - ◆ Use the [FLASH MCU Programmer](#)
 - USB Programming (X3)
 - ◆ Check jumper JP16 is closed
 - ◆ Connect the board via USB-Device (X3) to the USB-Port of the PC
 - ◆ Use the [FLASH USB DIRECT Programmer](#)
 - JTAG
 - ◆ Use the JTAG-adapter supported by the development toolchain.

FLASH MCU Programmer for UART Programming

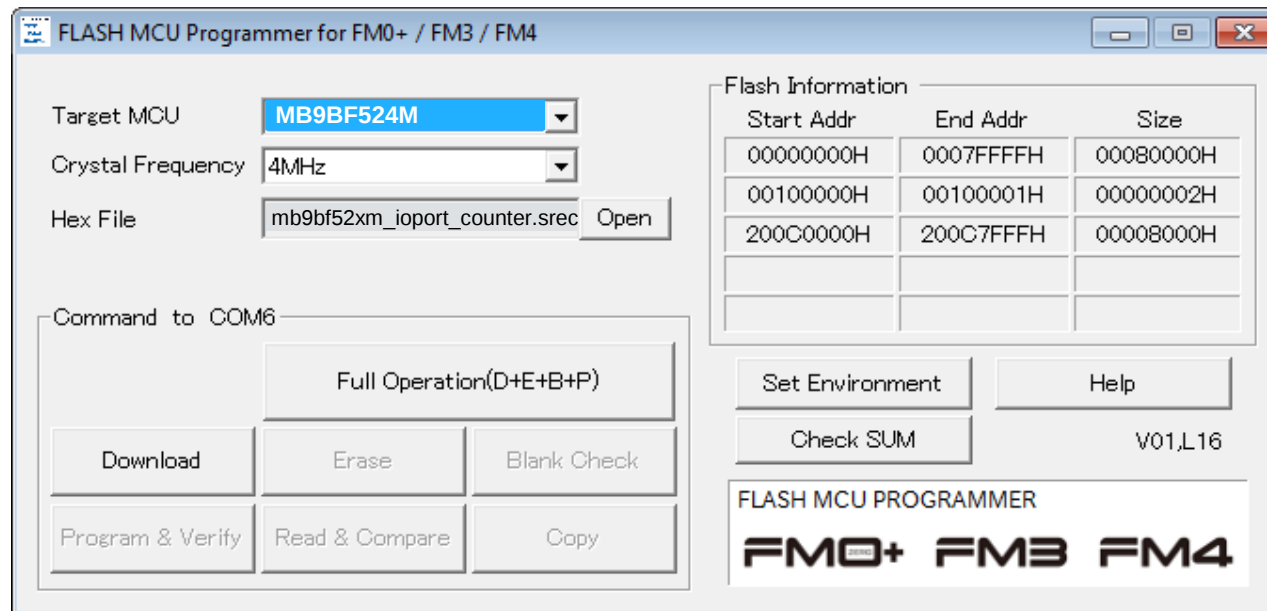
- FLASH MCU Programmer

- Free of charge, no registration required
- Windows based programming tool for FM3 microcontroller
- Uses PC serial port COMx (incl. virtual COM port: USB-to-RS232)
- [Start installation](#)



Program Download

- Start the FLASH MCU Programmer
- Select the target microcontroller (MB9BF524M)
- Select the crystal frequency (4 MHz)
- Choose the software example from the example 'exe'-folder (e.g. Examples\mb9bf52xm_ioport_counter-v10\example\IAR\output\release\exe\mb9bf52xm_ioport_counter.srec)

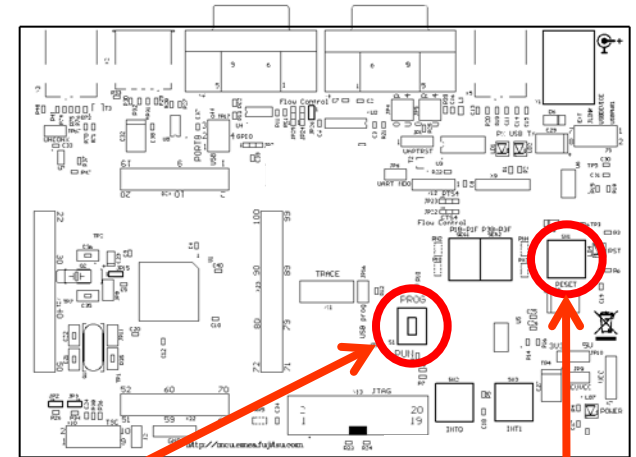


Program Download

- Connect to the PC
 - Connect UART0 with RS232 (X4) or with the USB interface X5
 - Select COM port (,Set Environment')
- Open JP16
- Set switch S1 to position ,PROG'
- Press ,Reset'
- Start ,Full Operation'

(see JP4, JP5 jumper settings)

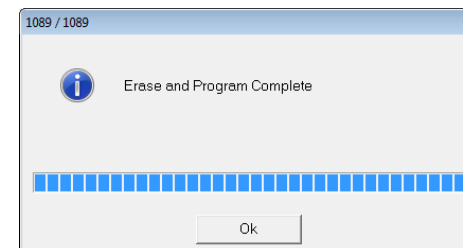
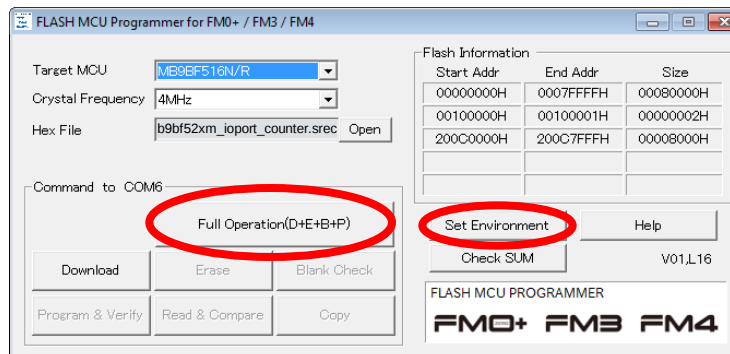
RS232 USB port



S1: Mode selection

PROG: Set switch to position ,PROG' in order to select the program-mode

Keybutton ,RESET'

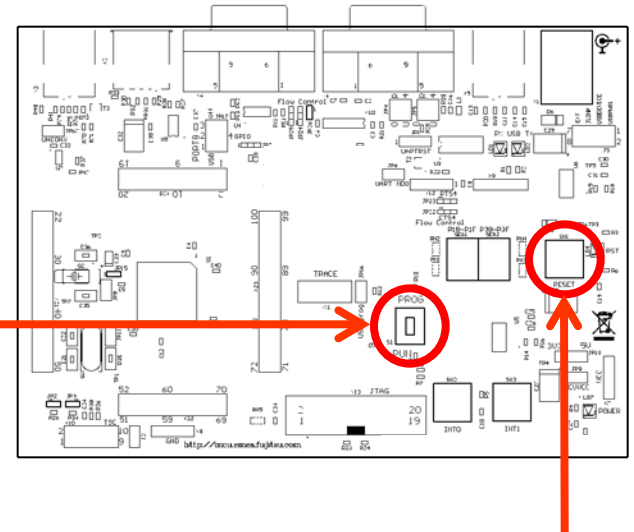


Program Download

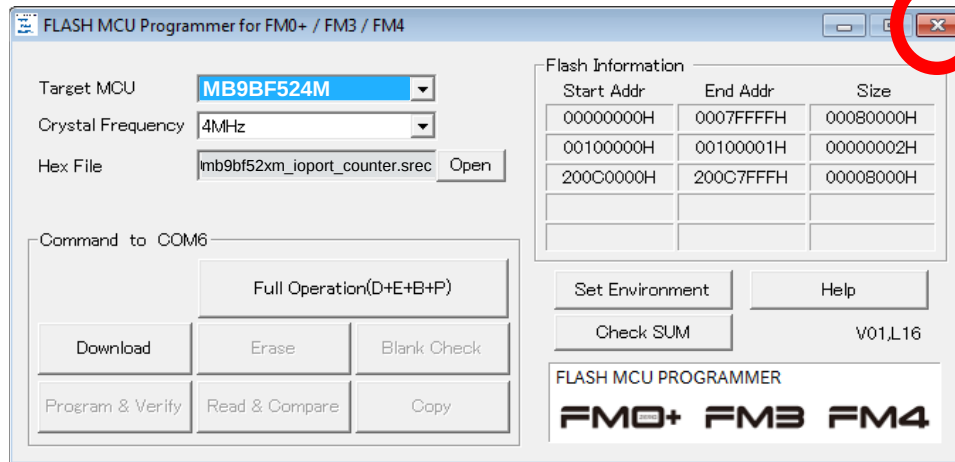
- Close the FLASH MCU Programmer
- Set switch S1 to position ,RUN‘
- Press ,Reset‘

S1: Mode selection

**RUN: Set switch to position ,RUN‘
in order to select the run-mode**



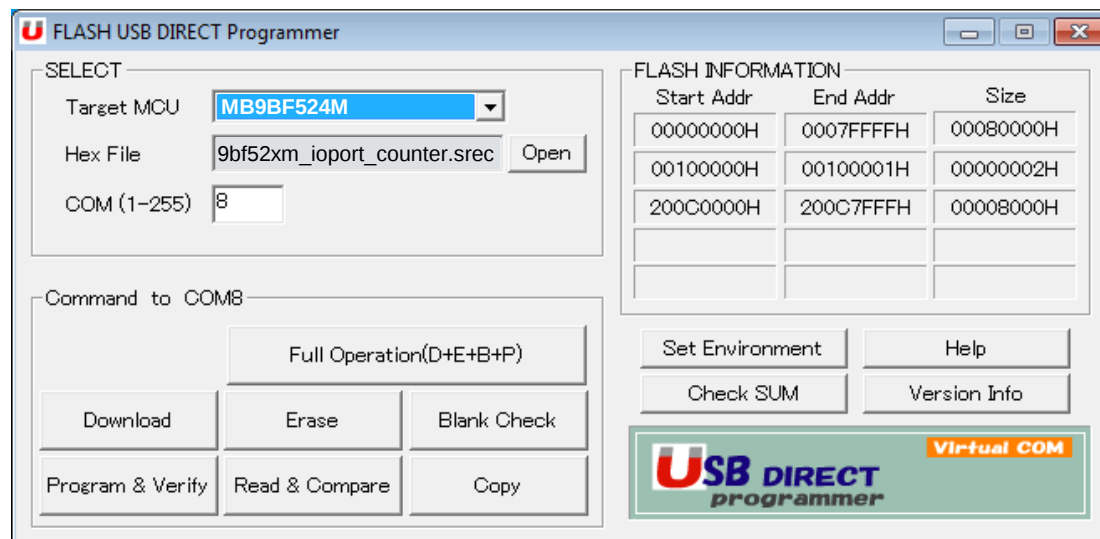
Keybutton ,RESET‘



**Close the FLASH MCU
Programmer**

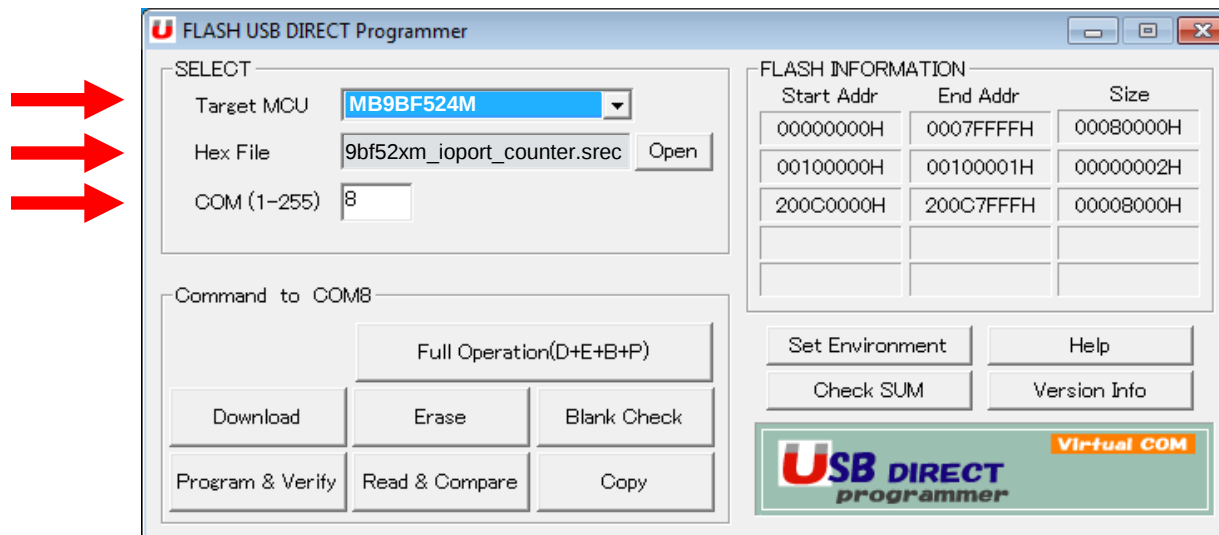
FLASH USB DIRECT Programmer for USB Direct Programming

- FLASH USB DIRECT Programmer
 - Windows based programming tool for FM3 microcontroller
 - Uses direct USB connection (via X3)
 - [Start installation](#)



