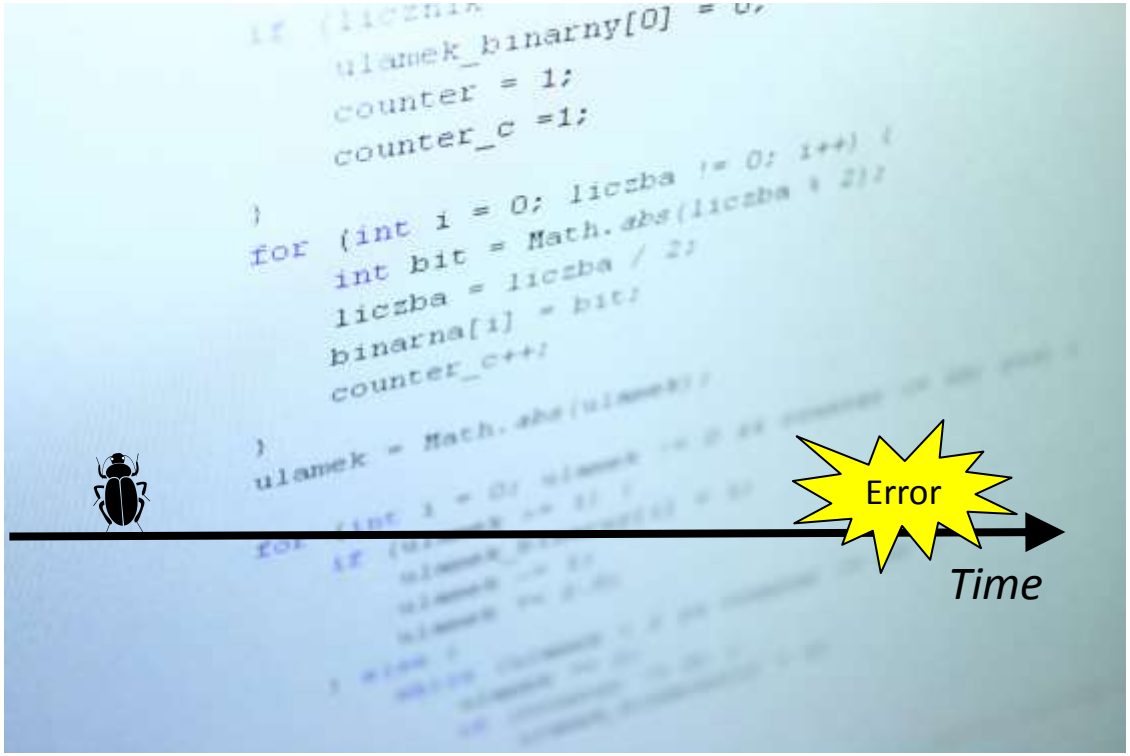
Tracing shows the real-time software behavior

