Intelligent compact drives
Progress – Shaping the future with decentralized and intelligent technology

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Voltage + fieldbus = positioning

Advantages for the switch cabinet
- No space consumption and no heat emission by the drive electronics
- Simple wiring
  - No EMC-critical motor cables need to be laid
  - Thanks to the extra low voltage supply, all components and connections can be touched
- Absolute position available at any time
  - No reference runs required
  - Reference initiators and associated wiring not necessary
- Easy implementation of machine safety
  - STO (safe torque off) optionally integrated

Tailored to your application
- Broad range of motor and gear variants
- Wide power range from 50 to 600 watts
- Assistance with selection and design by our drive specialists

Advantages for the application software
- Control of different types identical within a fieldbus
- Changeover or mixed operation between PROFIBUS and PROFINET possible with minimum effort
- Example PLC projects available

Problem-free use overseas
- Optionally available as a UL-Recognized Component
Drive technology – Position-controlled compact drive

Everything integrated

Interface

The encoTRive speaks many languages. It speaks the language of your control too.

Absolute encoder

Even if the drive is turned while de-energized, the absolute position is known as soon as the encoder is powered up again – battery-free, with a sturdy mechanical multiturn gear.

Positioning control

Simple to use:
Target and ramp parameters are preset using the fieldbus.
Reliable positioning is handled entirely in the drive.

Power electronics

The necessary power commutation to move the drive quickly and powerfully into position is generated from the extra-low voltage supply.

Motor

Numerous motor sizes and variants are available to suit the wide range of applications.
Whether brush motor or electronically commutated, with or without holding brake.

Gear

To consistently ensure the correct operating point, a wide range of gears with finely graduated reductions is available. Planetary gears - axial or with an angled stage - and worm gears are typical.

Safety

The safety functions STO (safe torque off) or SS1 (safe stop 1) are optionally integrated.
Tailored to your specific application

The individual series are designed for application categories. This means that drives with the optimum scope of performance are available for automation tasks with a wide variety of requirements. The control is identical across all variants within the same fieldbus interface. This saves time and effort in the development of your application software.

### Positioning drive
**EC (brushless)**
- For frequent and dynamic movements

**MP 060 … 180**
- With dynamic motors and simple and cost-efficient gears

**MP 200 … 280, MD 300**
- Highest dynamics, performance and accuracy. Flexibly designed for application-specific adaptations

### Actuating drive
**DC (brush)**
- For occasional movements

**MA 055 … 130**
- Particularly cost-efficient motors with identical gears in comparison to MP 060 … 180, therefore mechanically compatible

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**Decentralized drive technology with encoTRive**

EncoTRive is the brand name for the complete product line. It is derived from the two components "Absolute Encoder and Drive", modified by inserting the company abbreviation TR.
## encoTRive – MP 200

### Positioning drive MP 200

<table>
<thead>
<tr>
<th>Technical data</th>
<th>MP 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage VDC</td>
<td>24</td>
</tr>
<tr>
<td>Nominal torque S1 (S3) Nm</td>
<td>0.40 (1.10)</td>
</tr>
<tr>
<td>Nominal torque S3 (S3) Nm</td>
<td>0.40 (1.10)</td>
</tr>
<tr>
<td>Nominal power S1 (S3) W</td>
<td>91 (178)</td>
</tr>
<tr>
<td>Nominal power S3 (S3) W</td>
<td>182 (357)</td>
</tr>
<tr>
<td>Nominal speed S1 (S3) min⁻¹</td>
<td>2,175 (1,550)</td>
</tr>
<tr>
<td>Nominal speed S3 (S3) min⁻¹</td>
<td>4,350 (3,100)</td>
</tr>
<tr>
<td>Nominal current S1 (S3) A</td>
<td>5.2</td>
</tr>
<tr>
<td>Nominal current S3 (S3) A</td>
<td>4.8</td>
</tr>
<tr>
<td>Inertia torque gcm²</td>
<td>512 (612 with holding brake)</td>
</tr>
</tbody>
</table>

### Electric motor
- Technology: EC, electronically commutated motor
- Protection class: IP 54, motor shaft IP 41

### Encoder
- Technology: Absolute encoder, multi turn
- Positioning resolution: 0.088° / 4,096 steps per revolution
- Positioning range: 65,536 revolutions
- Positioning accuracy: ±0.7° / ±8 steps

### Options
- Holding brake

### Definitions
- **S1**: Continuous operation
- **S3**: Intermittent operation
  - 25 %, 4 min
  - Make time 1 min
  - Cycle time 4 min
  - Max. torque 1.10 Nm

### True absolute encoder
Fail-safe position information through electromechanical principle of measurement
Positioning drive MP 200

The MP 200 features high efficiency and dynamics in a compact size. The available gears can transfer high torques with precise angular accuracy. Numerous variants and reductions are available.

Thanks to its flexible design, the MP 200 is also suitable for the use of special gears or for direct mounting without a gear, e.g. on lifting spindles.