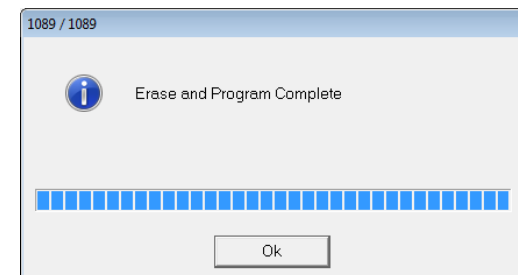
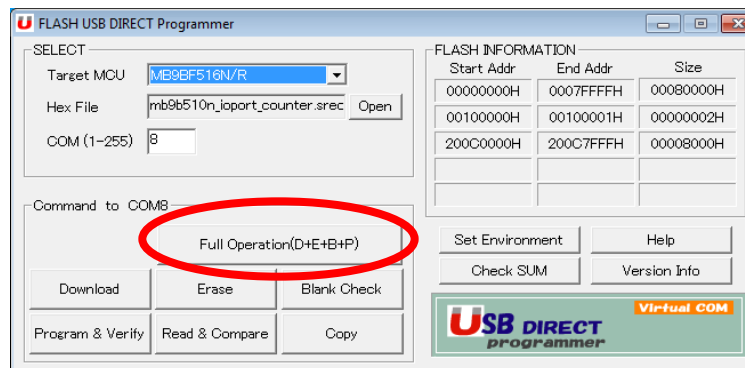
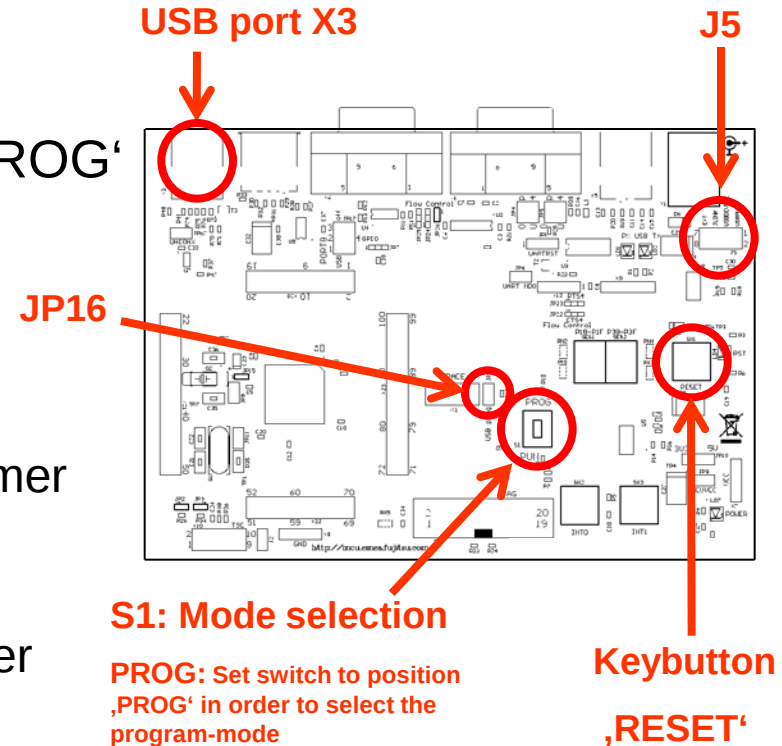
Program Download

- Start the FLASH USB DIRECT Programmer
- Select the target microcontroller (MB9BF524M)
- Choose the software example from the example 'exe'-folder (e.g. Examples\mb9bf52xm_ioport_counter-v10\example\IAR\output\release\exe\mb9bf52xm_ioport_counter.srec)
- Select the COM port



Program Download

- Select the MCU power supply ([J5](#))
 - Close JP16, Set switch S1 to position 'PROG'
 - Connect USB port X3 with the PC
 - Install the USB driver
 - See subfolder 'driver' of installed programmer
 - E.g.: C:\Program Files (x86)\Spansion\..
..FLASH USB DIRECT Programmer\driver
- Press 'Reset' and Start 'Full Operation'

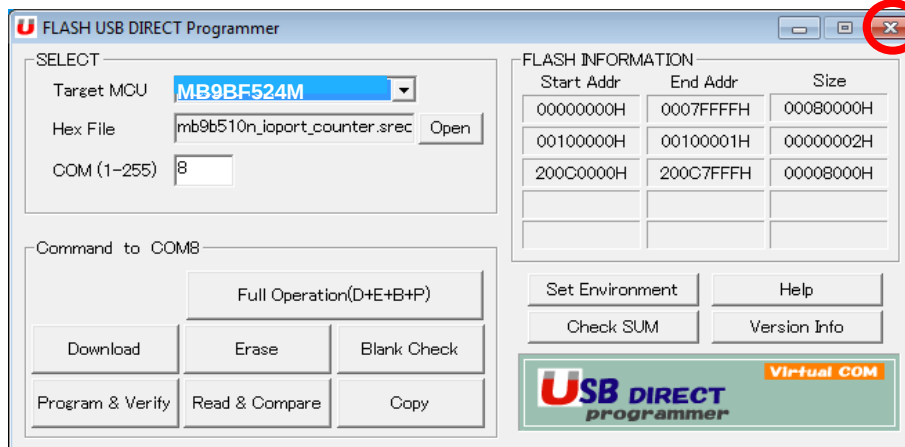
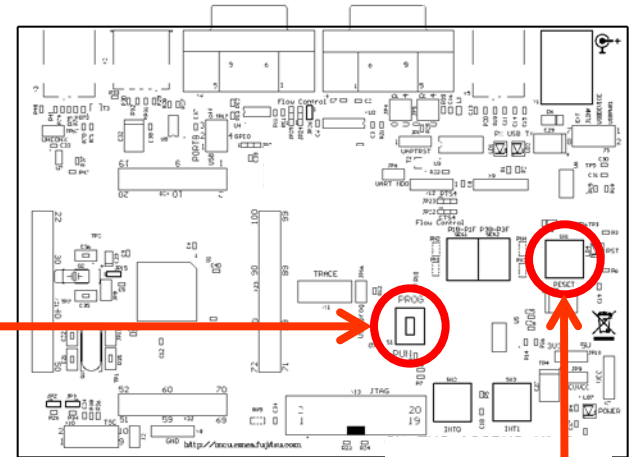


Program Download

- Close the FLASH USB DIRECT Programmer
- Set switch S1 to position ,RUN‘
- Press ,Reset‘

S1: Mode selection

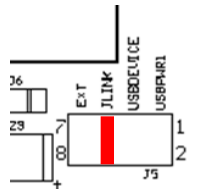
**RUN: Set switch to position ,RUN‘
in order to select the run-mode**



Keybutton ,RESET‘

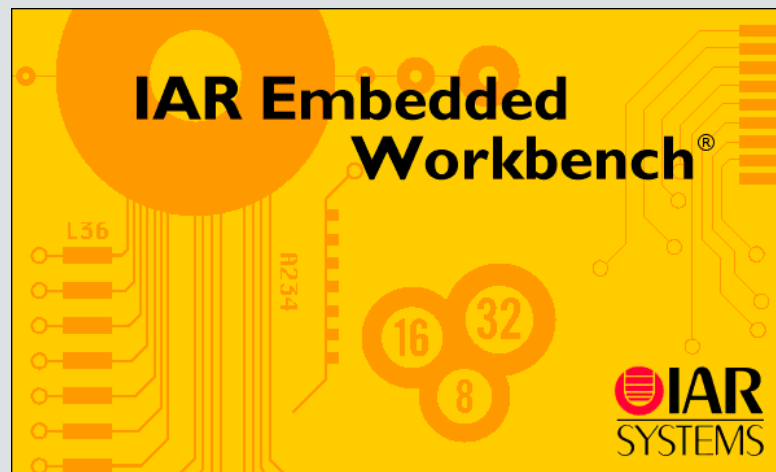
**Close the FLASH USB
DIRECT Programmer**

- The MB9BF524M microcontroller offers a JTAG-Interface that is supported by SK-FM3-80PMC-MB9BF524M.
 - Debug your program with a JTAG-Adapter e.g. Segger J-Link
 - Connect the J-Link to the JTAG-Interface routed to the 20-Pin-Header on X13 and to the USB-Port of your PC
 - Use IAR-Embedded Workbench to debug your program
 - If the JTAG-Adapter allows powering the target, then jumper J5 can be set as follows:



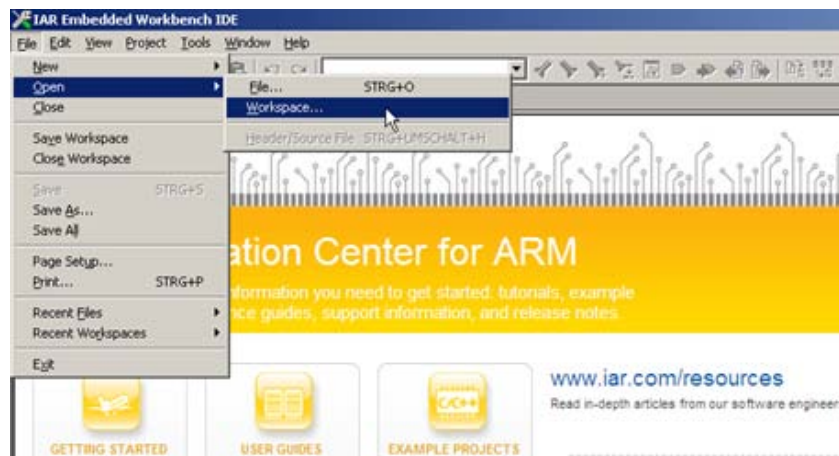
IAR Embedded Workbench

- Installation
- Getting Started
- Open Project
- Build Project
- Debug Project



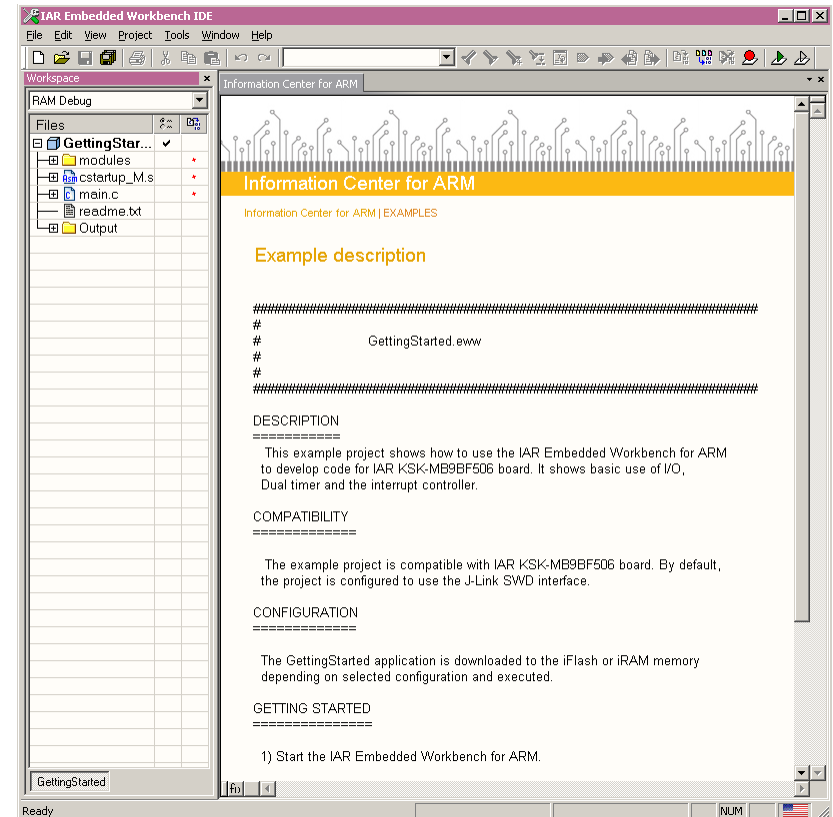
IAR Workbench Getting Started

- Install EWARM from IAR-CD or download latest version from IAR Website
 - EWARM size-limited (32k) or time-limited (full) Evaluation Version
 - ◆ <http://supp.iar.com/Download/SW/?item=EWARM-EVAL>
- Start EWARM Workbench
- Choose File → Open → Workspace
 - e.g.: <drive:>\<board>\ [mb9bf52xm_ioport_counter-v11\example\IAR\](#)
 - Choose mb9b52xm_ioport_counter.eww

