GHD Global Help Desk

ATV32: Torque threshold detection with ATVLogic

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Schneider Electric

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Pictograms

Quoted as example.

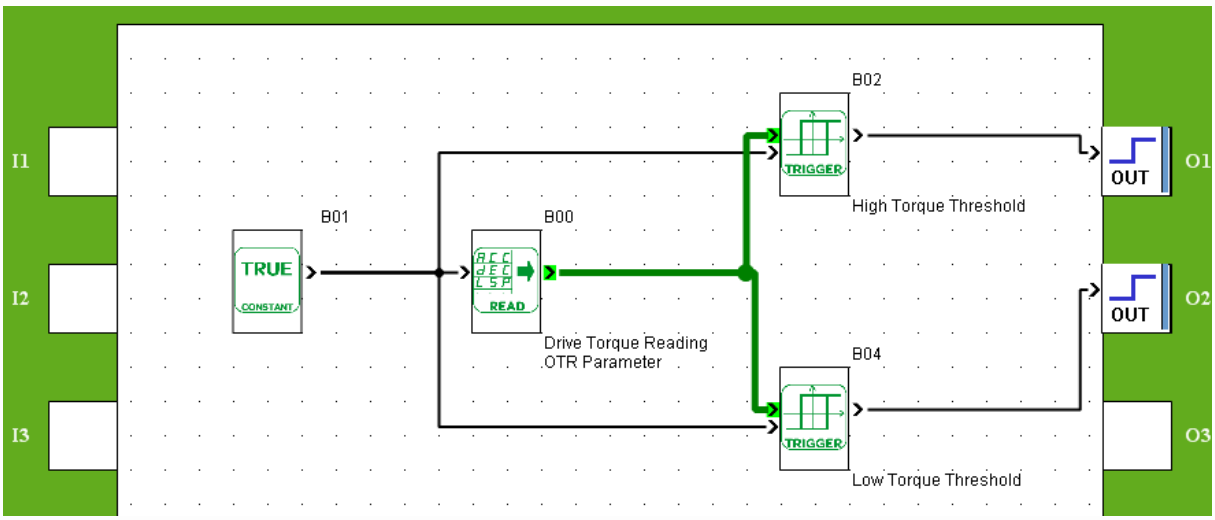
1. ATVLogic program

This program defines high and low torque threshold.

The value of drive OTR parameter is read.

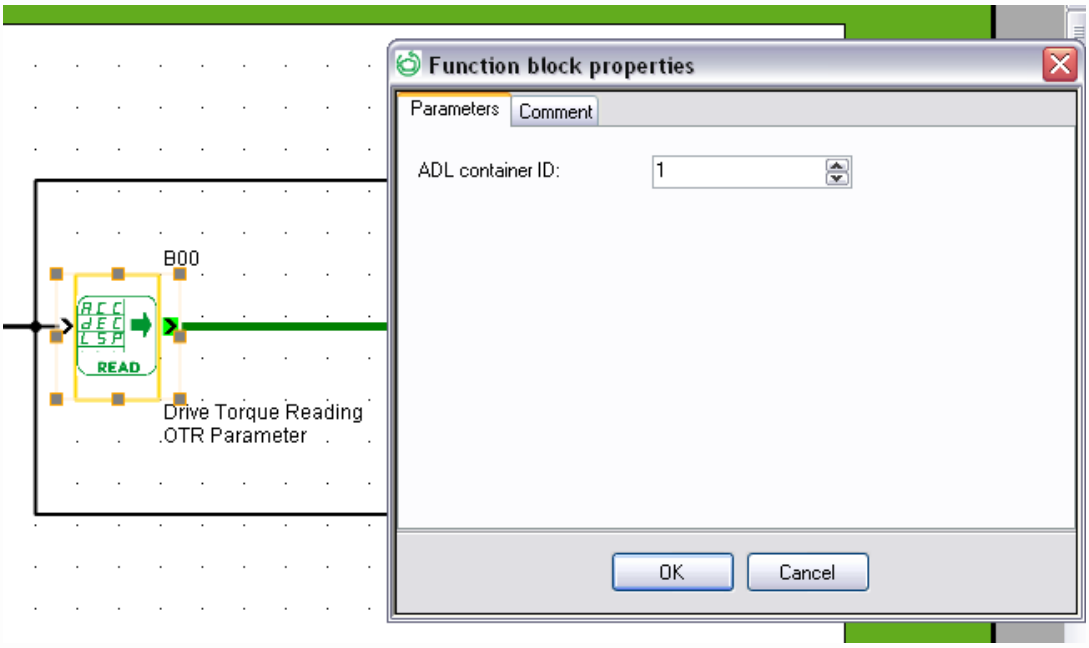
A High threshold is defined and activates or not the drive R1 Relay.

A Low threshold is defined and activates or not the drive R2 Relay.



2. Drive Torque Reading

The Read block will read the drive torque value.

