EPOS2 Positioning Control Units

Slave version (online commanded)
Single motion and I/O commands from the process control are transmitted to the positioning control unit by a superior system (Master). For that purpose product specific commands are available.

EPOS2 is a modular constructed digital positioning controller. It is suitable for DC and EC motors with incremental encoder with a power range from 1 - 700 watts. A number of operating modes provides flexible application in a wide range of drive systems in automation technology and mechatronics.

Point to point
The "CANopen Profile Position Mode" move the position of the motor axis from point A to point B. Positioning is in relation to the axis Home position (absolute) or the actual axis position (relative).

Interpolated Position Mode (PVT)
Thanks to Interpolated Position Mode, the EPOS2 is able to synchronously run a path specified by interpolating points. With a suitable master, coordinated multi-axis movements as well as any profile in a 1-axis system can be carried out. (PVT = Position and Velocity versus Time)

Position and Speed control with Feed Forward
The combination of feedback and feed forward control provides ideal motion behaviour. Feed forward control reduces control error. EPOS2 supports feed forward acceleration and speed control.

Speed control
In "CANopen Profile Velocity Mode", the motor axis is moved with a set speed. The motor axis retains speed until a new speed is set.
Torque control
In “Current Mode”, a controlled torque can be produced on the motor shaft. The sinusoidal commutation used produces minimum torque ripple.

Homing
The “CANopen Homing Mode” is for referencing to a special mechanical position. There are more than 30 methods available for finding the reference position.

Electronic gearhead
In “Master Encoder Mode”, the motor follows a reference input produced by an external encoder. A gearing factor can also be defined using software parameters. Two motors can be very easily synchronised using this method.

Step/Direction
In “Step/Direction Mode” the motor axis follows a digital signal step-by-step. This mode can replace stepper motors. It can also be used to control the EPOS2 by a PLC without CAN interface.

Analog Commands
In the position, speed and current mode it is possible to give commands via an external analog set value. This function offers further possibilities to operate the EPOS2 without serial on-line commanding.

Capture inputs (Position Marker)
Digital inputs can be configured so that the actual position value is saved when a positive and/or negative edge of an input appears.

Trigger output (Position Compare)
Digital outputs can be configured so that a digital signal is emitted at a set position value.

Dual Loop Position and Speed Control
With an additional sensor the load can be controlled directly and with high precision; the motor control is subordinated. The mechanical play and the elasticity can be compensated.

Wide range of sensors can be handled: digital incremental encoder, SSI absolute encoder, analog incremental encoder (sin/cos). (Only in use with EPOS2 50/5 and EPOS2 70/10.)

Control of Holding Brakes
The control of the holding brake can be implemented in the device state management. There the delay times can be individually configured for switching on and off.

Additional information for technical data of page 330/331
**EPOS2 Positioning control unit**  

Data

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### EPOS2 24/2

Matched with DC brush motors with encoder or brushless EC motors with Hall sensors and encoder up to 48 watts.

### EPOS2 Module 36/2

The EPOS2 is an OEM positioning controller plug-in module for brushed DC motors with encoder or brushless EC motors with Hall sensors and encoder up to 72 watts.

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**Controller versions**

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<table>
<thead>
<tr>
<th>Electrical Data</th>
<th>Slave version</th>
<th>Slave version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage V&lt;sub&gt;CC&lt;/sub&gt;</td>
<td>9 - 24 VDC</td>
<td>11 - 36 VDC (optional 0 - 36 VDC)</td>
</tr>
<tr>
<td>Logic supply voltage V&lt;sub&gt;L&lt;/sub&gt; (optional)</td>
<td>0.9 x V&lt;sub&gt;CC&lt;/sub&gt;</td>
<td>0.9 x V&lt;sub&gt;CC&lt;/sub&gt;</td>
</tr>
<tr>
<td>Max. output voltage</td>
<td>4 A</td>
<td>4 A</td>
</tr>
<tr>
<td>Max. output current I&lt;sub&gt;max&lt;/sub&gt; (&lt;1 s)</td>
<td>2 A</td>
<td>2 A</td>
</tr>
<tr>
<td>Continuous output current I&lt;sub&gt;cont&lt;/sub&gt;</td>
<td>10 kHz</td>
<td>10 kHz</td>
</tr>
<tr>
<td>Sample rate of PI - speed controller</td>
<td>1 kHz</td>
<td>1 kHz</td>
</tr>
<tr>
<td>Sample rate of PID - positioning control</td>
<td>1 kHz</td>
<td>1 kHz</td>
</tr>
<tr>
<td>Max. speed (1 pole pair)</td>
<td>25 000 rpm (sinusoidal); 100 000 rpm (block)</td>
<td>25 000 rpm (sinusoidal); 100 000 rpm (block)</td>
</tr>
<tr>
<td>Built-in motor choke per phase</td>
<td>47 µH / 2 A</td>
<td>10 µH / 2 A</td>
</tr>
</tbody>
</table>

**Input**

- Hall sensor signals: H1, H2, H3
- Encoder signals: A, A’, B, B’, I, I’ (max. 5 MHz)
- Digital inputs: 6 (TTL level)
- Analog inputs: 2
- CAN-ID (CAN node identification): configurable with DiP switch 1…4

**Output**

- Digital outputs: 2
- Analog outputs: 3
- Encoder voltage output: +5 VDC, max. 100 mA
- Hall sensor voltage output: +5 VDC, max. 30 mA
- Auxiliary voltage output: +5 VDC, max. 10 mA
- Interface: RxD, TxD (max. 115 200 bit/s)
- CAN: high; low (max. 1 Mbit/s)
- USB 2.0: Data+, Data- (max. 12 Mbit/s)

**Indicator**

- LED green = READY, red = ERROR
- green LED, red LED

**Ambient temperature and humidity range**

- Operation: -10…+45°C
- Storage: -40…+85°C
- No condensation: 20…80%

**Mechanical data**

- Weight: Approx. 30 g
- Dimensions (L x W x H): 55 x 40 x 19.6 mm
- Mounting threads: Flange for M2.5-screws

**Part Numbers**

- 390003: EPOS2 24/2 for DC motors
- 390438: EPOS2 24/2 for EC motors
- 380264: EPOS2 24/2 for DC/EC motors
- 309687: DSR 50/5 Shunt regulator
- 360665: EPOS2 Module 36/2
- 363407: EPOS2 Module Starter-Kit

**Order accessories separately, see page 339**