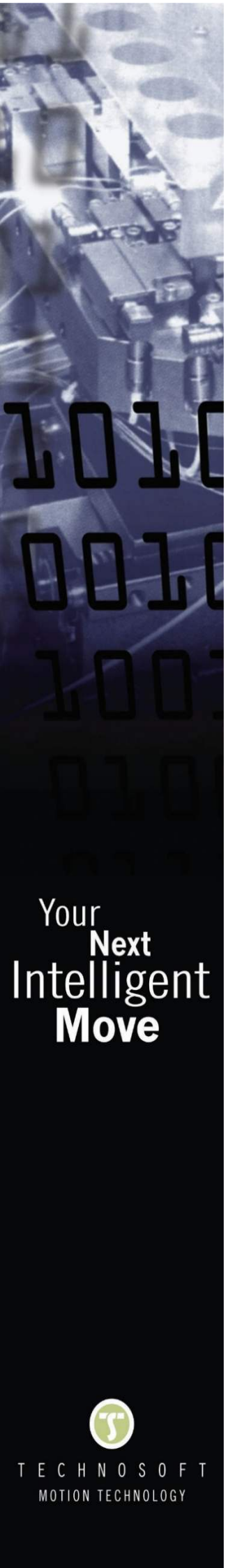

TECHNOSOFT
MOTION TECHNOLOGY

TML loop with motion profiles and events

Application Note

Easy Motion Studio II

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1. Application description

This application note outlines the procedure for constructing a loop utilizing a label and the "GOTO" TML instruction. For illustrative purposes, this loop incorporates two motion profiles, each triggered by distinct time events.

2. Application flow chart

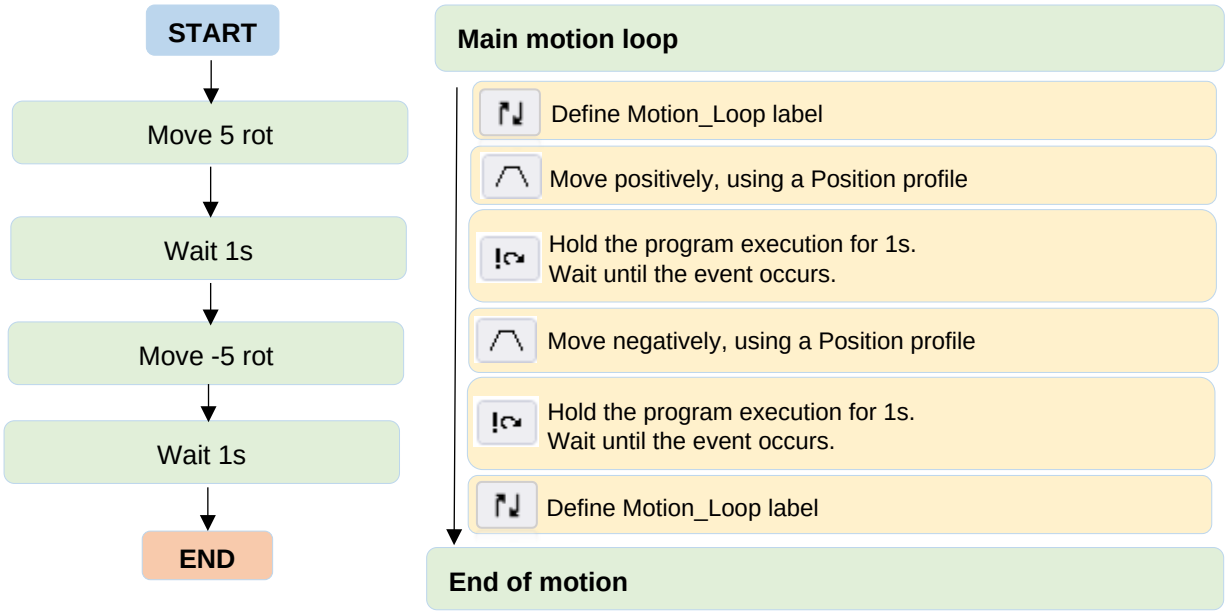

Figure 1 – Application structure

3. EasyMotion Studio II implementation

This application program features an infinite loop that executes five rotations in the positive direction followed by five rotations in the negative direction. A one second pause is implemented between the two movements to ensure precise timing and control.

