I2T

Current Limiter and I2T

In the Tuning Tab of the Control Center you can find the current limiters: Max force, Max current, Positive force limit and Negative force limit (see also Technical Note on Forces). These parameters limit the current through the actuator and are expressed in ‰ of rated current.

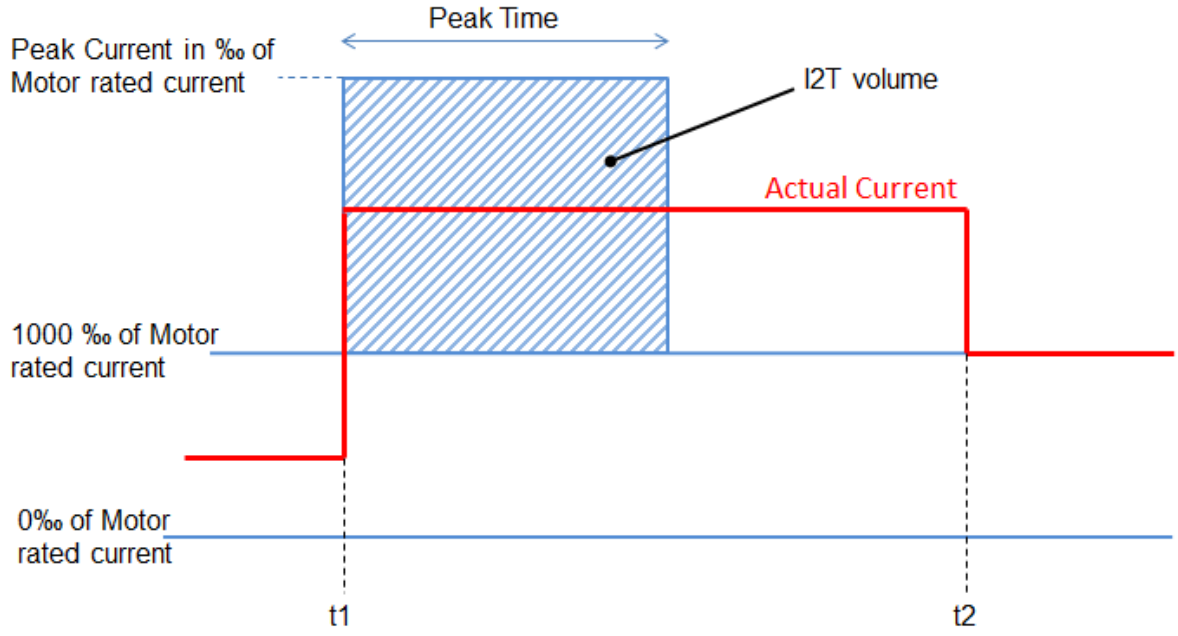
The motor rated current value, given in mA, is the maximum continues current.
Therefore, limiter values above 1000 would overheat the actuator if applied for long periods of time.

