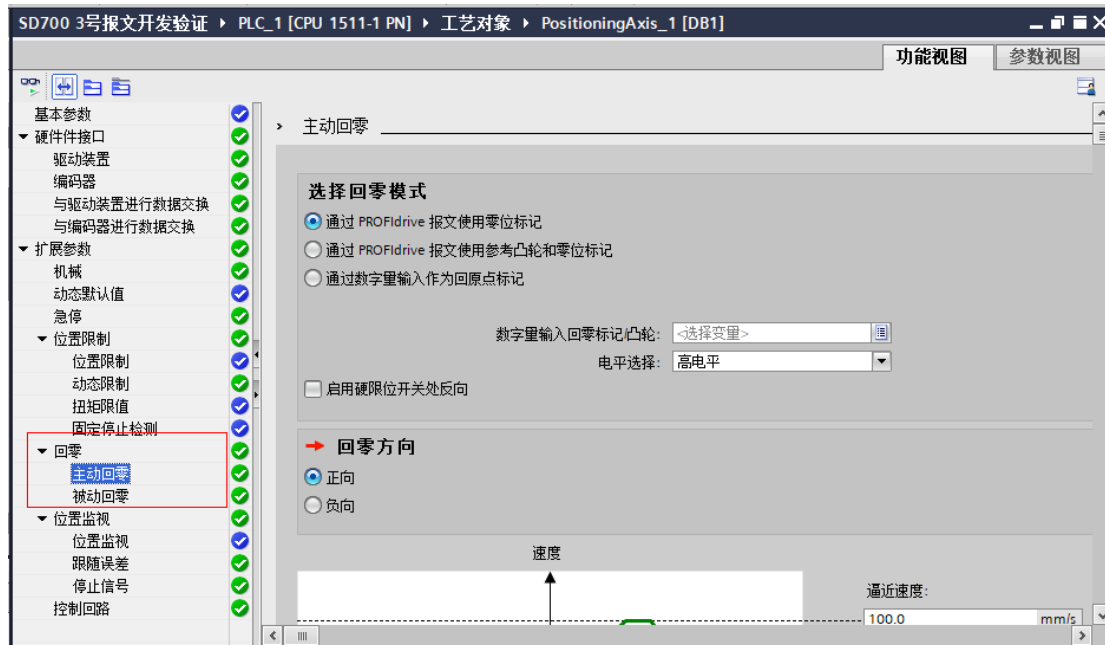


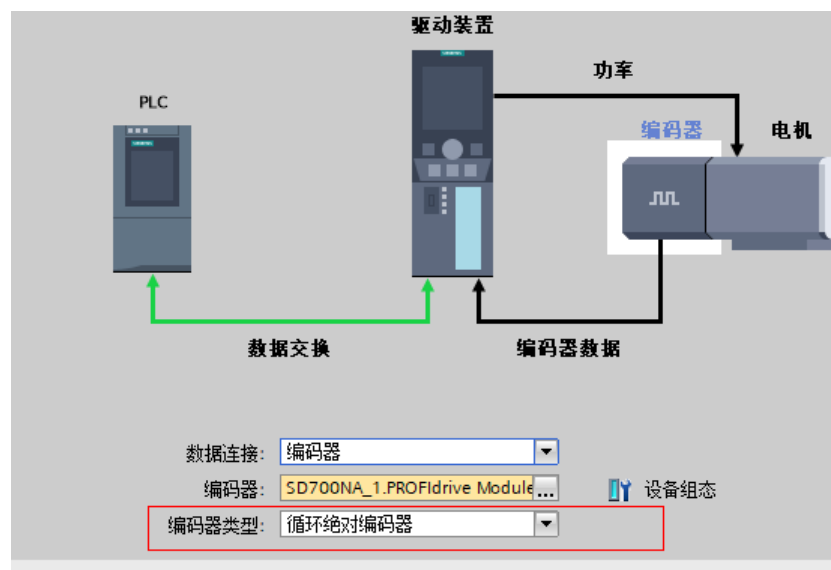
mode=0 , Absolute direct zero return

In the process object configuration, active zero return and passive zero return can be enabled. Call "MC_HOME" in the program to achieve the corresponding function. As shown in the figure below. The explanation of the zero return module MC_HOME can be found in the help bar inside the Botu software.

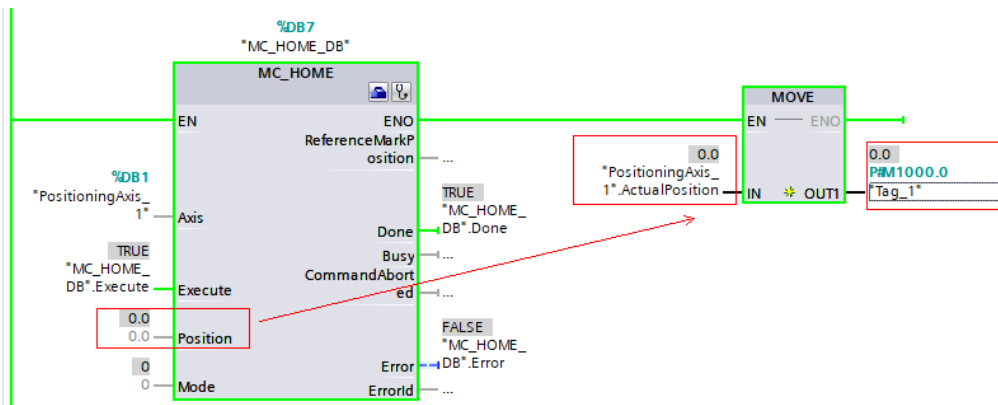


Mode=0, trigger back to zero, the motor does not run, just update the current position of the axis, Update the value of "position" directly to the current position. Here is the test description.