3.1 Detailed description of the EasyMotion Studio II implementation

The “Jumps and Function Calls” dialogue allows controlling the TML program flow through unconditional or conditional jumps and unconditional, conditional or cancelable calls of TML function. In this application example, it was used to create the infinite loop, using a label and a “GOTO” TML instruction.

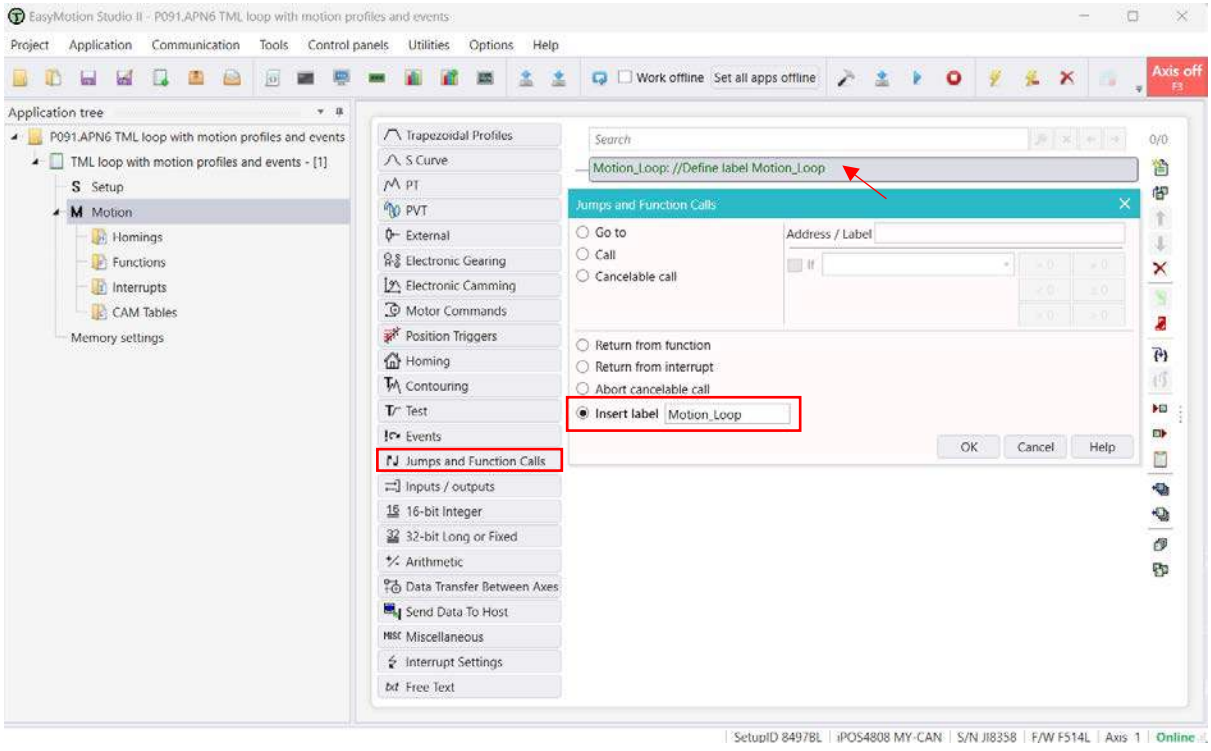

Figure 2 – Creating Motion_Loop label

The GOTO instruction is used to create a loop by jumping back to the specified label, in this case, Motion_Loop. This ensures the continuous execution of the sequence of commands within the loop. This process is managed through the Jumps and Function Calls dialog, which allows the program to control the flow of execution and create repetitive cycles effectively.

