FD2.x

Integrated stepper motor driver

MAIN CHARACTERISTICS

FD2 belongs to FD family micro-stepper drives. It is designed in a compact solution to be mounted directly on motor end-shield.

Supply voltage	24 – 130 V_{DC}
Motor current	Up to 10 A_P per phase
Motor type	Bipolar, 4 wires
IP	40
Inputs	6 Digital opto-insulated 1 Analog input
Outputs	2 Digital pnp-type
Field-bus interfaces	Modbus (RS-232, RS-485) CANopen
Encoder	12-bit/rev absolute single revolution
Dimensions	86 x 99 x 25 mm + motor

FEATURES

- Torque Control loop

Adjustable I_{MAX} (motor current at maximum torque)
Adjustable I_{MIN} (motor current at no torque)

- Step accumulator with programmable alarm limit

- 12-bit/rev absolute encoder

Absolute multi-turn position recovery at power on

- Step / dir or quadrature steps

- 32 programmable cycles, 10 cycles sequences

Predefined movements can be selected, started, stopped using digital inputs. Configurable speed, acceleration, deceleration, target position with linear and parabolic motion profiles.
Complex cycles as homing, delta stop, delay or sequence of cycles are also selectable and started.

- Position resolution

Configurable µsteps per revolution (400 – 208 400 µsteps/rev)

- Over temperature (100 °C), over voltage and short circuit alarms

- Fully re-programmable via RS-232 or RS-485

- CANopen CiA DS301, DSP402

Interpolated position mode, profile position mode, profile velocity mode, homing mode, custom modes.

- DIP switch to set CAN and RS-485 node address.

- External Logic supply (suffix D)

Additional 24V_{DC} to supply the logic and the communication when main power supply is off (multi-turn position retention, communication always active)

FD drives are all controlled by 72 MHz ARM-based microcontroller. They are equipped with very low $R_{DS\text{-}on}$ MOSFETs and Hall effect current sensors to optimize power efficiency.

The drive is equipped with 12-bit magnetic encoder, which can be used to verify the correct execution of the ordered steps, to modulate the motor current with the load and other functions which are described in detail on firmware manuals.

Model	Power supply	Dig. I/O	RS-232	RS-485	An. IN
FD2.1	24 – 130 V_{DC}	✓	✓	✓	✓
FD2.2		✓	✓		✓
A = CANopen (only applicable to FD2.1) D = DC/DC to supply the logic from V_{EXT} when V_{POW} is off					

FD2.1 and FD2.2 are equipped with configurable digital I/O's (6 inputs and 2 outputs), which can be used as step / dir or quadrature steps mode and start, stop, cycle selection mode, plus transceivers RS-232. FD2.1 is also equipped with RS-485. Both RS-232 and RS-485 supports Modbus communication.
The suffix A identifies the model equipped with CAN transceiver, available only on version FD2.1, i.e. FD2.1A. CANopen protocol is implemented. CAN and RS-485 are opto-insulated from power circuitry.

To avoid unwanted heat dissipation FD2 implements motor torque control, which reduce the current in absence of resistant torque and increase it proportionally with the load till the maximum value configured. Torque control is active all the times, also at zero speed, which means that if a load is applied when the motor is stopped, the drive will counteract the load, increasing motor current.

The step accumulation function provides great benefits to the application: it allows to accumulate the steps which cannot be executed because of a sudden resistant torque above the maximum motor torque. In this case FD2 maintains the maximum motor torque and, when the load decreases, it recovers the steps accumulated, accelerating and reaching the reference position. The engage, which is the change from chasing mode to synchronous mode, takes place through bump-less speed adjustment, without vibrations.

Fig. 1 FD2 applied on NEMA 34 stepper motor.

AUXIND
www.auxind.com

e-mail: info@auxind.com
Tel: (+39) 0522 520312 – Fax, Tel: (+39) 0522 521333
Via M. Montessori, 25 – 42123 Reggio Emilia, Italy
C.F. / P.I. 01844360352 – R.E.A. di R.E. 228913 – Reg. Impr. 27689 / 99