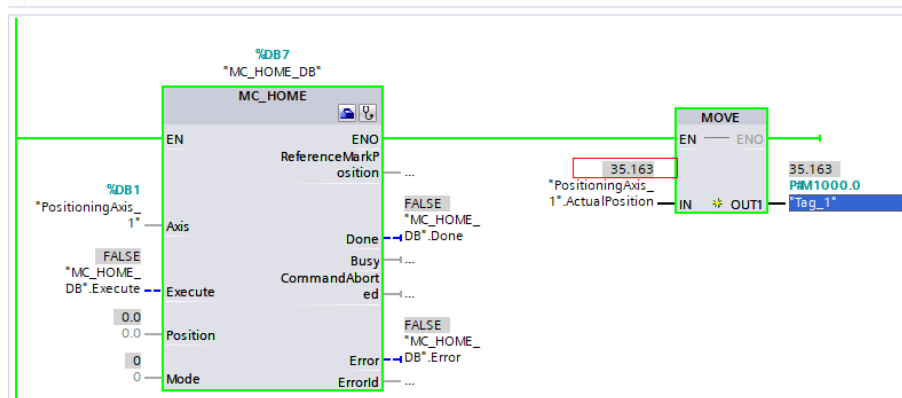
Setting description: Configure the cyclic absolute encoder as follows; Pn040 is set to 1



When the function block "MC_POWER" is enabled, the mode of "MC_HOME" is assigned to 0. Execute of MC_HOME is set high, rising edge triggers back to zero, and the actual position value is read.



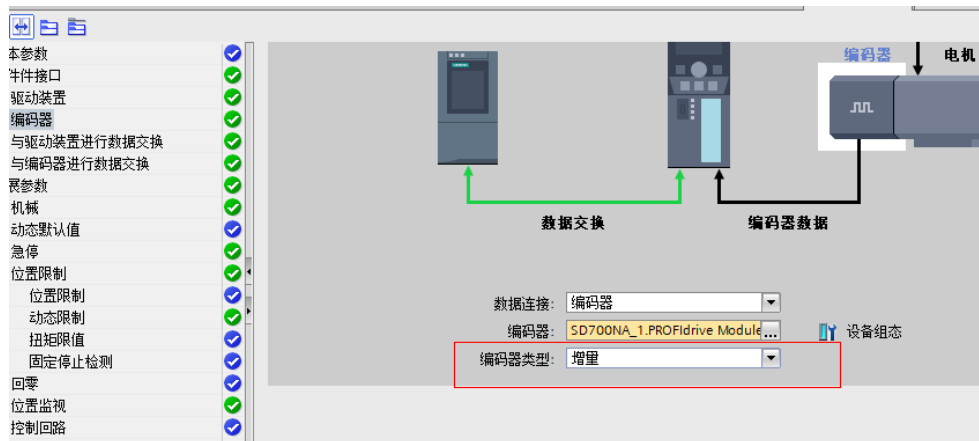
After re-powering the PLC, the position read is as follows



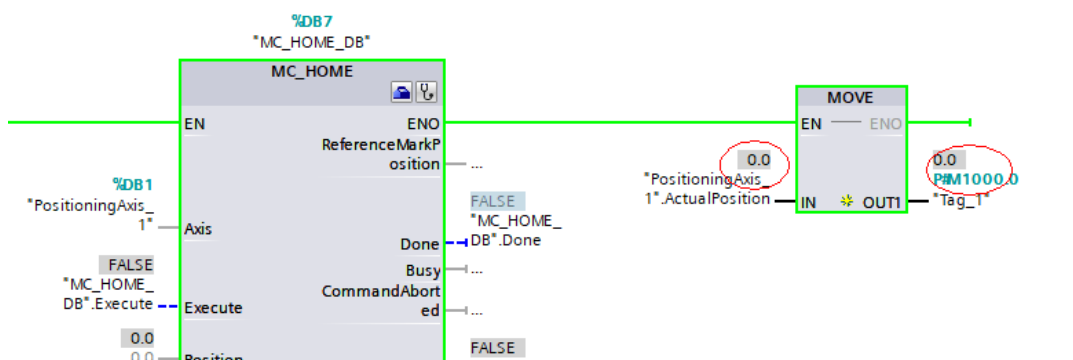
As you can see, the actual position value is not 0 anymore. At this time, the multi-turn value and single-turn value are read from the SD700 host computer , As shown in the figure below, you can get the position displayed on the PLC as (multi-turn*8388608+single-turn)/60.

<input type="checkbox"/>	Un009	位置编码器左里	0.000000
<input checked="" type="checkbox"/>	Un010	绝对值编码器单圈值	4916253 编码
<input checked="" type="checkbox"/>	Un011	绝对值编码器多圈值	0 编码

The following configuration is an incremental encoder, as shown in the figure below :

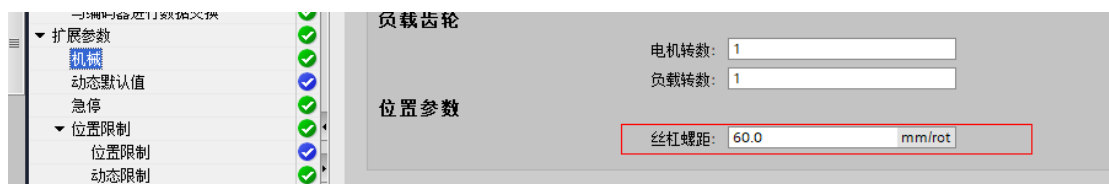


It can be measured that every time the PLC is re-powered, the position is 0



It is clear from the above that :

After the zero return activation, the PLC gets the position value as "position" value. The PLC is re-powered and the position before the power failure is not stored. The position value obtained after re-powering is different, when the configuration is incremental encoder, the position obtained by PLC is 0. When the configuration is absolute encoder, the position value acquired by PLC is $(\text{multi-turn value} \times 8388608 + \text{single-turn}) / 60$. The 60 here is the 60mm/rot written in the configuration. As shown below.

