



# DoGav Systems Ltd.

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## Count Execution Cycles Tool (e500)

### Description:

The “Count Execution Cycles” is a tool that measures the number of core cycles that it takes to run a desire function.

The tool initializes the e500 performance monitor and provides the number of cycles and the number of completed instructions. The advantage of the tool is that it measures in real time, under the user environment, the actual execution core cycles.

To operate the tool, simply call the “**DG\_PM\_Measure\_Cycles**” function. It should be called in a privilege mode (e.g. `MSR[pr] = 0`).

The tool is actually a single function. The prototype is:

```
UINT32 DG_PM_Measure_Cycles
(
    UINT32 pFunction,          // pointer to the examinee function
    UINT32 *param,            // array of up to 8 passing arguments
    UINT32 *pInstructions // pointer to store the number of instructions
);
```

The function arguments are:

- A pointer to the examined functions.
- An array of the passing arguments, each argument is assumed to be an unsigned long (UINT32). These arguments are passed to the examined function. (EABI compliant).
- A pointer to a location that specifies where to store the number of instructions that are completed within the context of the measurement.

The passing arguments should be arranged in an array, first entry corresponds to the first argument. The function always passes eight (8) arguments to the examined function.

The function also stores the number of the instructions that are completed during the measurement window. This number includes three instructions of the management function which can't be avoided. It was included in order to reflect the exact number of instructions that are executed during the measurement window. If this number is not desired, use **NULL** as `pInstructions`.

The function returns the number of the cycles (including cycles of three assembler instructions that fall into the measurement period).



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Note that the on-core performance monitor provides both results (cycles and number of instructions).

The tool incorporates the e500 Performance monitor using two counters (PMC0 for cycles and PMC1 for completed instructions).

The function can be downloaded from DoGav sites ([www.dogav.net](http://www.dogav.net)). It is a free tool at object level. For source level or for enhancements please contact [dogav@dogav.net](mailto:dogav@dogav.net) .

## **Demo Program:**

```
UINT32 DG_PM_Measure_Cycles // prototype
(
    UINT32 pFunction,
    UINT32 *param,
    UINT32 *pInstructions // NULL if not applicable
);

void test(UINT32 loop); // function under test

UINT32 Param[] = {10000,0,0,0,0,0,0,0 };

void main()
{
    UINT32 cycle, inst;

    cycle = DG_PM_Measure_Cycles
    (
        (UINT32) test,
        (UINT32*) Param,
        &inst
    );

    while (1) { i++; } // loop forever
} // main

void test(UINT32 loop)
{
    UINT32 i, x;

    for(i=0, x=0; i<loop; i++)
        x +=i;
}
```