

**SINAMICS\_S120**

# **SINAMICS drive Commissioning Workshop**

- **‘Closed loop’ Bode Analysis**
- **Current Controller Tuning**
- **Speed Controller Tuning**
- **Position Controller Tuning**

Engineering-Software SIMOTION SCOUT



## SINAMICS\_S120

**Set the Speed controller gain to 0.1(P1460) and int. time to 100msec (P1462). Now select measuring Function 1 from the drop Down Choice**

Start with the **first** Measuring function from the drop down list. This function is used to locate the frequency of the Current set point bandwidth filter.

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The axis will travel in the positive direction with readings started after the offset. **Reduce the travel with a lower Measuring periods.**

Measuring function set up SINAMICS\_S120

Measuring function | Measurements | Time diagram | FFT diagram | Bode diagram

Measuring function: Speed controller setpoint frequency response (after speed setpoint filter)

Drive: SERVO\_02

Settling periods: 1

Amplitude: 2.00 rpm

Offset: 4.00 rpm

Ramp-up time: 0.000 ms

Measuring time: 5117.500 ms

Measuring periods: 20

Bandwidth: 4000.00000 Hz  Values in %

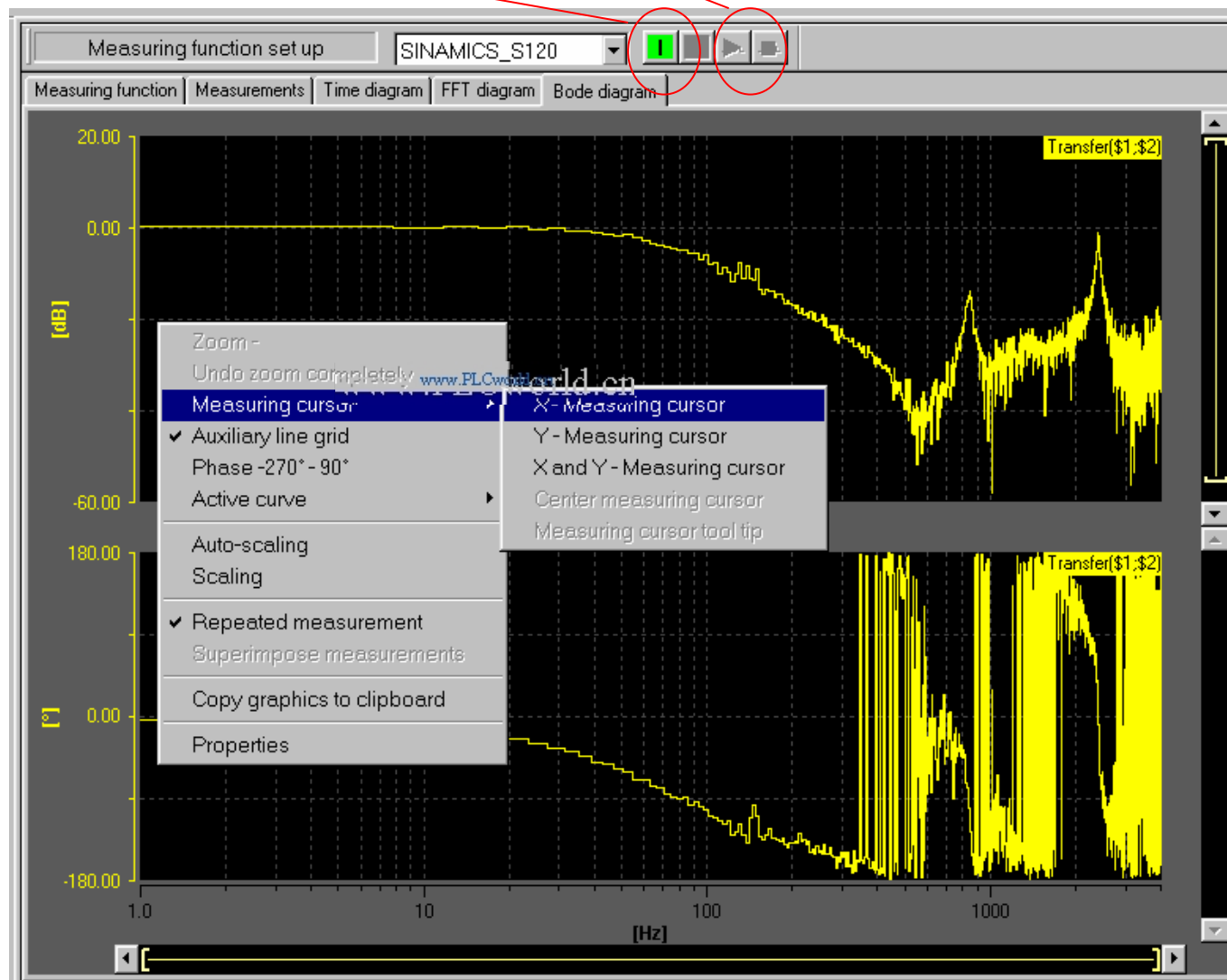
Reset

No.	Active	Signal	Comment	Color
1	<input checked="" type="checkbox"/>	SERVO_02.r62	SERVO_02.r62: Speed setpoint after the filter	Orange
2	<input checked="" type="checkbox"/>	SERVO_02.r61	SERVO_02.r61: Speed actual value motor encoder	Yellow
3	<input checked="" type="checkbox"/>	SERVO_02.r33	SERVO_02.r33: Torque utilization, smoothed	Green
4	<input type="checkbox"/>			Blue

Trace SERVO\_02

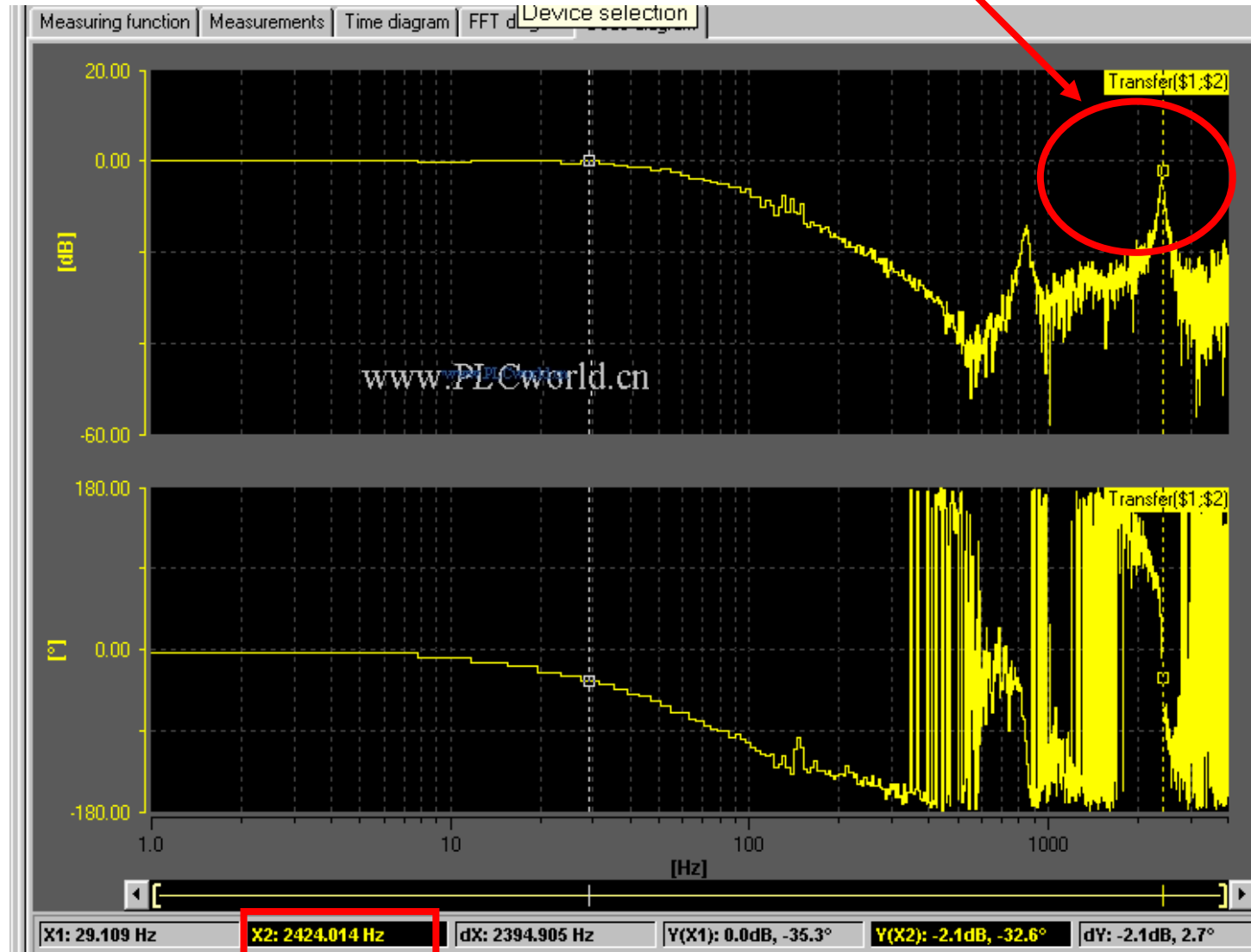
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Start the axis and then Run Trace and use X Cursor to find Frequency of 1st Pole