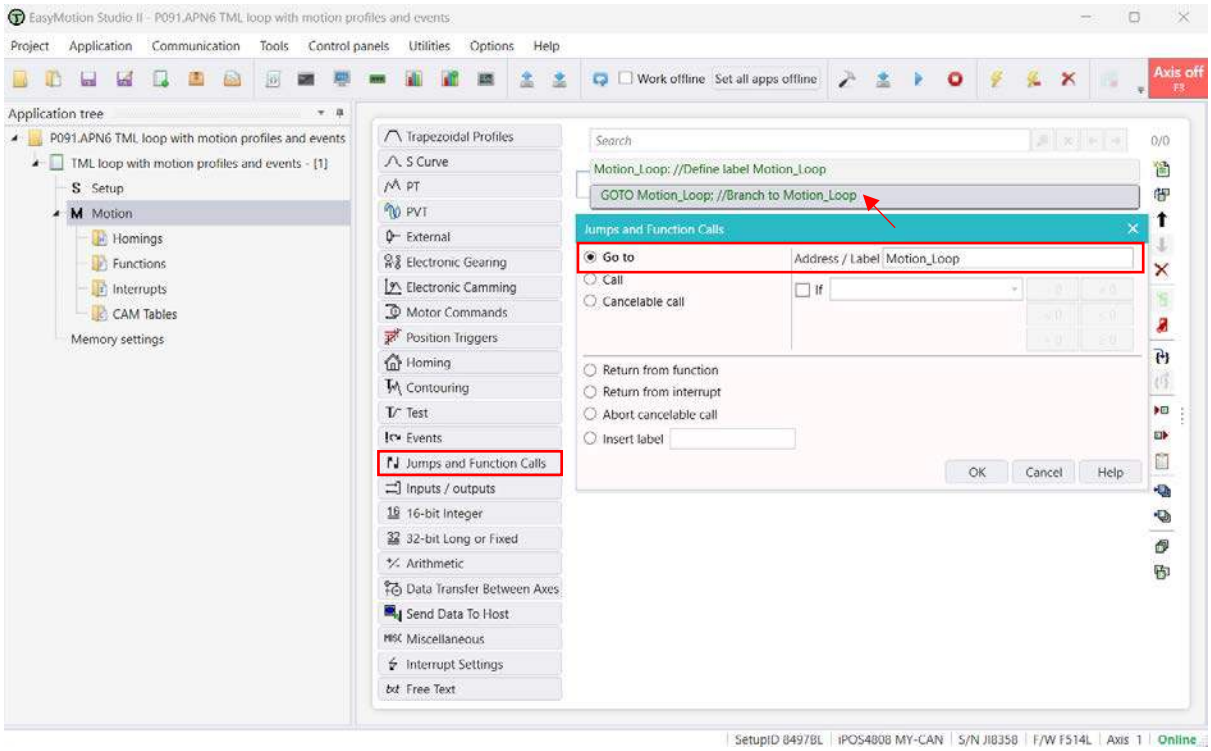

Figure 3 – Jump to Motion_Loop label

The "Motion – Trapezoidal Profiles" dialog allows the programming of a position or speed profile with a trapezoidal speed shape, resulting from limited acceleration. In this example, the "Motion – Trapezoidal Profiles" dialog is used to control the two movements.

When using a position profile, the load/motor is controlled in position mode. You can specify either an absolute position to reach or a relative position increment, along with the slew speed and acceleration rate. In relative mode, the target position can be calculated in two ways: standard or additive.

Key Points:

1. **Trapezoidal Profiles**:
   - The "Motion – Trapezoidal Profiles" dialog is used to create profiles where speed follows a trapezoidal shape due to limited acceleration.
2. **Position Control**:
   - The motor/load is controlled in position mode.
   - You can specify an absolute position to reach or a relative position increment.
3. **Profile Parameters**:
   - Define the slew speed and acceleration rate for the profile.
4. **Relative Mode Calculation**:
   - In relative mode, the target position can be computed in two ways:
     - **Standard**: The new position is calculated based on the initial position.
     - **Additive**: The new position is calculated by adding the increment to the current position.

By following these guidelines, one can effectively use the "Motion – Trapezoidal Profiles" dialog to program precise and controlled motion profiles.

The configuration sets up a motion profile that will cause the motor to move 5 rotations in the positive direction using relative positioning.

