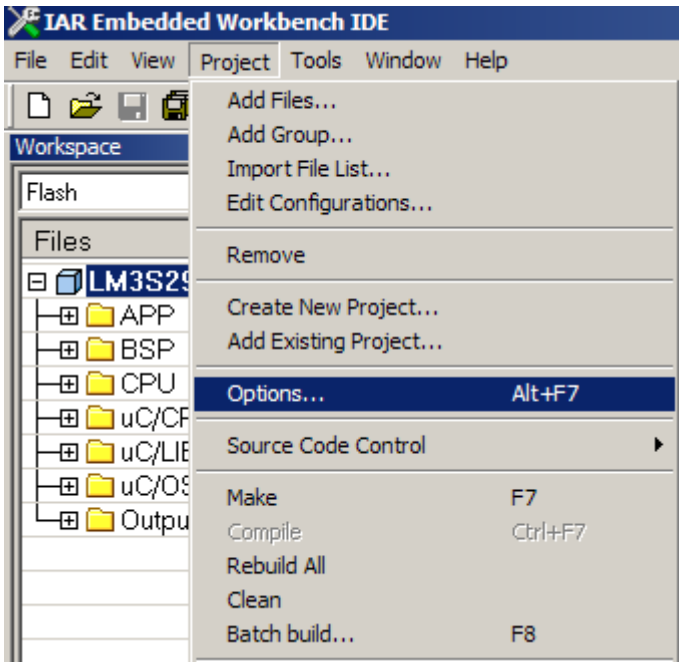
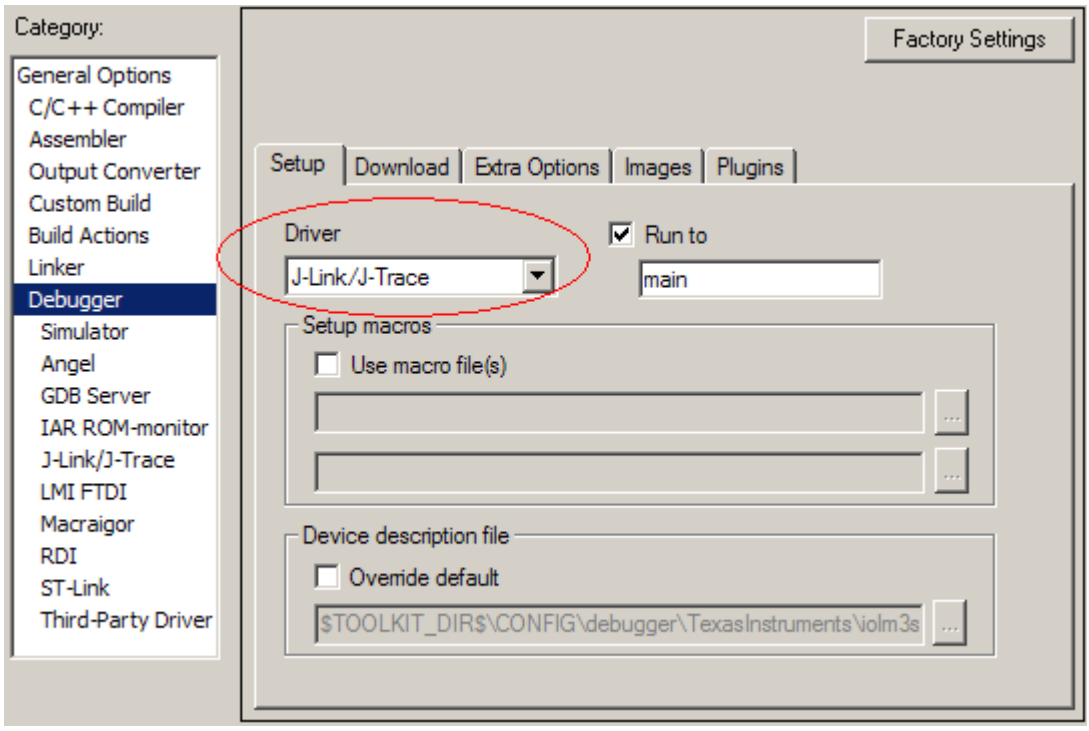
Measuring the time consumption of a piece of code by Cortex-M3 SWD/SWV

