

ideas make future

ACTUATOR controller type **ACP90**

Flap position control
by stepper motor

Short description

Product ACTUATOR controller, type ACP90 is stand-alone module, which control precisely position of valves and flaps used in industrial applications. For instance it is suitable for speed and mixture regulation of cogeneration units – CHP, generator unit or other systems regarding fast and accurate changes to the actuator.

For propulsion of valves and flaps it is used stepper motor with wheeled gearbox or toothed belt. The advantage of stepper motor use is low price, high torque, speed and accuracy to achieve the desired position. PID parameters are not necessary, because final position is immediate and precise on the principle of stepper motor.

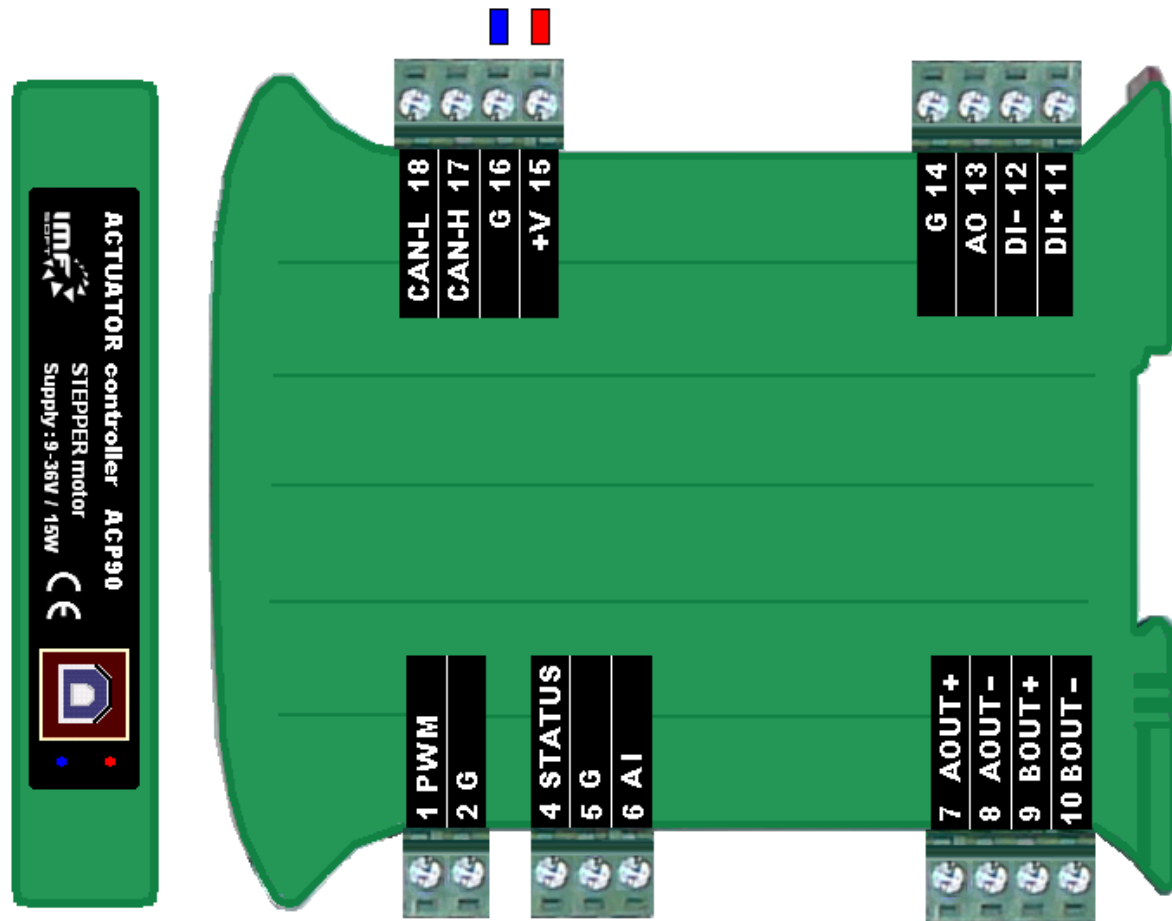
Product ACTUATOR controller carries out control of stepper motor position according to superior system. The information for the location is transmitted via interface Analog 0-5Vm, PWM 0-100%, or via CANbus in SAE J1939 protocol, or CANopen. Configuration and diagnostic is done through USB interface.

