

Programowanie serwonapędów SD6

firmy [Stober Antriebstechnik](http://www.stober.com)

 **STÖBER**  
DriveControlSuite



**Konfiguracja parametrów w programie DriveControlSuite**

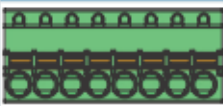
**dla parametryzowania sterowania +/- 10 V**

**sygnałem analogowym**

## 1. Wymagania sprzętowe:

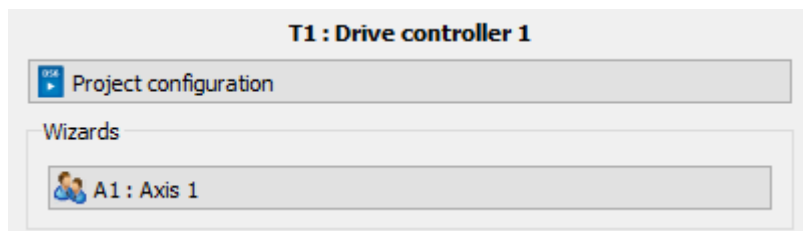
W celu realizacji sterowania sygnałem analogowym +/- 10 V należy zastosować sterownik silnika SD6 oraz dedykowaną kartę IO6, XI6 lub RI6 (RI6 służy do obsługi silników z resolverem).

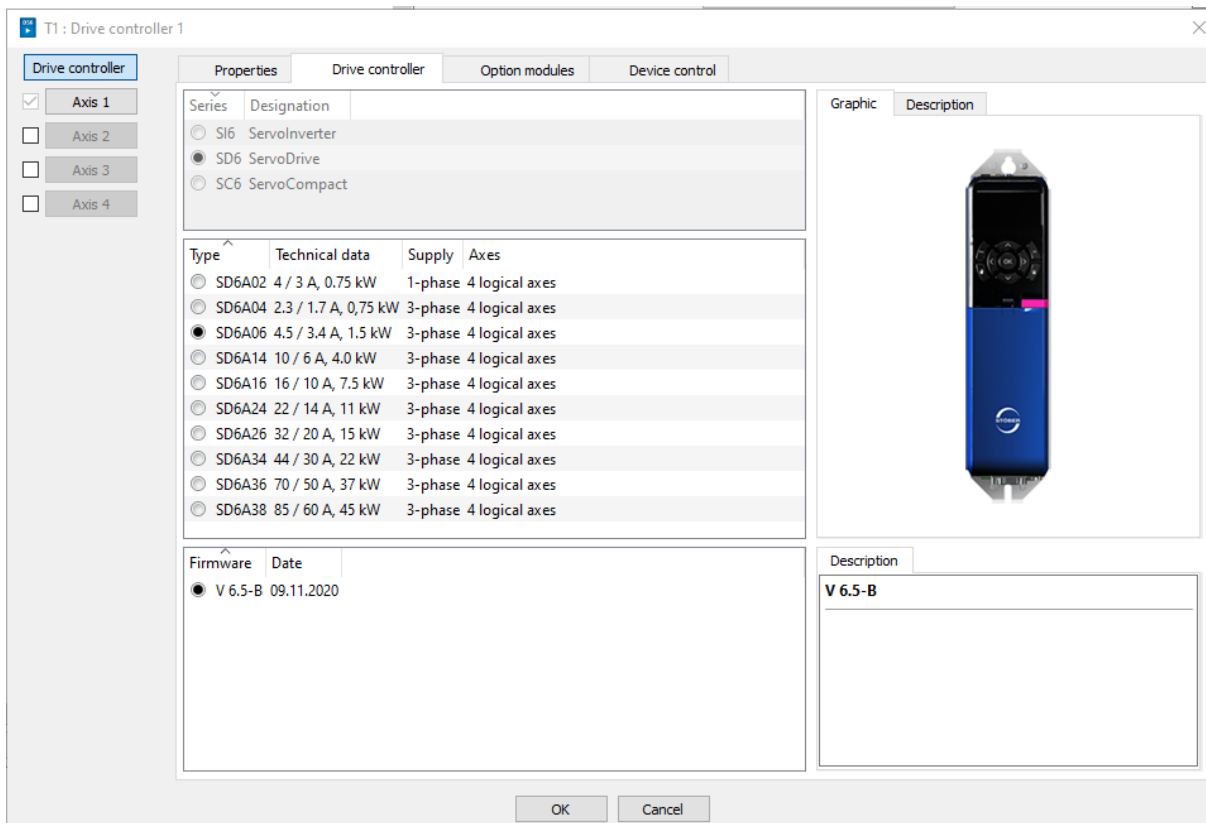
Złącze wykorzystywane do podłączenia sygnału analogowego:

| Terminal   | Pin | Designation | Function  |
|--|-----|-------------|---|
| <br>1 2 3 4 5 6 7 8 | 1   | AI1 +       | AI1+ input  |
|  | 2   | AI1 shunt   | Current input; shunt connection pin 2 is to be bridged to pin 1 |
|  | 3   | AI1 -       | AI1- input  |
|  | 4   | AI2 +       | AI2+ input  |
|  | 5   | AI2 -       | AI2- input  |
|  | 6   | AO1         | AO1 output  |
|  | 7   | AO2         | AO2 output  |
|  | 8   | 0 V AGND    | Reference potential   |