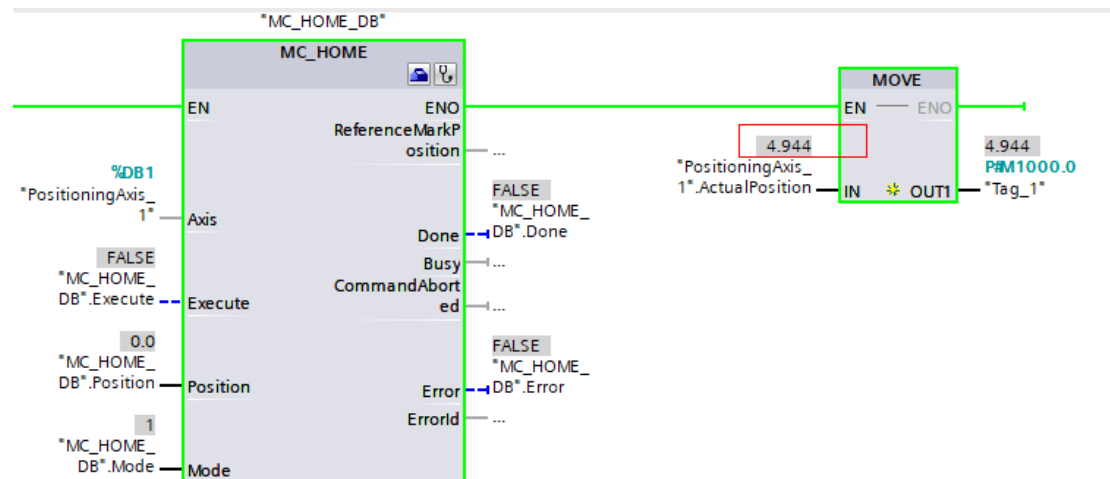


mode=1 , Relative direct zero return

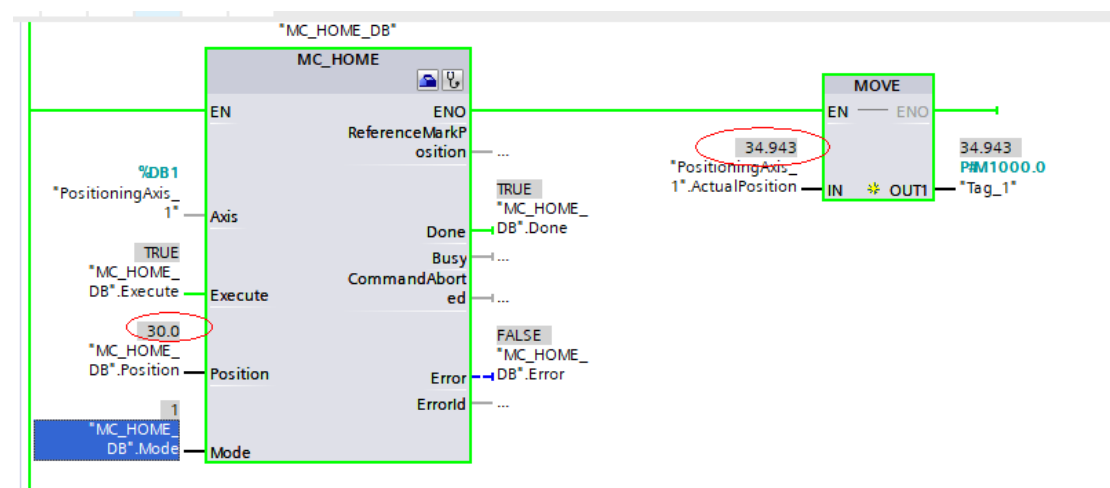
mode=1 , Trigger MC_HOME, the motor does not run, it just updates the current position of the axis. Unlike mode=0, the position is returned to zero by adding the value of "position" to the original one.

The following configuration is an incremental encoder that turns the motor to any

position, such as 4.944mm.



Then set Position to 30mm and trigger back to zero, as follows :



Based on the above, it can be seen that :

mode=1 is similar to mode=0, except that the value of Position is added to the original position. PLC re-powering behaves in the same way as mode=0.

mode=2/8/10 , Passive return to zero

In this zero return mode, only "incremental" encoders can be configured during axis configuration, and absolute encoders will be reported as errors. mode=2 or 8, passive zero return means that the current position of the axis is set to the value of "Position" when the axis hits the home switch during operation. If mode=10, then after returning to zero, the position is equal to the parameter position in the software configuration (<TO>.Homing.HomePosition).