Main Features

- ✓ Supply voltage range 7 to 36V (12V/24V)
- ✓ Operation temperature -40 až 85°C
- ✓ Input: AI [V] 0-5V (Analog)
 - PWM [%] 0-100% (Discrete)
 - DI+/DI- 0-100% (Discrete)
 - CAN-BUS J1939 / CANopen (250kbps)
- ✓ Output: AO [V] 0-5V (Analog)
 - Stepper motor 2 phases (4,6 or 8 wires)
 - torque up to 10Nm (motor x transfer)
 - real step up to 0,05° (motor x transfer x microsteps)
 - current max. 1.6A
 - microsteps 1/2, 1/8, 1/32
 - speed 2000 steps per second
 - suitable transfer 1:1 to 1:4
- ✓ Excellent ratio of Price / Performance
- ✓ Galvanically isolated USB – USB protection against earth fault
- ✓ PC application – visualization of measured values
- ✓ Measuring of the supply voltage
- ✓ Calibration is not required
- ✓ Installation standard – DIN rail 35mm
- ✓ Protection class – IP20
- ✓ Dimensions 118x101x23mm

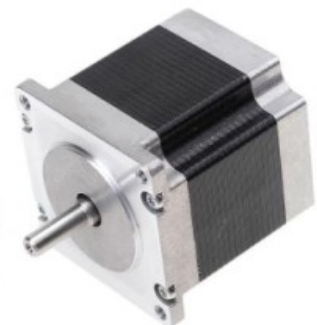
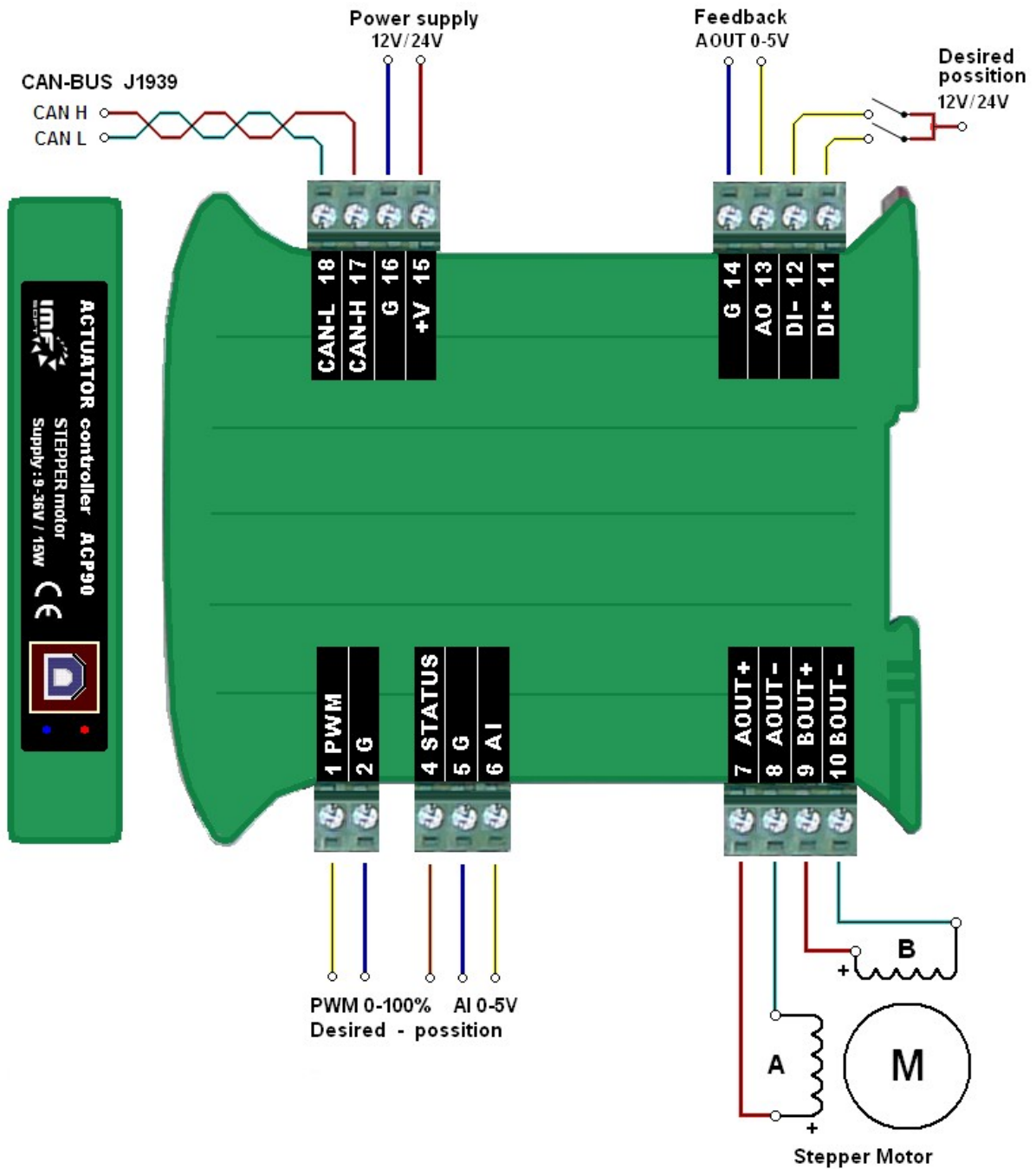