Record

Software Behavior

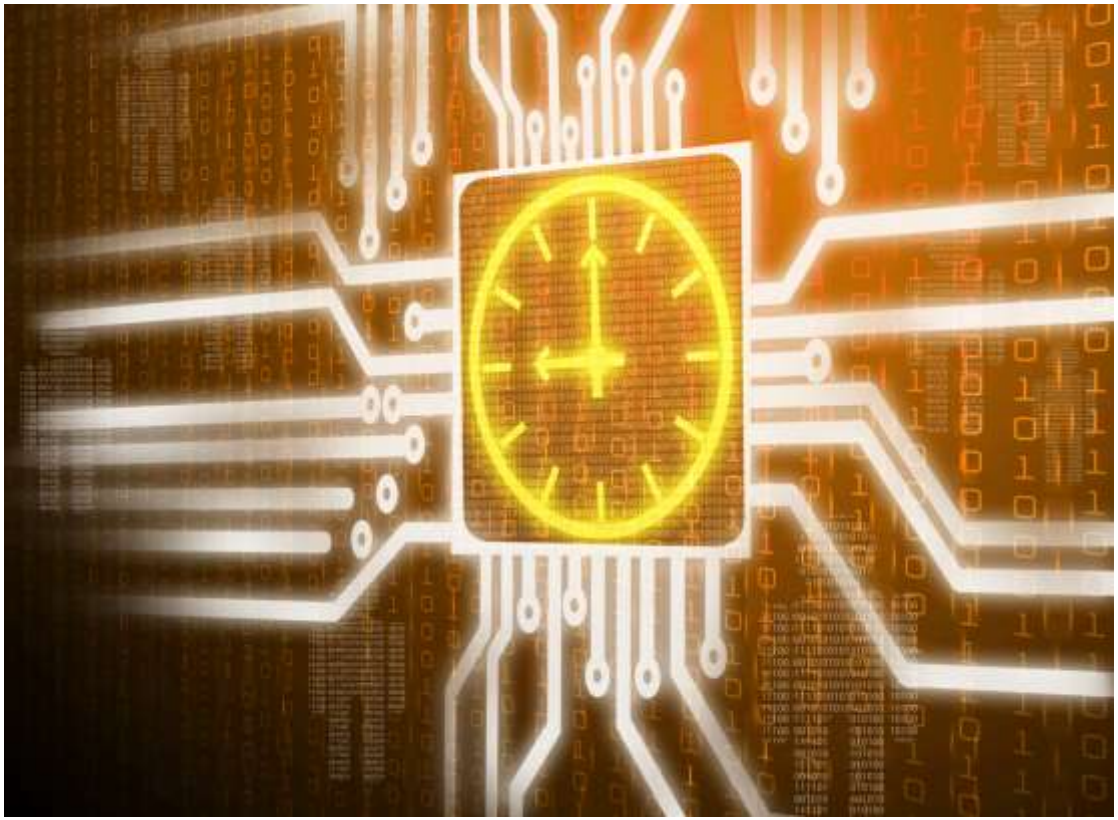
Visualize

When to use Tracing?