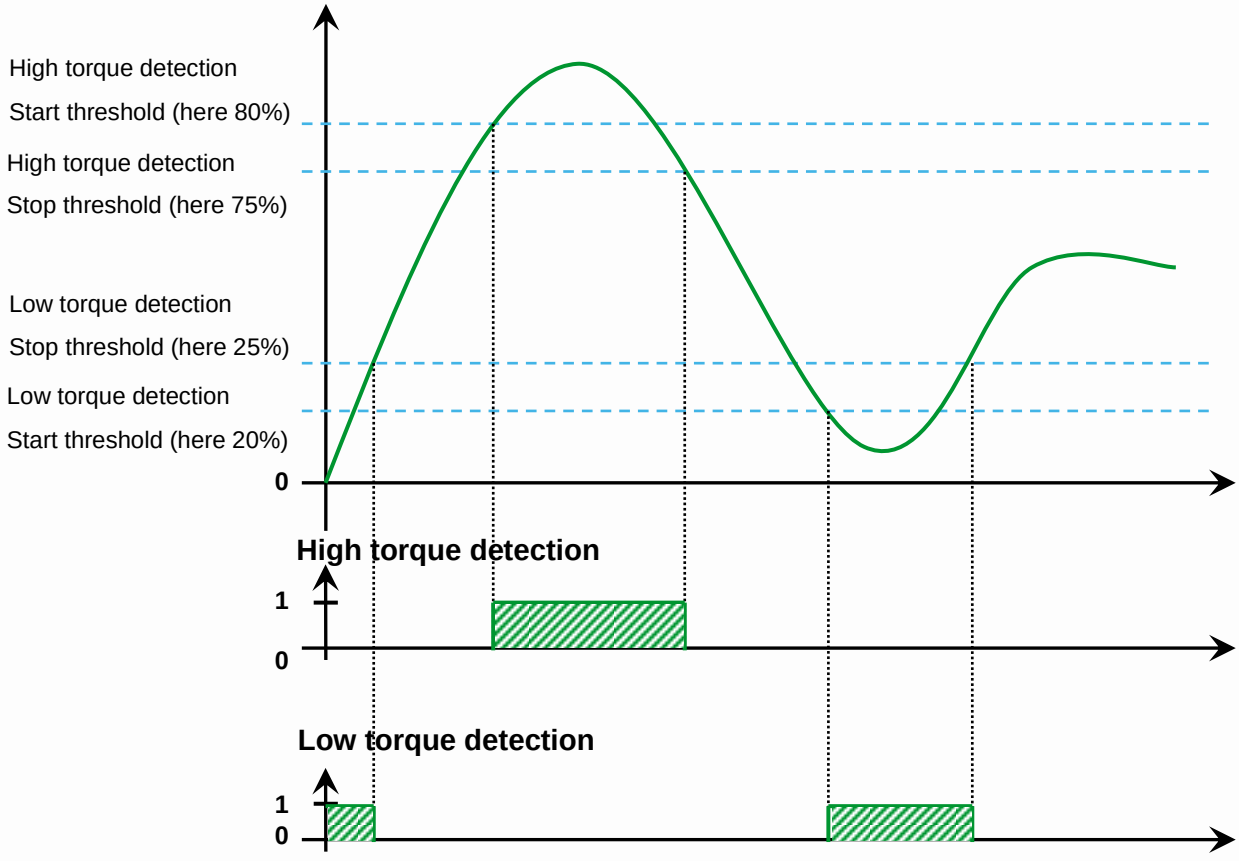


The Read block is configured to read the value of ADL container 1.

And in ADL container 1 we configure the OTR parameter (Address 3205)

3. Threshold configuration in motor mode (when the torque thresholds are positive)

3.1. Functional Principle



3.2. High torque

This block will define the high torque threshold.

The start threshold corresponds to the threshold where the output of Trigger will be active.

The stop threshold corresponds to the threshold where the output of Trigger will be inactive.

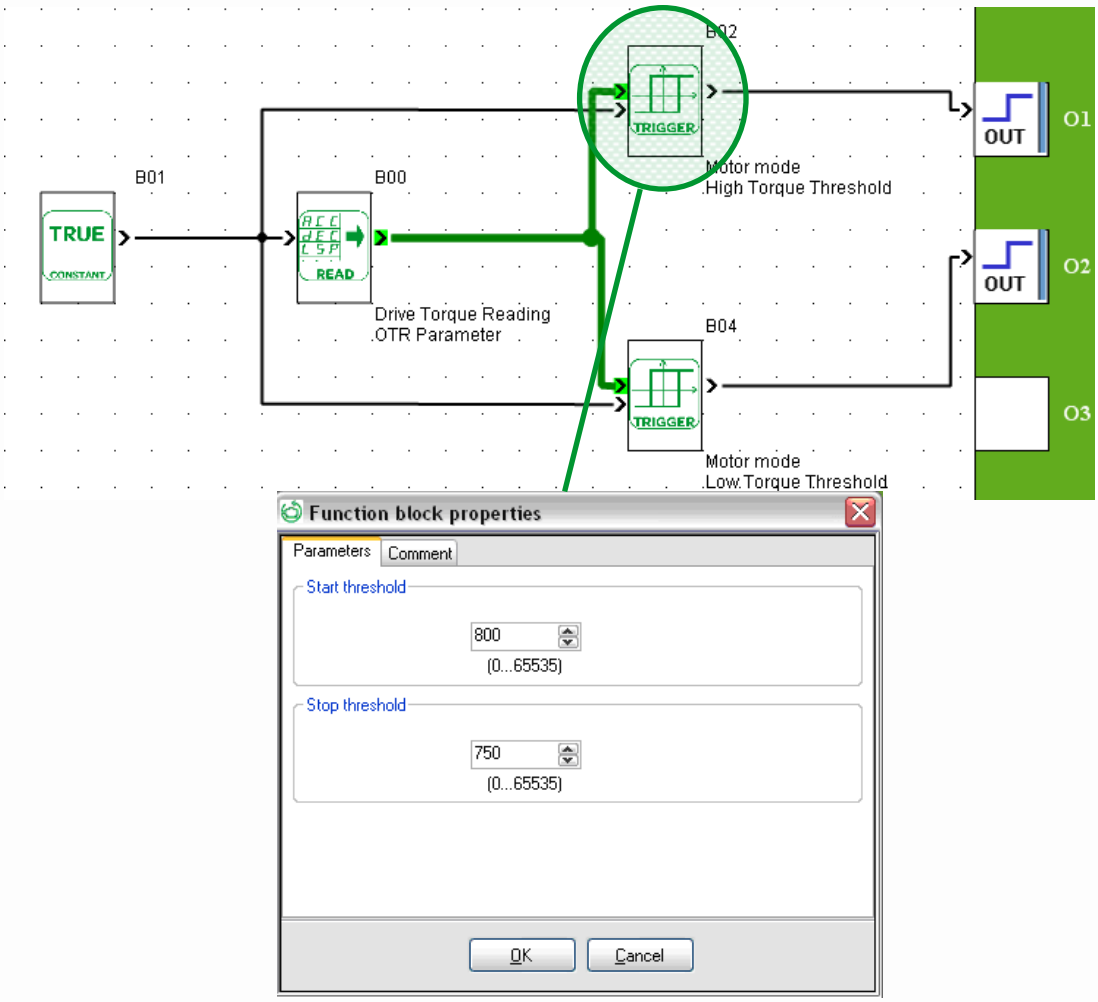
So when the torque will be higher than “Start threshold” the Trigger output will be active. And when the torque will be lower than “Stop threshold” the Trigger output will be inactive.