ACTUATOR controller – signal description



MARKING	MEANING	RANGE, ACTIVE LEVEL
+V	Power supply	9 to 36V (+12V/24V)
G	Ground supply	0V
AOUT+	Stepper motor – Signal A+	Power +12V/24V or regulated
AOUT-	Stepper motor – Signal A-	Power +12V/24V or regulated
BOUT+	Stepper motor – Signal B+	Power +12V/24V or regulated
BOUT-	Stepper motor – Signal B-	Power +12V/24V or regulated
AI	Analog Input	0-5V ($\pm 0.5\%$)
PWM	Discrete Input	0-100% (5-24V, 50-500Hz)
DI+/DI-	Discrete Input	0V or 5-24V
G	Signal Ground	0V
AO	Analog Output	0-5V ($\pm 0.5\%$)
STATUS	Status Output	Open Collector – 1k Pull up
CAN H CAN L	Fieldbus CANbus	SAE J1939 / CANopen 250kpbs

ACTUATOR controller – wiring schema



Application ACTUATOR control – visualization software

Visualization will run under application ACTUATOR control on your PC. The application works under Windows XP and higher. Installation requires 4MB of free space at your hard disc.

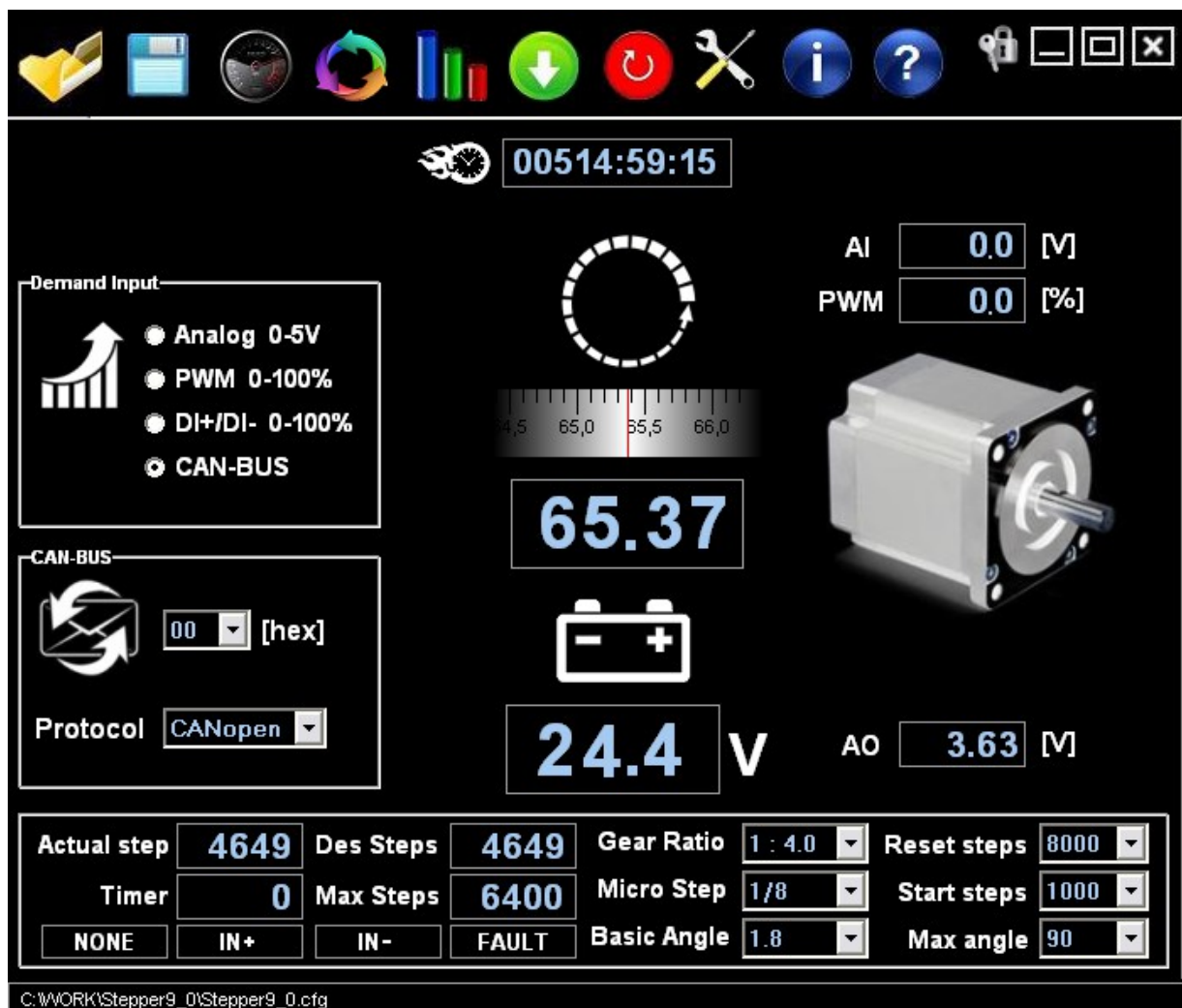
PC connection is done using USB interface. Driver for USB is included on the installation CD.

