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FUJITSU

Application Note

FCC907S-Time Measurements with MB2141 Emulator

History

18th Nov. 99	MSt	V1.0	New version

Introduction

In Softune Workbench exist 3 possibilities for time measurements.

The 3 methods are:
- Time Measurement
- Sequence
- Performance

This Note will show the differences between the 3 modes.

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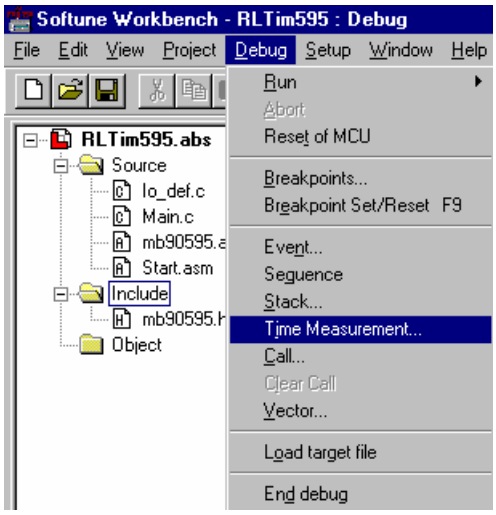
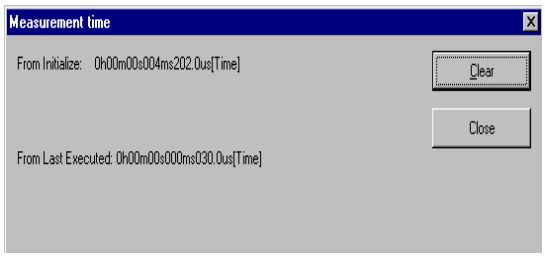
1. Time Measurement

The Time Measurement is the simplest method of measurement. In this method two breakpoints have to been set. After the program has run from breakpoint 1 to 2 the Time Measurement will show the difference between the breakpoints.



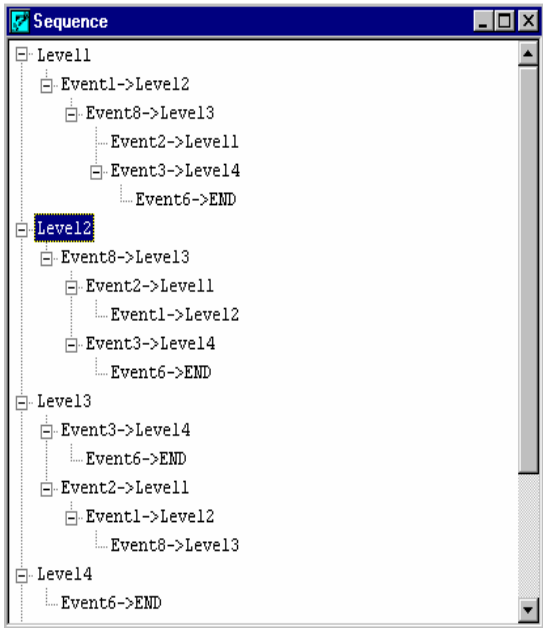


- **Time since initialisation is displayed**
- **Time since last execution (Breakpoint) is displayed**

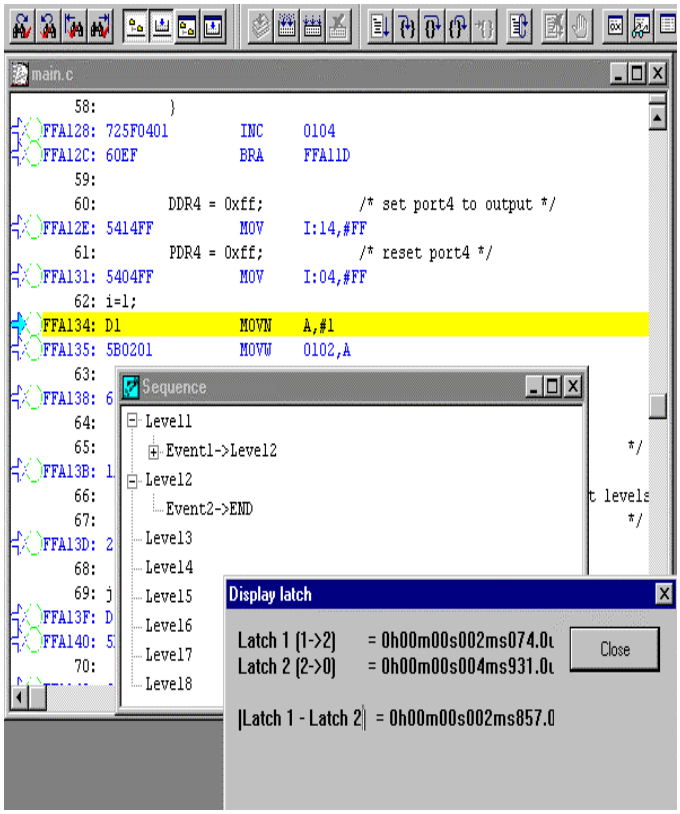
Note: This method has the biggest deviation. Measurements below 10 µs will get a large deviation, about 2-3 µs. The lowest value that could be shown is 3 µs. Setting only 1 breakpoint and running program twice times over the breakpoint doesn't work. Because the program stops but not the timers, so you get no correct values. It must be set always 2 breakpoints.

