

Application Note: AN10030

# How to use labels in inline assembly

This application note is a short how-to on programming/using the xTIMEcomposer tools. It shows how to use labels in inline assembly.

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## Required tools and libraries

This application note is based on the following components:

- xTIMEcomposer Tools - Version 14.0.0

## Required hardware

Programming how-tos are generally not specific to any particular hardware and can usually run on all XMOS devices. See the contents of the note for full details.

## 1 How to use labels in inline assembly

It is invalid to write inline assembly code that branches to another inline assembly statement. However it is sometimes useful to write inline assembly that branches within the instructions contained in that asm statement.

A common mistake is to write the following:

```
asm(  
    "bt %1, .Lfoo\n"  
    "mov %0, %2\n"  
    "bu .Ldone\n"  
    ".Lfoo:\n"  
    "mov %0, %3\n"  
    ".Ldone:\n"  
    : "=r"(a)  
    : "r"(b), "r"(c));
```

If the statement containing the asm statement is duplicated (e.g. due to function inlining or loop unrolling) this will result in an error due to the labels .Lfoo and .Ldone being defined multiple times.

Instead you should write:

```
asm(  
    "bt %1, .Lfoo%=\n"  
    "mov %0, %2\n"  
    "bu .Ldone%=\n"  
    ".Lfoo%=: \n"  
    "mov %0, %3\n"  
    ".Ldone%=: \n"  
    : "=r"(a)  
    : "r"(b), "r"(c), "r"(d));
```

The %= escape sequence emits a number that is unique to each expansion of the asm statement, making the labels unique.