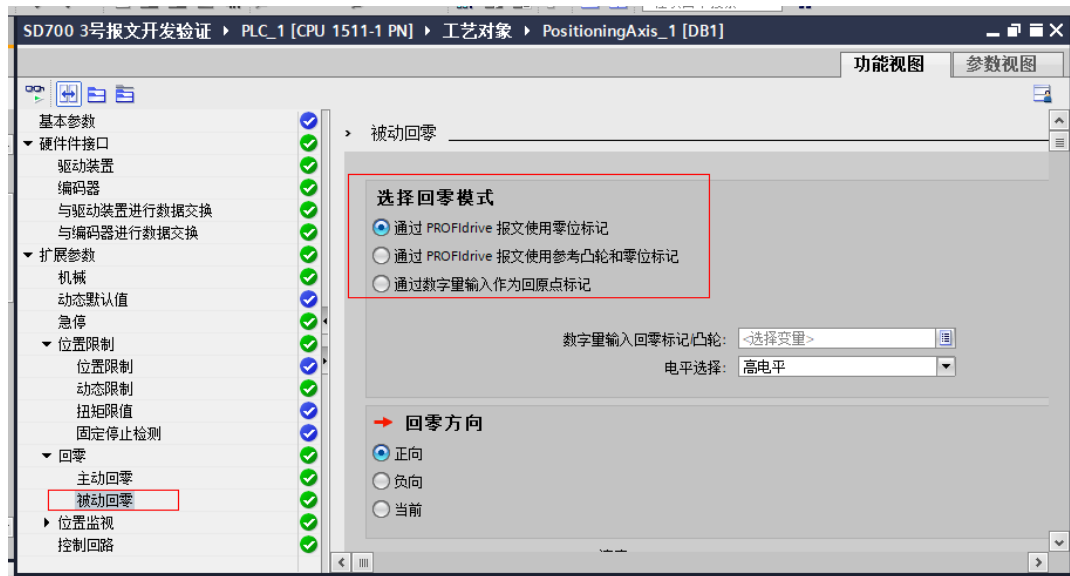
被动回原点

(“Position”参数无任何作用)

检测到回原点标记之后，实际值将被置为在“工艺对象 > 组态 > 扩展参数 > 回原点 > 被动回原点”(Technology object > Configuration > Extended parameters > Homing > Passive homing) 下设定的回原点位置。

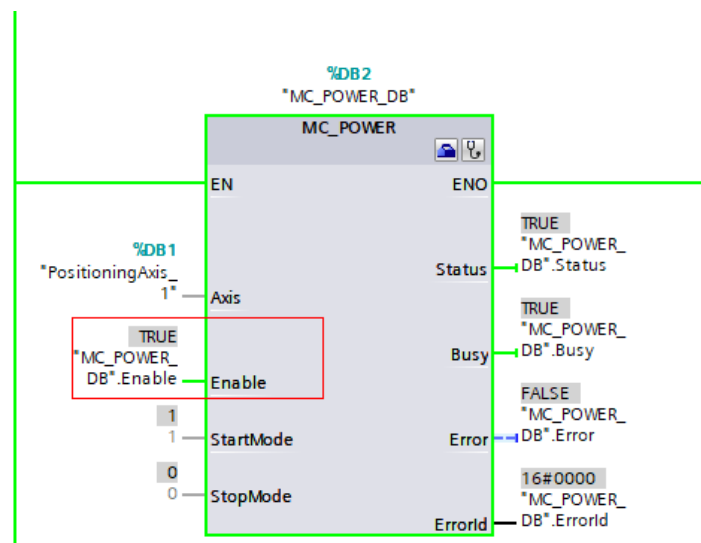
(<TO>.Homing.HomePosition)

The passive zero return motor is not running, it is the other control commands that make the motor run and trigger MC_HOME. Then when the motor touches the home position, the current position will change to the value of "Position". There are three modes of passive zero return, as shown in the following figure:

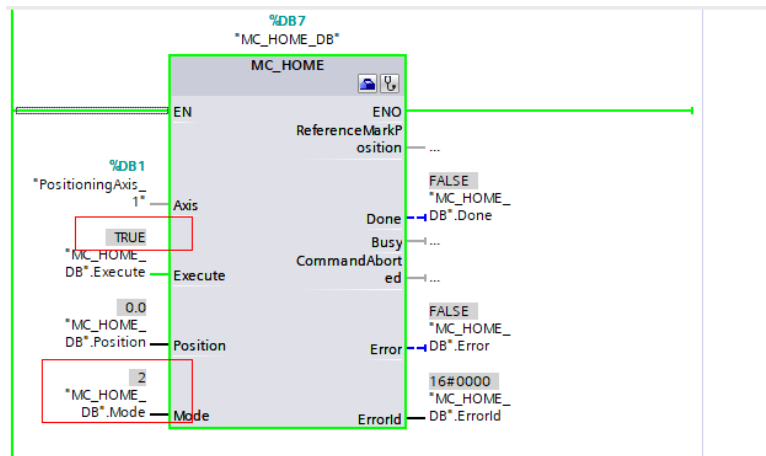


Test the first one as an example "Using zero marker by PROFIdrive Message".