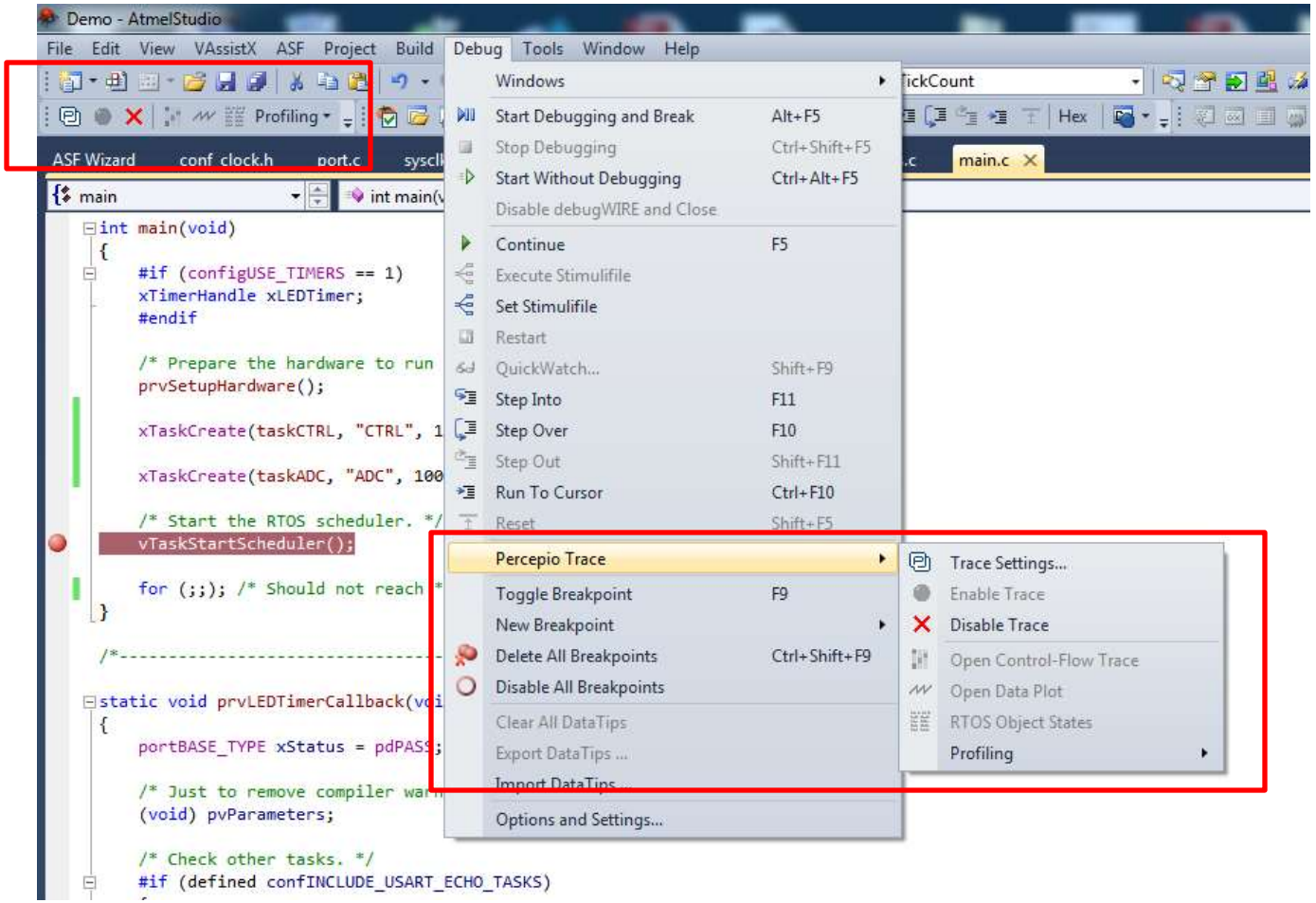
Complex problems – what events caused the error?

When to use Tracing?