In this example we set:

Start threshold = 800 → 80%

Stop threshold = 750 → 75%

Configuration of High torque in the ATVLogic program



3.3. Low torque

This block will define the Low torque threshold.

The start threshold corresponds to the threshold where the output of Trigger will be active.

The stop threshold corresponds to the threshold where the output of Trigger will be inactive.

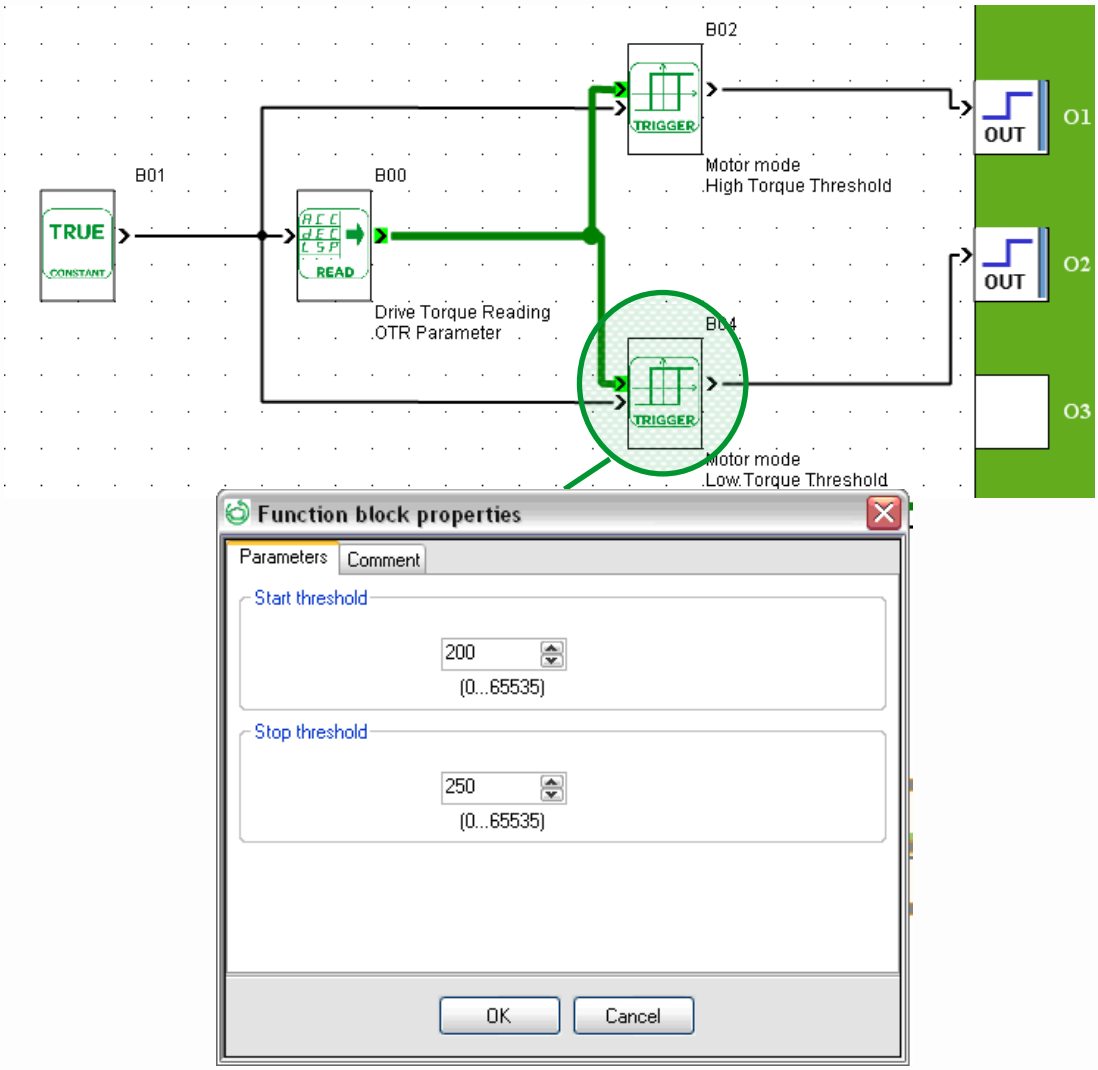
So when the torque will be lower than “Start threshold” the Trigger output will be active. And when the torque will be higher than “Stop threshold” the Trigger output will be inactive.