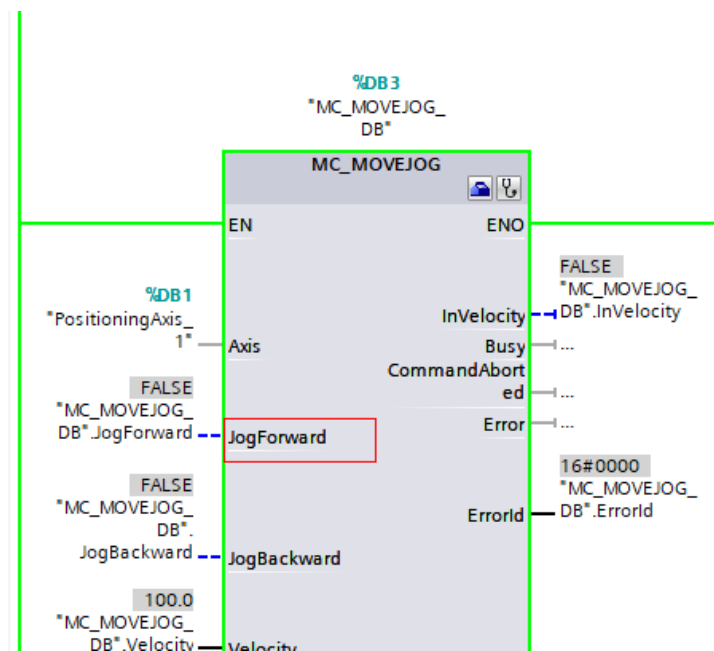
First enable the servo :



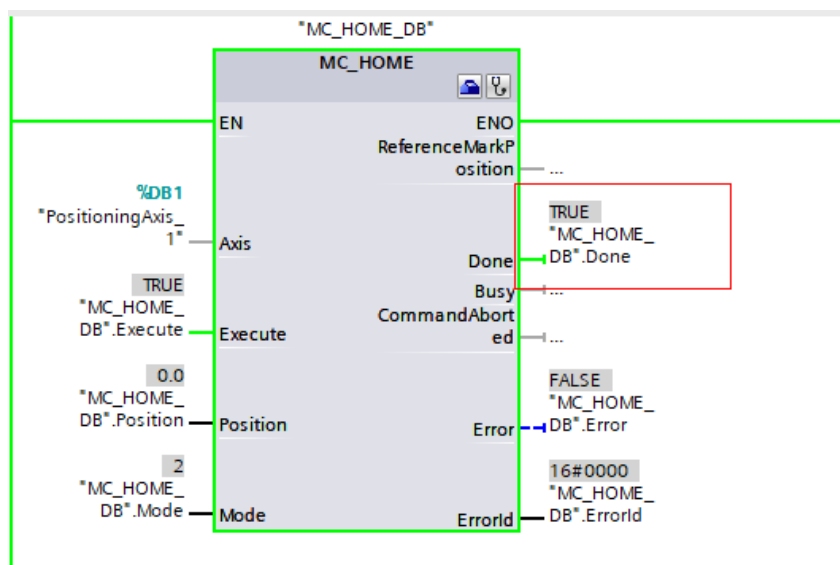
MC_HOME mode selection 2, then trigger.



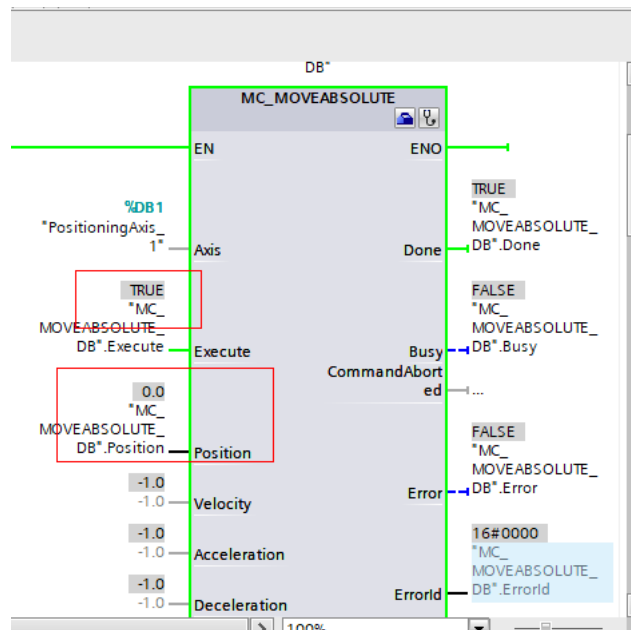
Tap Jog Run :



When the return to zero is complete, stop dropping the Jog.



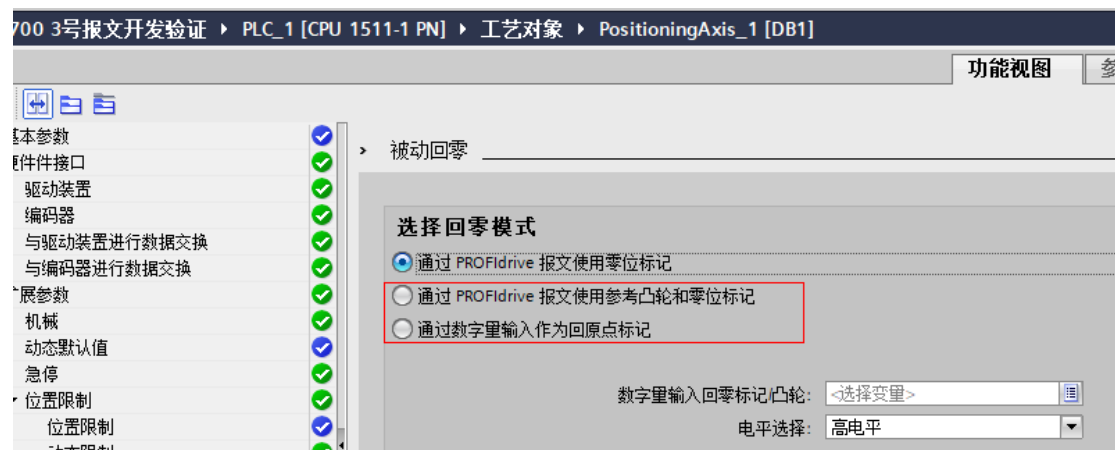
Then go absolute positioning, give position 0, start absolute positioning.