IDE: IAR Embedded Workbench for ARM (v5.40)
Hardware: Any target board based on ARM Cortex-M3 MCU
Debugger: J-Link (version 6.0 or above)

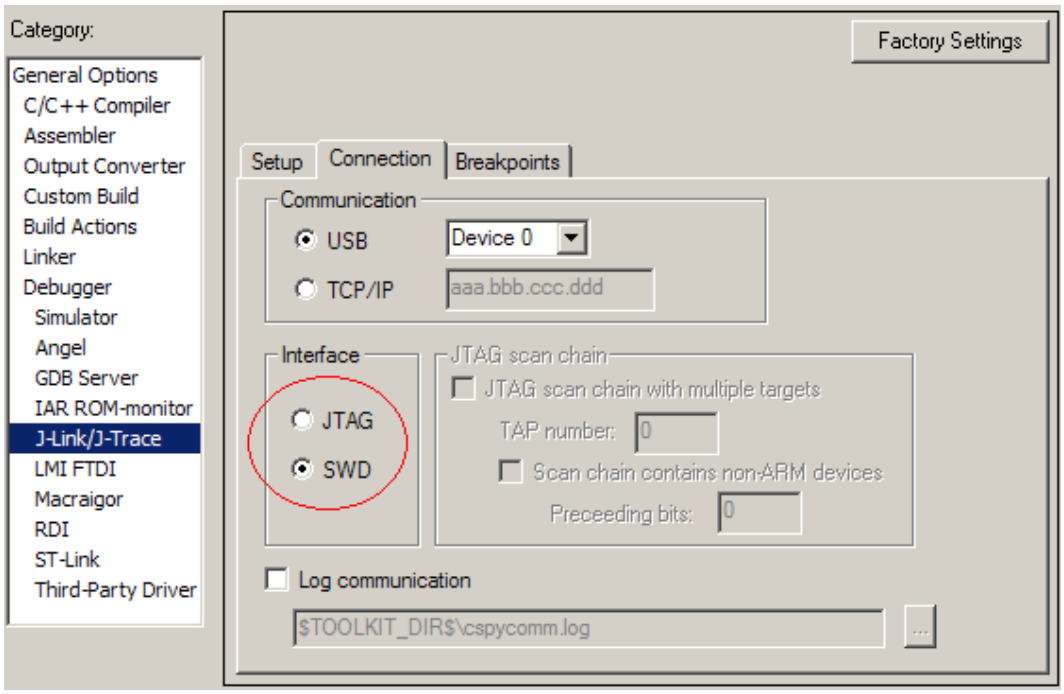
1. Open the “Options” dialog of your project in EWARM:



2. Select “J-Link/J-Trace” as the debug probe:



3. Select “SWD” as the debug interface:



4. Add a macro “ITM_Port8” into your code:

```
#define ITM_Port8(n)    (*((volatile unsigned char *)(0xE0000000+4*n)))
```