Dimensions [mm]

MP 200, with planetary gear PLE 60

Combination options

- **PLE 60**
  Details on page 16

- **WPLE 60**
  Details on page 16

- **PLE 80**
  Details on page 17

- **WPLE 80**
  Details on page 17

Customer-specific gear / without gear

Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.
**Positioning drive MP 220 / 280**

<table>
<thead>
<tr>
<th>Technical data</th>
<th>MP 220</th>
<th>MP 280</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>VDC</td>
<td>48</td>
</tr>
<tr>
<td>Nominal torque S1 (S2)</td>
<td>Nm</td>
<td>0.40 (1,4)</td>
</tr>
<tr>
<td>Nominal power S1 (S2)</td>
<td>W</td>
<td>167 (586)</td>
</tr>
<tr>
<td>Nominal speed S1 (S2)</td>
<td>min⁻¹</td>
<td>4.000 (4.000)</td>
</tr>
<tr>
<td>Nominal current S1 (S2)</td>
<td>A</td>
<td>4,5 (16)</td>
</tr>
<tr>
<td>Inertia torque</td>
<td>gcm²</td>
<td>360</td>
</tr>
</tbody>
</table>

**Electric motor**
- **Technology**: EC, electronically commutated motor
- **Protection class**: IP 54, motor shaft IP 41

**Encoder**
- **Technology**: Absolute encoder, multi turn
- **Positioning resolution**: 0.088° / 4,096 steps per revolution
- **Positioning range**: 65,536 revolutions
- **Positioning accuracy**: ±0.7° / ±8 steps

**Options**: Holding brake.

**definition**
- **S1**: Continuous operation
- **S2**: short-time operation 2 min

**True absolute encoder**
Fail-safe position information through electromechanical principle of measurement
Positioning drive MP 220 / 280

The MP 280 provides very high efficiency and dynamics in a compact size. The MP 220 can be used in all applications that require a combination of high torque and very short overall length. The available gears can transfer high torques with precise angular accuracy.

Numerous variants and reductions are available. Thanks to their flexible design, the MP 220 and MP 280 are also suitable for the use of special gears or for direct mounting without a gear, e.g. on lifting spindles.

Dimensions [mm]

MP 220/280, with planetary gear PLE 60

Combination options

- **PLE 60**
  - Details on page 16

- **WPLE 60**
  - Details on page 16

- **PLE 80**
  - Details on page 17

- **WPLE 80**
  - Details on page 17

Customer-specific gear / without gear

Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.
## Positioning drive MD 300

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>MD 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>VDC</td>
</tr>
<tr>
<td>Nominal torque S1 (S3)</td>
<td>Nm</td>
</tr>
<tr>
<td>Nominal power S1 (S3)</td>
<td>W</td>
</tr>
<tr>
<td>Nominal speed S1 (S3)</td>
<td>min⁻¹</td>
</tr>
<tr>
<td>Nominal current S1 (S3)</td>
<td>A</td>
</tr>
<tr>
<td>Inertia torque</td>
<td>gcm²</td>
</tr>
<tr>
<td>Electric motor</td>
<td></td>
</tr>
<tr>
<td>_Technology</td>
<td>EC, electronically commutated motor</td>
</tr>
<tr>
<td>_Protection class</td>
<td>IP 54, motor shaft IP 41</td>
</tr>
<tr>
<td>Encoder</td>
<td></td>
</tr>
<tr>
<td>_Technology</td>
<td>Absolute encoder, multi turn</td>
</tr>
<tr>
<td>_Positioning resolution</td>
<td>0.35° / 1,024 steps per revolution</td>
</tr>
<tr>
<td>_Positioning range</td>
<td>65,536 revolutions</td>
</tr>
<tr>
<td>_Positioning accuracy</td>
<td>±0.7° / ±2 steps</td>
</tr>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>Brake chopper</td>
<td>Holding brake, hand-held operator panel</td>
</tr>
<tr>
<td></td>
<td>Power 50 W, pulse energy 35 Ws</td>
</tr>
</tbody>
</table>

### Definitions

- **S1**: Continuous operation
- **S3**: Intermittent operation 25 %, 10 min
  - Make time 2.5 min
  - Cycle time 10 min
  - Max. torque 1.10 Nm

- **True absolute encoder**: Fail-safe position information through electromechanical principle of measurement

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**encoTRive – MD 300**

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Positioning drive MD 300

The MD 300 delivers high performance and dynamics. Digital inputs and outputs can be used for additional tasks and a serial interface enables drive diagnosis even without a connected fieldbus. The available gears can transfer high torques with precise angular accuracy.

Numerous variants and reductions are available. Thanks to its flexible design, the MD 300 is also suitable for the use of special gears or for direct mounting without a gear, e.g. on lifting spindles.

Dimensions [mm]

MD 300, with planetary gear PLE 60

Combination options

- **PLE 60**
  Details on page 16

- **WPLE 60**
  Details on page 16

- **PLE 80**
  Details on page 17

- **WPLE 80**
  Details on page 17

Customer-specific gear / without gear

Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.
## Technical data

<table>
<thead>
<tr>
<th></th>
<th>MP 060</th>
<th>MP 100</th>
<th>MP 140</th>
<th>MP 180</th>
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<tbody>
<tr>
<td><strong>Nominal voltage</strong></td>
<td>VDC</td>
<td>24</td>
<td>24</td>
<td>42</td>
</tr>
<tr>
<td><strong>Nominal torque S1</strong></td>
<td>Nm</td>
<td>0.17</td>
<td>0.26</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Nominal power S1</strong></td>
<td>W</td>
<td>55</td>
<td>84</td>
<td>120</td>
</tr>
<tr>
<td><strong>Nominal speed S1</strong></td>
<td>min⁻¹</td>
<td>3,080</td>
<td>3,090</td>
<td>2,860</td>
</tr>
<tr>
<td><strong>Nominal current S1</strong></td>
<td>A</td>
<td>4.0</td>
<td>5.6</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Inertia torque</strong></td>
<td>gcm²</td>
<td>72</td>
<td>128</td>
<td>172</td>
</tr>
</tbody>
</table>