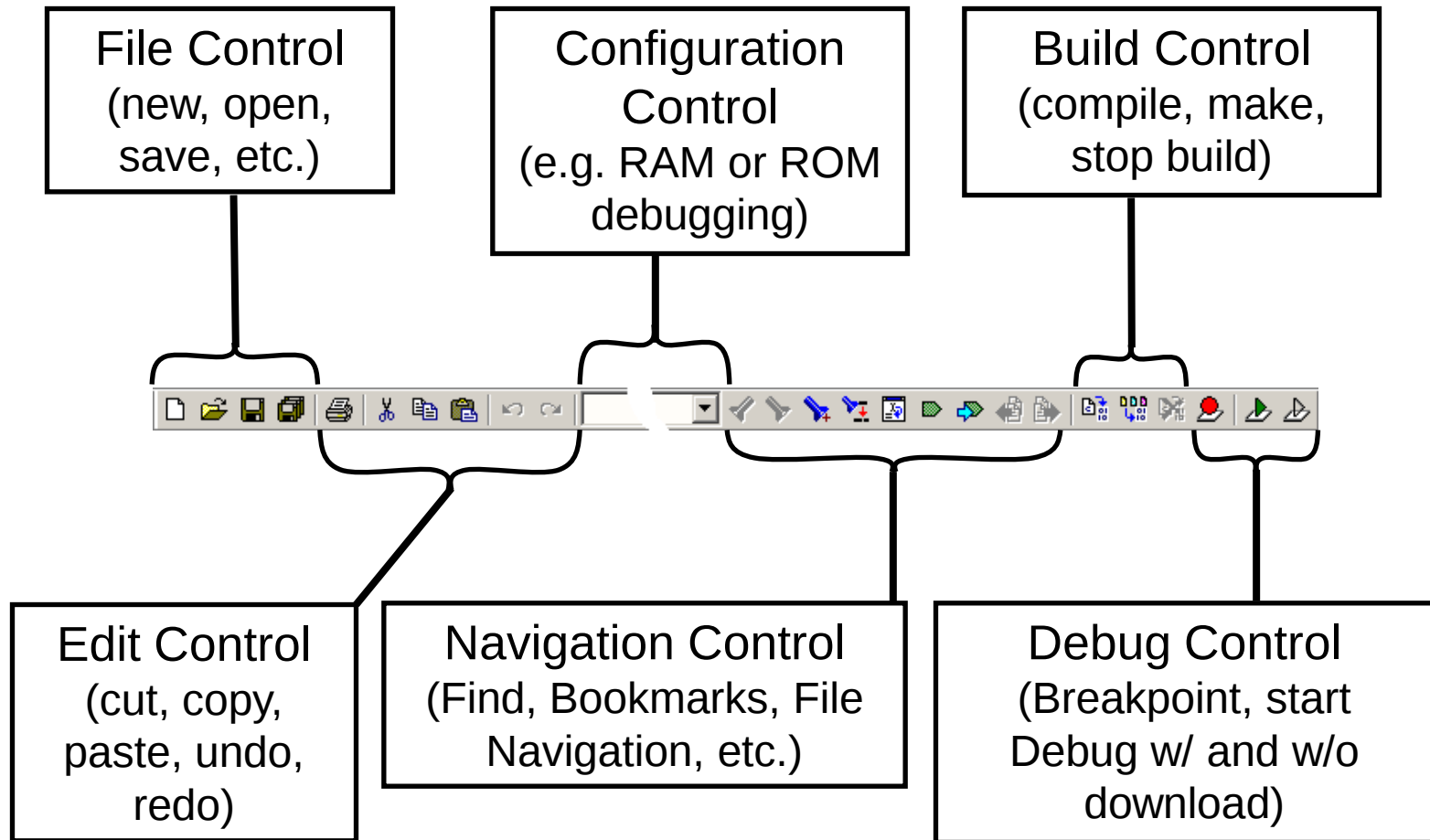


IAR Workbench – Main Window

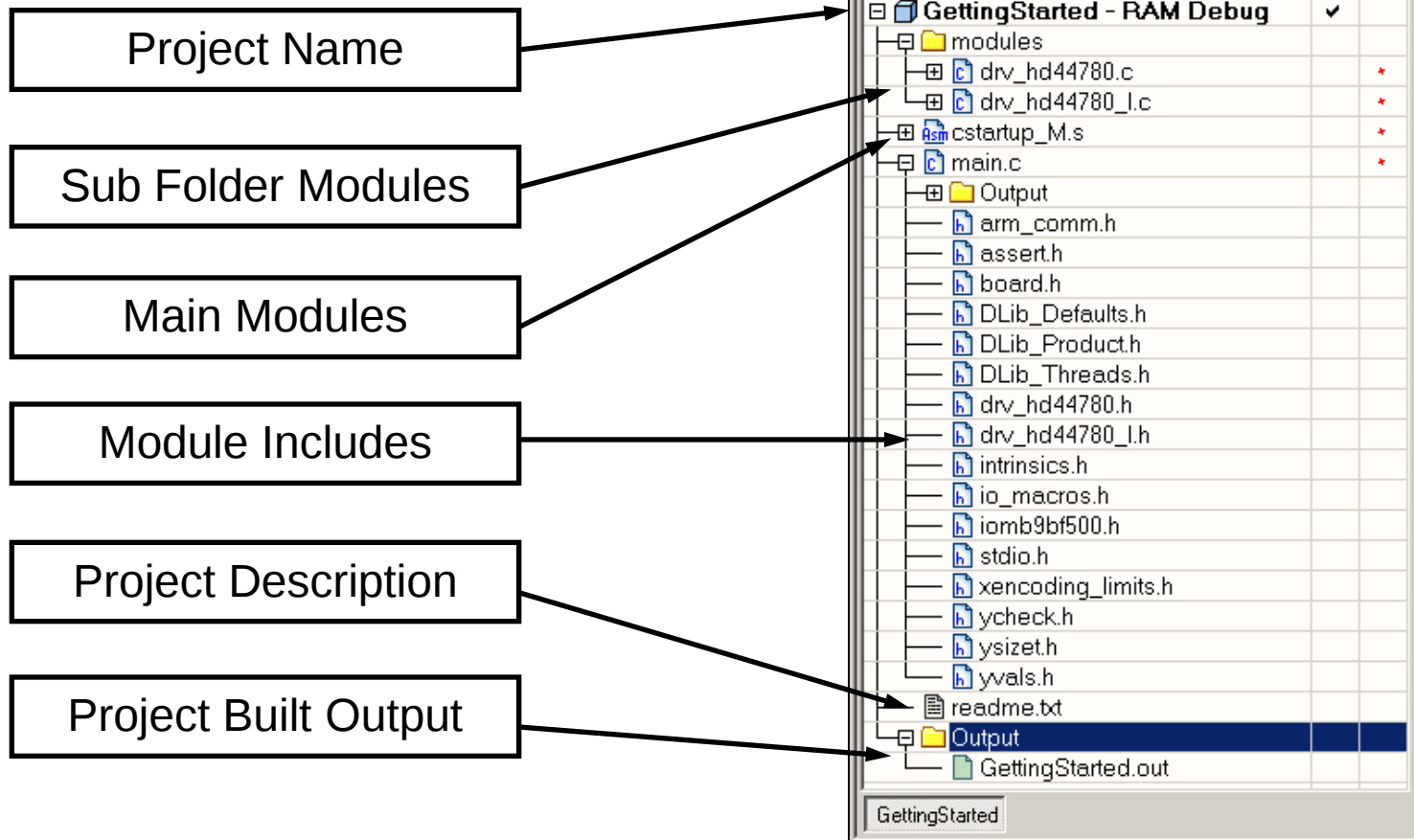
- IAR Workbench
 - Workspace on left side of Workbench window
 - ◆ If hidden then View→Workspace
 - Source files on right side of Workbench window as tabbed windows
 - Project open
File → Open → Workspace → *.eww
 - For new projects
start with ,mb9bf52xm_template'



- IAR Menu Bar

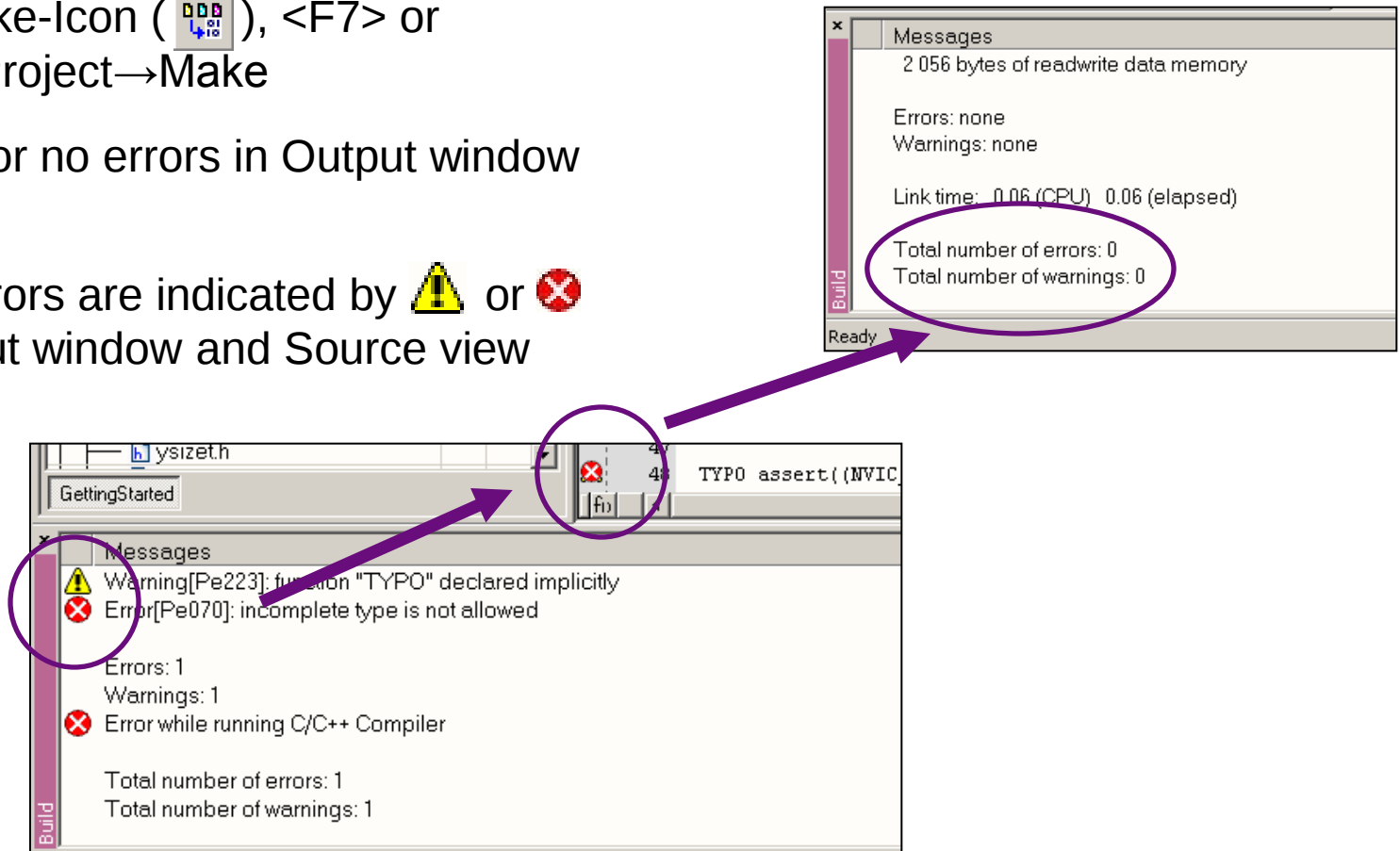


- IAR Workspace Window



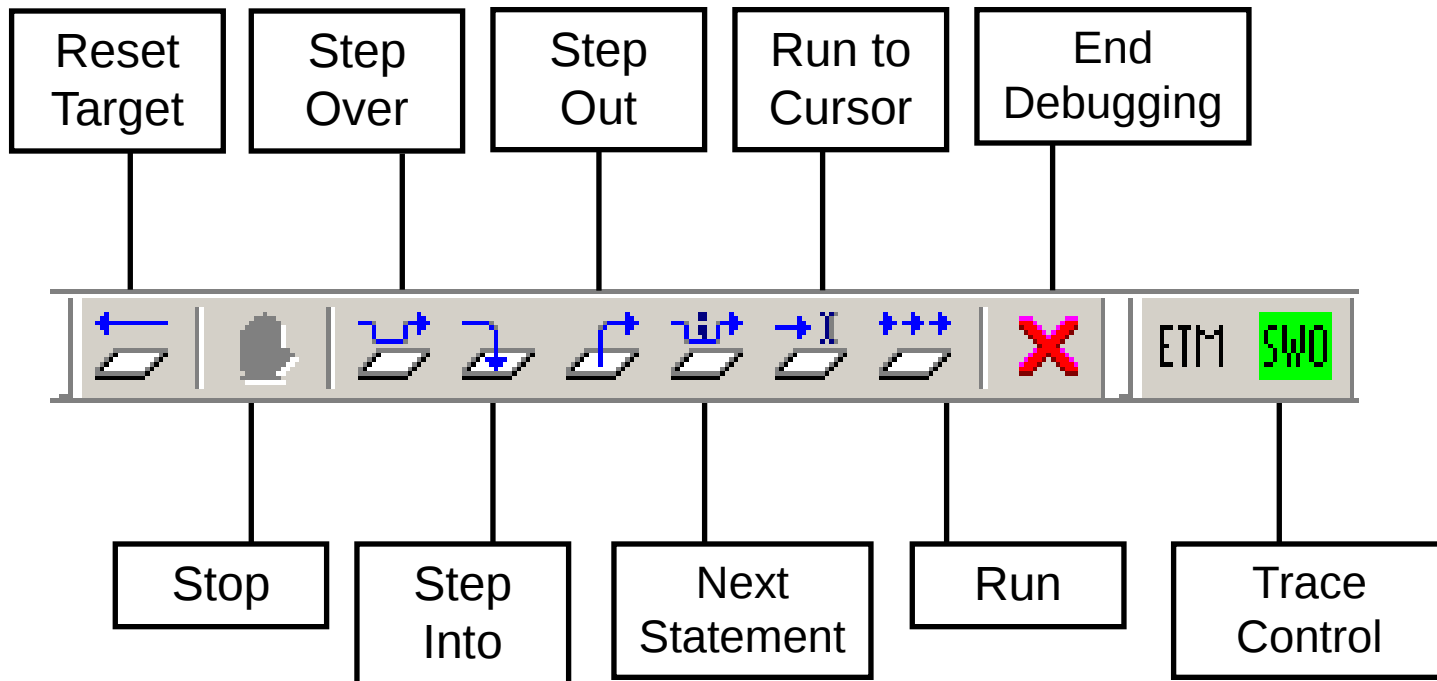
■ Making the Project

- Use Make-Icon (, <F7> or Menu: Project→Make
- Check for no errors in Output window below
- Build errors are indicated by  or 
In Output window and Source view