In this example we set:

Start threshold = 200 → 20%

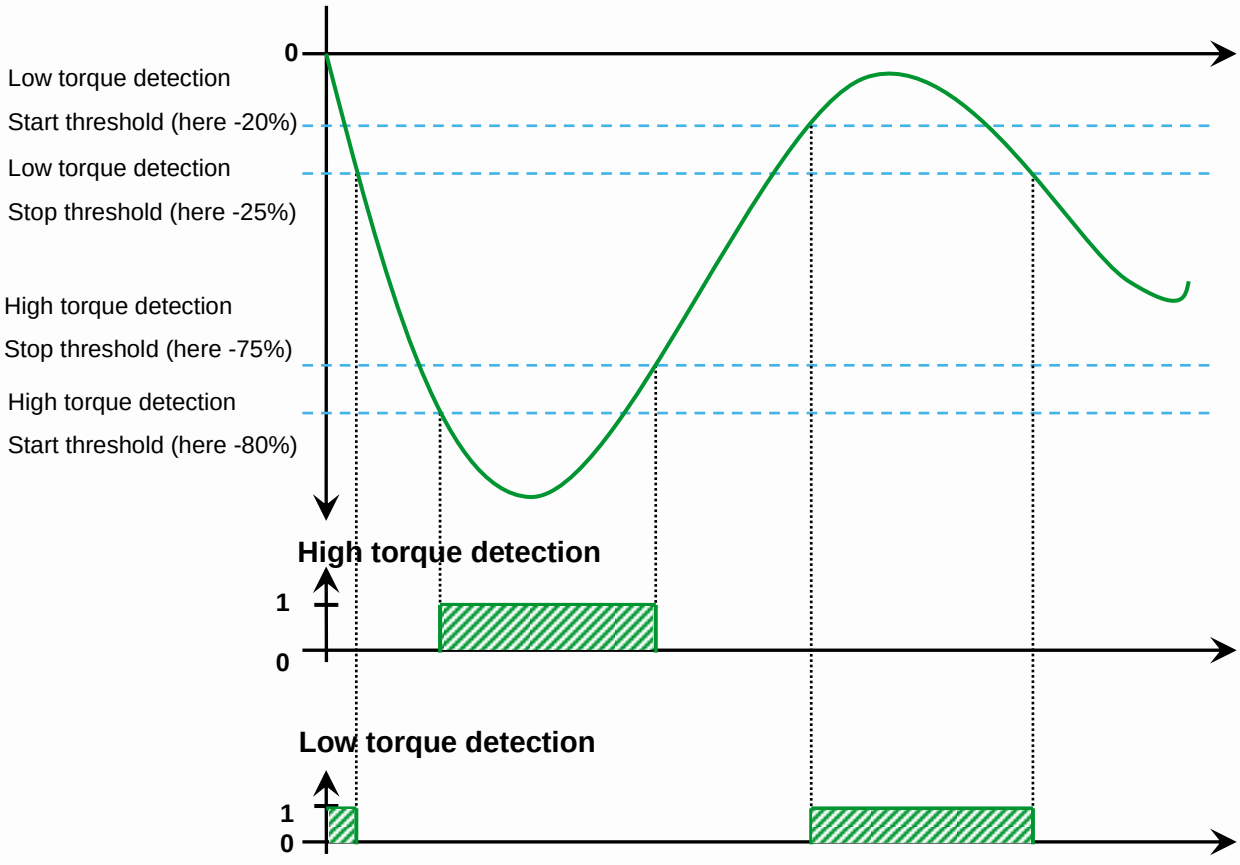
Stop threshold = 250 → 25%

Configuration of Low torque in the ATVLogic program



4. Threshold configuration in generator mode (when the torque thresholds are negative)

4.1. Functional Principle



4.2. Conversion of negative threshold

The difference with the motor mode is in the threshold definition. You have to calculate manually the “Two's complement”

Two's complement numbers are a way to encode negative numbers into ordinary binary.

To find the threshold you can calculate $2^{16}-|x|$ where |x| correspond to the absolute value of threshold.

For example you want a threshold at -80% → in the drive OTR is in 0,1% so it's mean -800.

$2^{16} - |800| = 64736$

4.3. High torque

This block will define the high torque threshold.

The start threshold corresponds to the threshold where the output of Trigger will be active.