### Electric motor
- **Technology**: EC, electronically commutated motor with neodymium magnet
- **Protection class**: IP 50

### Encoder
- **Technology**: Absolute encoder, multi turn
- **Positioning resolution**: 0.088° / 4,096 steps per revolution
- **Positioning range**: 65,536 revolutions
- **Positioning accuracy**: ±0.7° / ±8 steps

### Options
- Special voltages for large production series, Safe Torque Off
Positioning drive MP 060…180

Positioning drives MP 060…180 boast an extremely compact design. To ensure precise adaptation to the respective application, different motor outputs and gear variants with numerous gear reductions are available. The brushless motors can also handle continuous dynamic movements. The simple gears make the drives especially suitable for applications in which cost-effectiveness is a crucial factor.

Dimensions [mm]

MP 060…180, with planetary gear PLG 52

Combination options

PLG 52
Details on page 18

SG 80
Details on page 18

PLG 63
Details on page 19

SG 120
Details on page 19

Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.
Actuating drive MA 055 … 130

<table>
<thead>
<tr>
<th>Technical data</th>
<th>MA 055</th>
<th>MA 100</th>
<th>MA 130</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>VDC</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Nominal torque S1</td>
<td>Nm</td>
<td>0.14</td>
<td>0.27</td>
</tr>
<tr>
<td>Nominal power S1</td>
<td>W</td>
<td>44</td>
<td>86</td>
</tr>
<tr>
<td>Nominal speed S1</td>
<td>min⁻¹</td>
<td>3,000</td>
<td>3,050</td>
</tr>
<tr>
<td>Nominal current S1</td>
<td>A</td>
<td>2.7</td>
<td>4.9</td>
</tr>
<tr>
<td>Inertia torque</td>
<td>gcm²</td>
<td>400</td>
<td>750</td>
</tr>
</tbody>
</table>

**Electric motor**
- Technology: DC, brushed motor
- Protection class: IP 50

**Encoder**
- Technology: Absolute encoder, multi turn
- Positioning resolution: 0.088° / 4,096 steps per revolution
- Positioning range: 65,536 revolutions
- Positioning accuracy: ±0.7° / ±8 steps

**Options**
- Special voltages for large production series,
Actuating drive MA 055 … 130

Actuating drives MA 055 … 130 feature an extremely compact design. To ensure precise adaptation to the respective application, different motor outputs and gear variants with numerous reductions are available. The brush motors are particularly advantageous for non-time critical actuating tasks. The simple gears and motors make the drives ideal for applications in which cost-effectiveness is a crucial factor.

Dimensions [mm]

MA 055 … 130, with planetary gear PLG 52

Combination options

PLG 52
Details on page 18

SG 80
Details on page 18

PLG 63
Details on page 19

SG 120
Details on page 19

Illustrations are schematic diagrams. Binding dimension drawings and CAD data for specific order numbers at www.tr-electronic.com or on request.
encoTRive – Precision gear

Precision gear for MP 200 … 280 and MD 300

Planetary gear PLE 60
The PLE 60 is ideal for applications that require high torques and low backlash combined with high efficiency.

- High torque up to 44 Nm (S1) and 70 Nm (S3)
- Low backlash: 10 … 15 arcmin
- High efficiency: 98 … 88 %
- High permissible shaft forces: axial 600 N / radial 500 N

Angular planetary gear WPLE 60
The WPLE 60 is ideal for applications that require high torques and low backlash combined with high efficiency, with an orthogonal output shaft. Four different outlet directions are available.

- High torque up to 44 Nm (S1) and 70 Nm (S3)
- Low backlash: 16 … 21 arcmin
- High efficiency: 95 … 80 %
- High permissible shaft forces: axial 600 N / radial 500 N

### Gear

<table>
<thead>
<tr>
<th>Stages</th>
<th>Reduction</th>
<th>MP 200</th>
<th>MP 220</th>
<th>MP 280</th>
<th>MD 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3, 4, 5, 7, 8, 10</td>
<td>233.2 (267.6)</td>
<td>213.1 (246.1)</td>
<td>244.6 (277.6)</td>
<td>234.2 (268.6)</td>
</tr>
<tr>
<td>2</td>
<td>12, 15, 16, 20, 25, 32, 40</td>
<td>230.2 (263.2)</td>
<td>242.7 (275.7)</td>
<td>232.3 (266.7)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>60, 80, 100, 120</td>
<td>244.8 (279.2)</td>
<td>255.2 (288.2)</td>
<td>244.8 (279.2)</td>
<td></td>
</tr>
</tbody>
</table>

### Dimension A [mm]: Drive variant (with brake)

<table>
<thead>
<tr>
<th>MP 200</th>
<th>MP 220</th>
<th>MP 280</th>
<th>MD 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>35</td>
<td>30</td>
<td>35</td>
</tr>
</tbody>
</table>

**Dimensions [mm]**

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www.tr-electronic.com
Planetary gear PLE 80

The PLE 80 is ideal for applications that require very high torques and low backlash combined with high efficiency.