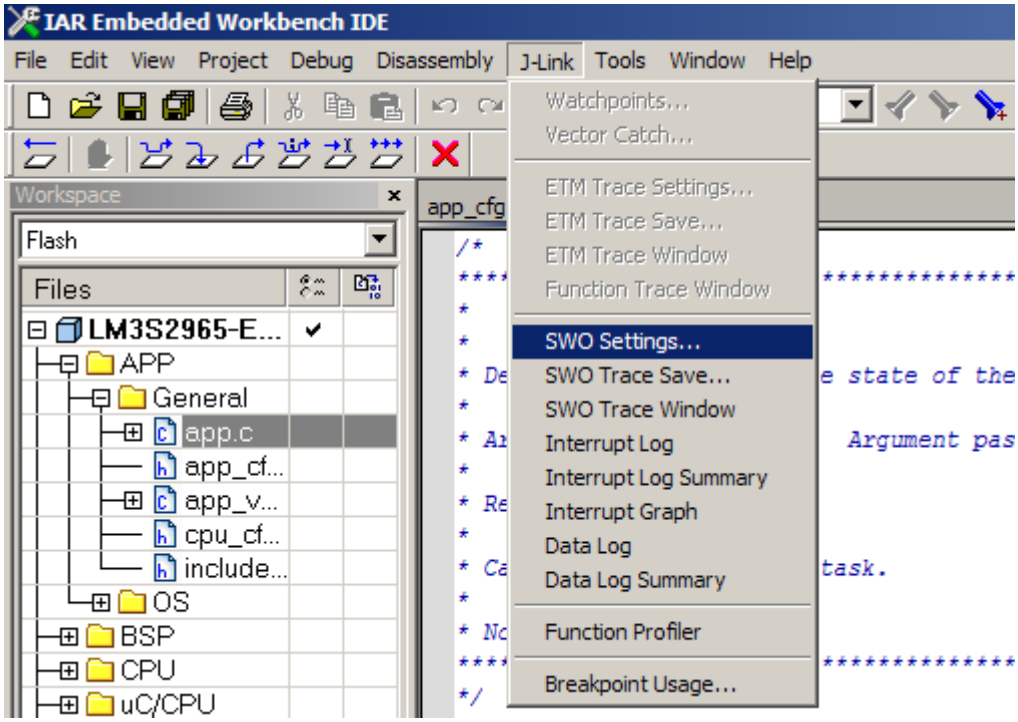
Add following statement at the beginning of the code to be measured:

```
ITM_Port8(0) = 0;
```

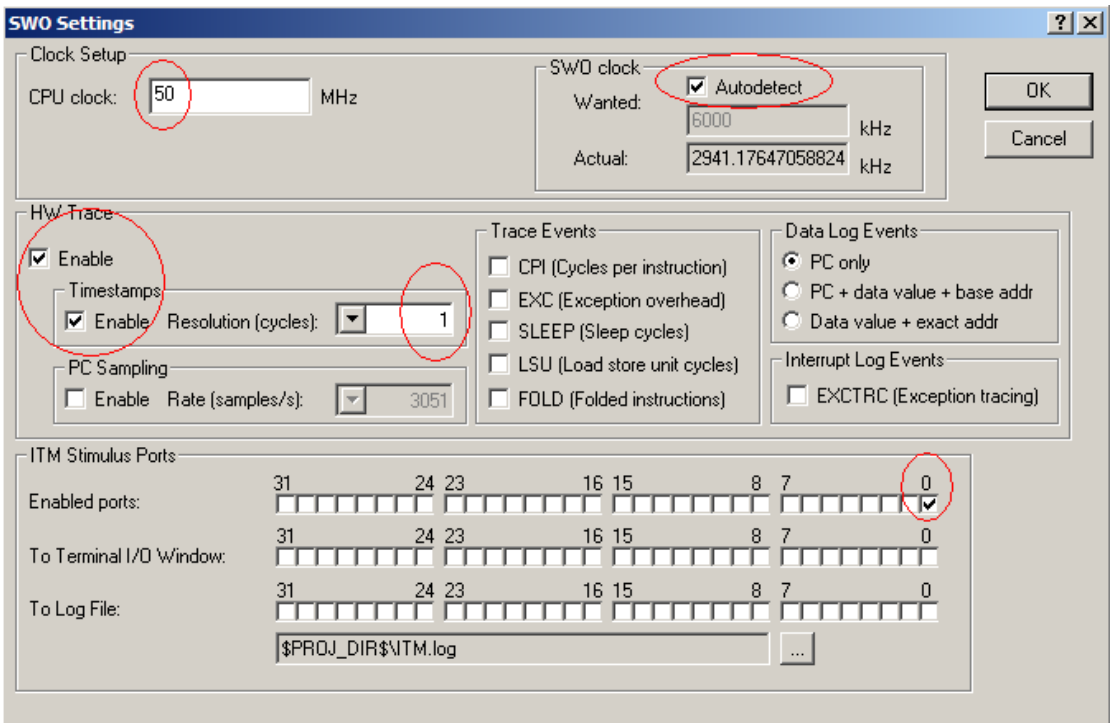
Add following statement at the end of the code to be measured:

```
ITM_Port8(0) = 1;
```