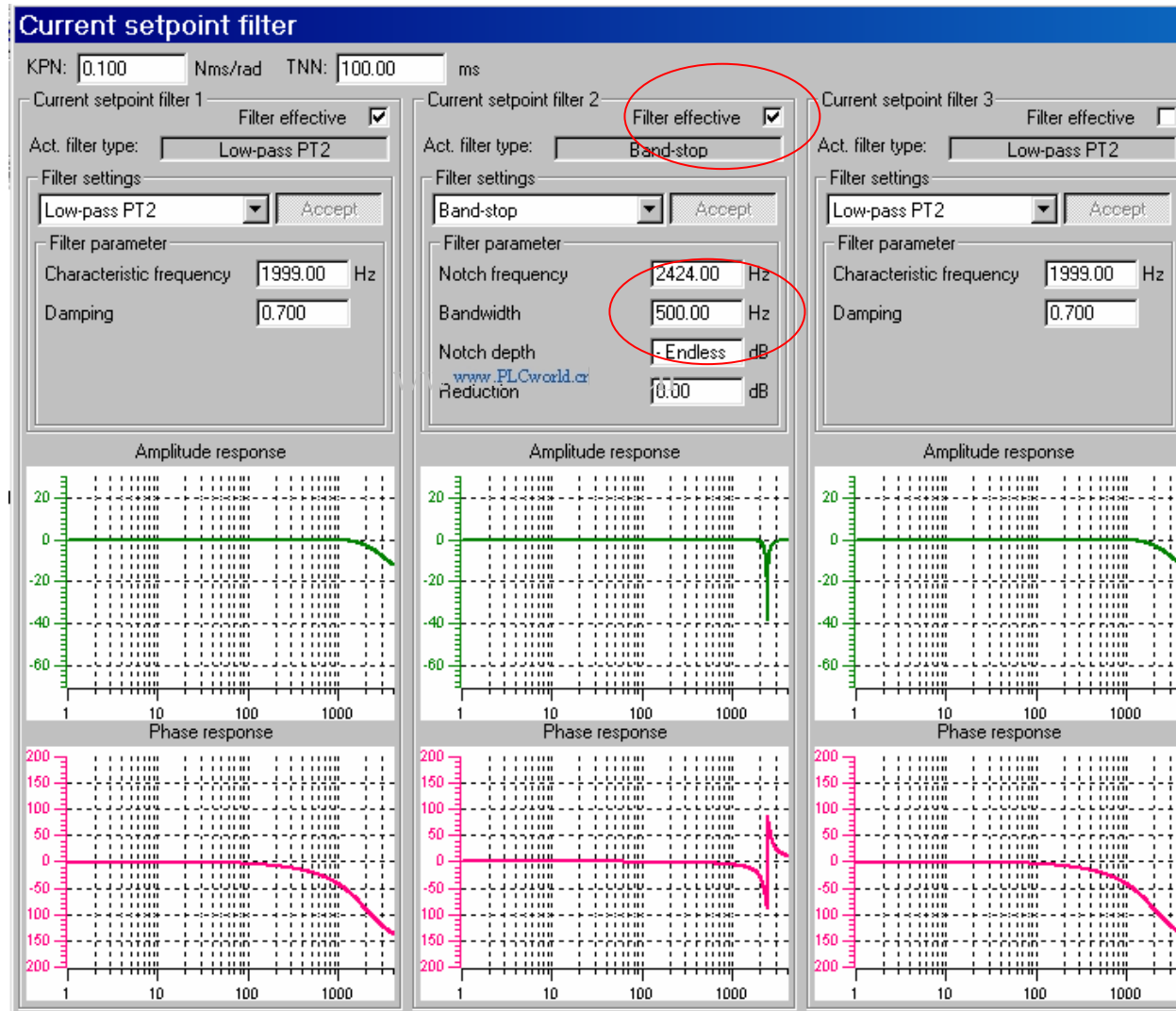
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Record Frequency for use in next section



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Open Current Setpoint Filter and use Previous value for Notch Frequency.