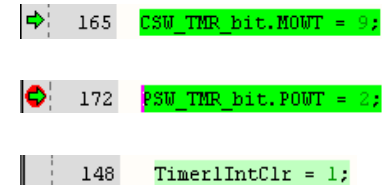
■ Download to Target and Start Debugging

- Use  Icon, <Ctrl>-D, or Project→Download and Debug
- A new menu bar will occur on successful connection to target



■ Source Window

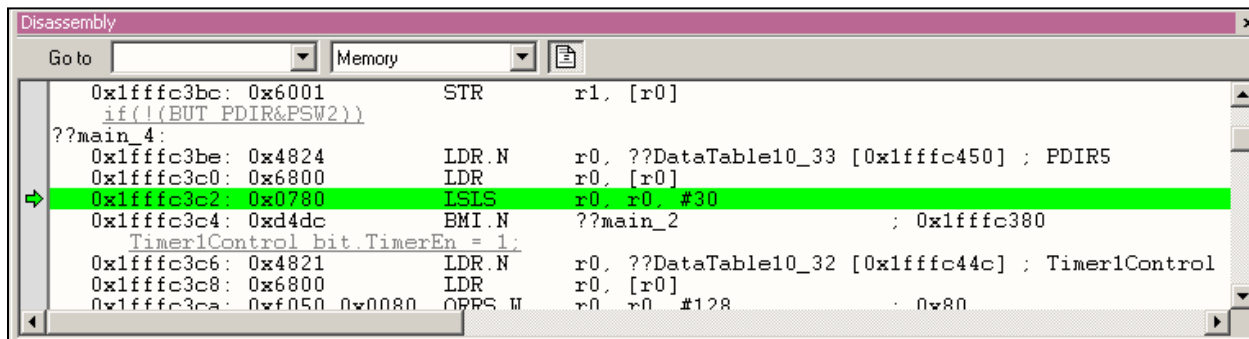
- The Source windows do not change contents but get additional information
 - ◆ Current line (PC):
 - ◆ Halted on Breakpoint:
 - ◆ Halted on Data break (example):



```
165 CSW_TMR_bit.MOWT = 9;
172 PSW_TMR_bit.POWT = 2;
148 Timer1IntClr = 1;
```

■ Disassembly Window

- Shows 'pure' disassembly view
- Shows mixed mode view

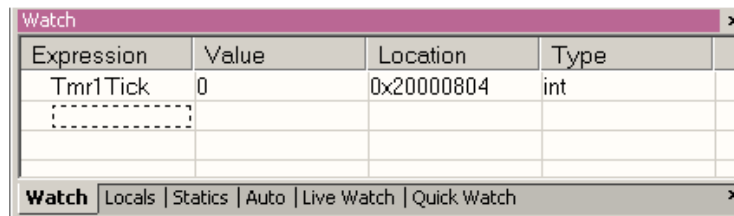


```
Disassembly
Goto Memory
0x1fffc3bc: 0x6001 STR r1, [r0]
if(! (BUT_PDIR&PSW2))
??main_4:
0x1fffc3be: 0x4824 LDR.N r0, ??DataTable10_33 [0x1fffc450] ; PDIR5
0x1fffc3c0: 0x6800 LDR r0, [r0]
0x1fffc3c2: 0x0780 LSLS r0, r0, #30
0x1fffc3c4: 0xd4dc BMI.N ??main_2 ; 0x1fffc380
Timer1Control_bit.TimerEn = 1;
0x1fffc3c6: 0x4821 LDR.N r0, ??DataTable10_32 [0x1fffc44c] ; Timer1Control
0x1fffc3c8: 0x6800 LDR r0, [r0]
0x1fffc3ca: 0xf050 0x0080 ORPS.W r0, r0, #128 ; 0x80
```

■ Watch Window

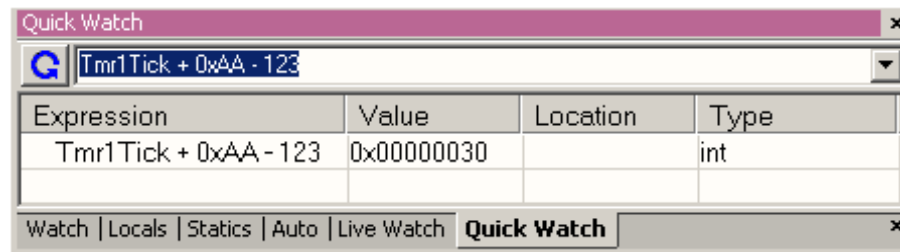
– Watch

- ◆ Expressions/Variables have to be added by user and are updated by Halt/Breakpoint



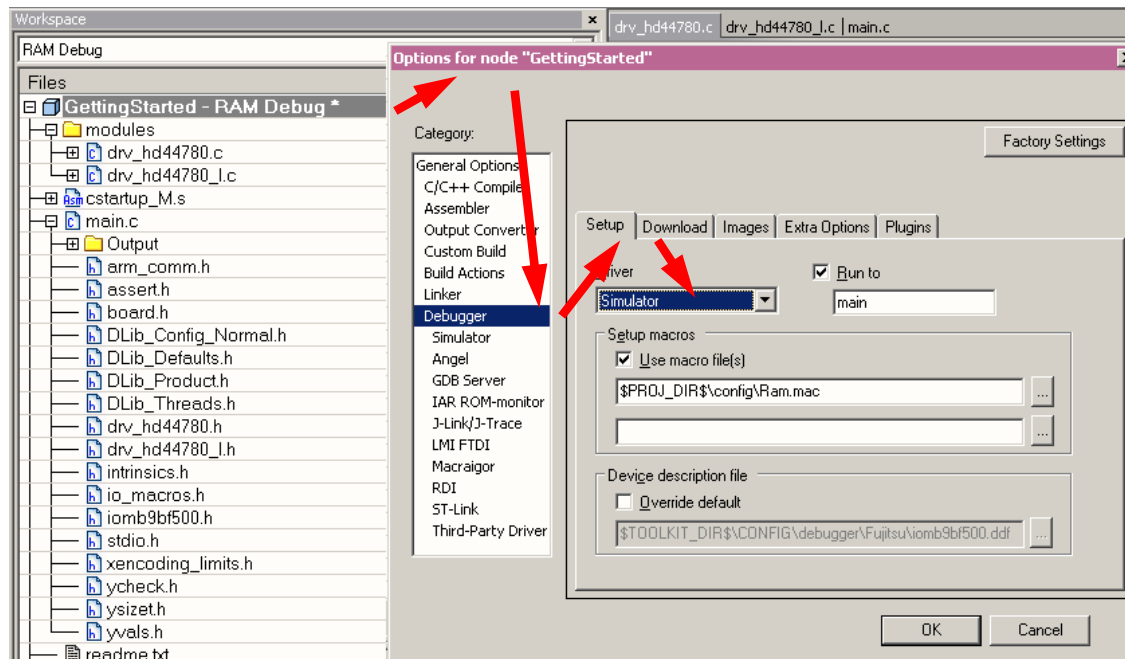
– Quick Watch

- ◆ The Quick watch allows the user to calculate and recalculate expressions even with variables



- ◆ The drop down menu memorizes the last typed contents

- Simulator
 - Mark Project File in Workspace
 - Choose Project→Options
 - Choose Simulator in Debugger Setup
 - Start Simulator with usual  Icon



KEIL μ Vision

- Installation
- Getting Started
- Open Project
- Build Project
- Debug Project

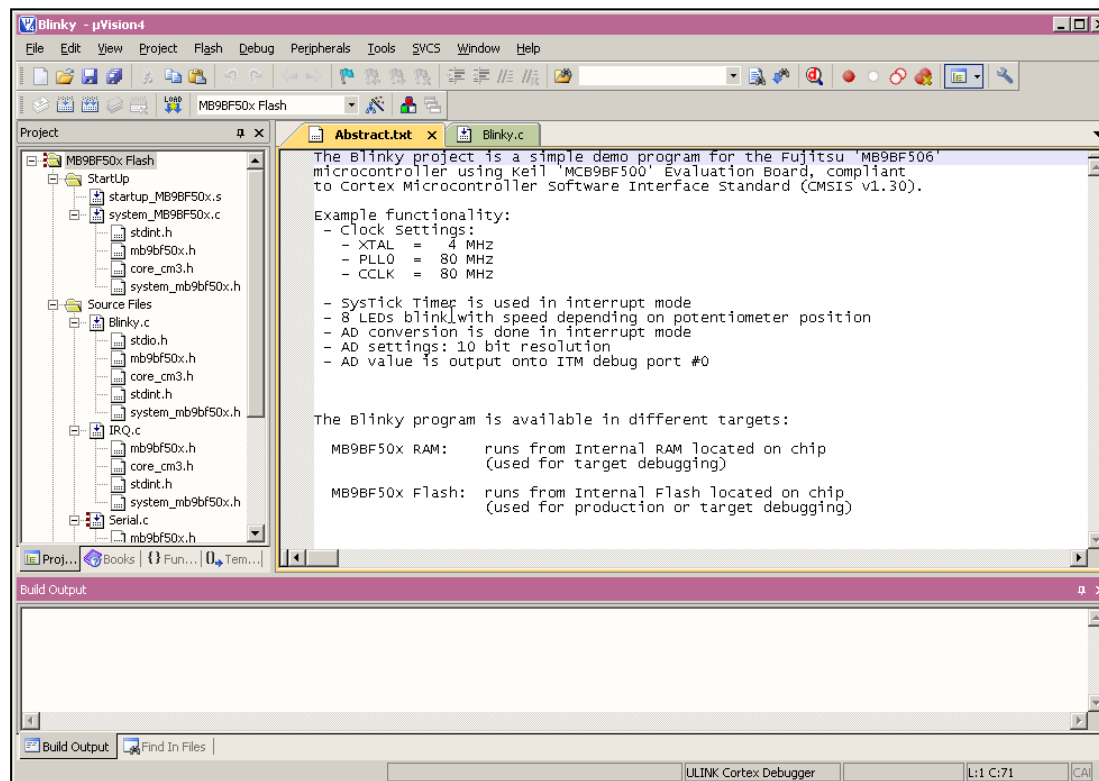




- Install μ Vision from KEIL-CD or download latest version from KEIL Website
 - Evaluation Version
 - ◆ <https://www.keil.com/demo/eval/arm.htm>
 - ◆ Registration required
- Install ULINK-ME
 - Special installation is not needed, because ULINK-ME acts as a USB Human Interface Device (HID) and thus needs no extra USB driver
- Install ULINK Pro (optional)
 - ULINK Pro needs an own dedicated USB driver located in:
<Installation Path>\KEIL\ARM\ULINK
- Start μ Vision

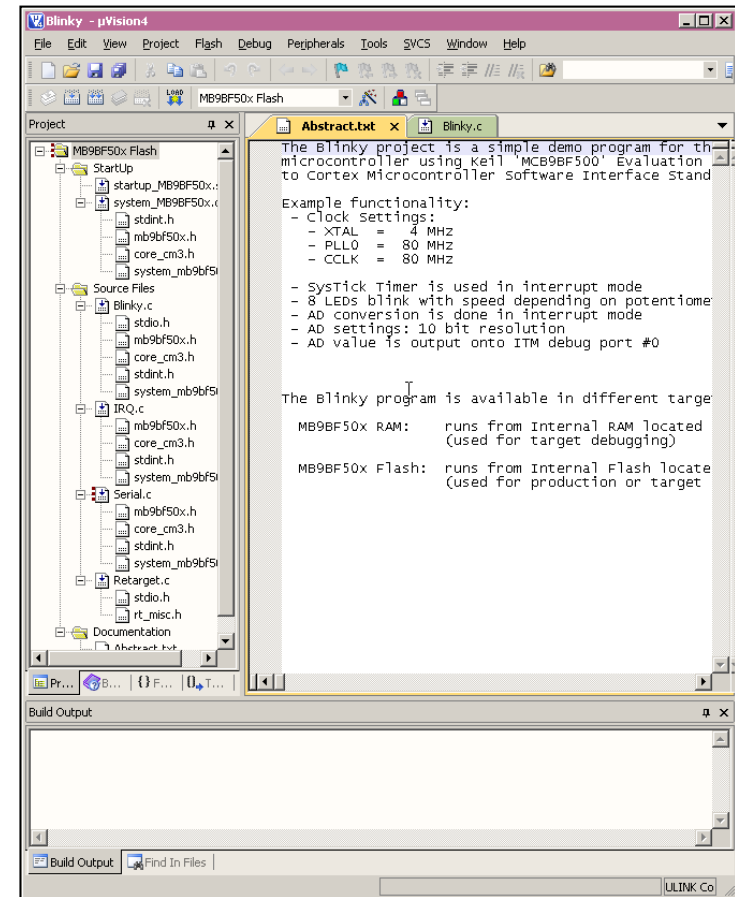
KEIL μ Vision – Getting Started

- Choose Menu: Project→Open Project...
 - Browse to: <drive:>\<board>\[Examples\mb9bf52xm_adc_dvm-v11\example\ARM\](#)
 - Choose mb9b52xm_adc_dvm.uvproj