Angular planetary gear WPLE 80

The WPLE 80 is ideal for applications that require very high torques and low backlash combined with high efficiency, with an orthogonal output shaft. Four different outlet directions are available.

### Planetary gear PLE 80

**Very high torque up to 120 Nm (S1) and 192 Nm (S3)**

**Low backlash:** 9 … 11 arcmin

**High efficiency:** 97 … 84 %

**High permissible shaft forces:** axial 1200 N / radial 950 N

### Angular planetary gear WPLE 80

**Very high torque up to 120 Nm (S1) and 192 Nm (S3)**

**Low backlash:** 15 … 17 arcmin

**High efficiency:** 94 … 72 %

**High permissible shaft forces:** axial 1200 N / radial 950 N

<table>
<thead>
<tr>
<th>Gear</th>
<th>Dimension A [mm]: Drive variant (with brake)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stages</td>
<td>Reduction</td>
</tr>
<tr>
<td>2</td>
<td>12, 15, 16, 20, 25, 32, 40</td>
</tr>
<tr>
<td>3</td>
<td>60, 80, 100, 120, 200, 256</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gear</th>
<th>Dimension B [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stufen</td>
<td>Reduction</td>
</tr>
<tr>
<td>2</td>
<td>12, 15, 16, 20, 25, 32, 40</td>
</tr>
<tr>
<td>3</td>
<td>60, 80, 100, 120, 200, 256</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimension A [mm]: Drive variant (with brake)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 200</td>
</tr>
<tr>
<td>254.1 (288.5)</td>
</tr>
</tbody>
</table>
Simple gear for MA 055...130 and MP 060...180

Planetary gear PLG 52
The PLG 52 is ideal for applications that require medium torques and moderate backlash combined with good efficiency.

- Torque up to 24 Nm (S1)
- Backlash: 0.7…1.5°
- Efficiency: 90…73 %
- Permissible shaft forces: axial 500 N / radial 350 N

Dimensions [mm]

<table>
<thead>
<tr>
<th>Gear</th>
<th>Dimension Maß A [mm]: Drive variant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stages</td>
<td>Reduction</td>
</tr>
<tr>
<td>1</td>
<td>4.5, 6.25, 8</td>
</tr>
<tr>
<td>2</td>
<td>15, 20.25, 28.125, 36, 50</td>
</tr>
<tr>
<td>3</td>
<td>91.125, 126.5625, 162, 225</td>
</tr>
</tbody>
</table>

Worm gear SG 80
The SG 80 is ideal for applications in which an orthogonal output shaft is used with restricted space conditions. It can be designed with a single or double-sided solid shaft or for direct mounting with a hollow shaft. Four different outlet directions are available.

- Torque up to 4 Nm (S1)
- Backlash: 1°
- Efficiency: 70…25 %
- Permissible shaft forces: axial 300 N / radial 350 N

Dimensions [mm]

<table>
<thead>
<tr>
<th>Gear</th>
<th>Dimension Maß A [mm]: Drive variant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction</td>
<td>MA 055</td>
</tr>
<tr>
<td>5, 10, 15, 24, 38, 50, 75</td>
<td>207.9</td>
</tr>
</tbody>
</table>
Planetary gear PLG 63

The PLG 63 is ideal for applications that require high torques and moderate backlash combined with good efficiency.

- High torque up to 100 Nm (S1)
- Backlash: 0.7 … 1.5°
- Efficiency: 90 … 73 %
- High permissible shaft forces: axial 800 N / radial 800 N

Dimensions [mm]

Worm gear SG 120

The SG 120 is ideal for applications that require high torques with an orthogonal output shaft. It can be designed with a single or double-sided solid shaft or for direct mounting with a hollow shaft. Four different outlet directions are available.

- High torque up to 15 Nm (S1)
- Backlash: 0.5°
- Efficiency: 70 … 25 %
- Permissible shaft forces: axial 300 N / radial 500 N

Dimensions [mm]
Integrated safety technology

Drives MP 060…200 PN are also optionally available with integrated safety technology. All drive functions continue to be controlled via the PROFINET interface. In addition, the **STO** (safe torque off) or **SS1** (safe stop 1) function can be triggered via a safe digital input.

**STO (safe torque off)**

In response to a specific trigger or a safety-relevant error, the drive is disconnected from the power, so that no further torque is generated and the motor coasts to a stop if necessary.

**Safe digital input**

Two channels are used, in order to also ensure safe control of the safety function. The correct signals must be present in order for the drive to turn: e.g. two 24 volt signals, depending on the configuration. If one of the two signals fails, this is immediately recognized as a safety-relevant error.

A second possibility is to define the signals non-equivalently: one 24 volt signal and one 0 volt signal. This has the advantage that a possible short-circuit between the signals is also recognized as a safety-relevant error.

Two digital signals are available for confirmation. These indicate whether a safety-relevant error is present and whether the drive is in a safe (powerless) state.