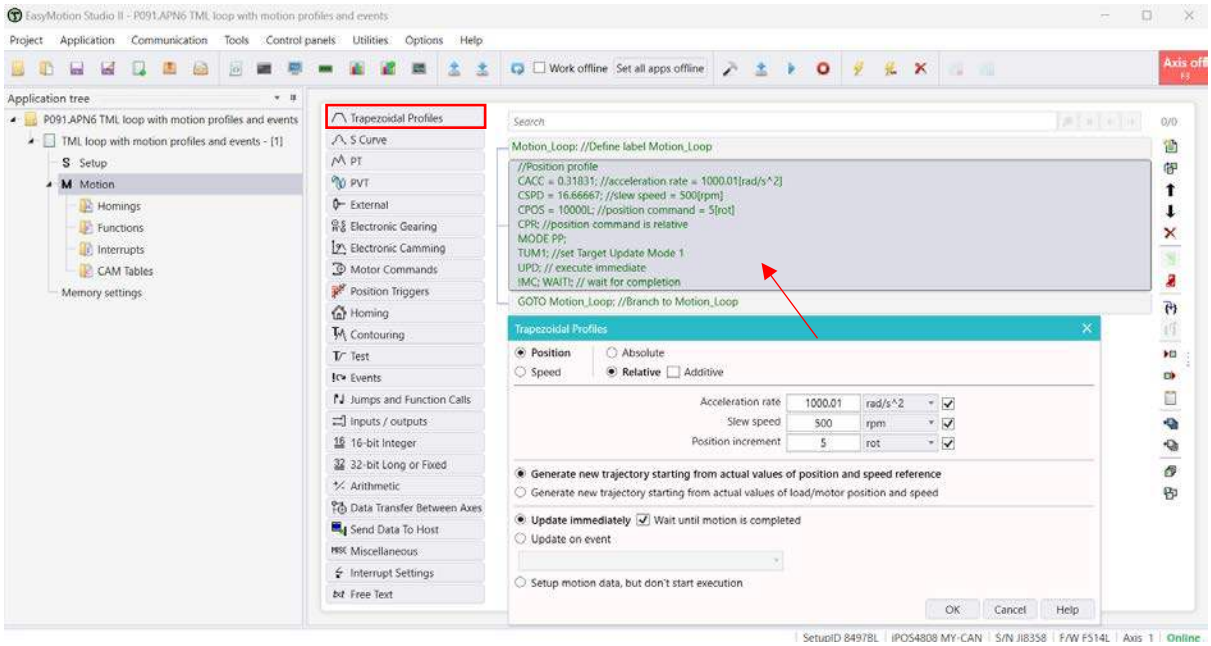

Figure 4 – Inserting a trapezoidal position profile

The “Events” dialogue allows to define events. An event is a programmable condition, which once set, is monitored for occurrence.

The following actions can be connected to an event:
- stop the motion when the event occurs
- wait for the programmed event to occur
- exit from the wait loop after a set wait time

In the Events dialog, click on the dropdown menu to view the available event types and select "After a wait time." Once selected, a new field will appear where you can specify the wait duration. Enter the value 1 and choose s (seconds) from the time unit dropdown menu. Finally, click the "OK" button to confirm and apply the wait time event. This process inserts a one second wait time between the two motion profiles in the loop.