Observe if the motor single-turn value is near 0. If it is near 0, it proves that the return to zero is correct. As follows:

功能码	参数名称	当前值
<input type="checkbox"/>	Un006 输入脉冲计数器	0 指
<input type="checkbox"/>	Un007 反馈脉冲计数器	0 指
<input type="checkbox"/>	Un008 反馈脉冲计数器1	0 指
<input type="checkbox"/>	Un009 位置偏差量	0 指
<input checked="" type="checkbox"/>	Un010 绝对值编码器单圈值	194 圈
<input type="checkbox"/>	Un011 绝对值编码器多圈值	0 圈
<input type="checkbox"/>	Un012 全闭环反馈脉冲计数器	0 外
<input type="checkbox"/>	Un021 电机绝对位置	0 指

The other two ways to return to zero need to connect the IO input on the PLC, not tested for the time being. The principle should be the same, and later it is recommended to purchase the IO module of the PLC to test the other two ways to return to zero.



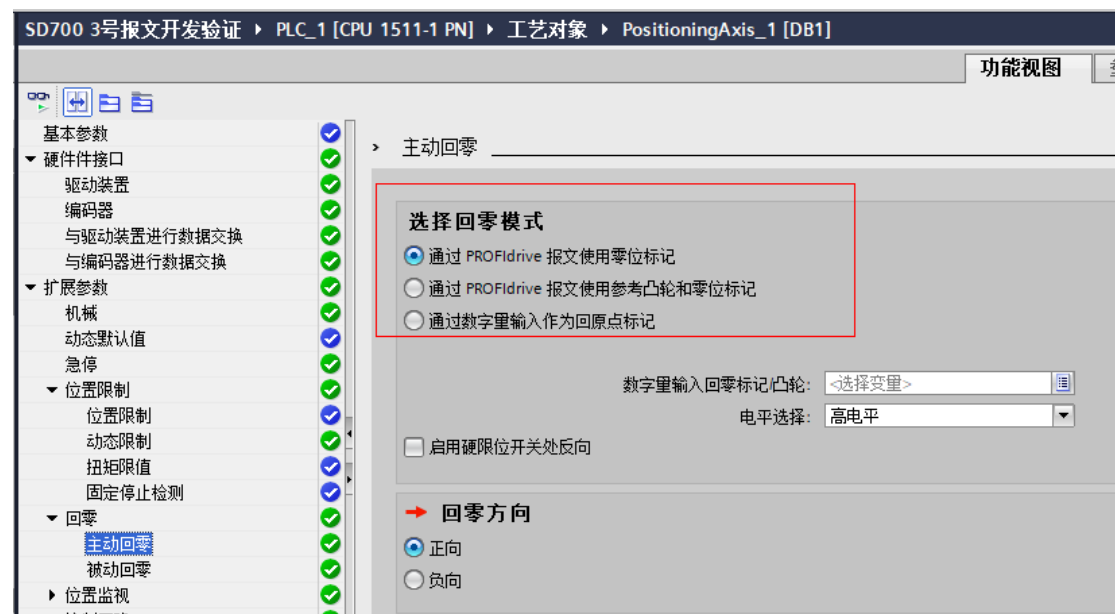
mode=3/5 , Active zero return

Only "incremental" encoders can be selected for active zero return configuration, if "absolute" encoders are configured, an error will be triggered.

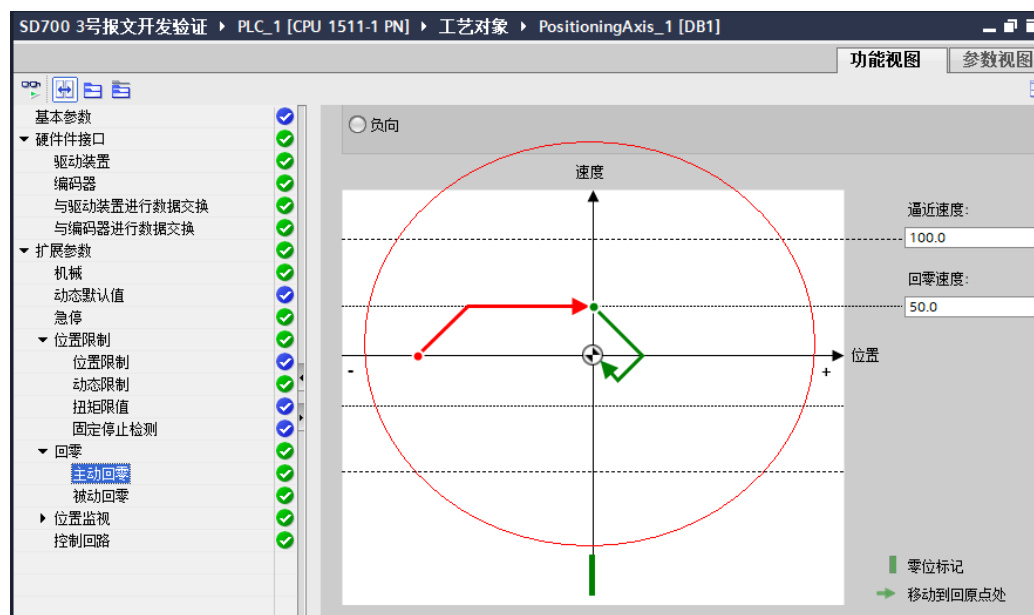
Mode=3 The position after returning to zero is the "Position" - the starting position offset in the configuration.

mode=5 is similar to mode=3, but the position after returning to zero is the home position in the configuration - the start position offset in the software configuration.