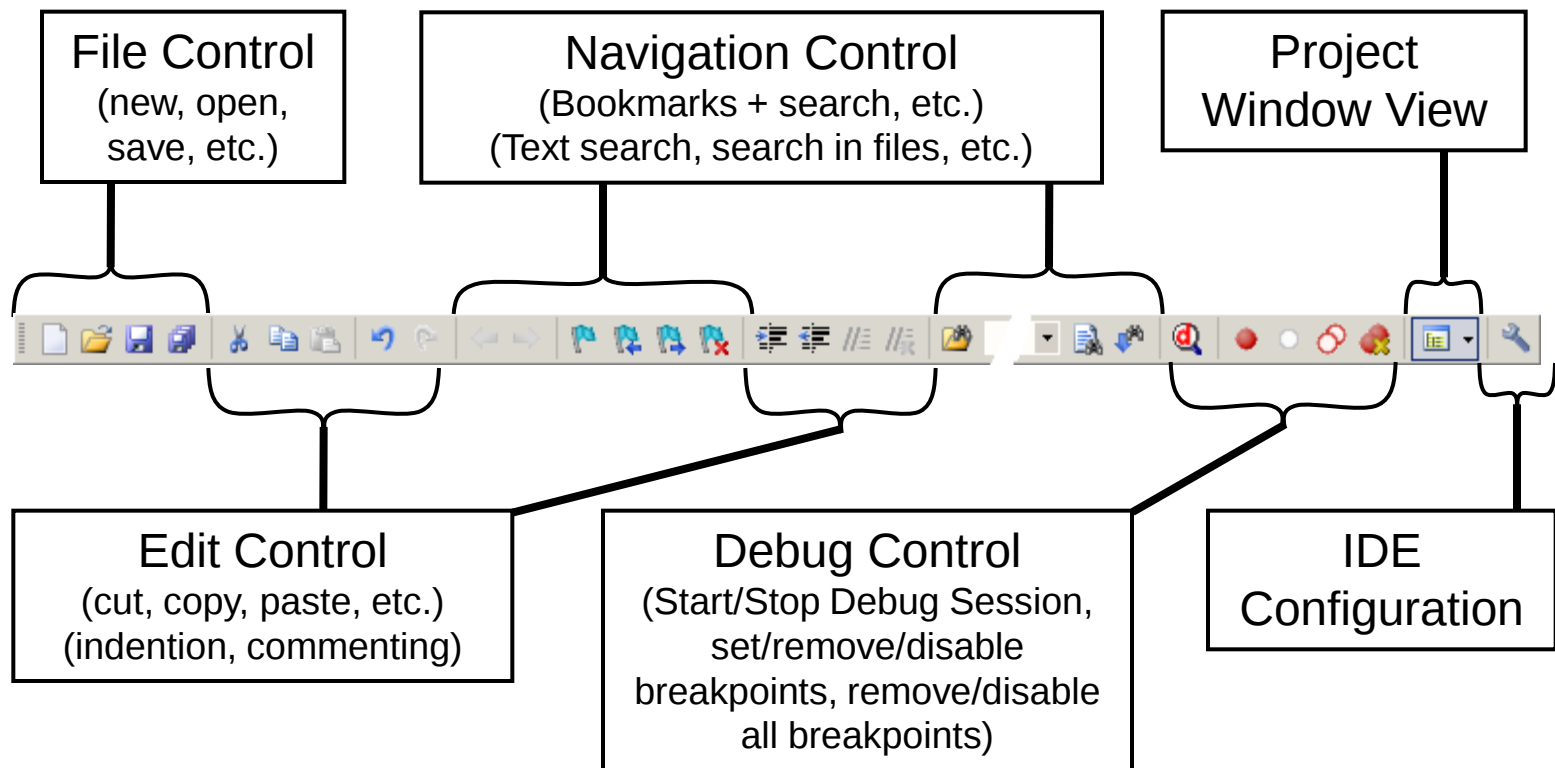


■ KEIL μ Vision

- Project window on left side of IDE window
 - ◆ Choose:
View→Project Window
if hidden
- Source files on right side of IDE window as tabbed windows
- Output window on bottom side of IDE window

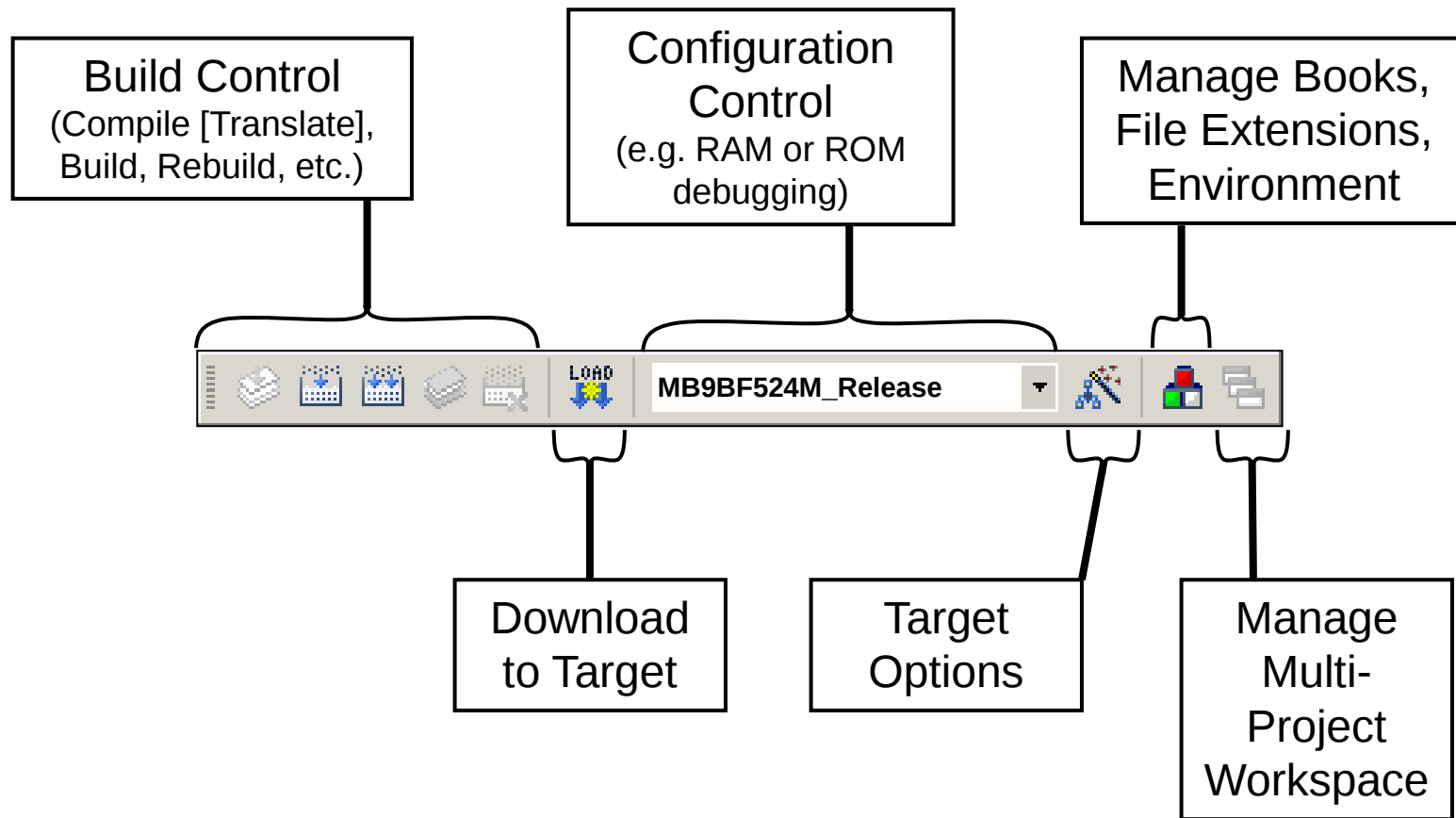


- Menu Bar 1
 - Can be moved in bar window area or set floating

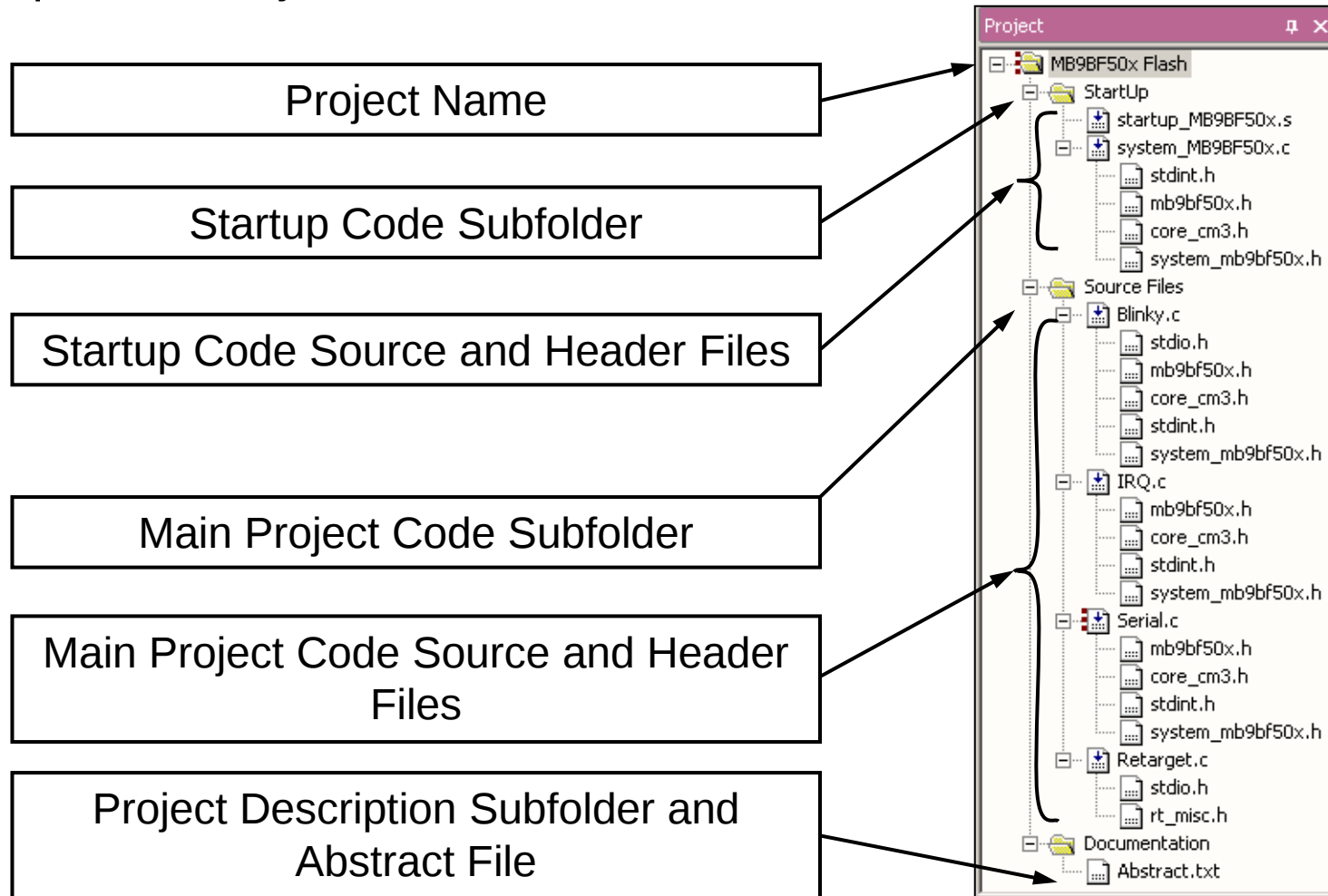


■ Menu Bar 2

- Can be moved in bar window area or set floating

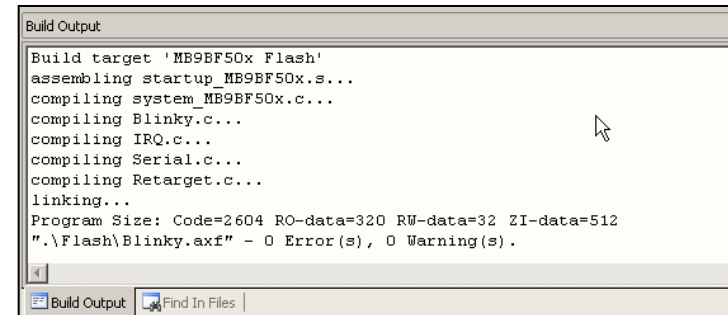


■ μ Vision Project Window

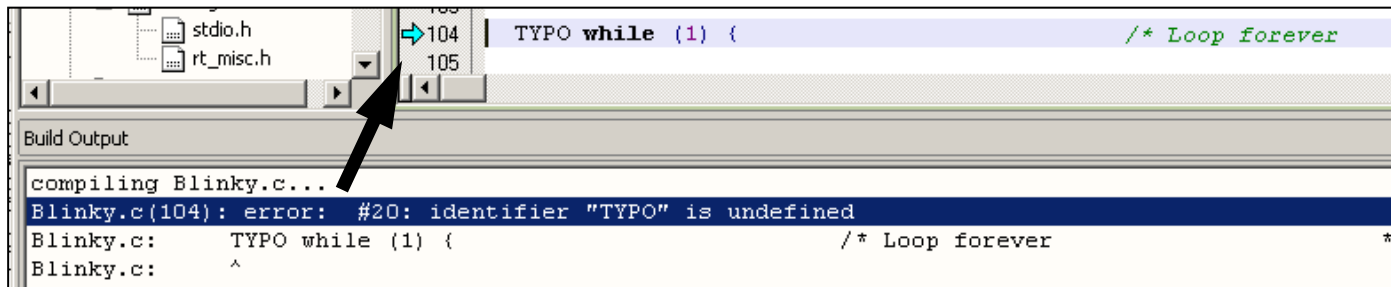


■ Making the Project

- Use Rebuild Icon
() or
Project→Rebuild all target
files
- Check for no errors in
Output window below