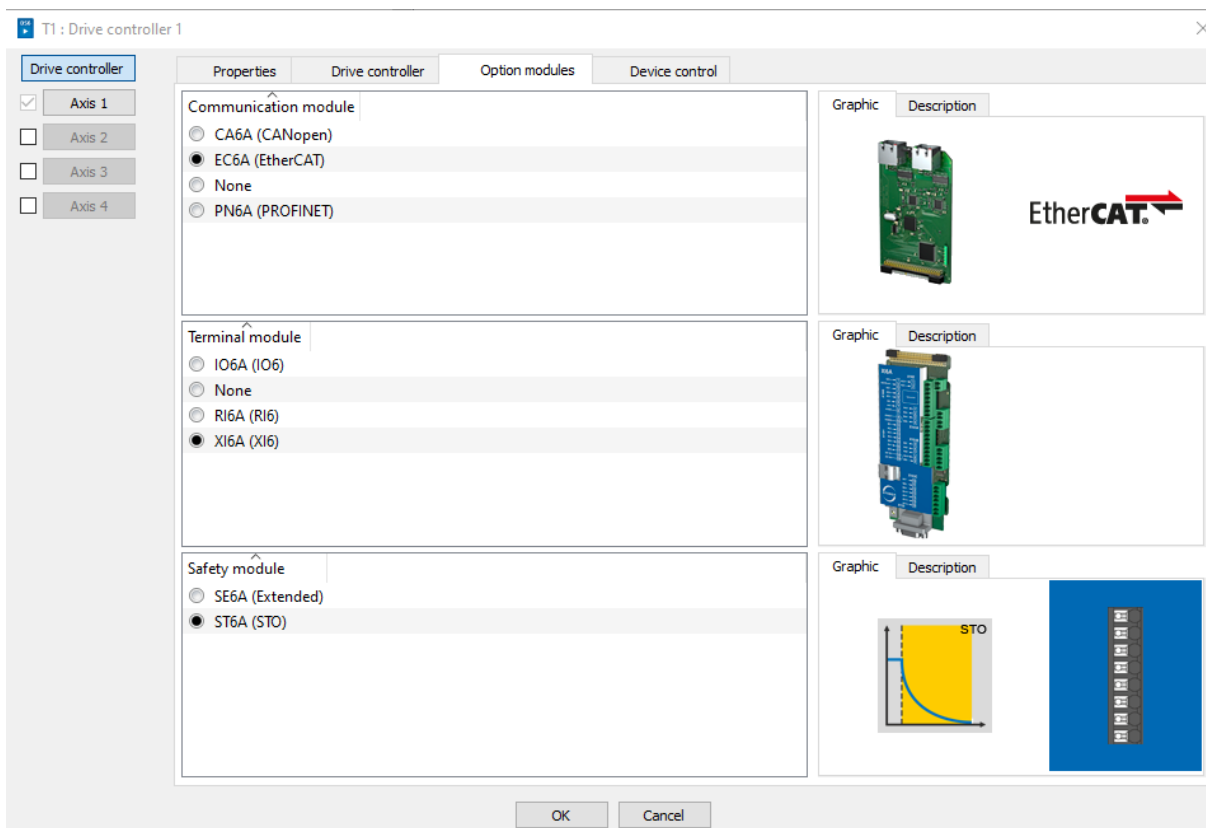
W celu parametryzacji należy wykorzystać oprogramowanie DS6.

W zakładce Project configuration wybieramy odpowiednio typ napędu SD6:

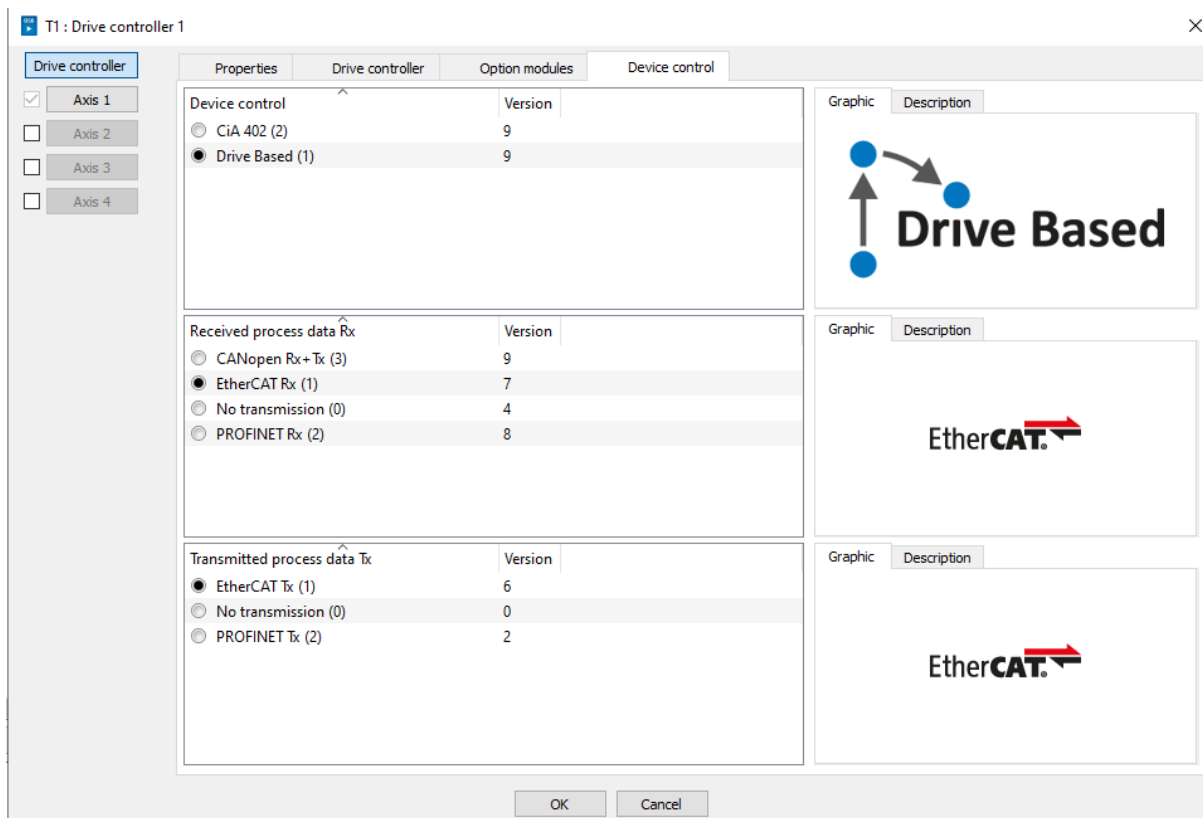




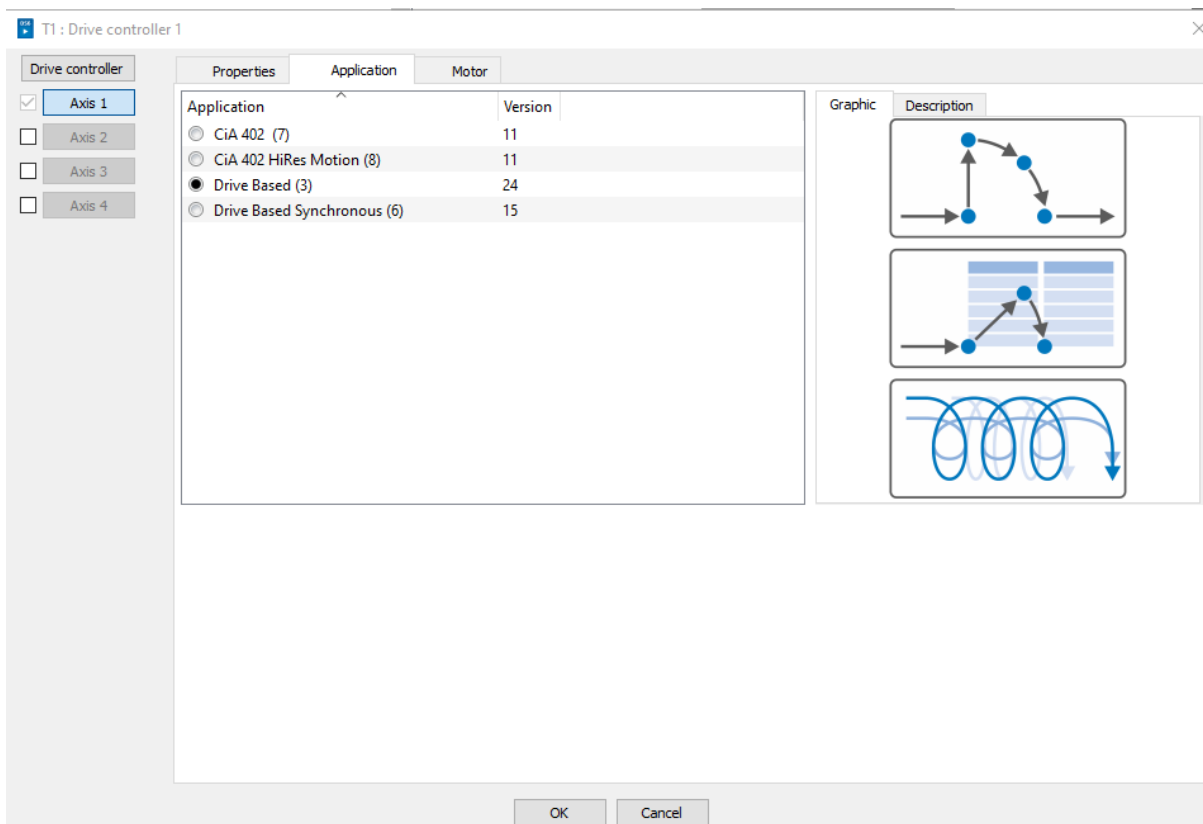
Następnie wybieramy opcje kart jakie mamy zainstalowane:



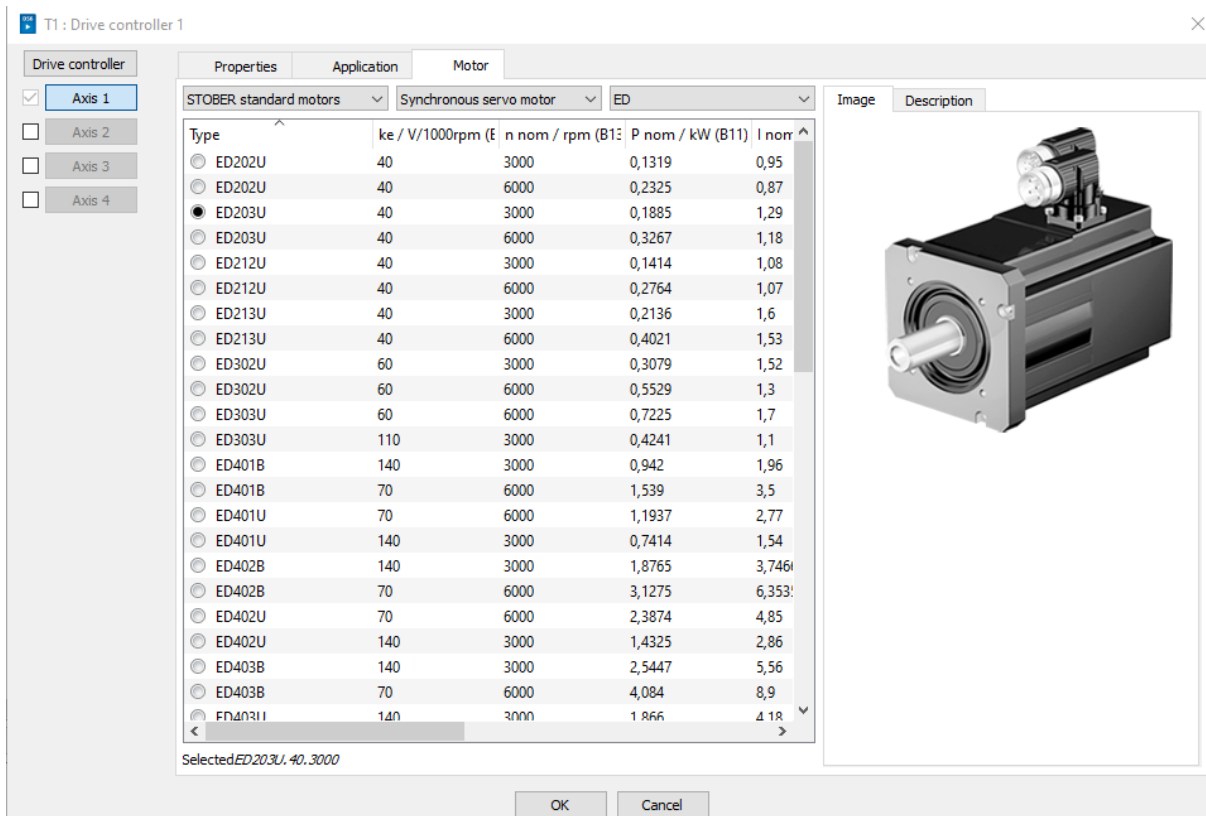
Wybieramy opcjonalnie komunikację przemysłową oraz aplikację:



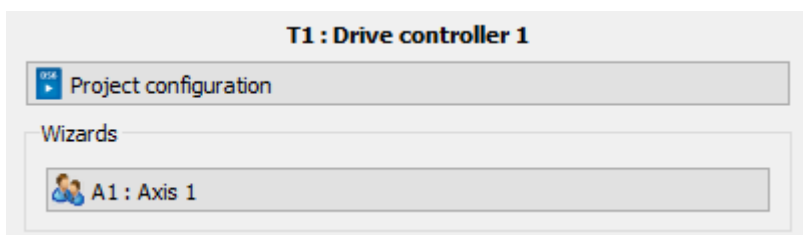
W kolejnym kroku wybieramy aplikację dla osi:



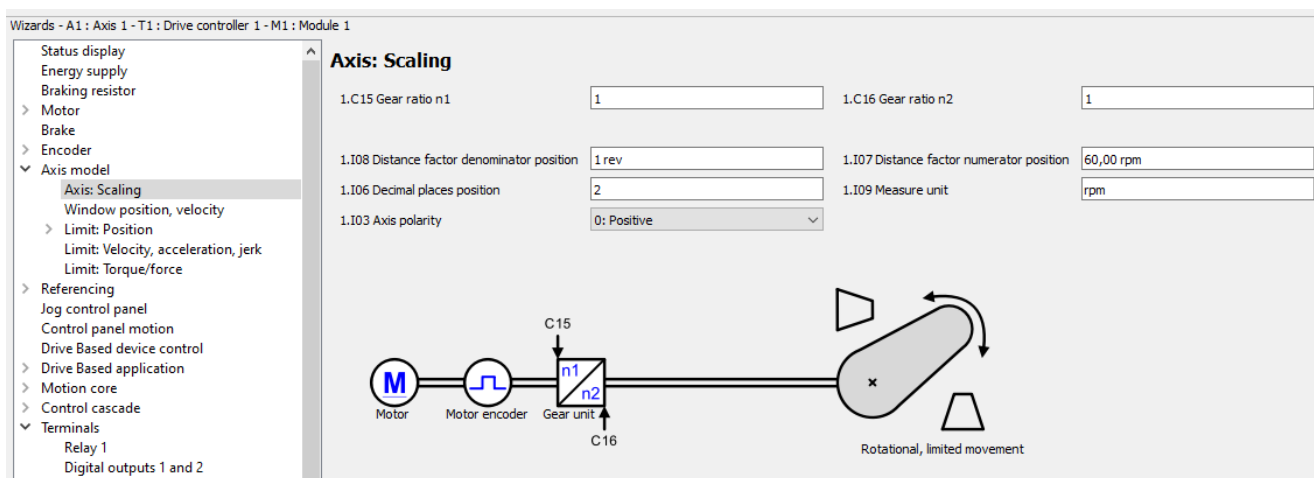
W ostatnim kroku wybieramy silnik:



Następnie przechodzimy do konfiguracji osi klikając na Axis 1



Jeżeli chcemy mieć obroty w RPM to ustawiamy zakładkę skalowania jak poniżej:



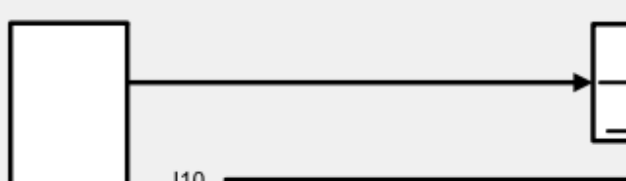
Następnie ustawiamy limity dynamiki:

Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

- Status display
- Energy supply
- Braking resistor
- > Motor
- Brake
- > Encoder
- ▼ Axis model
  - Axis: Scaling
  - Window position, velocity
  - > Limit: Position
  - Limit: Velocity, acceleration, jerk
  - Limit: Torque/force
- > Referencing
- Jog control panel
- Control panel motion
- Drive Based device control
- > Drive Based application
- > Motion core
- > Control cascade
- ▼ Terminals

### Limit: Velocity, acceleration, jerk

|                              |                           |
|------------------------------|---------------------------|
| 1.I10 Maximal speed          | 3000 rpm/s                |
| 1.I11 Maximal acceleration   | 18000 rpm/s <sup>2</sup>  |
| 1.I17 Quickstop deceleration | 18000 rpm/s <sup>2</sup>  |
| 1.I16 Maximal jerk           | 180000 rpm/s <sup>3</sup> |



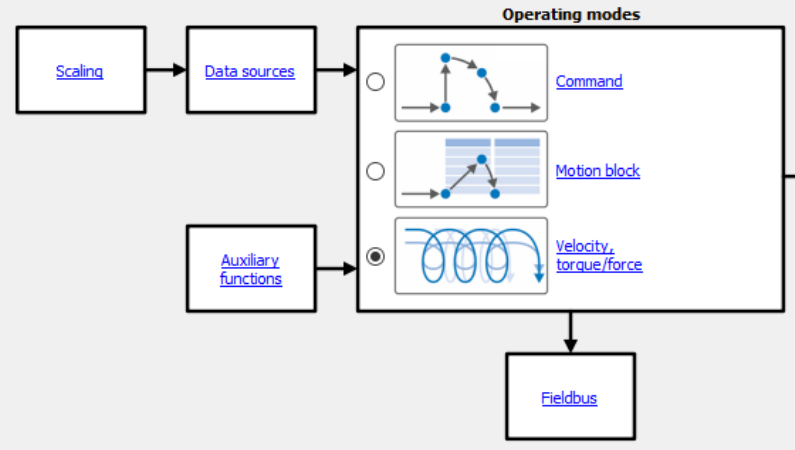
Wybieramy aplikację:

Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

- Status display
- Energy supply
- Braking resistor
- > Motor
- Brake
- > Encoder
- > Axis model
- > Referencing
- Jog control panel
- Control panel motion
- Drive Based device control
- ▼ Drive Based application
  - ▼ Velocity, torque/force operating mode
    - Main set value
    - Additional set value
    - Limit: Velocity; operating mode: Ve
    - > Fixed set values: Velocity
    - > Fixed values: Acceleration
    - > Fixed values: Deceleration
    - > Fixed values: Jerk
    - Control panel for velocity, torque/f
  - ▼ Data sources
    - Application digital signals: Data sou
    - Device control digital signals: Data
    - Torque/force limit: Data source
    - External velocity: Data source