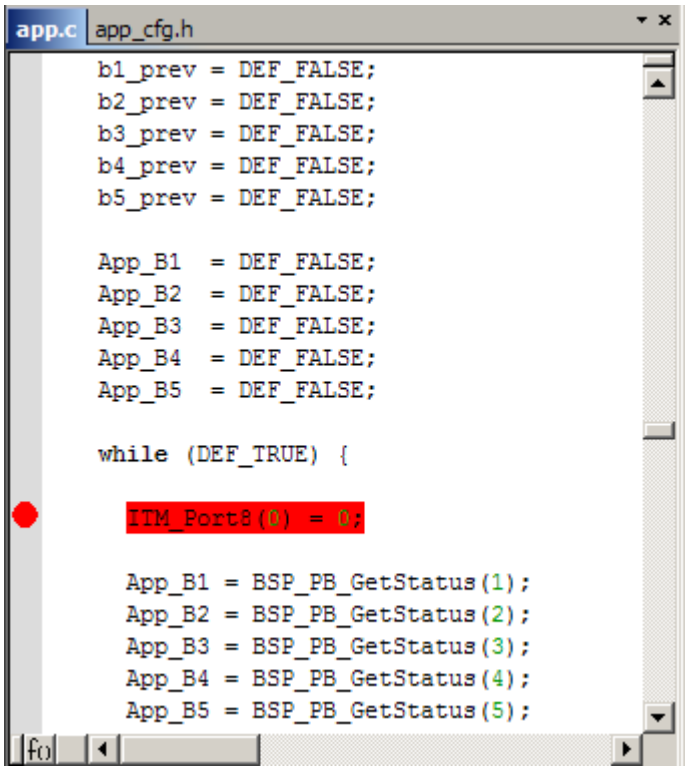
5. Rebuild your project. Start the C-SPY debugger. Open the “SWO Settings” dialog:

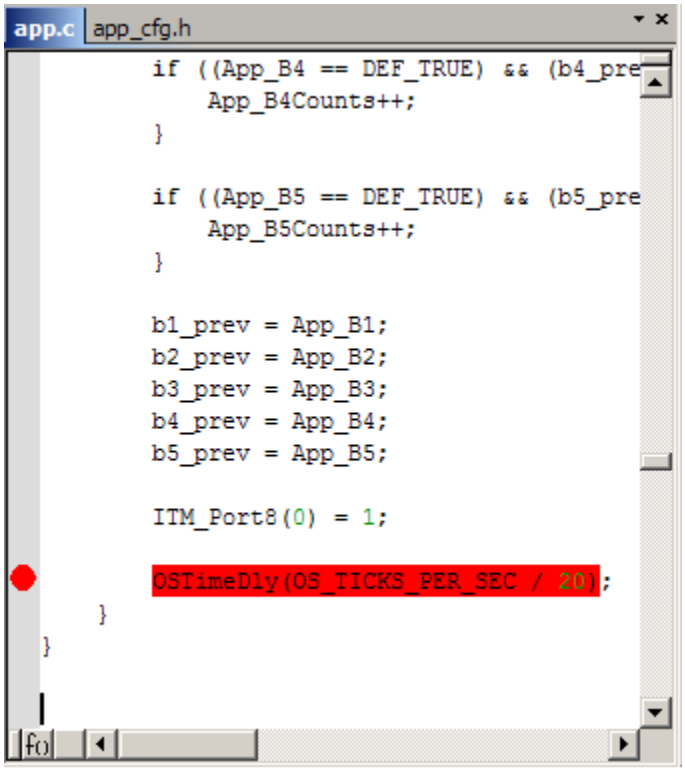


6. Configure necessary options for SWO Settings:
   Set “CPU clock” according to the actual frequency of your target system;
   Enable “HW Trace” and “Timestamps”. Set “Resolution (cycles)” to 1;
   Enable “Autodetect” for “SWO clock”;
   Enable the ITM Stimulus Port 0.

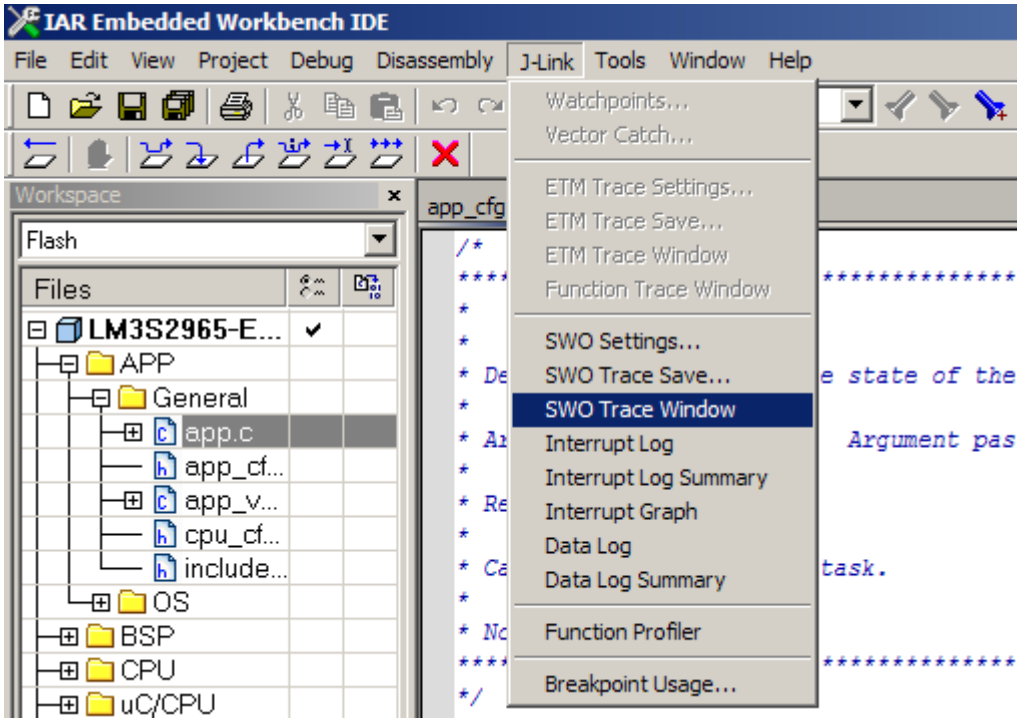


7. Add two breakpoints before and after the code to be measured. The latter one should be set on the next statement of “ITM_Port8(0) = 1”.