- Build errors are shown in Output window.
 - ◆ Can be double-clicked by showing the source line with a blue arrow

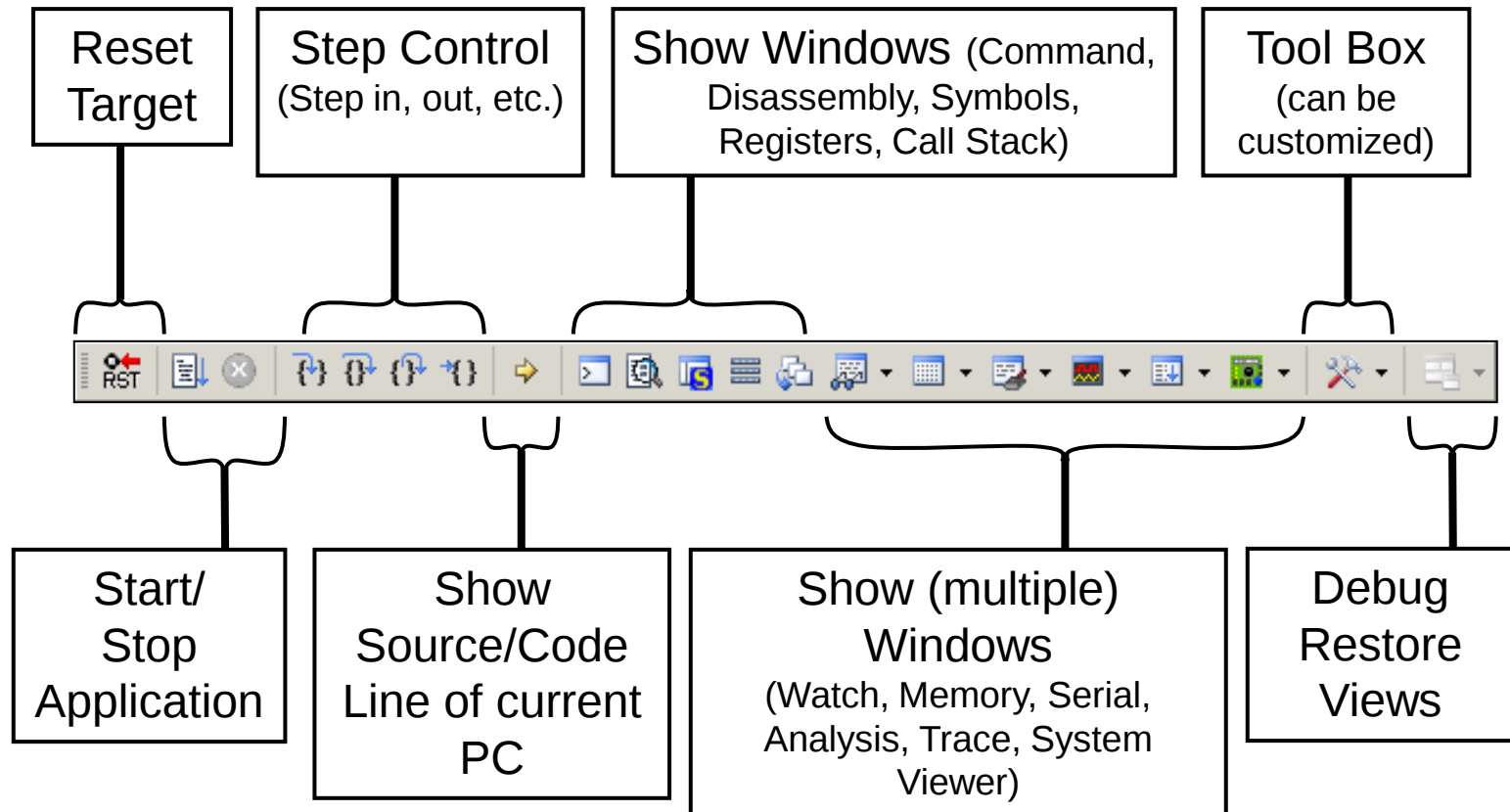


■ Start Debugging

- Download to target first, when MCU Flash does not contain the current application openend and built in the IDE
 - ◆ Use Download Icon () or Menu: Flash→Download
- Start Debug Session
 - ◆ Use Start/Stop Debug Icon () or Menu: Debug→Start/Stop Debug Session
- Ending Debug Session
 - ◆ Use same way as for starting debug session

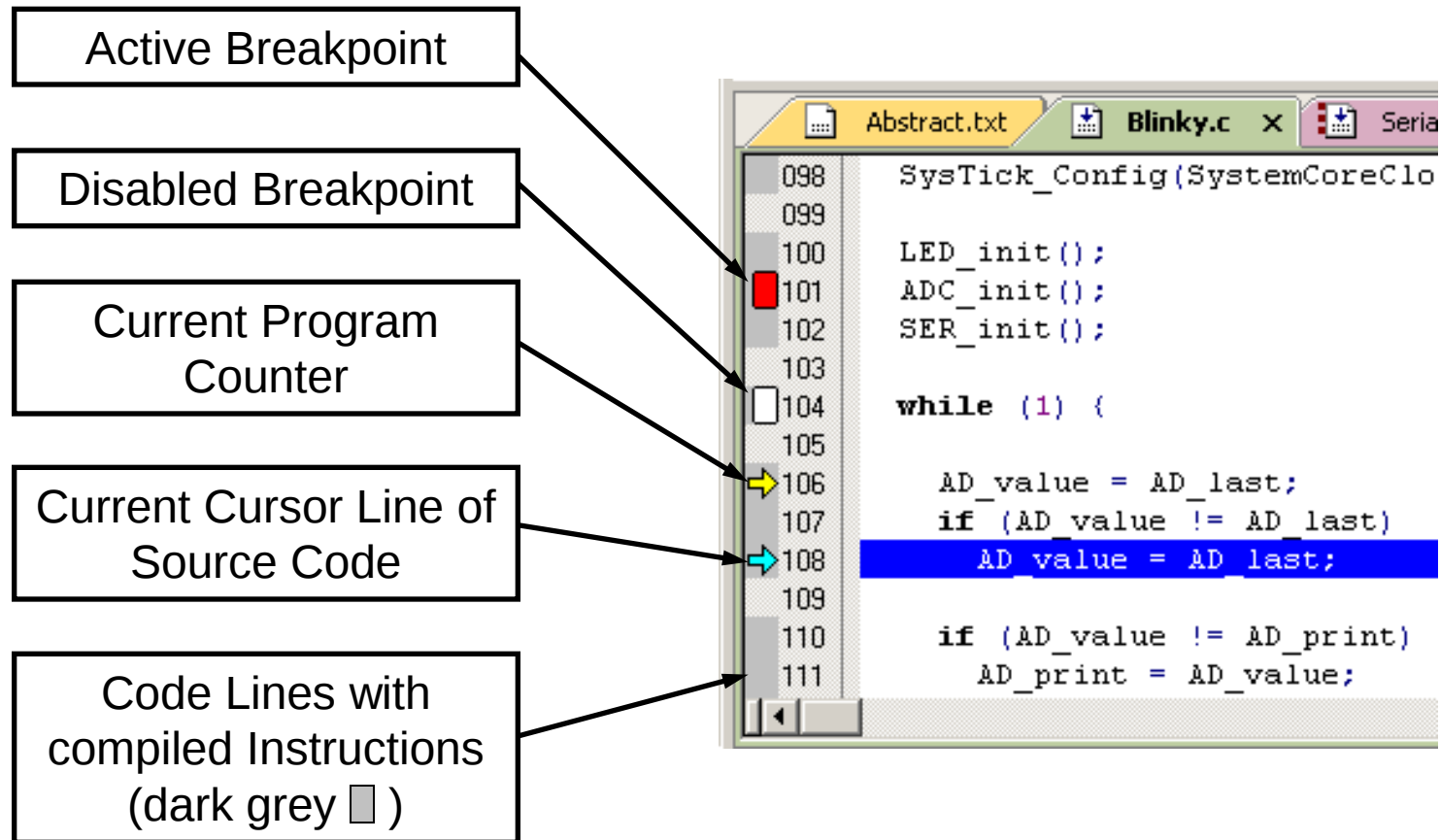
■ Debugging Icon Bar

- During a Debug Session there will be visible a new icon bar



■ Source View

- The Source windows do not change contents but get additional information



- Disassembly View
 - Mixed mode is selectable and deselectable

The screenshot shows the Disassembly View window in KEIL µVision. The window title is "Disassembly". The code is displayed in a list format with addresses, hex values, mnemonics, and comments. The current program counter is at address 0x00000438, which is highlighted in yellow. A red square indicates a disabled breakpoint at address 0x0000042E. A yellow square indicates the current cursor line of code highlighted in yellow background (0x00000438). The code is as follows:

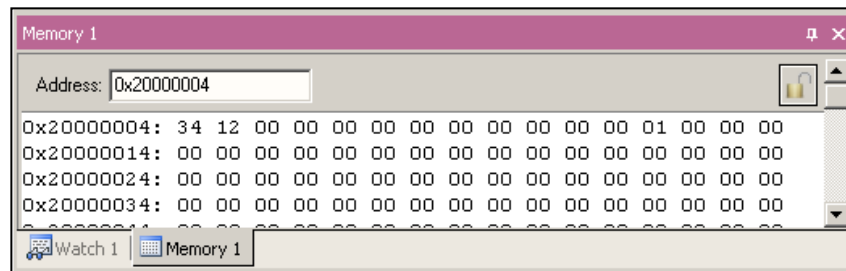
Address	Hex Value	Mnemonic	Comment
0x0000042A	F7FFFA3	BL.W	LED_i
101:	ADC_init();		
0x0000042E	F7FFF67	BL.W	ADC_i
102:	SER_init();		
103:			
0x00000432	F000F8AE	BL.W	SER_i
104:	while (1) {		
105:			
0x00000436	E015	B	0x0000
106:	AD_value = AD_last;		
0x00000438	4816	LDR	r0, [p
0x0000043A	8804	LDRH	r4, [r
107:	if (AD_value != AD_last		

Annotations:

- Active Breakpoint: Points to the red square at address 0x0000042E.
- Disabled Breakpoint: Points to the red square at address 0x0000042E.
- Current Program Counter: Points to the yellow square at address 0x00000438.
- Current Cursor Line of Code highlighted in yellow background (■): Points to the yellow square at address 0x00000438.

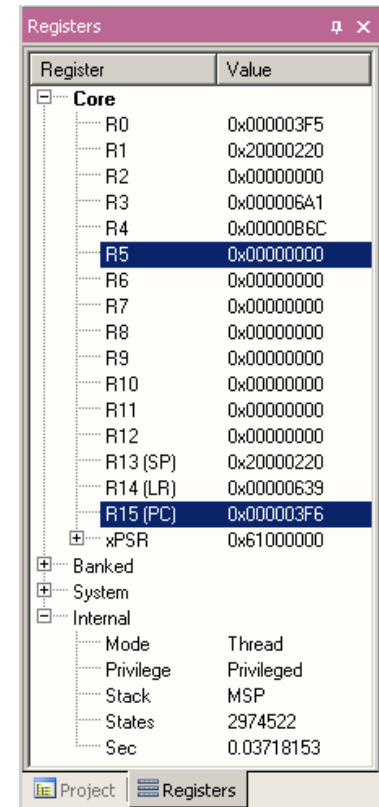
■ Memory Window

- Up to 4 Memory windows can be displayed in tabs
- Memory is updated during runtime
- Memory window tabs are shared with Watch windows



■ Register View

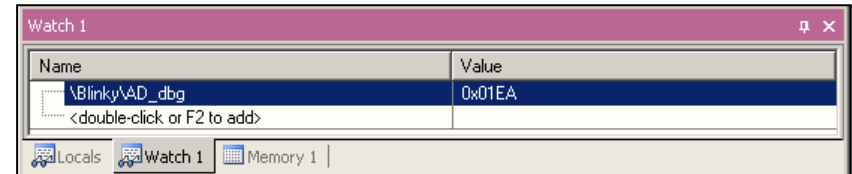
- Register view is a tab of the Project window
- Changes are highlighted in dark blue text background
- Register tree knots can be expanded



