Timer triggers 3 ADCS for simultaneous sampling

Purpose of sample code

This code is used to control three ADCs to conduct N samplings based on equal time intervals.

Note: This sample code is written based on Artery's V2.x.x BSP. For other versions of BSP, users should pay attention to the differences in use.

Applicable products:

Product series	AT32F403 series
	AT32F403A series
	AT32F407 series

List of major peripherals used:
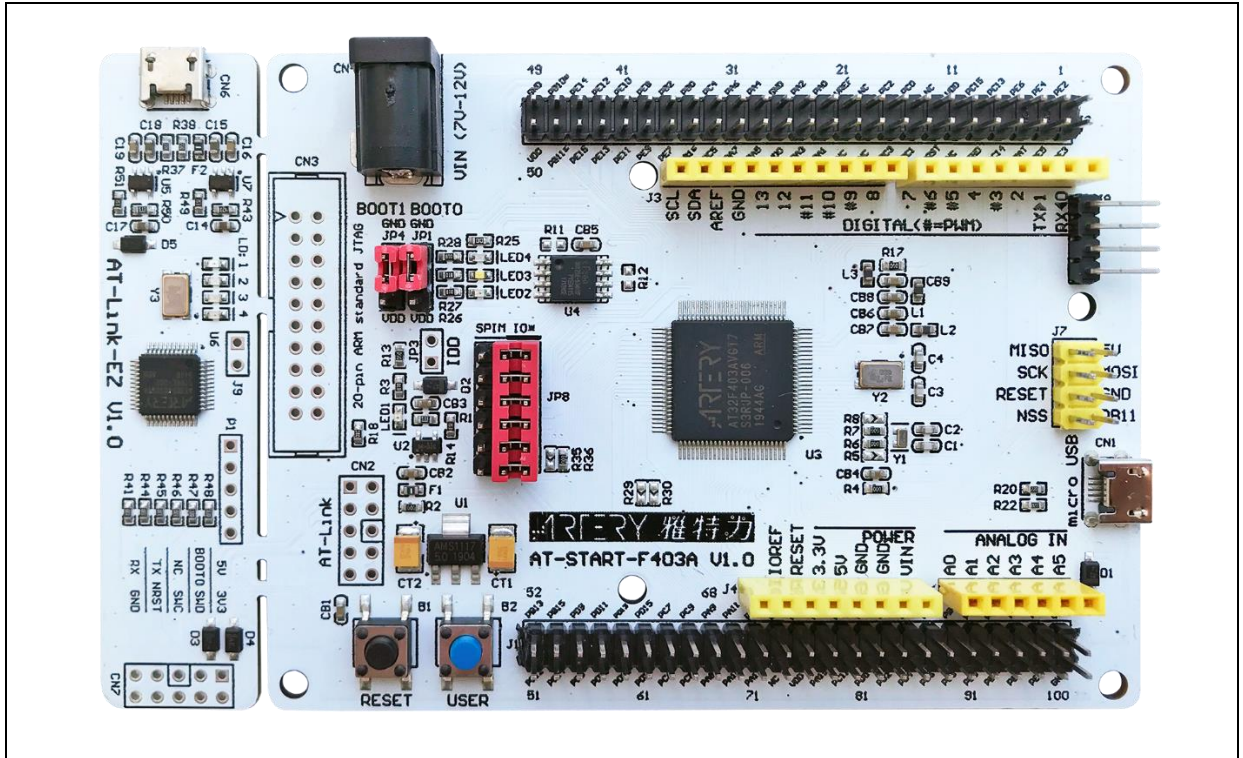
Peripherals	TIMER
	ADC

1   Quick start

1.1   Hardware resources

1)   AT-START-F403A V1.x evaluation board

2)   Serial output PA9 (via AT-Link-EZ)

Figure 1. AT-START-F403A V1.0 evaluation board

1.2   Software resources

1)   AT32F403A MCU, and AT32F403A_407_Firmware_Library_V2.0.6 (BSP version)

2)   TMR1_CH1 low level triggers TMR2_CH2 and TMR2_CH3 to output 20 pulses ("#define pluse_cnt 20" value can be changed in the at32f403a_407_board.h);

TMR2_CH2 rising edge triggers ADC1/ADC2 sampling;

TMR2_CH3rising edge triggers ADC3 sampling

3)   DMA1 is responsible for transporting 20 ADC1/ADC2 sampling values;

DMA2 is responsible for transporting 20 ADC3 sampling values

4)   Sampling results are output to PC via PA9 (USART1_TX), and LED2/3/4 toggle

Note: All of projects are built based on Keil 5. For the need to run in other compiling environments, user can make simple adjustments according to AT32xxx_Firmware_Library_V2.x.x\project\at_start_xxx\templates.

1.3 Example case

1) Open *\SourceCode\at32f403a_tmr1_tmr2_3adcs_V2.0.0\utilities\mdk_v\3adcs.uvprojx* (source code), compile and download it to the evaluation board

2) Apply different voltages to PC2/PC3/PC4

3) View print information through a serial interface. ADC1 and ADC2 are stored in the same 32-bit register, in which, the high 16 bits represent ADC2 sampling results, and the low 16 bits ADC1 sampling results.

Figure 2. Running information print

2 Revision history

Table 1. Document revision history

Date	Revision	Changes
2022.01.17	2.0.0	Initial release
2022.03.25	2.0.1	Adjusted the format of this document.

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