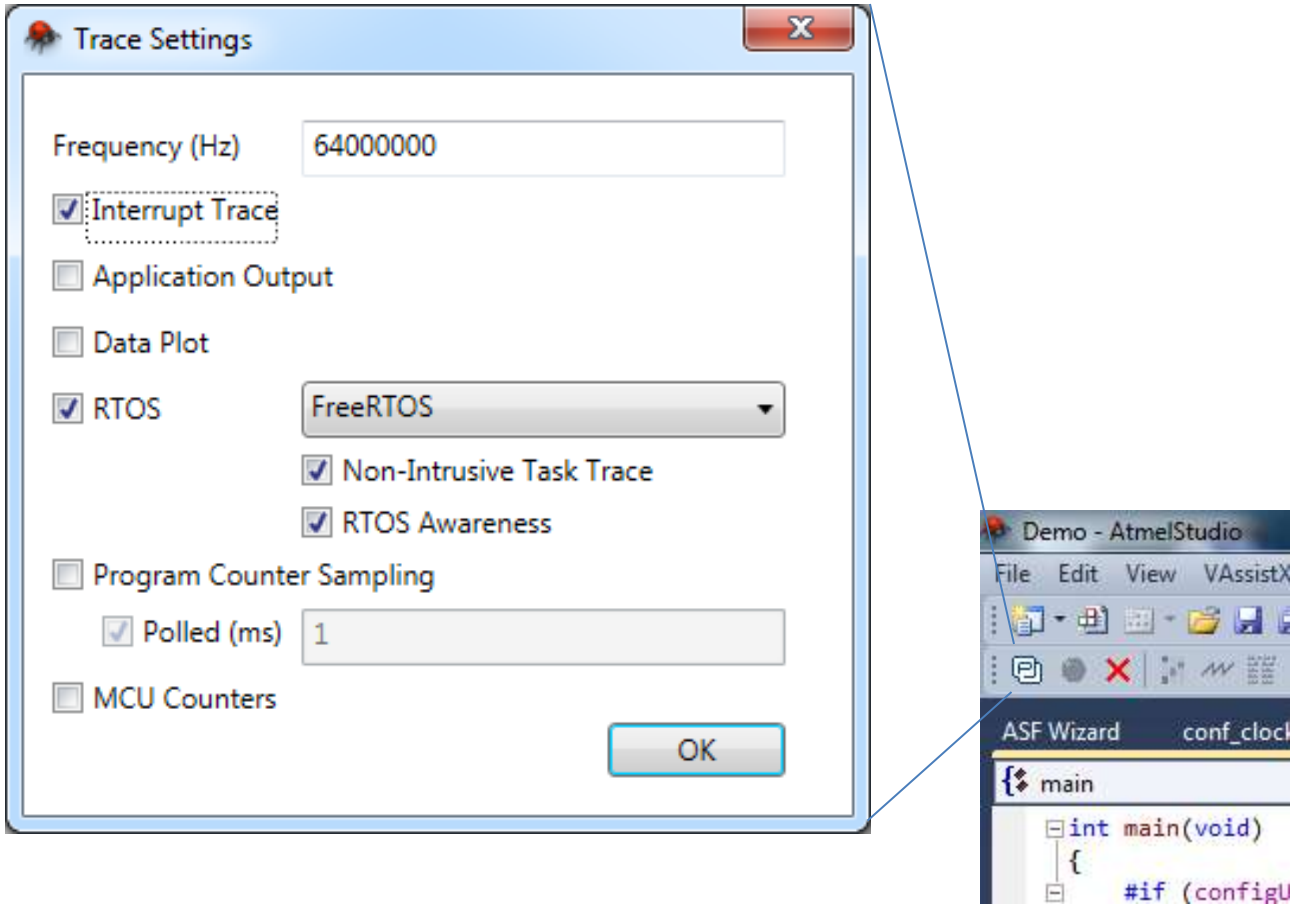


Timing issues and performance optimization

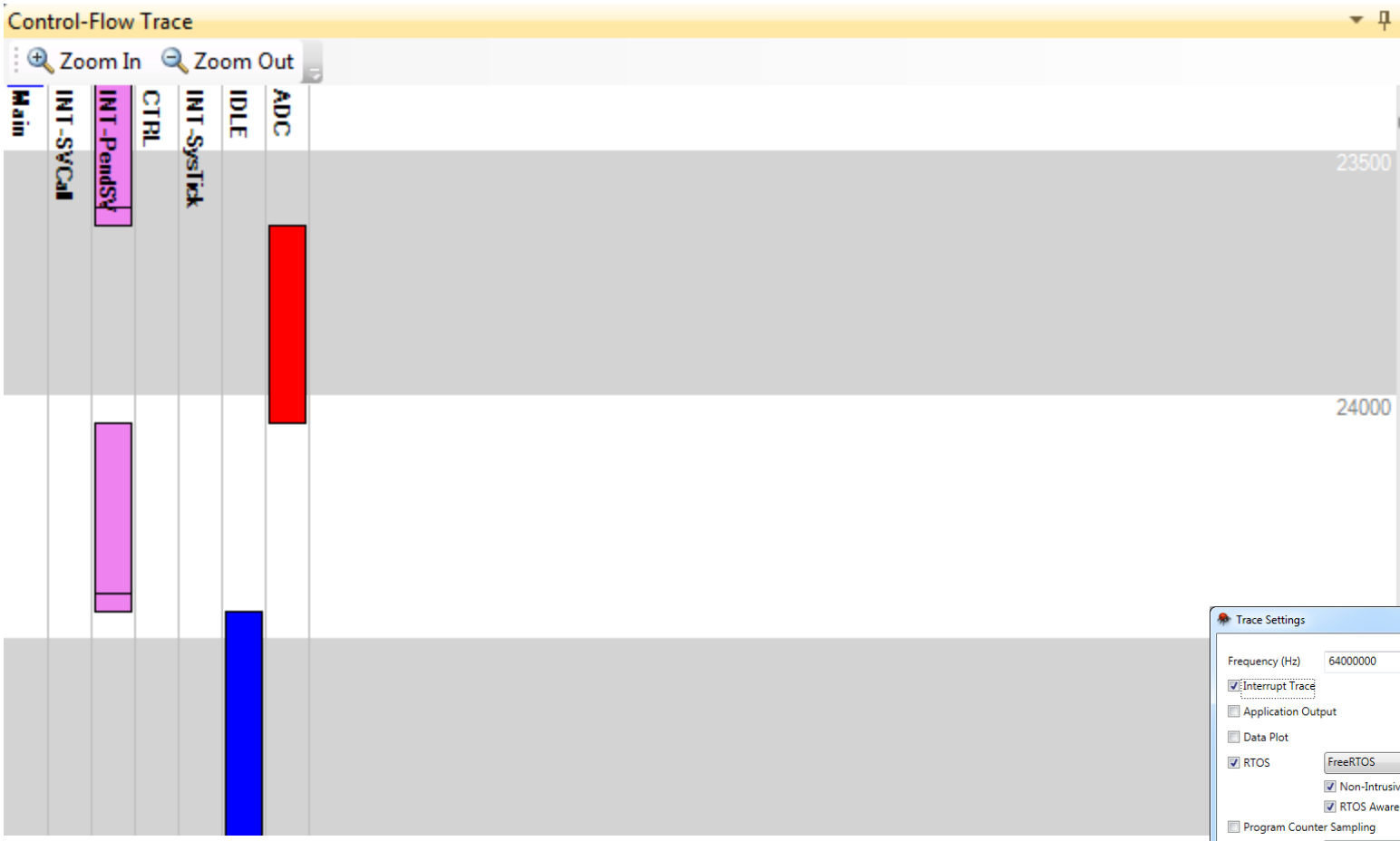
Percepio Trace™

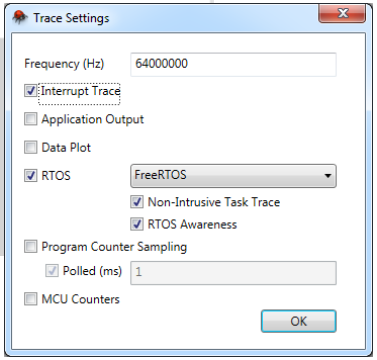


Percepio Trace Settings

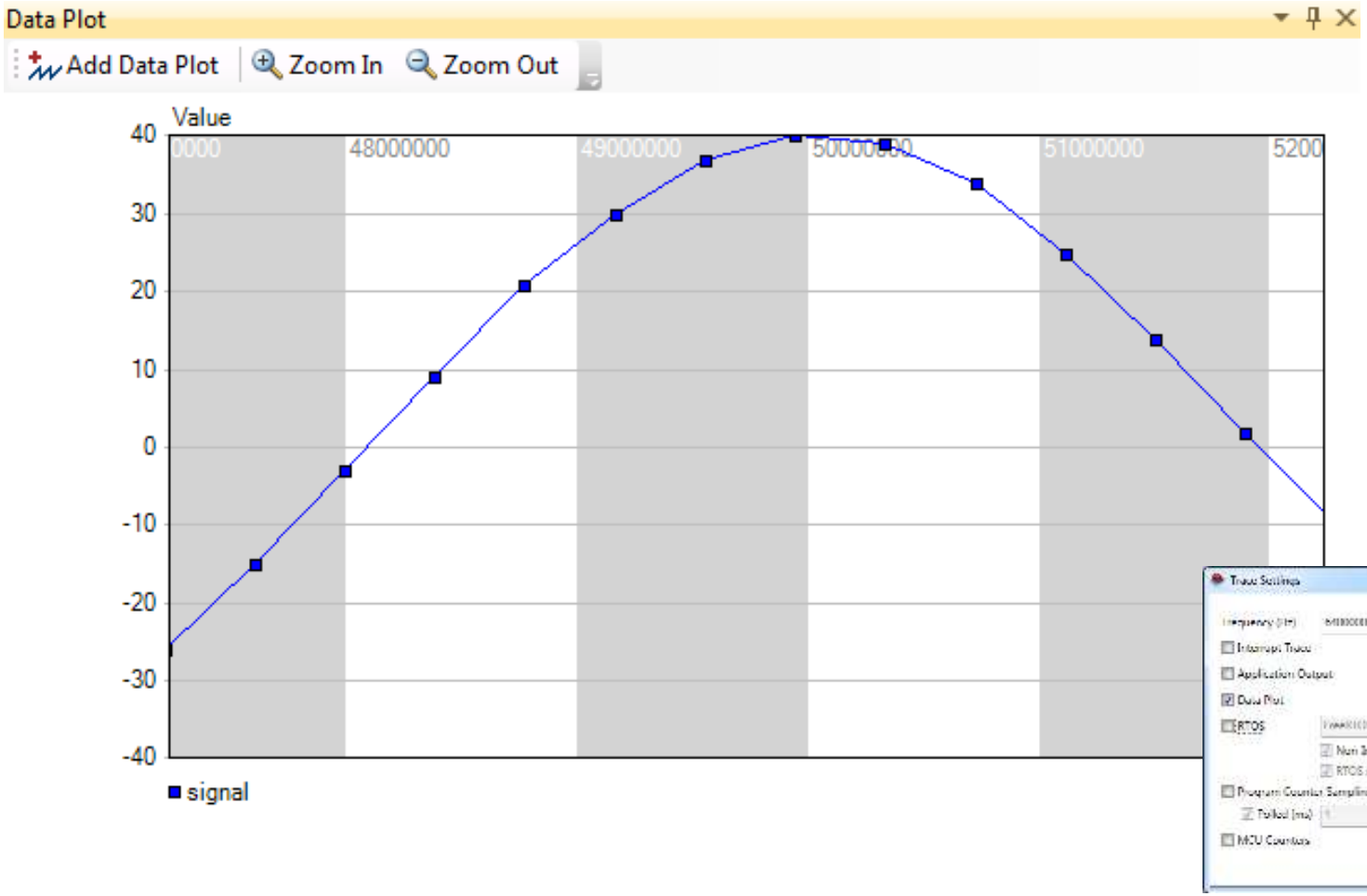


Control-Flow Trace