### Drive Based application

1.A150 Cycle time: 4: 1 ms    E191 Runtime usage: 54,9 %



W kolejnej zakładce:

Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

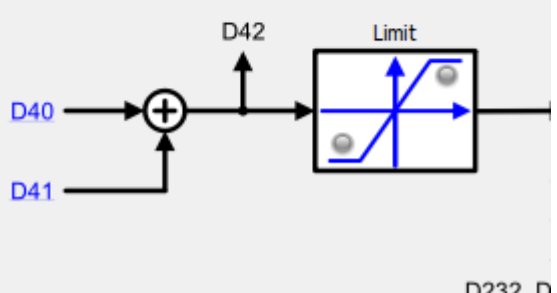
- Status display
- Energy supply
- Braking resistor
- > Motor
- > Brake
- > Encoder
- > Axis model
- > Referencing
- Jog control panel
- Control panel motion
- Drive Based device control
- > Drive Based application
  - > Velocity, torque/force operating mode
    - Main set value
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    - Limit: Velocity; operating mode: Ve
    - > Fixed set values: Velocity
    - > Fixed values: Acceleration
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    - > Fixed values: Jerk
    - Control panel for velocity, torque/f
  - > Data sources
    - Application digital signals: Data sou
    - Device control digital signals: Data
    - Torque/force limit: Data source
    - External velocity: Data source

## Velocity, torque/force operating mod

1.D01 Command 1: MC\_MoveSpeed ▾

D232 Maximum positive M/F

D233 Maximum negative M/F



D232, D

Następnie definiujemy odpowiednio prędkość jaką chcemy sterować:

|  |   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
|--|---|---|------------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|---|---------|--|---------|--|---------|--|---------|--|---------|--|---------|--|------------|
| <ul style="list-style-type: none"> <li>Status display</li> <li>Energy supply</li> <li>Braking resistor</li> <li>&gt; Motor</li> <li>  Brake</li> <li>&gt; Encoder</li> <li>&gt; Axis model</li> <li>&gt; Referencing</li> <li>  Jog control panel</li> <li>  Control panel motion</li> <li>  Drive Based device control</li> <li>✓ Drive Based application           <ul style="list-style-type: none"> <li>▼ Velocity, torque/force operating mode               <ul style="list-style-type: none"> <li>Main set value</li> <li>Additional set value</li> <li>Limit: Velocity; operating mode: Velocity</li> <li>&gt; Fixed set values: Velocity</li> <li>&gt; Fixed values: Acceleration</li> <li>&gt; Fixed values: Deceleration</li> <li>&gt; Fixed values: Jerk</li> <li>Control panel for velocity, torque/force</li> </ul> </li> <li>▼ Data sources               <ul style="list-style-type: none"> <li>Application digital signals: Data source</li> <li>Device control digital signals: Data source</li> <li>Torque/force limit: Data source</li> <li>External velocity: Data source</li> <li>External additional velocity: Data source</li> <li>Velocity override: Data source</li> </ul> </li> </ul> </li> </ul> | <h3>Fixed set values: Velocity</h3> <table border="1"> <tr><td>1.D12[0] Fixed velocity reference value</td><td>3000 rpm/s</td></tr> <tr><td>1.D12[1] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[2] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[3] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[4] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[5] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[6] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[7] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[8] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[9] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[10] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[11] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[12] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[13] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[14] Fixed velocity reference value</td><td>0 rpm/s</td></tr> <tr><td>1.D12[15] Fixed velocity reference value</td><td>3000 rpm/s</td></tr> </table> | 1.D12[0] Fixed velocity reference value | 3000 rpm/s | 1.D12[1] Fixed velocity reference value | 0 rpm/s | 1.D12[2] Fixed velocity reference value | 0 rpm/s | 1.D12[3] Fixed velocity reference value | 0 rpm/s | 1.D12[4] Fixed velocity reference value | 0 rpm/s | 1.D12[5] Fixed velocity reference value | 0 rpm/s | 1.D12[6] Fixed velocity reference value | 0 rpm/s | 1.D12[7] Fixed velocity reference value | 0 rpm/s | 1.D12[8] Fixed velocity reference value | 0 rpm/s | 1.D12[9] Fixed velocity reference value | 0 rpm/s | 1.D12[10] Fixed velocity reference value | 0 rpm/s | 1.D12[11] Fixed velocity reference value | 0 rpm/s | 1.D12[12] Fixed velocity reference value | 0 rpm/s | 1.D12[13] Fixed velocity reference value | 0 rpm/s | 1.D12[14] Fixed velocity reference value | 0 rpm/s | 1.D12[15] Fixed velocity reference value | 3000 rpm/s |
| 1.D12[0] Fixed velocity reference value  | 3000 rpm/s  |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[1] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[2] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[3] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[4] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[5] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[6] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[7] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[8] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[9] Fixed velocity reference value  | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[10] Fixed velocity reference value   | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[11] Fixed velocity reference value   | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[12] Fixed velocity reference value   | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[13] Fixed velocity reference value   | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[14] Fixed velocity reference value   | 0 rpm/s   |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |
| 1.D12[15] Fixed velocity reference value   | 3000 rpm/s  |   |            |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |   |         |  |         |  |         |  |         |  |         |  |         |  |            |

