

# Control Signals

## Signal overview and timing

As explain in the [connections description](#), one signal called TRIGGER SIGNAL from PLC or Sensor is used to start the motion sequence of the pick and place.

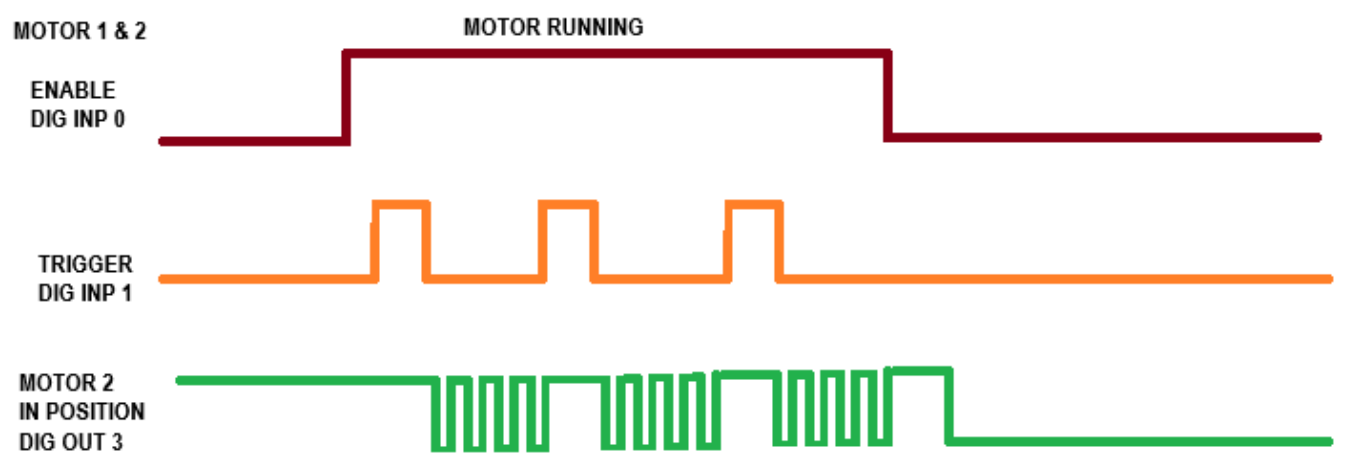
This signal must have a period compatible with the total motion time of the pick and place cycle.

Here below one example considering a pick and place speed of 0.6 sec total pick and place time corresponds to 100 pick and place per minutes. The Master sync signal is generated by the master (motor 1) with a small delay (debouncing) of 3 msec after the detection of the rising edge of the Trigger Signal (Digital Input 1 - Pin 9). This signal is generated for 4 times and it is the motion trigger of the slave (motor 2). The motion task of the motor 2 (slave) is performed at every rising edge of the Master sync received. In position signal is the confirmation of the motion due to the motor 2 (slave). When the In position level is low the motor has reached the position window. In position window tolerance is defined using the parameter 183 (dec). This parameter is present in the Motot parameter window of the [NiLAB Starter software](#).



## Enable and Disable signal

**The Digital IN0 (Enable / Disable) signal must be switched only when the Trigger signal is low !**



At every Disable, Digital Input 0 low the two motors executes Automatic Homing to reach the parking position.

This function is call Soft Landing and it is enabled by the parameter 184. The current sequence of validated by the Motor 2 Digital Output 3 set to In position function. After every Auto Homing the Motor 2 in position must be LOW.

Please, at every disable waiting that the two motors complete the auto homing function waiting 3 secs or looking to the motor state using MODBUS RTU communication. The motor status must be Ready (Status word register 0x1200 value must be 1). During the automatic homing this register is set to 3.

Product deviator Example of motion task configuration using NiLAB Starter

MOTOR 1 - Master

| Motion Table   |             |            |                                  |                     |                   |         |              |  |  |
|--|-------------|------------|----------------------------------|---------------------|-------------------|---------|--------------|--|--|
| MODBUS ADDRESS   |             |            |                                  |                     |                   |         |              |  |  |
| <input checked="" type="checkbox"/> Load/Write these data from/to motor  |             |            |                                  |                     |                   |         |              |  |  |
| <div><div></div> Value changed and not downloaded</div> <div><div></div> Value downloaded / uploaded correctly</div> |             |            |                                  |                     |                   |         |              |  |  |
| Index  | Motion type | Position   | A                                | B                   | C                 | Waiting | Trigger mode |  |  |
|  |             |            | Acceleration time or motion time | Constant speed time | Deceleration time |         |              |  |  |
| 1793 0   | Polynomial  | 60,000 mm  | 150 msec                         | 0 msec              | 0 msec            | 6 msec  | DIG IN risir |  |  |
| 1804 1   | Polynomial  | 160,000 mm | 150 msec                         | 0 msec              | 0 msec            | 6 msec  | Auto         |  |  |
| 1815 2   | Polynomial  | 130,000 mm | 150 msec                         | 0 msec              | 70 msec           | 6 msec  | Auto         |  |  |
| 1826 3   | Polynomial  | 30,000 mm  | 150 msec                         | 0 msec              | 0 msec            | 6 msec  | Auto         |  |  |

MOTOR 2 - Slave

Motion Table

MODBUS ADDRESS

1793

0

Polynomial

30,000

mm

150

msec

0

msec

0

msec

5

msec

DIG IN rising

1804

1

Polynomial

130,000

mm

150

msec

0

msec

0

msec

5

msec

DIG IN rising

1815

2

Polynomial

160,000

mm

150

msec

0

msec

70

msec

5

msec

DIG IN rising

1826

3

Polynomial

60,000

mm

150

msec

0

msec

0

msec

5

msec

DIG IN rising

Load/Write these data from/to motor

Value changed and not downloaded

Value downloaded / uploaded correctly

A

Acceleration time or motion time

B

Constant speed time

C

Deceleration time

Waiting

Trigger mode

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Last update:

2024/03/04 14:14