2. Sequence

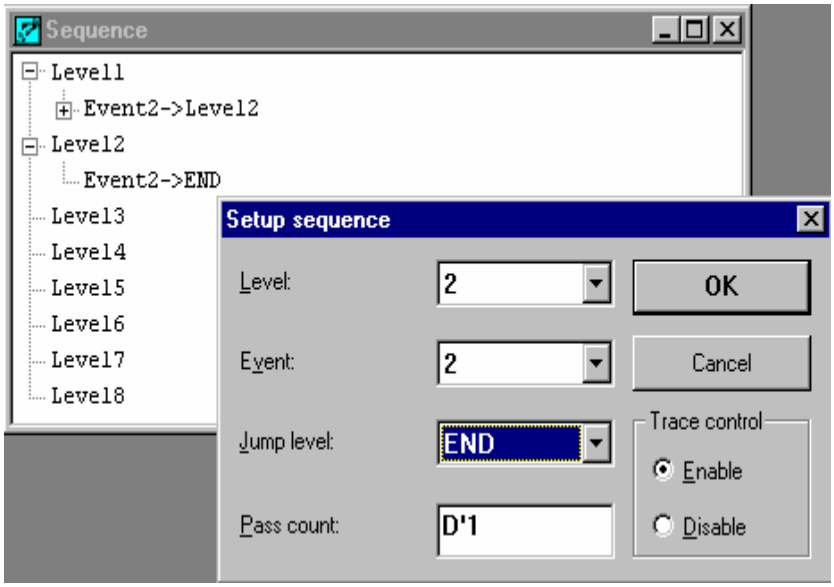
In Sequence measurement several conditions (called Events) can be set. So begin and end of measurement can be defined.



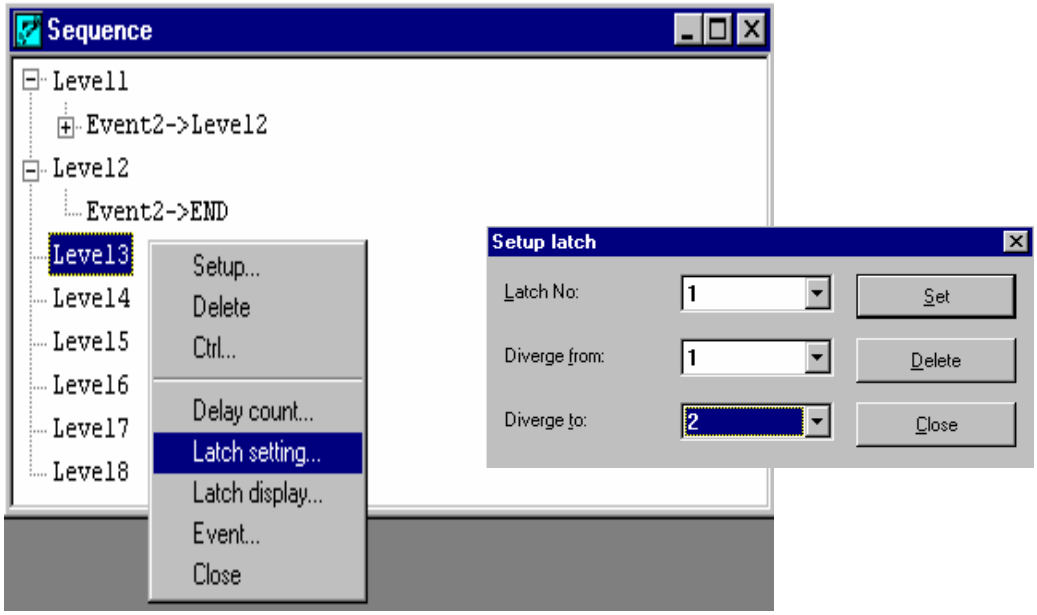
- In the main the sequencer is used to define quite complex breakpoints
- Events are defined to specify the sequencer flow
- Events can be code or data access
- In the sequencer context menu it is also possible to set Timer Latches
- Two Latches can be used which store the current state of an internal timer