**SS1 (safe stop 1)**

In response to a specific trigger or a safety-relevant error, a safety timer starts. When this has run down the drive is disconnected from the power, so that no further torque is generated and the motor coasts down if necessary. While the safety timer is running down, the drive can be controlled normally and can e.g. be braked in a controlled manner.

**Configuration**

The different configuration options are defined according to the customer’s requirements and set in the factory. This guarantees that the safety function is correctly configured in the system and saves the user the need for onerous setting procedures and separate configuration programs.

**Different selection options include:**

- **STO** or **SS1**
- The desired **SS1** time
- With or without short-circuit monitoring
Customer-specific solutions

Thanks to our expert development team, we are also able to implement special requirements. On this page you will find a selection of our customer-specific developments. Please speak to us about implementing your own application.

MA 025-EN
Extremely cost-efficient format adjuster with proprietary Ethernet protocol.

MC 200-PN
Intelligent screwdriver control for automobile assembly with integrated Profinet interface.

MP 200-PB
With multi-stage gear for extreme torques.

MP 200-AN
Highly dynamic thanks to optical encoder and sealed against the penetration of application-specific media.
Interfaces

PROFINET

The encoTRive drives with PROFINET use the same device profile PROFIdrive V3.0 as PROFIBUS DP. When migrating from PROFIBUS to PROFINET, the control logic and the PZD configuration remain the same. Logical programming adjustments do not occur. The range of PROFIBUS functions is fully integrated into PROFINET. PROFINET offers some additional functions. There is an alarm telegram in case of trouble when the cycle times are too low and there are more addressable nodes.

The projecting is carried out with the same tools used for PROFIBUS. Together with the identical program and processing logic, the change from PROFIBUS to PROFINET is solely a matter of the communication technology.

Features
- no bus termination necessary
- address assignment via software
- the protocol analysis can be done with freely available Ethernet tools (for example with Wireshark™)
- the topology is simplified by star, lines, tree and ring structures as well as arbitrary hybrid forms

Technical Communication Data

<table>
<thead>
<tr>
<th></th>
<th>PROFINET-IO</th>
<th>PROFIBUS - DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of functions</td>
<td>Conformance Class A, Real Time Class 1</td>
<td>DP-V0 and DP-V1</td>
</tr>
<tr>
<td>Device profile</td>
<td>PROFIdrive V3.0, Application Class 3</td>
<td></td>
</tr>
<tr>
<td>Transfer</td>
<td>cyclic (process data), acyclic (alarm and time uncritical parameters)</td>
<td></td>
</tr>
<tr>
<td>Process data configuration</td>
<td>free or over standard protocols</td>
<td></td>
</tr>
<tr>
<td>Max. participants</td>
<td>&gt;1000</td>
<td>max. 96</td>
</tr>
<tr>
<td>Terminating resistance</td>
<td>needless</td>
<td>MD: internal, MP/MA: external</td>
</tr>
</tbody>
</table>
Function blocks for PROFIBUS and PROFINET

The available demo function blocks allow commissioning any drive type without having to know the parameter features and the telegram sequences.

<table>
<thead>
<tr>
<th>Description</th>
<th>CANopen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter PIV</td>
<td>Function block for parameterizing individual parameters using the cyclic PIV channel (parameter identification value)</td>
</tr>
<tr>
<td>Parameter DPV1</td>
<td>Function block for parameterizing individual parameters using the acyclic data channel (DPV1)</td>
</tr>
<tr>
<td>Control PCD</td>
<td>Function block for commissioning and activating the drive using the cyclic PCD channel (processdata)</td>
</tr>
<tr>
<td>Demo Control PCD</td>
<td>Demo program for using the Control PCD function block to cyclically approach two positions in positioning mode</td>
</tr>
</tbody>
</table>

CANopen defines, for distributed industrial automation systems, a standardized protocol based on CAN. All common bit rates are accessible and set over a DIP-switch. The fast exchange of process data uses a process data object (PDO), the access to the entries within the object directory happens over service data object (SDO). All drive specific information is summed up within the object directory.

Features

- installation of the GSD (ML) file within the projecting tool
- positioning and speed control
- cyclic and acyclic communication with PDO/SDO
- free configurable process data telegram according to the communication profile CiA DS 301
- each transmission direction with up to 4 PDOs

CANopen defines, for distributed industrial automation systems, a standardized protocol based on CAN. All common bit rates are accessible and set over a DIP-switch. The fast exchange of process data uses a process data object (PDO), the access to the entries within the object directory happens over service data object (SDO). All drive specific information is summed up within the object directory.

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<thead>
<tr>
<th>Communication profile</th>
<th>CANopen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device profile</td>
<td>CiA DS 301-OP</td>
</tr>
<tr>
<td>Geräteprofil</td>
<td>CiA DSP 402</td>
</tr>
<tr>
<td>Address range</td>
<td>0 … 127</td>
</tr>
<tr>
<td>Address adjustment</td>
<td>hardware, DIP-switch</td>
</tr>
<tr>
<td>Bitrates</td>
<td>10/20/50/100/125/250/500/800/1.000 kBit/s</td>
</tr>
<tr>
<td>Process data configuration</td>
<td>free or over standard protocols</td>
</tr>
<tr>
<td>Terminating resistance</td>
<td>MD: internal, MP/MA: external</td>
</tr>
<tr>
<td>Transfer</td>
<td>cyclic (PDO), acyclic (SDO)</td>
</tr>
</tbody>
</table>
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Absolute encoder, incremental rotary encoder, wire-actuated encoder

Rotary encoders with optical and magnetic scanning function register the precise position in a wide variety of applications and industries. In medical engineering, miniature versions ensure correct positioning while SIL3-approved absolute rotary encoders provide the necessary safety. We offer not only high-quality rotary encoders (from Ø 22 to 160 mm) for almost any application but also comprehensive accessories.