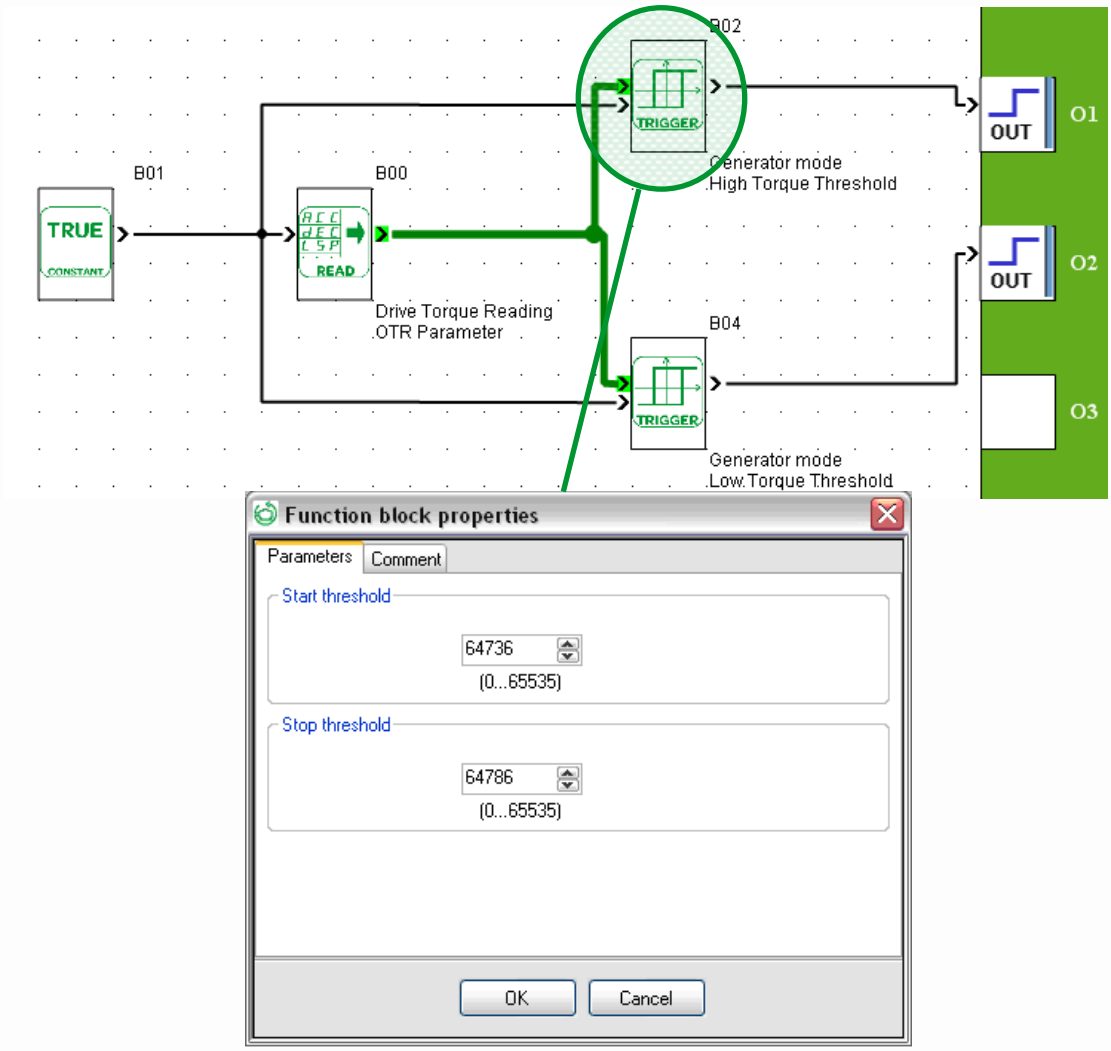
The stop threshold corresponds to the threshold where the output of Trigger will be inactive.

So when the torque will be higher (in absolute value) than "Start threshold" the Trigger output will be active. And when the torque will be lower (in absolute value) than "Stop threshold" the Trigger output will be inactive

In this example we set:

Start threshold = 65536 – 800 = 64736 → -80%

Stop threshold = 65536 – 750 = 64786 → -75%



4.4. Low torque

This block will define the Low torque threshold.

The start threshold corresponds to the threshold where the output of Trigger will be active.

The stop threshold corresponds to the threshold where the output of Trigger will be inactive.

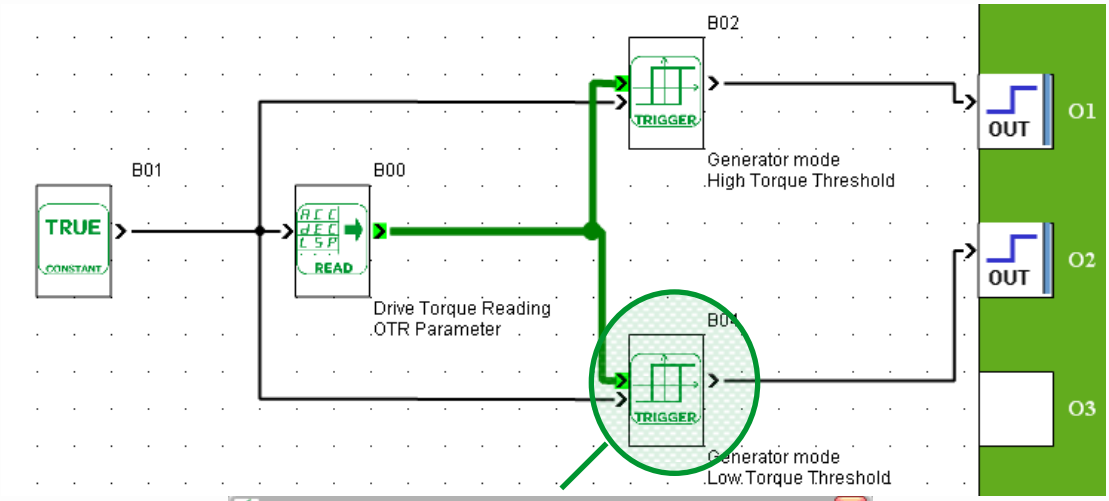
So when the torque will be lower (in absolute value) than “Start threshold” the Trigger output will be active. And when the torque will be higher (in absolute value) than “Stop threshold” the Trigger output will be inactive.