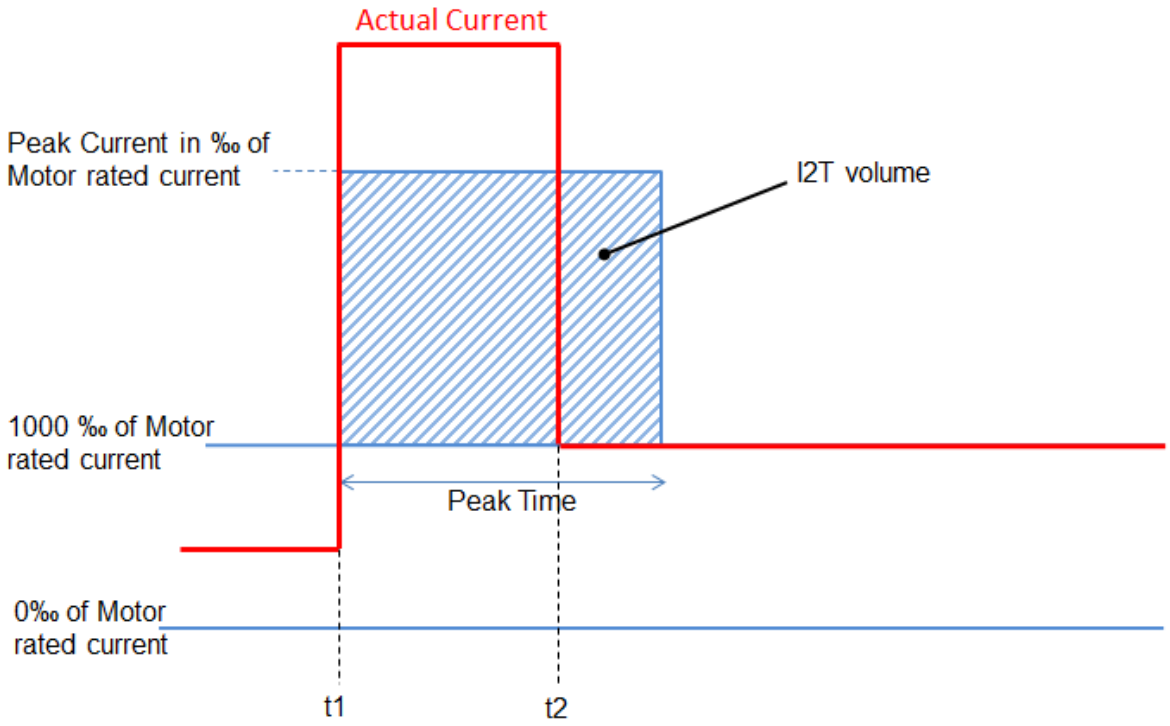
To protect the actuator against long term overheating the I2T is used. The I2T integrates the amount of current that is provided to the actuator which is above the motor rated current. When that integration reaches the I2T volume, the motor will drop its current to the motor rated current until an equal amount of I2T volume has appeared beneath the motor rated current.

The motor rated current and the I2T parameters (peak time & peak current) are carefully chosen to protect the motor against overheating. Changing these parameters can void the warranty.

The next page shows examples of how the I2T limits the current.

The behaviour of I2T is shown in the images below. At t1 the actual current increases above motor rated current. When the volume above the Actual Current reaches the I2T volume (t2), the actual current will be limited to the motor rated current level.





Detecting I2T occurrence

If you need to know if the I2T has been triggered you can use the interrupt. In order to program the interrupt you need to set the interrupt vector (nr 9 for I2T), set the macro number you want to call at occurrence of the I2T and enable it. This is done in macro 0, line 3 and 4 in the program shown below.

#	Line	Command	Parameter	Comment
0		MacroNumber	0	HOMING
5	0-1	Homing	Endstop_and_indexpulse,Negative,Acc=,Vendstop=,Force=,Vindex=,Timeout=,Off...	
6	0-2	PositionMove	Absolute,Target=0,Vel=10000,Acc=50000,Change_immediate	
1	0-3	SetVariable	Var=Interrupt_vector-Interrupt_9_vector(0x092C07),Constant,Const=2	Set interrupt vector 9 (i2t) to jump to macro 2
1	0-4	SetVariable	Var=Interrupt_enable-Interrupt_9_enabled(0x092C08),Constant,Const=1	Enable interrupt vector 9
0		MacroNumber	1	Continues force mode
2	1-1	Motor	On	
3	1-2	ForceMove	Target=1500,Slope=	
1	1-3	Macro	Repeat,RepeatCount=0	
0		MacroNumber	2	Interrupt macro
3	2-1	SetOutput	Digital_output_0,On	
1	2-2	GetVariable	Var=Current_actual_value(0x006078)	
1	2-3	Macro	Return	

In this program macro 2 will be called at occurrence of the I2T. After this macro is executed the Return at Macro 2, line 3 will take care the program will continue where it was called from.