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## Adresses - international

### Headquarters
TR-Electronic GmbH  
Eglishalde 6  
D-78647 Trossingen  
Germany  
Tel.: +49 / 7425 228-0  
Fax: +49 / 7425 228-33  
info@tr-electronic.de  
www.tr-electronic.de

### International

#### Argentina
AEA Aparatos Eléctricos Automáticos S.A.C.I.E.  
Asunción 2130  
AR-1419 Buenos Aires  
Tel.: +54 / 11 - 4574 1155  
Fax: +54 / 11 - 4574 2400  
servicioalcliente@aea.com.ar  
www.aea.com.ar

#### Brazil
Grupo C+Tecnologia  
Rua dos Caetés 601  
CEP - 05419-000  
BR-Perdizes - São Paulo - SP  
Tel.: +55 / 11-2168 655-4  
Fax: +55 / 11-2168 655-5  
cbj@tr-electronic.dk  
www.ctecnologia.com.br

#### Canada
TR Electronic  
P.O. Box 2543, Station B  
CA-London  
Ontario Canada N6A 4G9  
Tel.: +1 / 519-452 1999  
Fax: +1 / 519-452 1177  
custmercare@trelectronic.com  
www.trelectronic.com

#### China
TR-Electronic (Beijing) Co., Ltd.  
Room 717 / 718, Building A2  
Electronic City Science Park  
Jiu Xian Qiao Dong Road No. 9  
Chaoyang District  
CN-100027 Beijing, P.R. China  
Tel.: +86 / 10 - 582 386 55  
Fax: +86 / 10 - 582 372 10  
lu.yu@tr-electronic.de  
www.tr-electronic.com.cn

#### Czech Republic, Slovakia
DEL a.s.  
Biskupský dvůr 1146/7  
Nové Město  
CZ-110 00 Praha 1  
Tel.: +420 / 566 657 100  
Fax: +420 / 566 621 657  
tr-electronic@del.cz  
www.del.cz

#### Denmark
TR-Electronic Danmark ApS  
Hustedgårdvej 22  
DK-8722 Hedensted  
Tel.: +45 / 75 89 06 03  
Fax: +45 / 75 89 06 03  
info@ctecnologia.com.br  
www.ctecnologia.com.br

#### Finland
Sarlin Oy Ab  
P.O. Box 750  
FI-00101 Helsinki  
Tel.: +358 / 10 - 550 4000  
Fax: +358 / 10 - 550 4201  
pasi.torenius@sarlin.com  
www.sarlin.com

#### France
TR-Electronic France SARL  
1 Avenue  
Christian Doppler - Bat 2  
FR-77700 Serris  
Tel.: +33 / 1-64 63 68 68  
Fax: +33 / 1-61 10 17 66  
info@tr-electronic.fr  
www.tr-electronic.fr

#### Germany
TR-Electronic GmbH  
Tragösserstraße 117  
A-8600 Bruck/Mur  
Tel.: +43 / 3862 – 55006 0  
Fax: +43 / 3862 – 55006 33  
info@tr-electronic.at  
www.tr-electronic.at

#### India
Global-Tech (India) Pvt Ltd.  
"INFINITY House", Survey No-85, A-1/4, Lalit Estate, Plot No-7,  
Next to Eminent Building, Near Gananaj Chowk, Baner Road,  
IN-Pune – 411045, Maharashtra  
Tel.: +91 / 20 6744 0033  
Fax: +91 / 20 - 2447 00 86  
info@globaltechindia.com  
www.globaltechindia.com

#### Brazil
Grupo C+Tecnologia  
Rua dos Caetés 601  
CEP - 05419-000  
BR-Perdizes - São Paulo - SP  
Tel.: +55 / 11-2168 655-4  
Fax: +55 / 11-2168 655-5  
cbj@tr-electronic.dk  
www.ctecnologia.com.br

#### Canada
TR Electronic  
P.O. Box 2543, Station B  
CA-London  
Ontario Canada N6A 4G9  
Tel.: +1 / 519-452 1999  
Fax: +1 / 519-452 1177  
custmercare@trelectronic.com  
www.trelectronic.com

#### China
TR-Electronic (Beijing) Co., Ltd.  
Room 717 / 718, Building A2  
Electronic City Science Park  
Jiu Xian Qiao Dong Road No. 9  
Chaoyang District  
CN-100027 Beijing, P.R. China  
Tel.: +86 / 10 - 582 386 55  
Fax: +86 / 10 - 582 372 10  
lu.yu@tr-electronic.de  
www.tr-electronic.com.cn

#### Great Britain
TR-Electronic Ltd.  
4 William House, Old St.  
Michaels Drive  
GB-Braintree Essex CM7 2AA  
Tel.: +44 / 1 371-876 187  
Fax: +44 / 1 371-876 287  
info@tr-electronic.co.uk  
www.tr-electronic.co.uk