■ Variable Windows

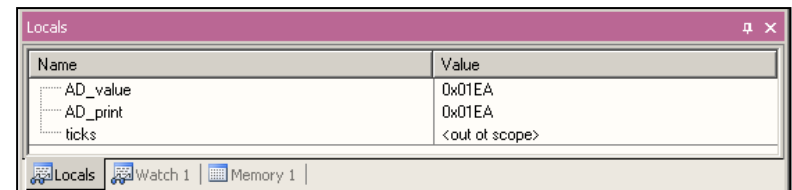
– Watch Windows

- ◆ Up to 2 Watch windows are sharing their tabs with e.g. Memory and Local views
- ◆ Updated during runtime
- ◆ Any changes are highlighted in dark blue text background color
- ◆ Displayed values can be changed by user during break



– Local View

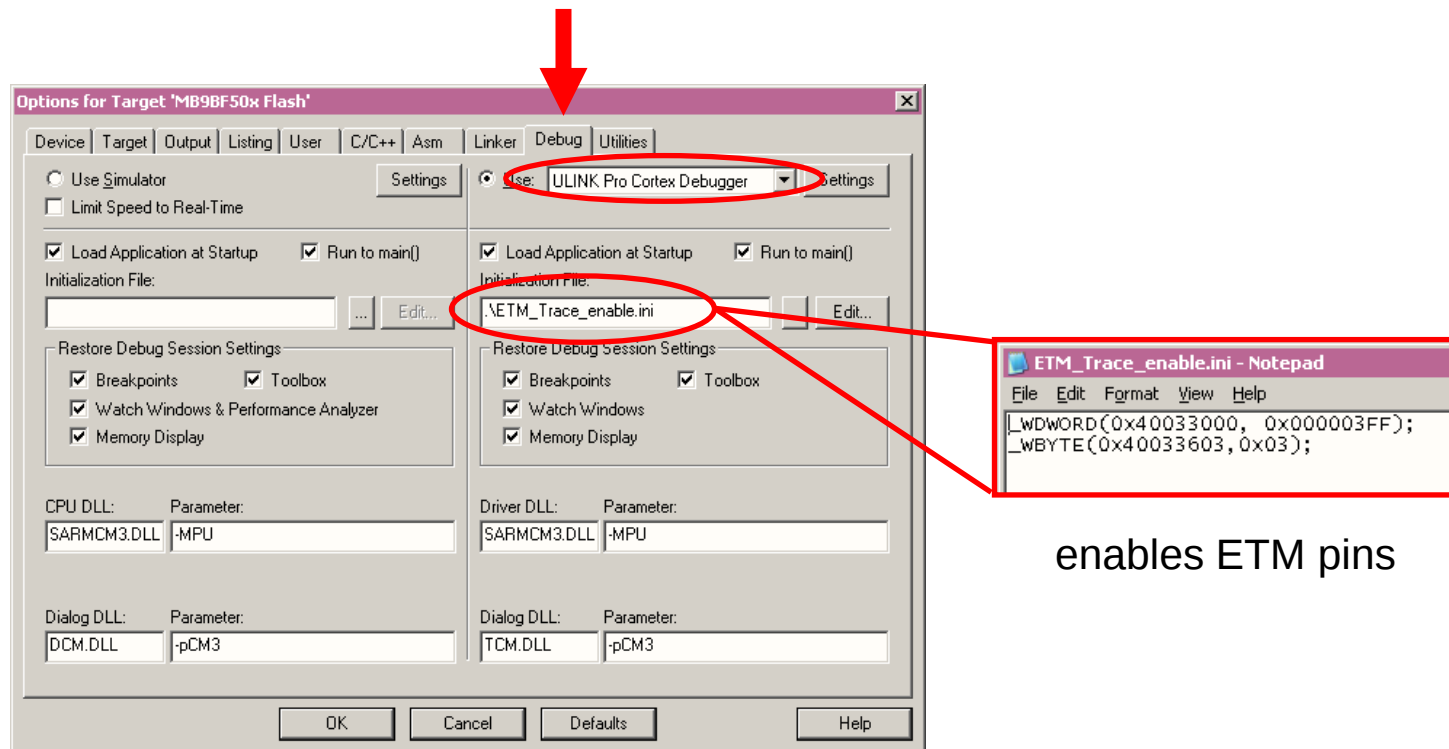
- ◆ The local view shares the tab with e.g. Memory and Watch windows
- ◆ Any changes are highlighted in dark blue text background color
- ◆ Displayed values can be changed by user during break



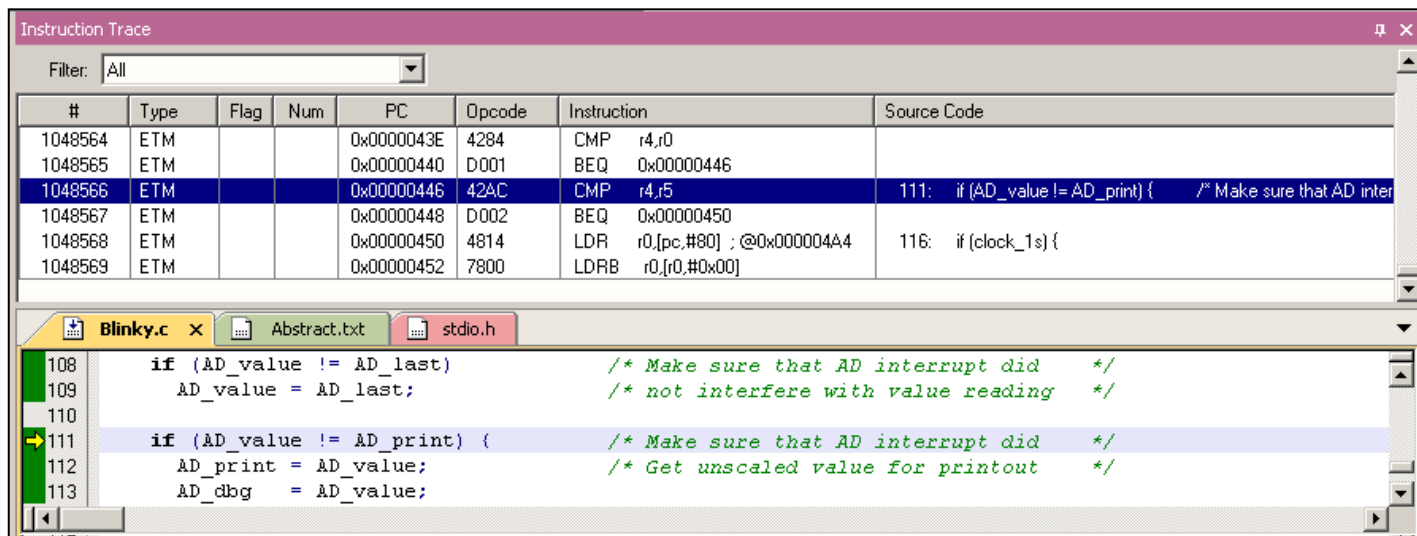
- Trace via ITM
 - Simple Trace views via Instrumentation Trace Macro is supported by μ LINK ME
 - Records
 - Exceptions
 - Counters

Type	Dly	Num	Address	Data	PC	Dly	Cycles	Time[s]
ITM		0	41H				82975148	1.03718935
ITM		0	44H				82975293	1.03719116
ITM		0	20H			X	82988592	1.03735740
ITM		0	76H			X	82988592	1.03735740
ITM		0	61H			X	82988592	1.03735740
ITM		0	6CH			X	82988592	1.03735740
ITM		0	75H			X	82988592	1.03735740
ITM		0	65H			X	82988592	1.03735740
ITM		0	20H			X	82988592	1.03735740
ITM		0	3DH			X	82988592	1.03735740
ITM		0	20H			X	82988592	1.03735740
ITM		0	30H			X	82988592	1.03735740
ITM		0	78H			X	82988592	1.03735740
ITM		0	30H				82993831	1.03742289
ITM		0	31H			X	83001392	1.03751740
ITM		0	45H			X	83001392	1.03751740
ITM		0	42H			X	83001392	1.03751740
ITM		0	0DH			X	83001392	1.03751740
ITM		0	0AH			X	83001392	1.03751740
ITM		0	0DH			X	83001392	1.03751740

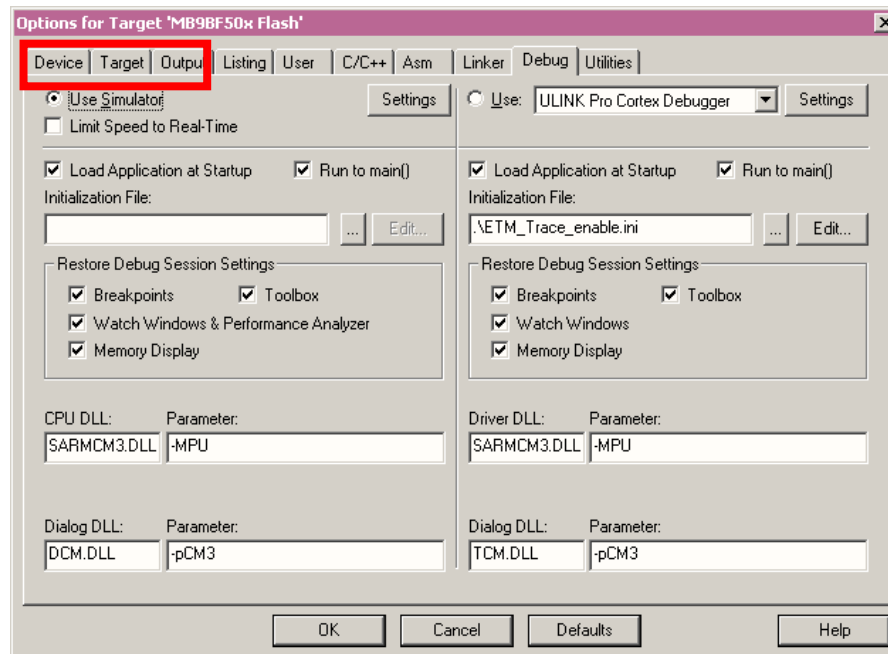
- Trace via ETM
 - Check settings in menu:
Flash→Configure Flash Tools... Tab:Debug



- Instruction Trace
 - Real Time Trace recording
 - Output can be filtered by several ETM and ITM events
 - Trace buffer is held in PC memory and transferred to μ Vision on break

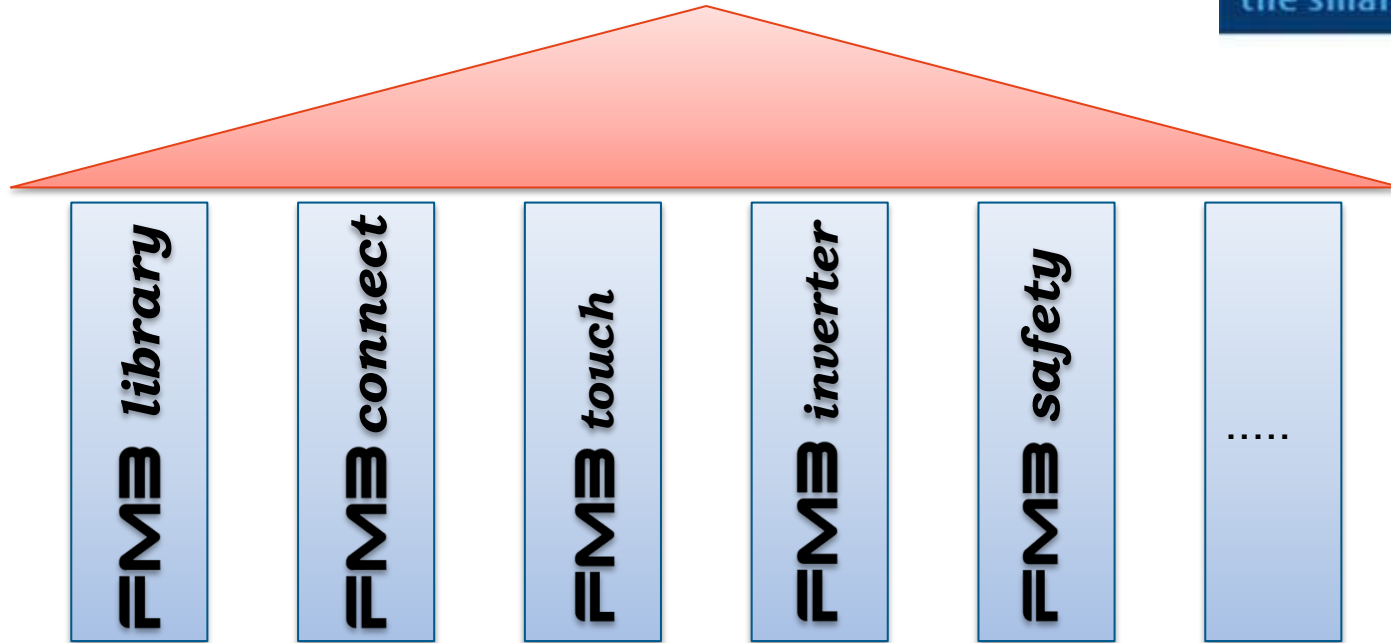


- Simulator
 - The Core Simulator can be selected by the menu:
[Flash] → [Configure Flash Tools...] → [Debug]
and then choosing [Use Simulator]
 - Look & feel is like using ULINK debugger
 - Controlable also with *.ini files