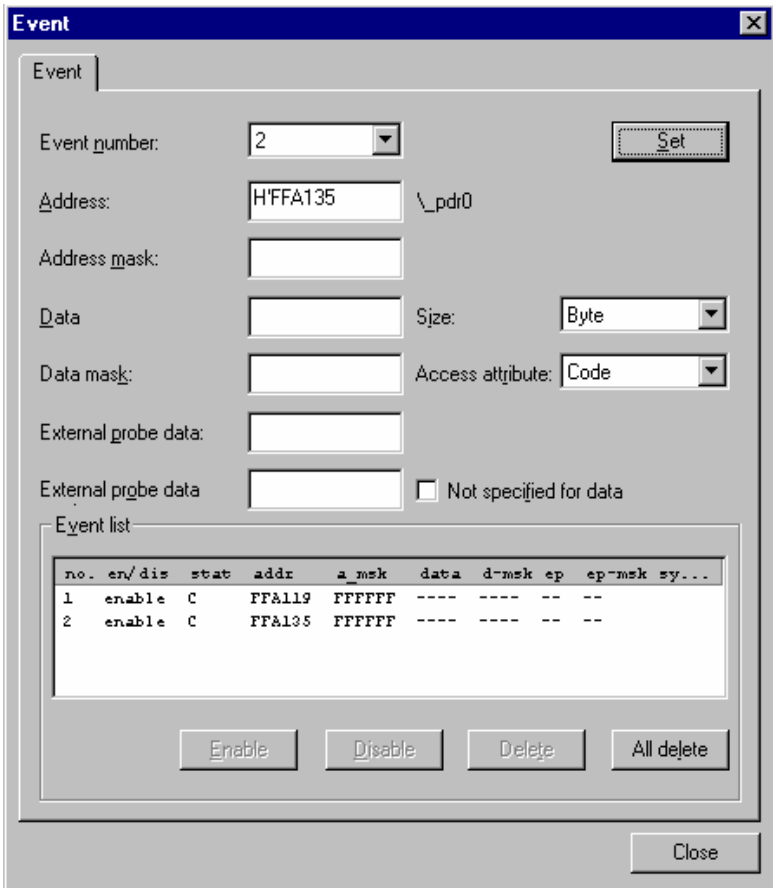
- The Sequencer flow must be initialised first
- The Latches are triggered by a user defined sequencer level sequence
- The Latch dialog box offers the latched time for Latch1, 2 and the difference of the two values



- The Sequencer flow must be initialise using the setup tab of the context menu



- The Sequencer flow must be initialised using the setup tab of the context menu

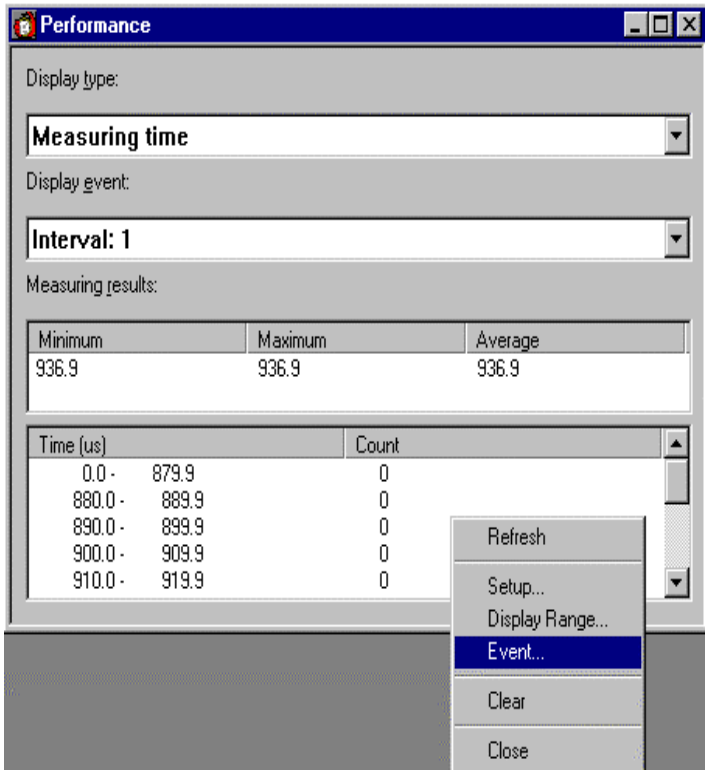


- The Events has to be defined
- Events can defined for code and data access
- Address and data mask can be specified
- External Probe data can be used for Event definition
- Probe data mask can be used
- Attributes for size and access attributes as read, read/write, code are provided

The program will stop after reaching last defined Event. In the Latch display the result is shown.