#### India
Global-Tech (India) Pvt Ltd.  
"INFINITY House", Survey No-85, A-1/4, Lalit Estate, Plot No-7,  
Next to Eminent Building, Near Gananaj Chowk, Baner Road,  
IN-Pune – 411045, Maharashtra  
Tel.: +91 / 20 6744 0033  
Fax: +91 / 20 - 2447 00 86  
info@globaltechindia.com  
www.globaltechindia.com

#### Israel
Dor Drives Systems 2020 Ltd.  
P.O.Box 6  
IL-4880500 Kibutz Einat  
Tel.: +972 / 3 900 75 95  
Fax: +972 / 3 900 75 99  
info@doreng.co.il  
www.doreng.co.il

#### Japan
SANTEST CO. Ltd.  
1-60 Tsuneyoshi, 1-Chome  
Konohanaku  
J-Osaka 554-8691  
Tel.: +81 / 6-6465 5561  
Fax: +81 / 6-6465 5921  
info@sanest.co.jp  
www.sanest.co.jp

#### Austria
Leuze electronic PTY Ltd.  
Unit 2/843 Mountain Highway  
Bayswater VIC 3153  
Tel.: +61 / 1300 538 933  
Fax: +61 / 3 9738 2677  
sales@leuze.com.au  
www.leuze.com.au

#### China
TR-Electronic (Beijing) Co., Ltd.  
Room 717 / 718, Building A2  
Electronic City Science Park  
Jiu Xian Qiao Dong Road No. 9  
Chaoyang District  
CN-100027 Beijing, P.R. China  
Tel.: +86 / 10 - 582 386 55  
Fax: +86 / 10 - 582 372 10  
lu.yu@tr-electronic.de  
www.tr-electronic.com.cn
Mexico
TR Electronic
P.O. Box 2543, Station B
CA-London, Ontario Canada
N6A 4G9
Tel.: +1/519-452 1999
Fax: +1/519-452 1177
customercare@trelectronic.com
www.trelectronic.com

Republic of Korea
MS Intech Co., Ltd.
B-306 SK Twintech Tower
345-9 Gasan-dong/
Geumcheon-gu
KR-08589 Seoul
Tel.: +82/2-334 0577
Fax: +82/2-862 1591
sales@msintech.com
www.msintech.com

South Africa
Angstrom Engineering (Pty) Ltd.
Sybrand van Niekerk
Business Park Meyerton
19 Tom Muller Road
ZA-1960 Meyerton
Tel.: +27/362 0300
info@angstromeng.co.za
www.angstromgroup.co.za

Thailand
T+R Electronic (Thailand) Co., Ltd.
120/62 Moo 8 Bang Sare
TH-Sattahip, Chonburi 20250
Tel.: +66/38 737 487
Fax: +66/38 737 171
trthailand@trelectronic.co.th
www.trelectronic.co.th

Netherlands
TR-Electronic Benelux
Dorpstraat 18C
NL-5386AM Geffen
Tel.: +31 / 73 844 9600
Mobil: +31 / 6383 28 303
rene.verbruggen@tr-electronic.nl
www.tr-electronic.nl

Russia
Sensotec LLC
Kievskoye highway 22 km
(Moskovskiy settlement)
housing estate 4, building 5,
ofice 505E
RU-108811 Moscow
Tel.: +7/495 181-56-67
Fax: +7/495 181-56-67
info@sensotek.ru
www.sensotek.ru

Spain, Portugal
Intertron Internacional, SL
C/Johannes Gutenberg, 4 y 6
Parque Tecnológico Paterna
ES-46980 Valencia
Tel.: +34/963 758 050
Fax: +34/963 751 022
info@intertron.es
www.intertron.es

Turkey
ÜN İÇ ve DIŞ TİC. MAK.
SAN. LTD. ŞTİ.
Cemal Gürsel Caddesi No: 11/7
TR-35600 Karşıyaka-İZMİR
Tel.: +90/232 382 23 14
Fax: +90/232 382 23 24
info@universa.com.tr
www.universa.com.tr

USA (TR-Electronic)
TR Electronic
200 East Big Beaver Road
Suite 164
US-Troy, MI 48009
Tel.: +1/248-244-2280
Fax: +1/248-244-2283
customercare@trelectronic.com
www.trelectronic.com

Singapore
Globaltec Electronics
(Far East) Pte. Ltd.
50 Bukit Batok Street 23
#06-27 Midview Building
SG-659578 Singapore
Tel.: +65/6267 9188
Fax: +65/6267 8011
janice@globotec.com.sg
www.globotec.com.sg

Switzerland
TR-Electronic SA
14, Ch. Pré-Fleuri
CH-1228 Plan-les-Ouates/Genève
Tel.: +41/22-7 94 21 50
Fax: +41/22-7 94 21 71
info@tr-electronic.ch
www.tr-electronic.ch

SPA
TR Electronic Sweden AB
Djupdalsvägen 10
SE-192 51 Sollentuna
Tel.: +46 / 8-756 72 20
Fax: +46 / 8-756 76-80
info@trelectronic.se
www.trelectronic.se

USA (TRsystems)
TRS Fieldbus Systems, Inc.
666 Baldwin Court
US-Birmingham, MI 48009
Tel.: +1/586 826-9696
Fax: +1/586 826-9697
support@trs-fieldbus.com
www.trs-fieldbus.com