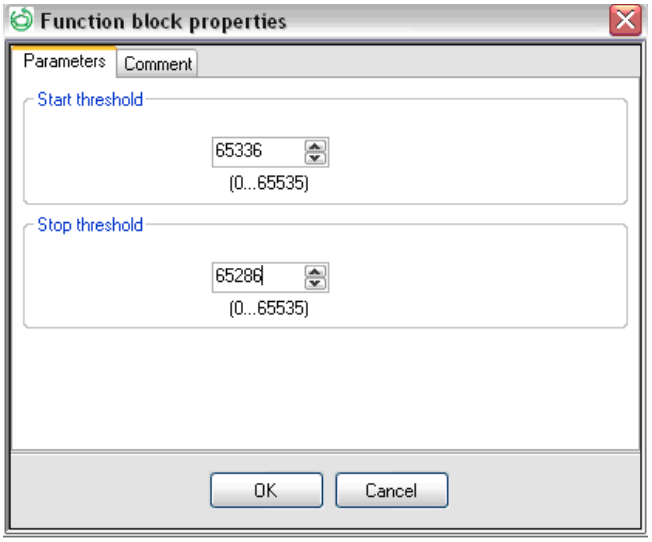
In this example we set:

Start threshold = 65536 – 200 = 65336 → -20%

Stop threshold = 65536 – 250 = 65286 → -25%

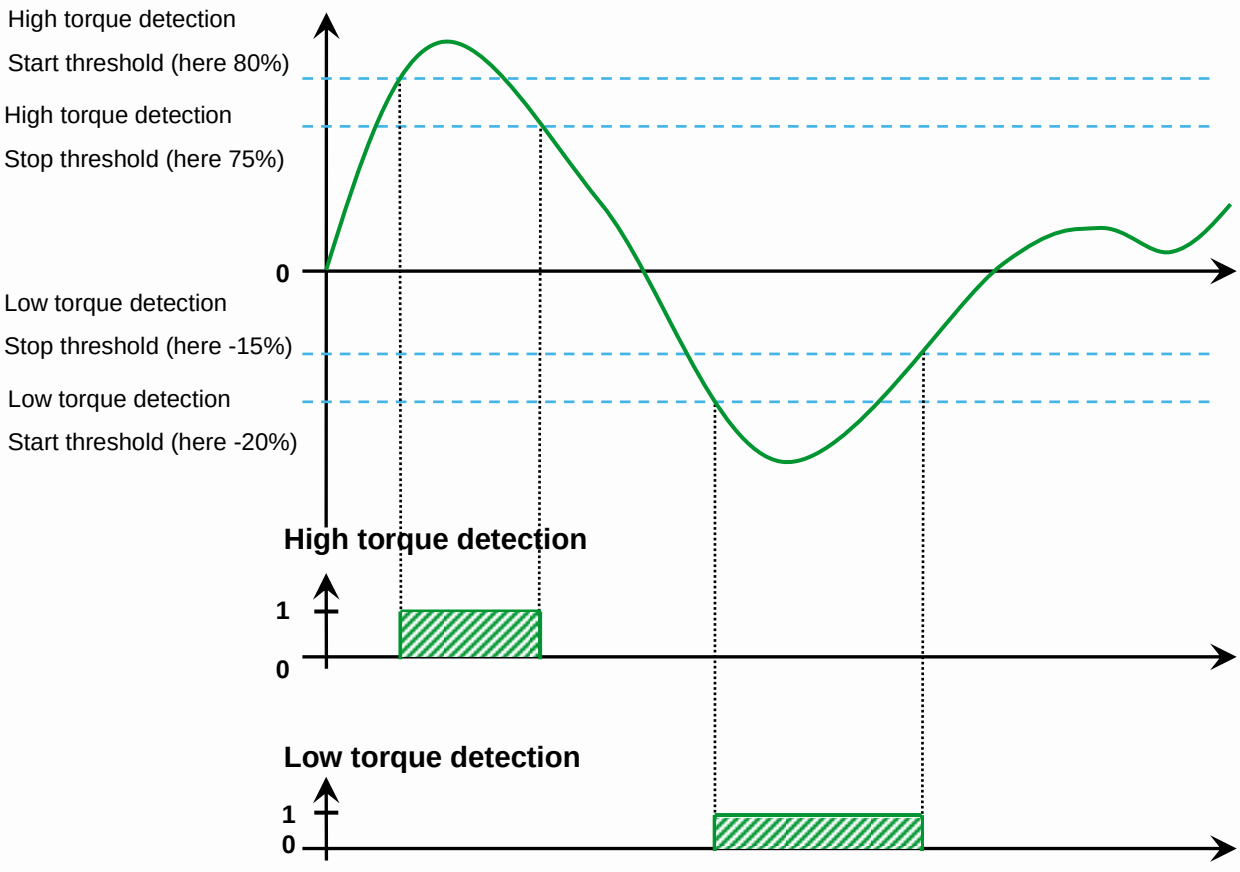
Configuration of Low torque in the ATVLogic program





5. Threshold configuration in Motor and Generator Mode (when the high torque threshold is positive and low torque threshold is negative)

5.1. Functional Principle



5.2. High torque

This block will define the high torque threshold.

The start threshold corresponds to the threshold where the output of Trigger will be active.