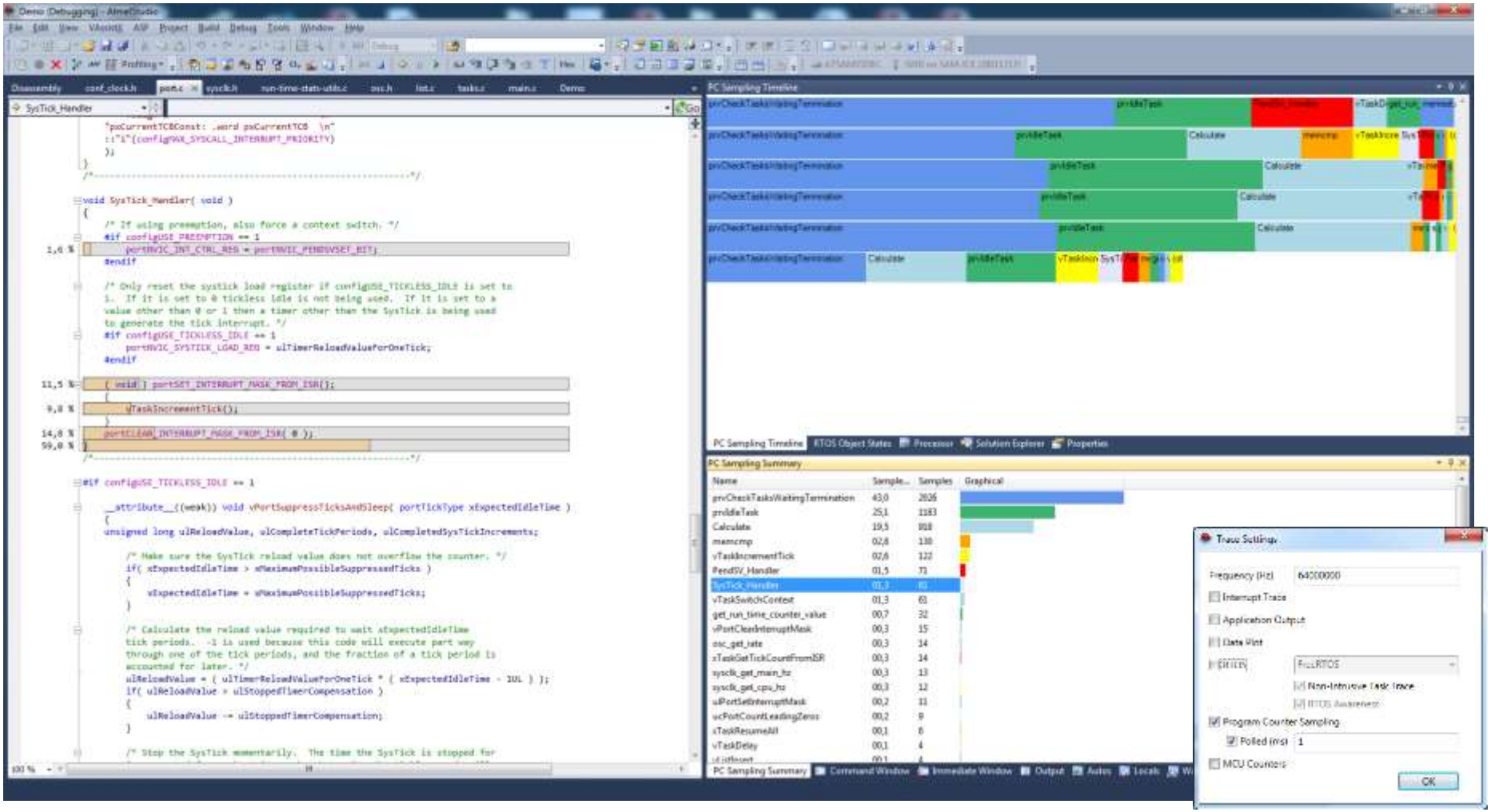




Data Trace

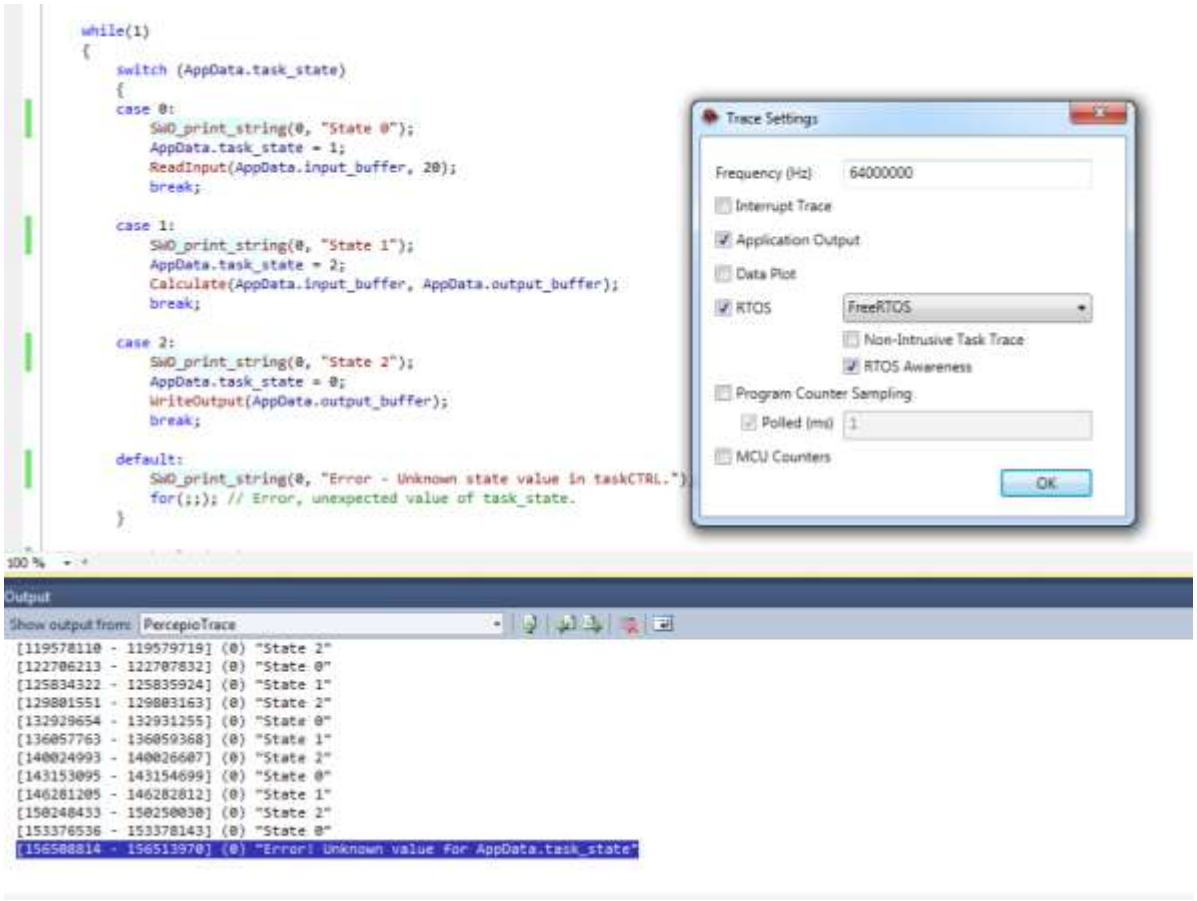

Data Plot
Add Data Plot
Zoom In
Zoom Out
Value
40
30
20
10
0
-10
-20
-30
-40
48000000
49000000
51000000
5200
signal

Profiling



percepio
SENSING SOFTWARE

Debug prints (SWO)



SWO_print_string (SAM3/4)

```
#define ITM_TER *(volatile int*)0xE0000E00 // Trace Enable Register
#define ITM_TCR *(volatile int*)0xE0000E80 // Trace Control Register
#define ITM_STIM_8(n) *(volatile uint8_t*)(0xE0000000 + ((n) * 4)) // 8 Bit N < 32

void SWO_print_char(int port, char c);
void SWO_print_string(int port, const char *s);

void SWO_print_char(int port, char c)
{
            while ((ITM_STIM_8(port) & 1) == 0);
            ITM_STIM_8(port) = c;
}

void SWO_print_string(int port, const char *s)
{
            if ((ITM_TCR & 1) == 0) return;
            if ((ITM_TER & 1) == 0) return;
            while (*s) SWO_print_char(port, *s++);
            SWO_print_char(port, 0);
}
```

Demo

- SAM3S-EK2 board + SAM-ICE
- Basic FreeRTOS project with three issues.
  - Data corruption
  - Task scheduling issue
  - Performance bottleneck