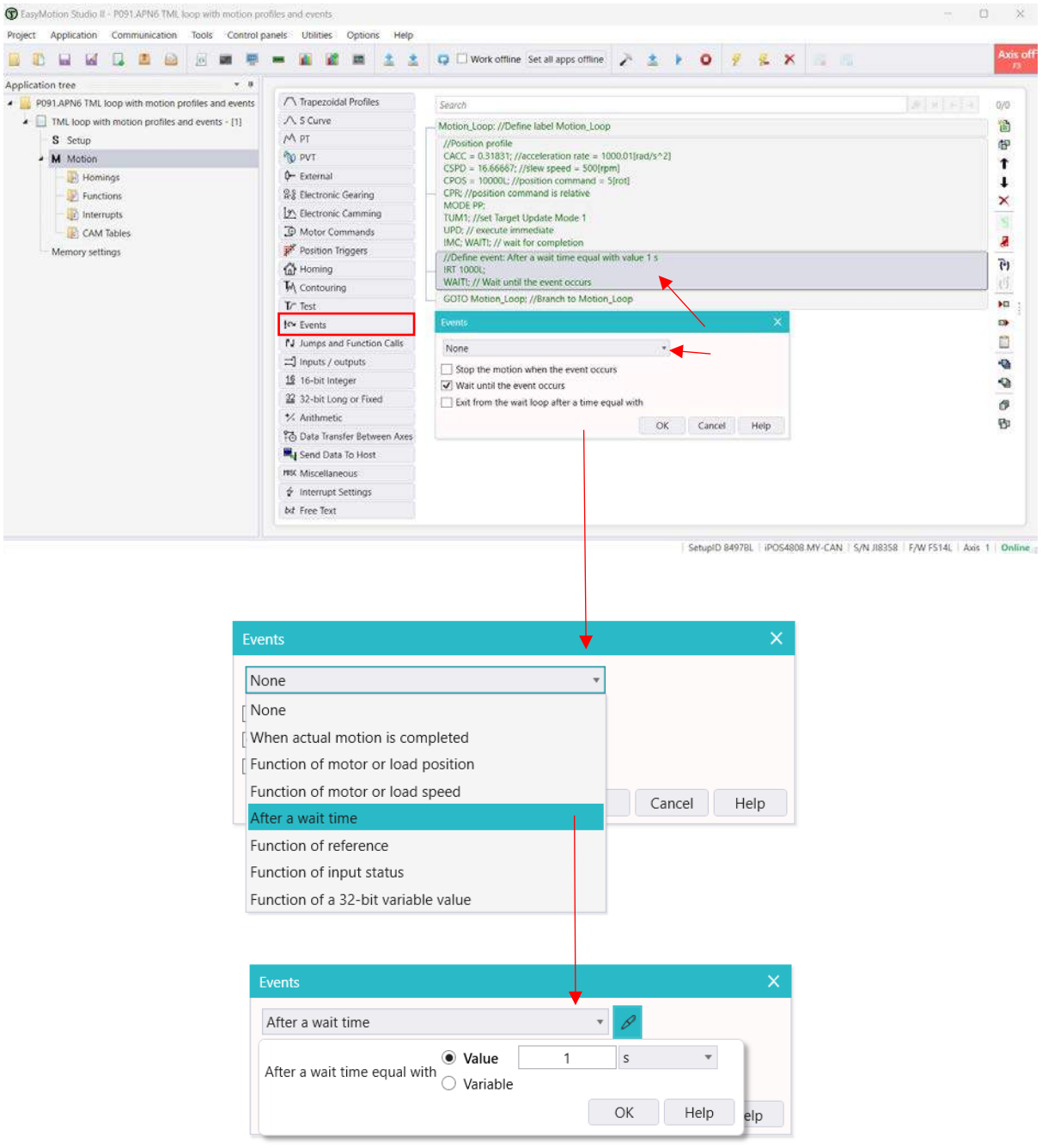

Figure 5 – Inserting a time event

In this example, the "Trapezoidal Profiles" dialog is used to configure and insert an additional motion profile that moves the motor 5 rotations in the negative direction using relative positioning.