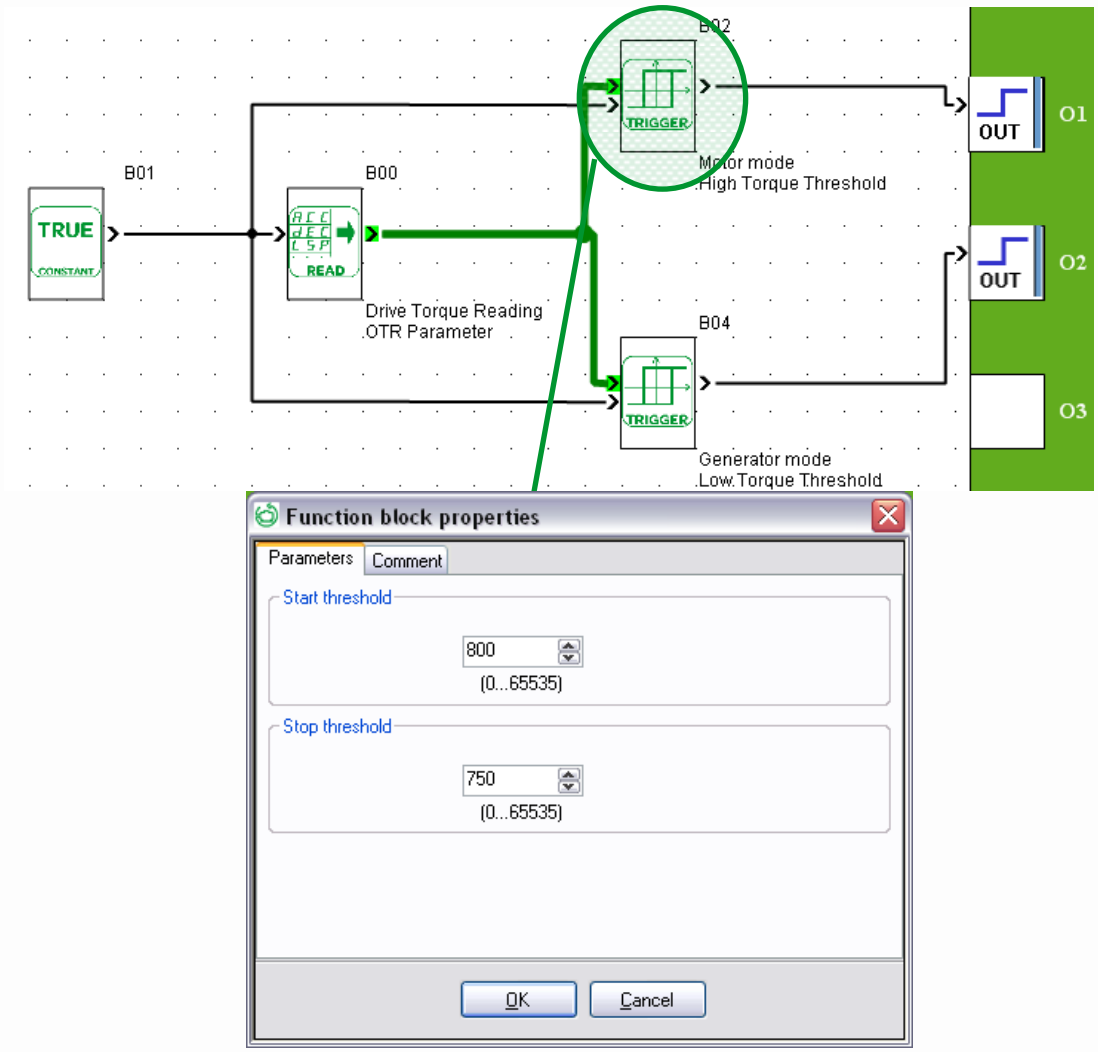
The stop threshold corresponds to the threshold where the output of Trigger will be inactive.

So when the torque will be higher than “Start threshold” the Trigger output will be active. And when the torque will be lower than “Stop threshold” the Trigger output will be inactive.

In this example we set:

Start threshold = 800 → 80%

Stop threshold = 750 → 75%



5.3. Low torque

This block will define the Low torque threshold.

The start threshold corresponds to the threshold where the output of Trigger will be active.

The stop threshold corresponds to the threshold where the output of Trigger will be inactive.