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## Use this Measuring Function Choice for Next Step

Select the **last** Measuring function from the drop down list. This function is used to optimize the Current Controller P Gain (p1715) and reset (p1717) parameters.

Measuring function set up | SINAMICS\_S120

Measuring function: **Current controller setpoint jump (after current setpoint filter)**

Drive: SERVO\_02

Settling time: 0.000 ms

Amplitude: 2.000 %

Offset: 0.000 %

Ramp-up time: 0.000 ms

Measuring time: 10.000 ms

Max. measuring time: 1023.875 ms

Values in %

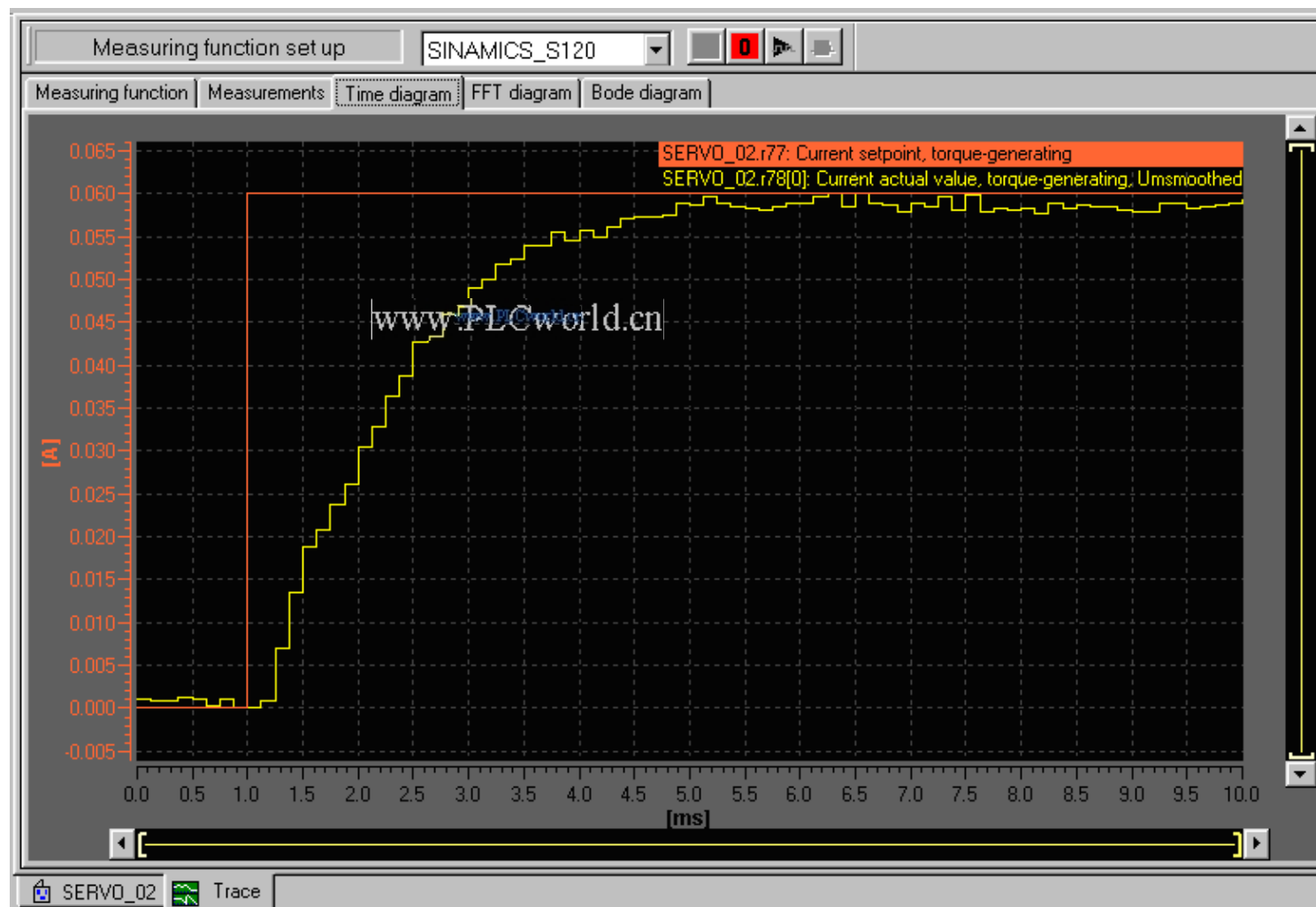
Reset

No.	Active	Signal	Comment	Color
1	<input checked="" type="checkbox"/>	SERVO_02.r77	SERVO_02.r77: Current setpoint, torque-generating	Orange
2	<input checked="" type="checkbox"/>	SERVO_02.r78[0]	SERVO_02.r78[0]: Current actual value, torque-generating, U	Yellow
3	<input type="checkbox"/>	...		Green
4	<input type="checkbox"/>	...		Blue