Visualized information

- Shaft Angle [°]
- Actual Step [-]
- Desired Step [-]
- Analog Input – AI [V], PWM [%]
- Analog Output – AO [V]
- Supply voltage – U [V]
- Readout – engine hours [h:m:s]



Run the visualization



The screenshot shows the visualization software interface with a Windows taskbar at the top. The main window displays the following information:

- Time:** 00514:59:15
- Demand Input:**
 - Analog 0-5V
 - PWM 0-100%
 - DI+/DI- 0-100%
 - CAN-BUS
- CAN-BUS:**
 - Hex value: 00 [hex]
 - Protocol: CANopen
- AI (Analog Input):** 0.0 [V]
- PWM:** 0.0 [%]
- Shaft Angle:** 65.37 (with a scale from 64.5 to 66.0)
- Supply Voltage (U):** 24.4 [V]
- AO (Analog Output):** 3.63 [V]
- Motor:** A 3D model of a stepper motor is shown on the right.
- Bottom Panel:**
 - Actual step: 4649
 - Des Steps: 4649
 - Timer: 0
 - Max Steps: 6400
 - Gear Ratio: 1 : 4.0
 - Micro Step: 1/8
 - Basic Angle: 1.8
 - Reset steps: 8000
 - Start steps: 1000
 - Max angle: 90
 - Status: NONE, IN+, IN-, FAULT

File path: C:\WORK\Stepper9_0\Stepper9_0.cfg