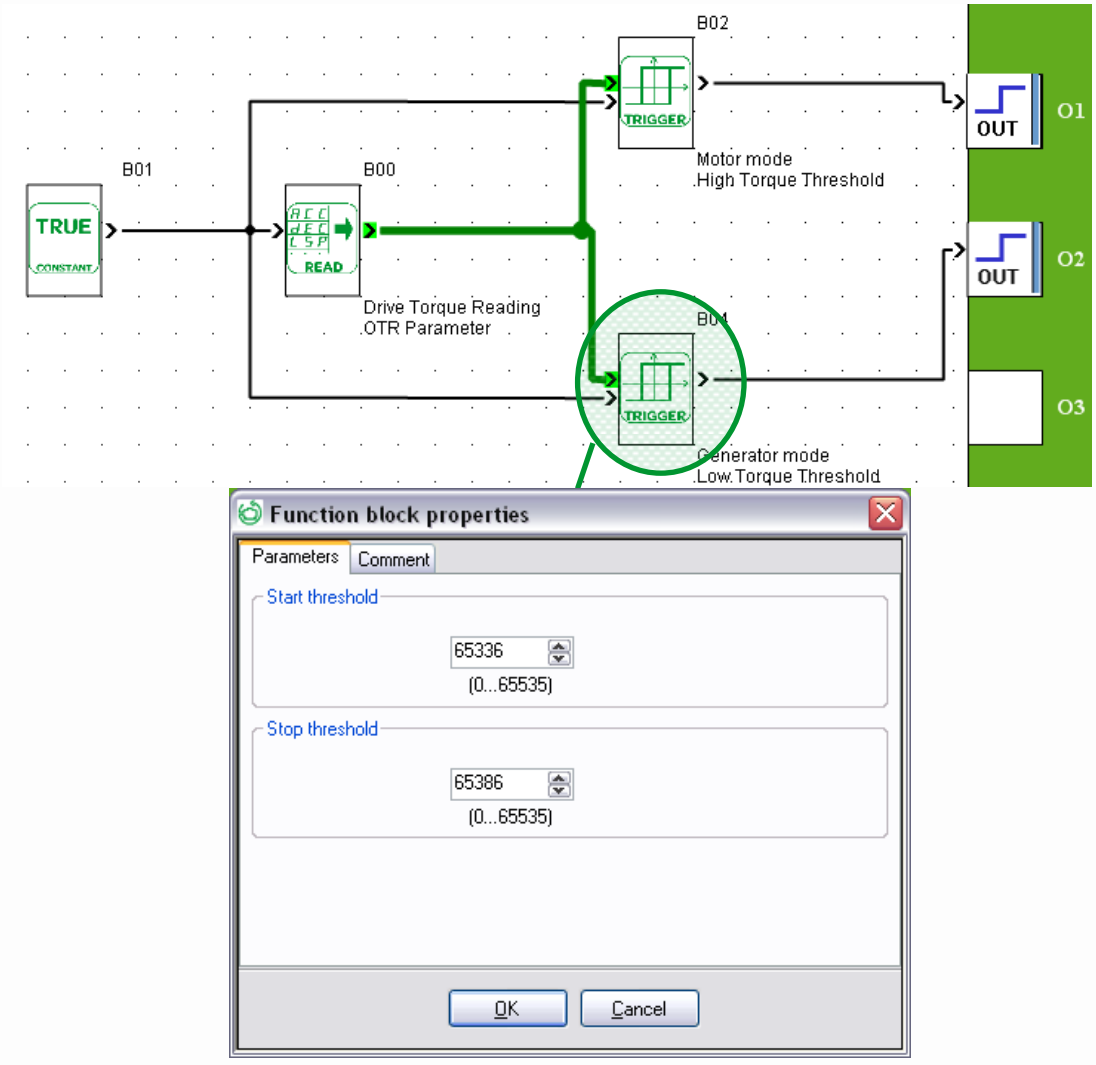
So when the torque will be higher (in absolute value) than “Start threshold” the Trigger output will be active. And when the torque will be lower (in absolute value) than “Stop threshold” the Trigger output will be inactive.

In this example we set:

Start threshold = 65536 – 200 = 65336 → -20%

Stop threshold = 65536 – 150 = 65386 → -15%

Configuration of Low torque in the ATVLogic program



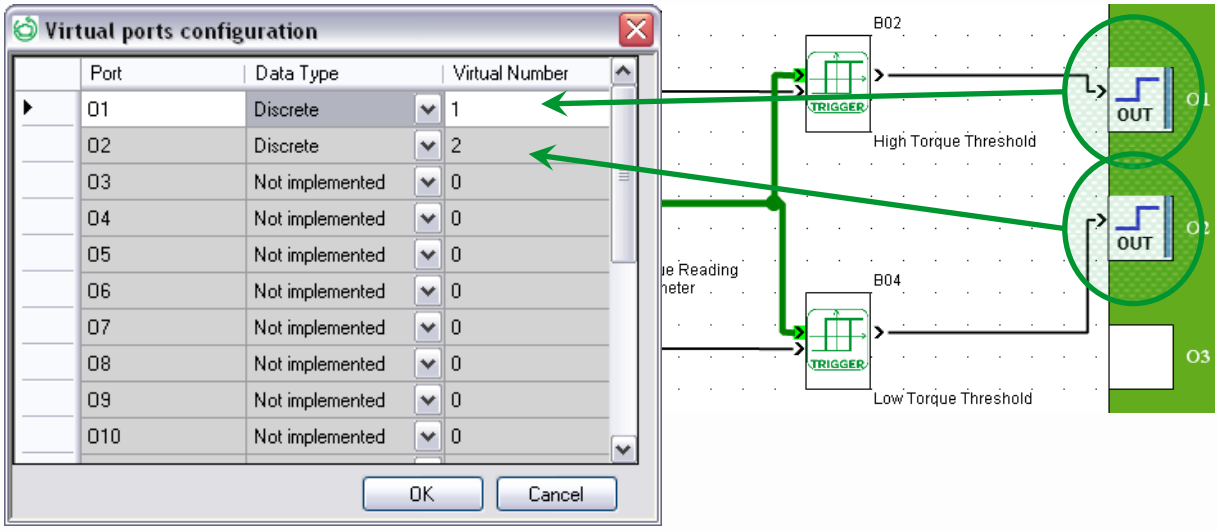
6. Output configuration

In our example we activate R1 relay for high torque detection and R2 relay for Low torque detection.

In ATVLogic, configure the 2 virtual logic outputs.

O1 is configured to the virtual logic output 1 with data type discrete → OL01.

O2 is configured to the virtual logic output 2 with data type discrete → OL02.



The R1 and R2 relay are affected to OL01 and OL02.