Poland
Stoltronic-Polska Sp.z o.o. Sp.k.
u. Dąbirowskiego 238
P-93-231 Łódź
Tel.: +48/42 649 12 15
Fax: +48/42 649 11 08
stoltronic@stoltronic.pl
www.stoltronic.pl

Slovenia
S.M.M. d.o.o.
Jaskova 18
Sl-2001 Maribor
Tel.: +386/2450 2300
Fax: +386/2450 2302
info@smm.si
www.smm.si

Taiwan
TR-Electronic (Beijing) CO., LTD.
Room 717 / 718, Building A2
Electronic City Science Park
Jiu Xian Qiao Dong Road No. 9
Chaoyang District
CN-100027 Beijing, P.R. China
Tel.: +86/10 - 582 386 55
Fax: +86/10 - 582 372 10
lu.yu@tr-electronic.de
www.tr-electronic.com.cn

Peru
Grupo C+Tecnologia
Rua dos Caetés 601
CEP-05419-000
BR-Perdizes - São Paulo - SP
Tel.: +55/11-2168 6554
Fax: +55/11-2168 6555
info@ctecnologia.com.br
www.ctecnologia.com.br

S. Korea
Republic of Korea
MS Intech Co., Ltd.
B-306 SK Twintech Tower
345-9 Gasan-dong/
Geumcheon-gu
KR-08589 Seoul
Tel.: +82/2-334 0577
Fax: +82/2-862 1591
sales@msintech.com
www.msintech.com

South Africa
Angstrom Engineering (Pty) Ltd.
Sybrand van Niekerk
Business Park Meyerton
19 Tom Muller Road
ZA-1960 Meyerton
Tel.: +27/362 0300
info@angstromeng.co.za
www.angstromgroup.co.za

Thailand
T+R Electronic (Thailand) Co., Ltd.
120/62 Moo 8 Bang Sare
TH-Sattahip, Chonburi 20250
Tel.: +66/38 737 487
Fax: +66/38 737 171
trthailand@trelectronic.co.th
www.trelectronic.co.th

Netherlands
TR-Electronic Benelux
Dorpstraat 18C
NL-5386AM Geffen
Tel.: +31 / 73 844 9600
Mobil: +31 / 6383 28 303
rene.verbruggen@tr-electronic.nl
www.tr-electronic.nl

Russia
Sensotec LLC
Kievskoye highway 22 km
(Moskovskiy settlement)
housing estate 4, building 5,
ofice 505E
RU-108811 Moscow
Tel.: +7/495 181-56-67
Fax: +7/495 181-56-67
info@sensotek.ru
www.sensotek.ru

Spain, Portugal
Intertron Internacional, SL
C/Johannes Gutenberg, 4 y 6
Parque Tecnológico Paterna
ES-46980 Valencia
Tel.: +34/963 758 050
Fax: +34/963 751 022
info@intertron.es
www.intertron.es

Turkey
ÜN İÇ ve DIŞ TİC. MAK.
SAN. LTD. ŞTİ.
Cemal Gürsel Caddesi No: 11/7
TR-35600 Karşıyaka-İZMİR
Tel.: +90/232 382 23 14
Fax: +90/232 382 23 24
info@universa.com.tr
www.universa.com.tr

USA (TR-Electronic)
TR Electronic
200 East Big Beaver Road
Suite 164
US-Troy, MI 48009
Tel.: +1/248-244-2280
Fax: +1/248-244-2283
customercare@trelectronic.com
www.trelectronic.com

Singapore
Globaltec Electronics
(Far East) Pte. Ltd.
50 Bukit Batok Street 23
#06-27 Midview Building
SG-659578 Singapore
Tel.: +65/6267 9188
Fax: +65/6267 8011
janice@globotec.com.sg
www.globotec.com.sg

Switzerland
TR-Electronic SA
14, Ch. Pré-Fleuri
CH-1228 Plan-les-Ouates/Genève
Tel.: +41/22-7 94 21 50
Fax: +41/22-7 94 21 71
info@tr-electronic.ch
www.tr-electronic.ch

USA (TRsystems)
TRS Fieldbus Systems, Inc.
666 Baldwin Court
US-Birmingham, MI 48009
Tel.: +1/586 826-9696
Fax: +1/586 826-9697
support@trs-fieldbus.com
www.trs-fieldbus.com

Poland
Stoltronic-Polska Sp.z o.o. Sp.k.
u. Dąbirowskiego 238
P-93-231 Łódź
Tel.: +48/42 649 12 15
Fax: +48/42 649 11 08
stoltronic@stoltronic.pl
www.stoltronic.pl

Slovenia
S.M.M. d.o.o.
Jaskova 18
Sl-2001 Maribor
Tel.: +386/2450 2300
Fax: +386/2450 2302
info@smm.si
www.smm.si

Taiwan
TR-Electronic (Beijing) CO., LTD.
Room 717 / 718, Building A2
Electronic City Science Park
Jiu Xian Qiao Dong Road No. 9
Chaoyang District
CN-100027 Beijing, P.R. China
Tel.: +86/10 - 582 386 55
Fax: +86/10 - 582 372 10
lu.yu@tr-electronic.de
www.tr-electronic.com.cn