Przyspieszenie oraz hamowanie:



Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

- Status display
- Energy supply
- Braking resistor
- > Motor
- Brake
- > Encoder
- > Axis model
- > Referencing
- Jog control panel
- Control panel motion
- Drive Based device control
- ▼ Drive Based application
  - ▼ Velocity, torque/force operating mode
    - Main set value
    - Additional set value
    - Limit: Velocity; operating mode: Velocity
    - > Fixed set values: Velocity
    - > Fixed values: Acceleration
    - > Fixed values: Deceleration
    - > Fixed values: Jerk
    - Control panel for velocity, torque/force
  - ▼ Data sources
    - Application digital signals: Data source
    - Device control digital signals: Data source
    - Torque/force limit: Data source
    - External velocity: Data source
    - External additional velocity: Data source
    - Velocity override: Data source
    - Set torque/force, velocity bracketing: Data source
  - > Analog inputs: Scaling
  - Additional functions

### Fixed values: Acceleration

|                                    |                          |
|------------------------------------|--------------------------|
| 1.D14[0] Fixed acceleration value  | 18000 rpm/s <sup>2</sup> |
| 1.D14[1] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[2] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[3] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[4] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[5] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[6] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[7] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[8] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[9] Fixed acceleration value  | 0 rpm/s <sup>2</sup>     |
| 1.D14[10] Fixed acceleration value | 0 rpm/s <sup>2</sup>     |
| 1.D14[11] Fixed acceleration value | 0 rpm/s <sup>2</sup>     |
| 1.D14[12] Fixed acceleration value | 0 rpm/s <sup>2</sup>     |
| 1.D14[13] Fixed acceleration value | 0 rpm/s <sup>2</sup>     |
| 1.D14[14] Fixed acceleration value | 0 rpm/s <sup>2</sup>     |
| 1.D14[15] Fixed acceleration value | 18000 rpm/s <sup>2</sup> |

Oraz jerk:

Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

- Status display
- Energy supply
- Braking resistor
- > Motor
- Brake
- > Encoder
- > Axis model
- > Referencing
- Jog control panel
- Control panel motion
- Drive Based device control
- ▼ Drive Based application
  - ▼ Velocity, torque/force operating mode
    - Main set value
    - Additional set value
    - Limit: Velocity; operating mode: Velocity
    - > Fixed set values: Velocity
    - > Fixed values: Acceleration
    - > Fixed values: Deceleration
    - > Fixed values: Jerk
    - Control panel for velocity, torque/force
  - ▼ Data sources
    - Application digital signals: Data source
    - Device control digital signals: Data source
    - Torque/force limit: Data source
    - External velocity: Data source
    - External additional velocity: Data source
    - Velocity override: Data source
    - Set torque/force. velocity bracketing: Data source

### Fixed values: Jerk

|                            |                           |
|----------------------------|---------------------------|
| 1.D18[0] Fixed jerk value  | 180000 rpm/s <sup>3</sup> |
| 1.D18[1] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[2] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[3] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[4] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[5] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[6] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[7] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[8] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[9] Fixed jerk value  | 0 rpm/s <sup>3</sup>      |
| 1.D18[10] Fixed jerk value | 0 rpm/s <sup>3</sup>      |
| 1.D18[11] Fixed jerk value | 0 rpm/s <sup>3</sup>      |
| 1.D18[12] Fixed jerk value | 0 rpm/s <sup>3</sup>      |
| 1.D18[13] Fixed jerk value | 0 rpm/s <sup>3</sup>      |
| 1.D18[14] Fixed jerk value | 0 rpm/s <sup>3</sup>      |
| 1.D18[15] Fixed jerk value | 180000 rpm/s <sup>3</sup> |

Jeżeli chcemy sterować za pomocą sygnału analogowego to przechodzimy do następującej zakładki:

Wybrane jest wejście analogowe 1 AI1.

Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

- Status display
- Energy supply
- Braking resistor
- > Motor
- Brake
- > Encoder
- > Axis model
- > Referencing
- Jog control panel
- Control panel motion
- Drive Based device control
- ▼ Drive Based application
  - ▼ Velocity, torque/force operating mode
    - Main set value
    - Additional set value
    - Limit: Velocity; operating mode: Velocity
    - > Fixed set values: Velocity
    - > Fixed values: Acceleration
    - > Fixed values: Deceleration
    - > Fixed values: Jerk
    - Control panel for velocity, torque/force
  - ▼ Data sources
    - Application digital signals: Data source
    - Device control digital signals: Data source
    - Torque/force limit: Data source
    - External velocity: Data source
    - External additional velocity: Data source
    - Velocity override: Data source
    - Set torque/force, velocity bracketing: Data source
  - > Analog inputs: Scaling
  - Additional functions
  - Jog

### External velocity: Data source

|  |                                 |     |
|--|---------------------------------|-----|
| 1.G461 Source external velocity        | 5: Indirect read parameter G811 | 1.0 |
| 1.G460 External velocity               | 0 rpm/s                         | 1.0 |
| 1.I110 Maximal speed                   | 3000 rpm/s                      | 1.0 |
| 1.G811 Indirect read external velocity | 1.G270                          | 1.0 |
| 1.G270 Scaled AI1                      | <offline>                       |     |

Jeżeli chcemy wykorzystać napięcie wyjściowe z karty 10V to możemy wykonać następujące ustawienia:

Wizards - A1 : Axis 1 - T1 : Drive controller 1 - M1 : Module 1

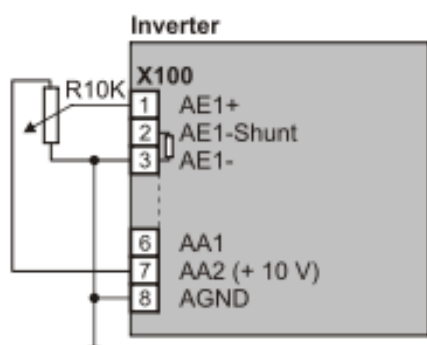
- Control panel for velocity, torque/force
- ▼ Data sources
  - Application digital signals: Data source
  - Device control digital signals: Data source
  - Torque/force limit: Data source
  - External velocity: Data source
  - External additional velocity: Data source
  - Velocity override: Data source
  - Set torque/force, velocity bracketing: Data source
- ▼ Analog inputs: Scaling
  - Analog input 1: Scaling
  - Analog input 2: Scaling
  - Analog input 3: Scaling
- Additional functions
- Jog
- > Motion core
- > Control cascade
- ▼ Terminals
  - Relay 1
  - Digital outputs 1 and 2
  - Digital outputs 3 - 10
  - > Analog input 1
  - > Analog input 2
  - > Analog input 3
  - Analog output 1
  - Analog output 2
  - Inputs/outputs used
- > Control/status words

### Analog output 2

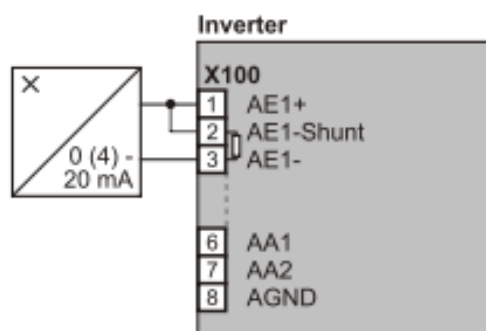
|                                  |             |                        |           |
|----------------------------------|-------------|------------------------|-----------|
| 1.F50 AO2 source                 | 1.F52       | F52 AO2 lowpass filter | 10,0 ms   |
| 1.F51 AO2 reference value source |             |                        | 4: 1 ms   |
| 1.F52 AO2 lowpass filter         | 10,0 ms     |                        |           |
| 1.F53 AO2 factor                 | 100 %       |                        |           |
| 1.F54 AO2 amount                 | 0: Inactive |                        |           |
| 1.F55 AO2 offset                 | 0 %         | E14[0] terminal value  | <offline> |
| 1.F56 AO2 lower limit            | -100 %      | E14[1] scaled value    | <offline> |
| 1.F57 AO2 upper limit            | 100 %       | E14[2] relative        | <offline> |

Przykład podłączenia potencjometru:

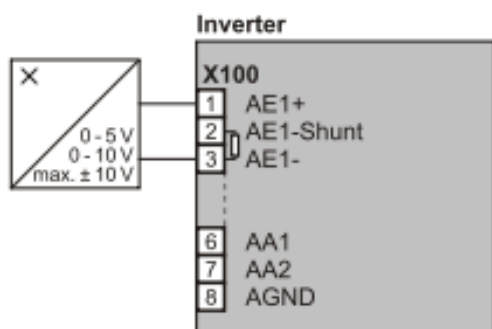
Potentiometer



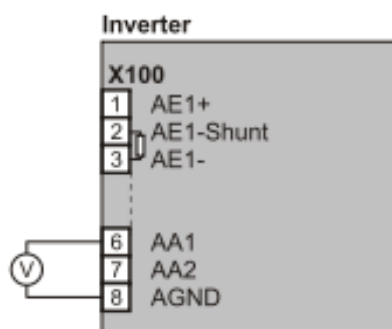
Current (0 - 20 mA, 4 - 20 mA)



Voltage (max.  $\pm 10$  V)



Analog output voltage



Przykładowy schemat połączeń dla sterownika SD6