SERVO\_02 Trace

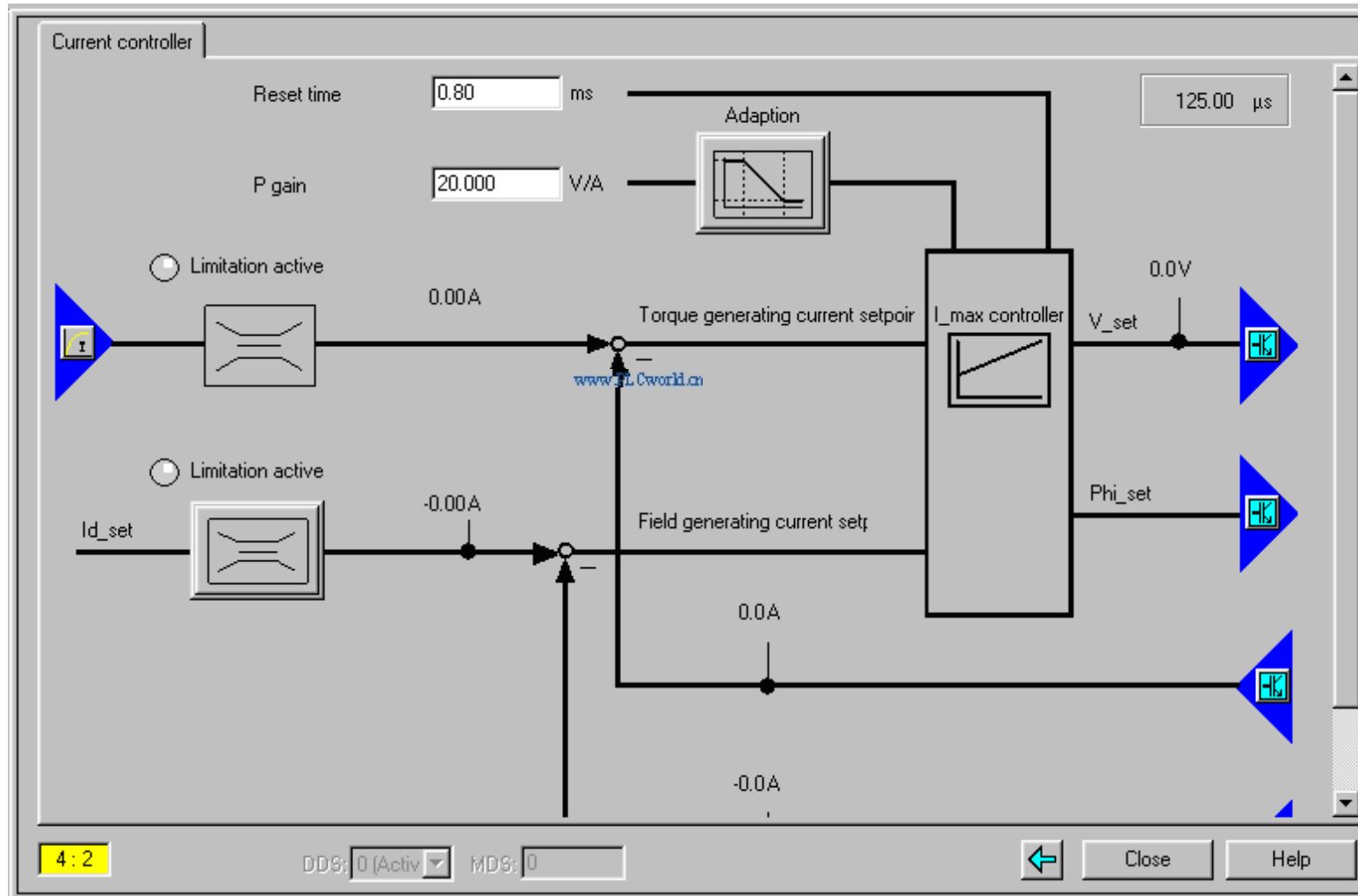
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Start the axis and Measuring function again . Now adjust the Current controller gain and Int. times to achieve the desired response  
P1715 = gain P1717 = int. time.



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Note the default value for the gain and integration time



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