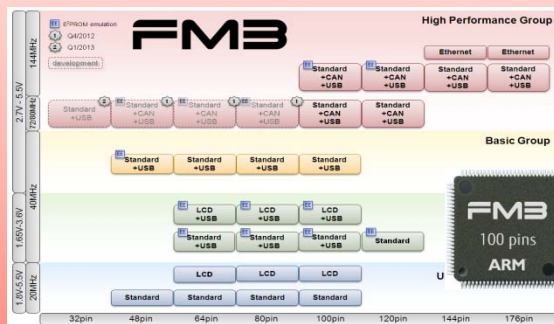




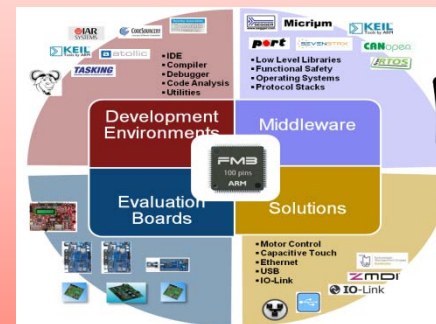
Solutions



Products



Eco system



■ FM3 Low Level Library (L3)

- CMSIS compliant header files
- Driver collection to supports MCU peripherals
- Hardware abstraction layer offers an API
- Interrupt handling supported
- Optimized memory use
 - ◆ For unused resources, no memory for library code is allocated

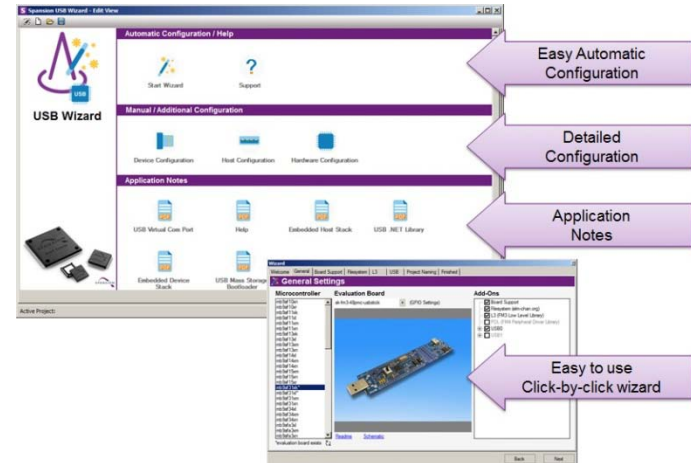


■ Supported Modules

- ADC (A/D-Converter), BT (Base Timer), CAN, CRC, CLK , CRTRIM (CR Clock Trimming), CSV (Clock Supervisor) , DAC (D/A-Converter), DMA, DSM (Deep Standby Modes), DT (Dual Timer), EXINT (External Interrupts), EXTIF (External Bus Interface), FLASH, GPIO, LVD (Low Voltage Detection), MFS (Multi Function Serial: UART, SPI, I2C, LIN), MFT (Multi Function Timer), QPRC (Quadrature Encoding), RESET (Reset Cause), RTC (Real Time Clock), USB (Host and Device) , WC (Watch Counter), WDG (Watchdog: SW, HW), ..., and more.

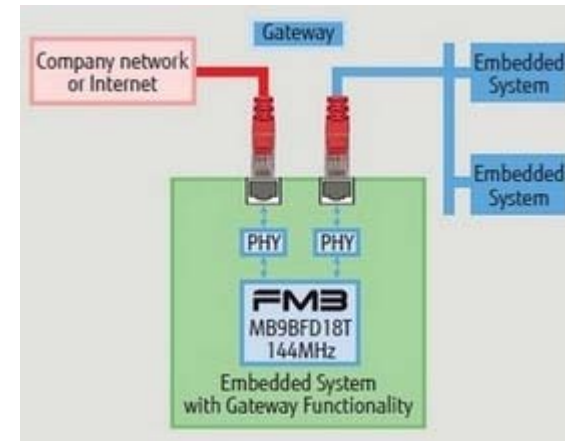
■ FMconnect USB

- Up to two USB interfaces
 - ◆ Supports Host/Device/OTG
 - ◆ Control, interrupt, bulk, isochronous
- Free software examples
- Spansion USB Wizard (PC based GUI):
 - ◆ USB driver configuration
 - ◆ Easy creation of USB descriptors
 - ◆ Code injection in existing projects



■ FMconnect Ethernet

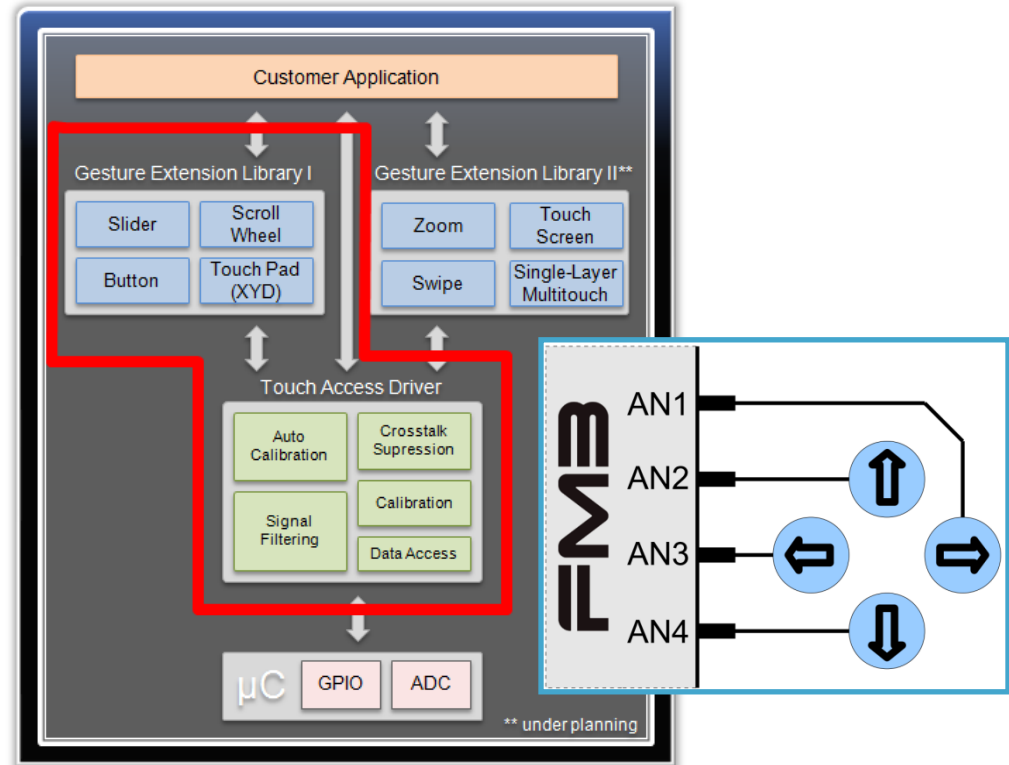
- One or two channels Ethernet MAC
- Dedicated Ethernet starter kit
- Free Ethernet software:
 - ◆ Low level driver available
 - ◆ TCP/IP stack available
 - ◆ Software examples, e.g.: web server
- Commercial products from partners



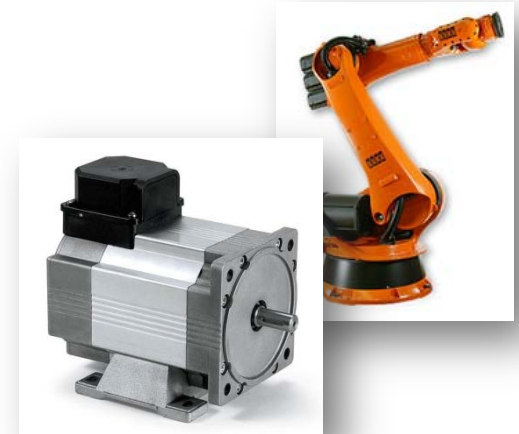
FM3 touch

- Software FM3touch library

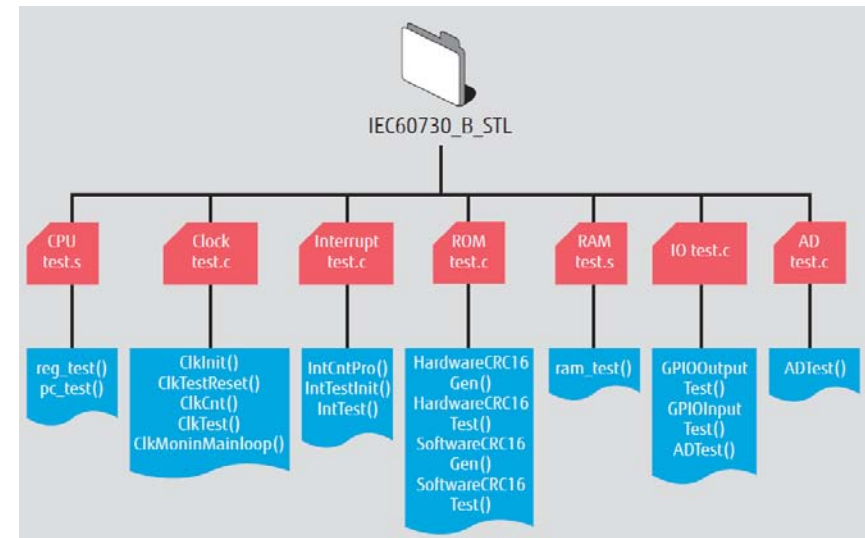
- Works on all FM3 derivatives, user can freely choose best-fitting FM3 MCU and add touch functionality
- No external components
- Only one pin (ADC channel) per touch input
- High sensitivity (<10fF)
- Low resource usage, no 'atomic' handling required
- Flexible configuration and event system for easy integration
- Configuration tool included
- Free of charge (basic variant)



- FM3 inverter drive hardware features
 - Up to 3 ch flexible 3-phase motor timers, automatic dead time insertion
 - Up to 3 ch independent 12-bit 1Msps ADCs, up to 32 ADC inputs
 - Up to 3 ch ABZ quadrature decoder units
 - DTTI input for motor emergency stop
 - 3.3V and true 5V single supply guarantees robustness
- FM3 software motor control library
 - Support for BLDC, PMSM, IPM and ACIM
 - Field oriented control
 - Support for encoder or hall sensor feedback, or sensorless application



- FM3 functional safety hardware features
 - Two stage watchdog with independent clock source
 - Clock supervisor (clock failure and abnormal frequency detection)
 - On-Chip Low Voltage Detector
 - CRC hardware module
 - MPU (Memory Protection Unit)
 - DTTI input for motor emergency stop
- IEC60730 Class B
 - Self-Test Library available
 - CPU test
 - Clock test
 - Interrupt test
 - Memory test
 - I/O test
 - A/D converter test





Finally



FM Seminar	Motor Control	USB Workshop	Ethernet Workshop
Please register here: http://news.spansion.com/seminars			
• Overview FM family • Memory • Peripheral resources • Packages • Processor architecture • Bus structure • Flash memory • Flash programming • Peripheral resources • Clock distribution • Timer • Interfaces • FM features • Development tool chains • IAR workbench / J-Link • KEIL µVision / uLink • Starter Kits • Practical exercises • Flash programming • Project setup/modification • Debugging • External interrupts	• Introduction of Spansion MCU • Line-Up of microcontrollers with motion control features • Performance • Introduction of motors types • ACIM • BLDC • PMSM • Introduction of control types • Sinusoidal commutation • Field Orientated Control • Space Vector Modulation • Peripherals of FM3/FM4 MCUs • Base Timer • Multifunction Timer • 12-bit A/D Converter • Quadrature Position and Revolution Counter • Interrupt Controller • Hands-on exercise / SW-Example • BLDC motor with hall sensor • PMSM motor with field orientated control	• Introduction of Spansion MCU • Line-op of USB MCUs • USB vs. RS232 • Historical Background • Electrical Layer • USB Protocol • Enumeration Process (Descriptors & USB Settings) • Transfer Types • Data Transfers • USB Class Concept • Software Driver Concepts • USB Host • USB Examples • Virtual COM Port • USB Descriptor Manager • Create Template Classes • Create Descriptors • PC software based on LibUSB • Special Use Cases • e.g. boot loader	• Introduction of Spansion MCU • Line-op of Ethernet MCUs • Fundamentals of Ethernet • Ethernet Microcontrollers • Hardware Design considerations • Software Design considerations • Communication layer models • The Internet Protocol suite • Web technologies in embedded systems • Developing Ethernet applications • Tools and methods • Practical hints and advice on FM3 Ethernet solutions • Hands-on training

- Please check the following website, for any available updates

www.spansion.com

www.spansion.com/starterkit

- Please contact your local support team for any technical question

America: Spansion.Solutions@Spansion.com

China: mcu-ticket-cn@spansion.com

Europe: mcu-ticket-de@spansion.com

Japan: mcu-ticket-jp@spansion.com

Other: <http://www.spansion.com/Support/SES/Pages/Ask-Spansion.aspx>

- Gültig für EU-Länder:

- Gemäß der Europäischen WEEE-Richtlinie und deren Umsetzung in landesspezifische Gesetze nehmen wir dieses Gerät wieder zurück.
- Zur Entsorgung schicken Sie das Gerät bitte an die folgende Adresse:

- Valid for European Union Countries:

- According to the European WEEE-Directive and its implementation into national laws we take this device back.
- For disposal please send the device to the following address:



CCS Express GMBH
c/o Spansion International Inc.
Frankfurter Str. 83-107
D-65479 Raunheim
Germany



- This board is compliant with China RoHS



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