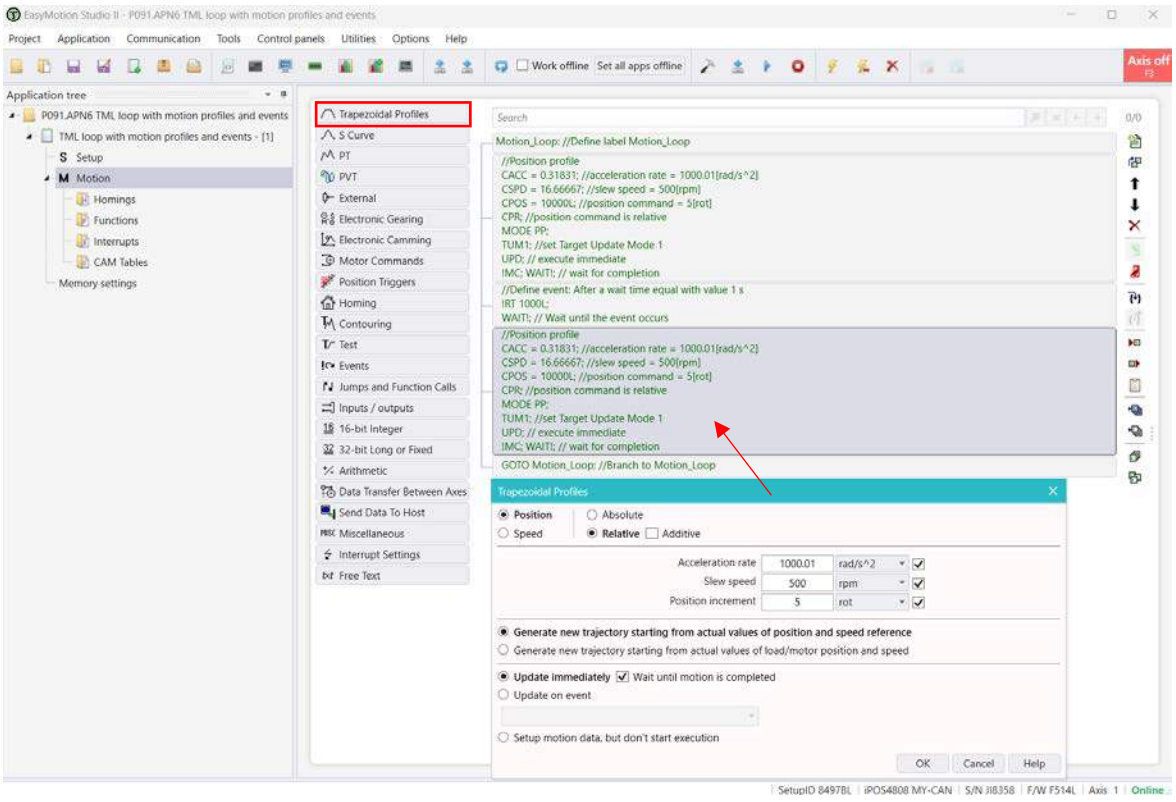

Figure 6 – Inserting a trapezoidal position profile

Following this motion, another wait event of 1 second will be defined, similar to the one shown in Figure 5.

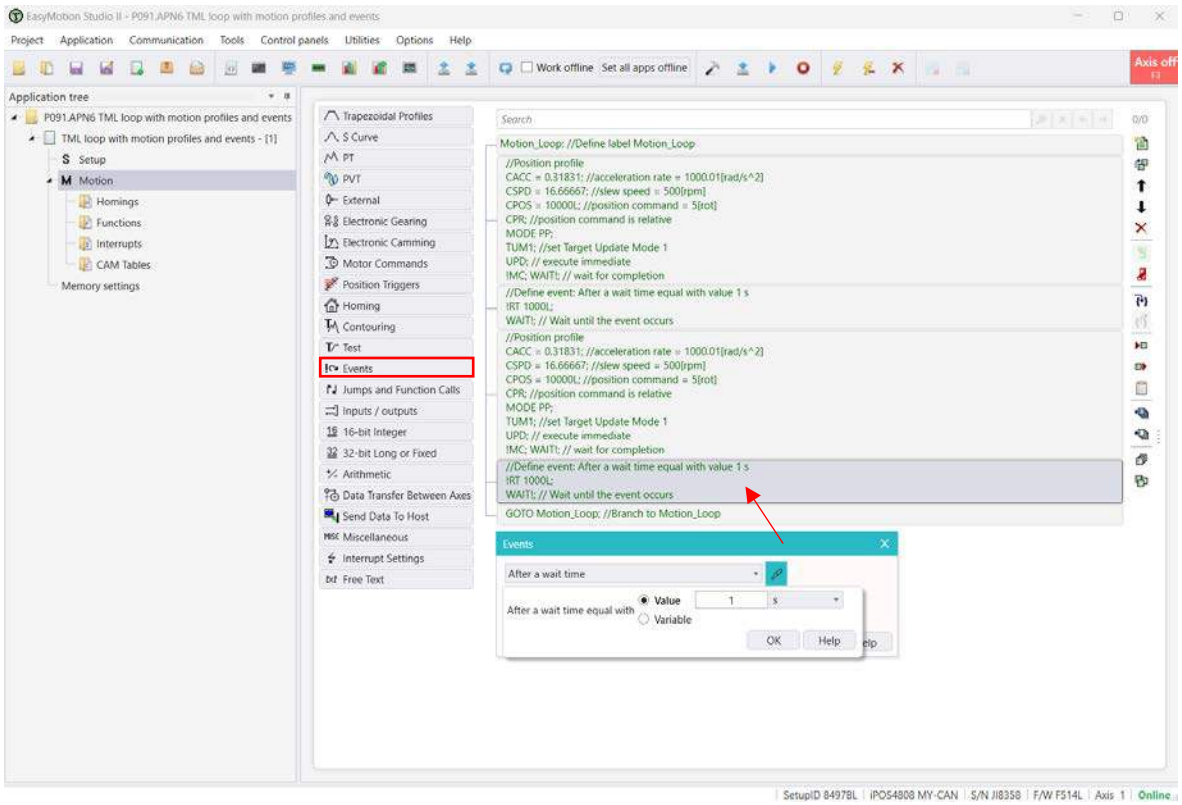

Figure 7 – Inserting a time event