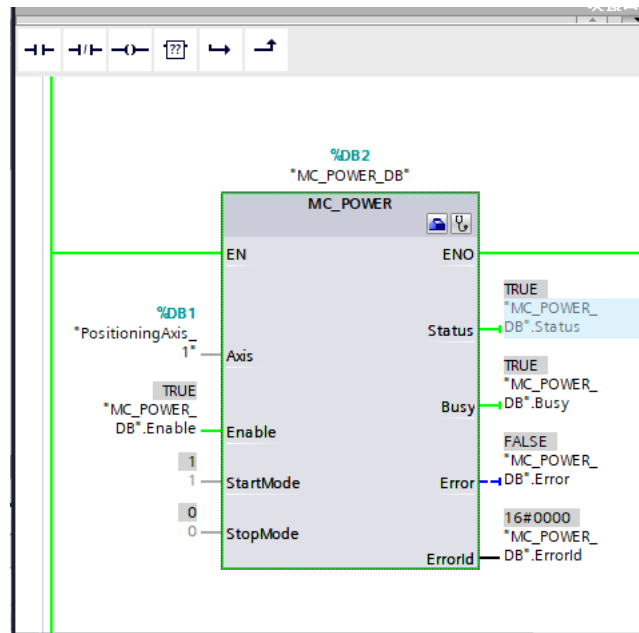
Active zero return is the action that the motor automatically completes to return to zero after triggering MC_home. There are also three modes of active zero return, as follows:



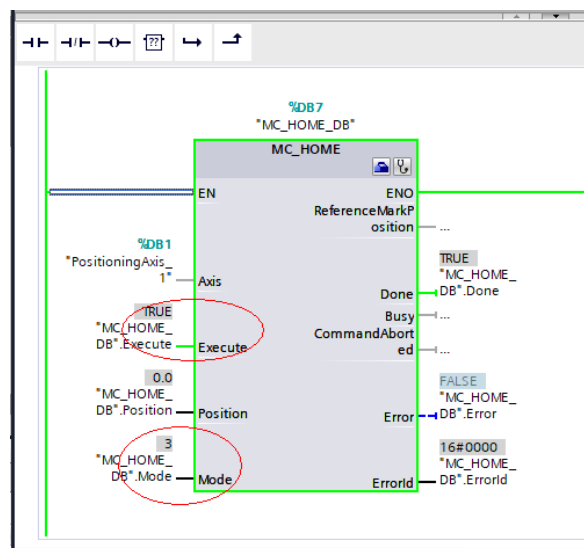
Now test with the first zero return method, the configuration of the zero return method shown below



First enable the servo :



Zero return mode is selected as 3 to trigger zero return.



Observe the motor running to near Z position and stop. Observe the single-turn position, whether it is near 0. If it is near, it means the zero return is correct.

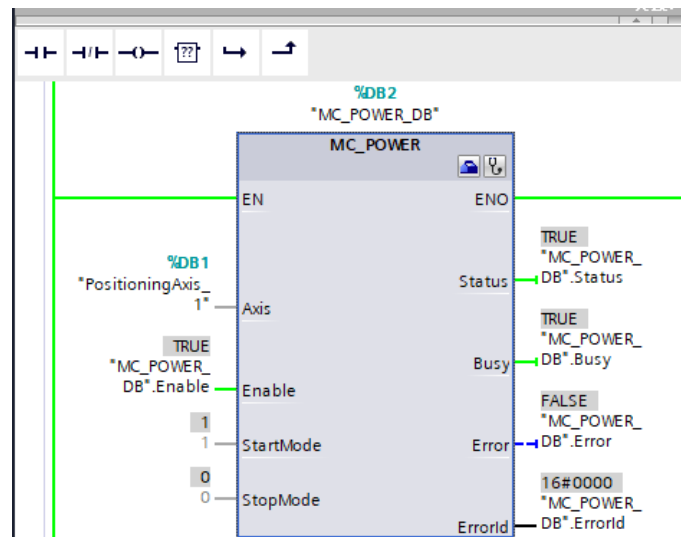
实时监控			
导出			
监控参数1	监控参数2	监控参数3	监控参数4
功能码	参数名称	当前值	
<input type="checkbox"/> Un006	输入脉冲计数器	0	指
<input type="checkbox"/> Un007	反馈脉冲计数器	0	指
<input type="checkbox"/> Un008	反馈脉冲计数器1	0	指
<input type="checkbox"/> Un009	位置偏差量	0	指
<input checked="" type="checkbox"/> Un010	绝对值编码器单圈值	16	圈
<input type="checkbox"/> Un011	绝对值编码器多圈值	0	圈
<input type="checkbox"/> Un012	全闭环反馈脉冲计数器	0	外
<input type="checkbox"/> Un021	电机绝对位置	0	指
<input type="checkbox"/> Un00A	累计负载率	0	%