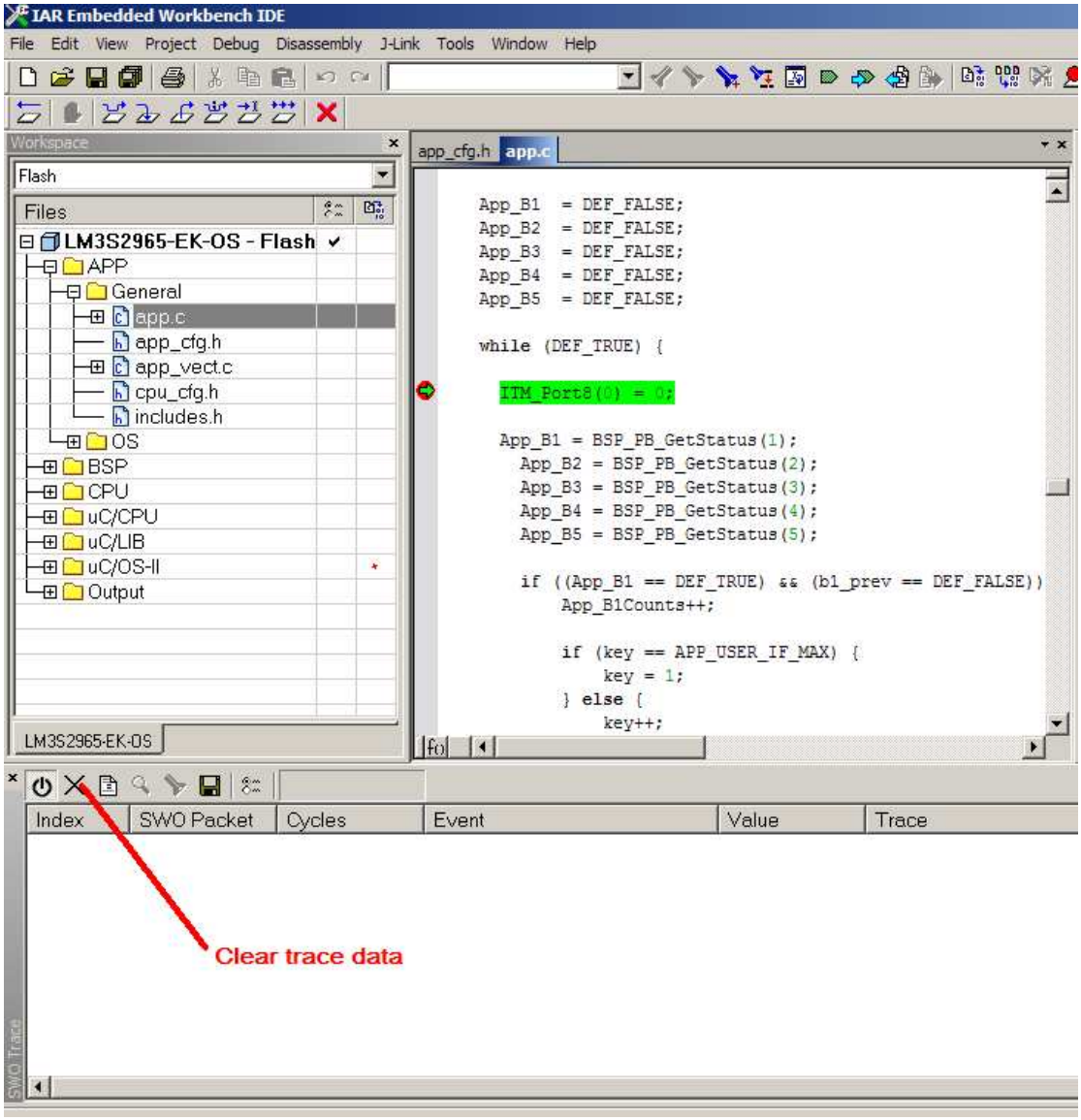




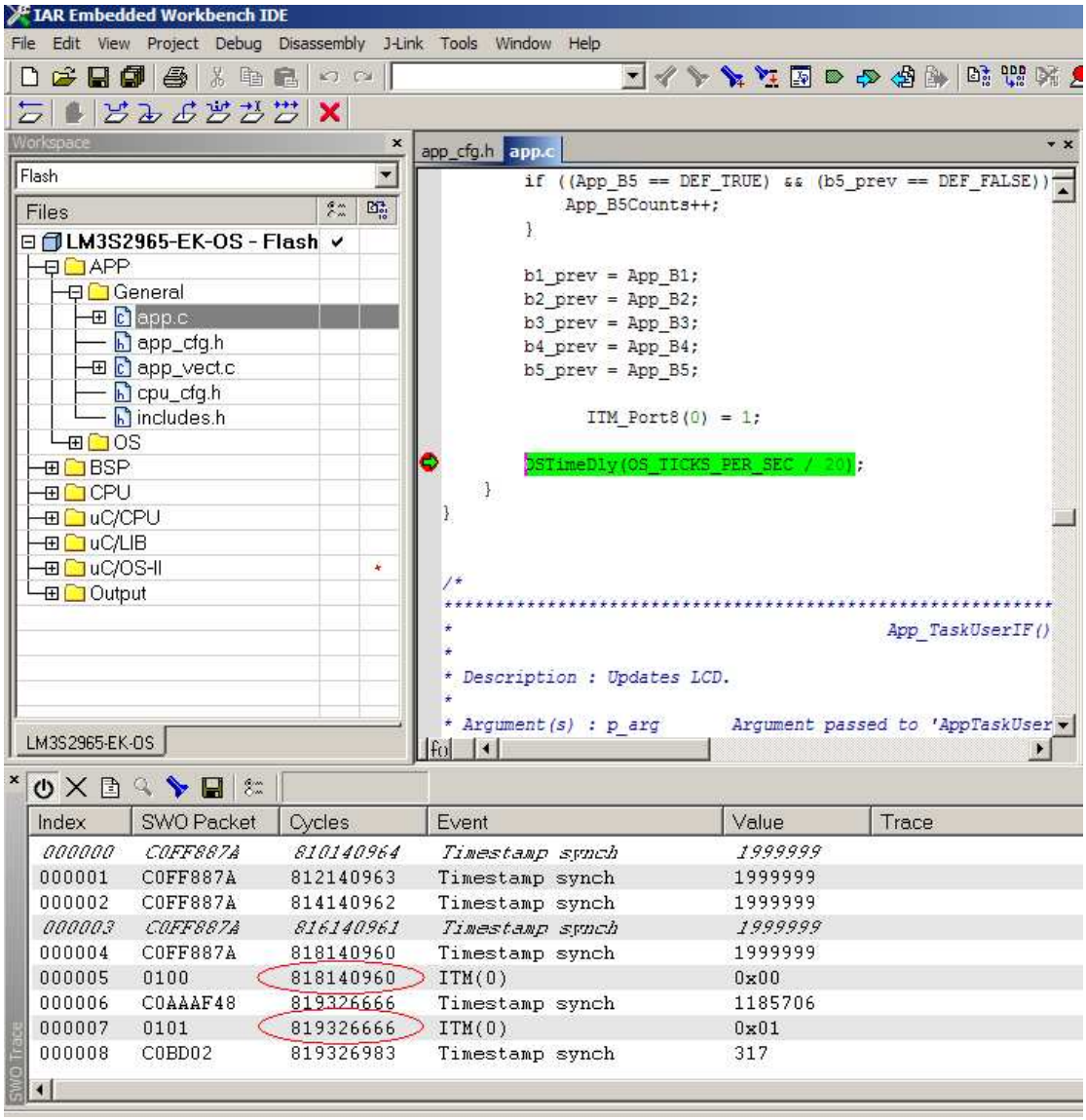
8. Open the “SWO Trace” window:



9. Execute your program in full speed until the first breakpoint is reached. Click the "Clear trace data" button to clean the "SWO Trace" window:



10. Execute your program in full speed again, until the second breakpoint is reached:



11. Find the two ITM(0) events in “SWO Trace” window. The time consumption can be calculated from the difference of the two “Cycles” value, and the main frequency of your target system.