Note: Setting an Event in an Interrupt service routine don't use first address in routine. Because the interrupt routine saves variable and stack first. If using first address the measurement gets incorrect values.

3. Performance



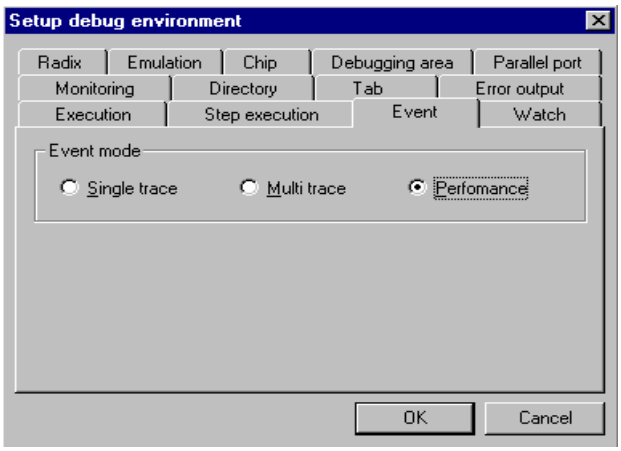
- With the <View>, <Performance> menu the Performance window can be displayed
- The time for each interval is measured individually
- Up to 4 different Intervals can be defined.
- Each Interval is defined by two events
- Interval1: Event1 - Event2
- Interval2: Event3 - Event4
- Interval3: Event5 - Event6
- Interval4: Event7 - Event8
- The settings are invoked with the right mouse button which drops down the context **menu**

The Performance measurement can store about 32000 values. So you get an average result. The measurement can run until buffer is full or can be stopped before. In this case it is shown how many measurements are done.

Note: Setting an Event in a Interrupt Service Routine the first address in routine cannot be used. Because the interrupt service routine saves at first variables and stack. Using first address won't get correct results.

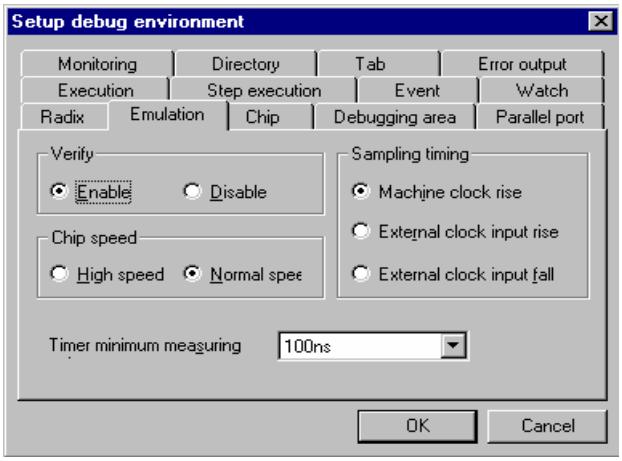
Basic Settings

Set Event Mode



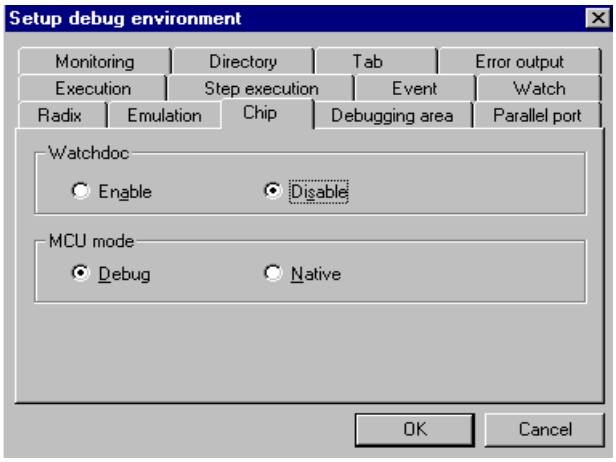
Event Mode has to be set to Performance

Set Timer minimum for measurement



The time measurement interval count can be set to 1µs or 100ns

Set CPU mode to debug or native



If the MCU Mode is set to native, Events can only be set for code address access. In native mode, the performance measurement is more accurate