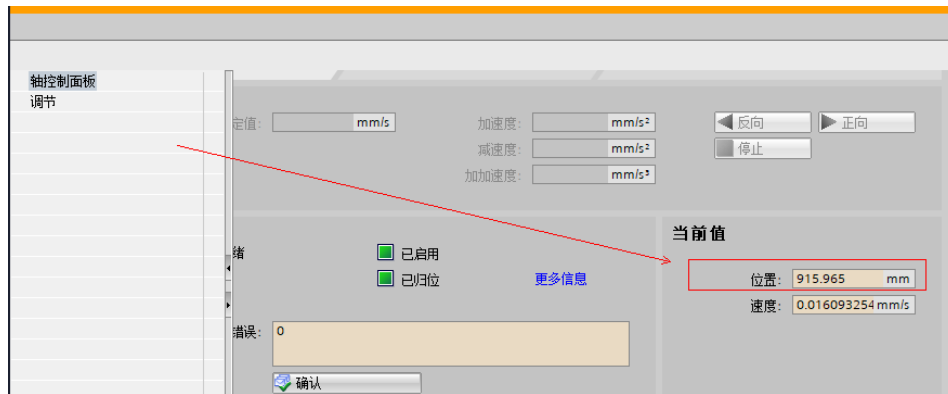
The other two ways to return to zero can be tested and verified after purchasing the IO module of PLC.

mode=6 , Absolute encoder adjustment (relative)

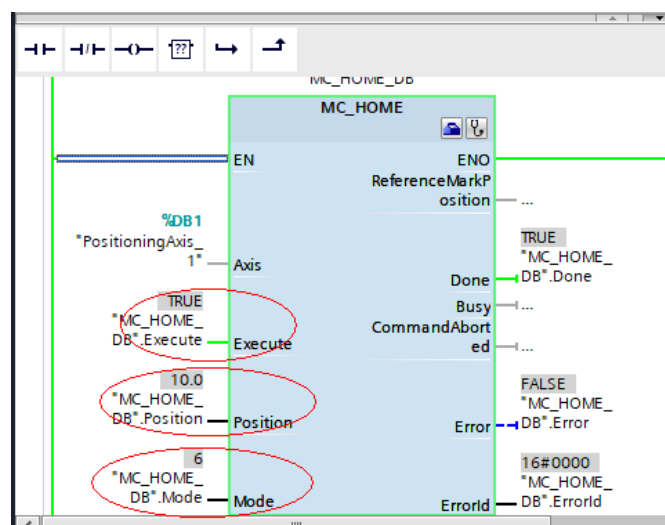
When using this return mode, only "absolute" encoders can be selected during configuration. If the configuration is for an "incremental" encoder, an error will be reported. After triggering the zero return with mode 6, the axis position = current position + the parameter value of "Position", and the axis position value remains unchanged when the PLC is powered off again.

First enable the servo and read the current position value as follows :





Then change the zero return mode to 6, and give a value such as 10mm to Position to trigger the zero return.



Observing the position value, you can see that it adds 10mm to the original.



When the PLC is re-powered and the current position value is observed, you can see that the position value is retained and is the same as before the power failure.

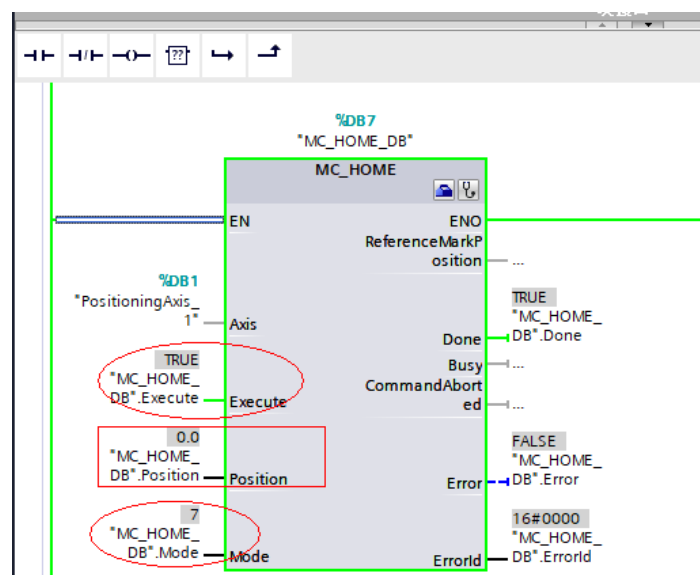


mode=7 , Absolute encoder adjustment (absolute)

For this type of zero return, only the "absolute" encoder type can be selected for axis configuration. If an incremental encoder is selected, an error will be reported when the zero return is triggered.

After mode 7 triggering back to zero, the axis position = "Position" parameter value.

First enable the servo, then select the zero return mode as 7 to trigger the zero return.



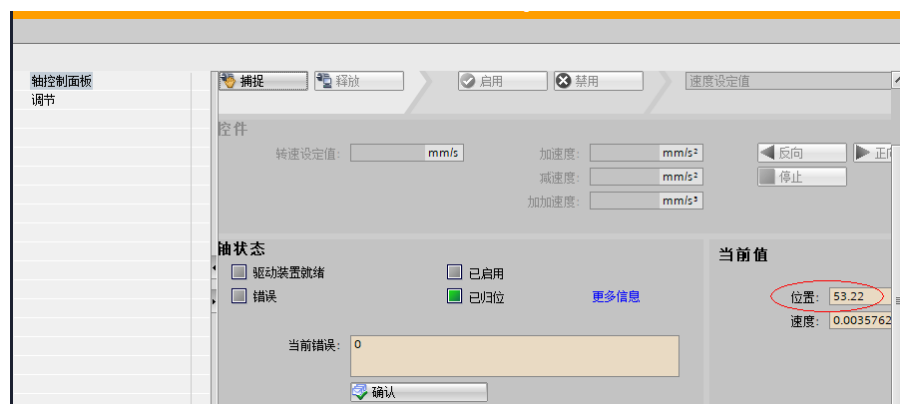
The current position of the observation axis changes to 0.



Re-powering the PLC, the axis position remains the same



Let the motor go forward some distance.



Re-energized and found its position unchanged.

