

# DIS-2 series Decentralised servo drive



Connection types



Software tools



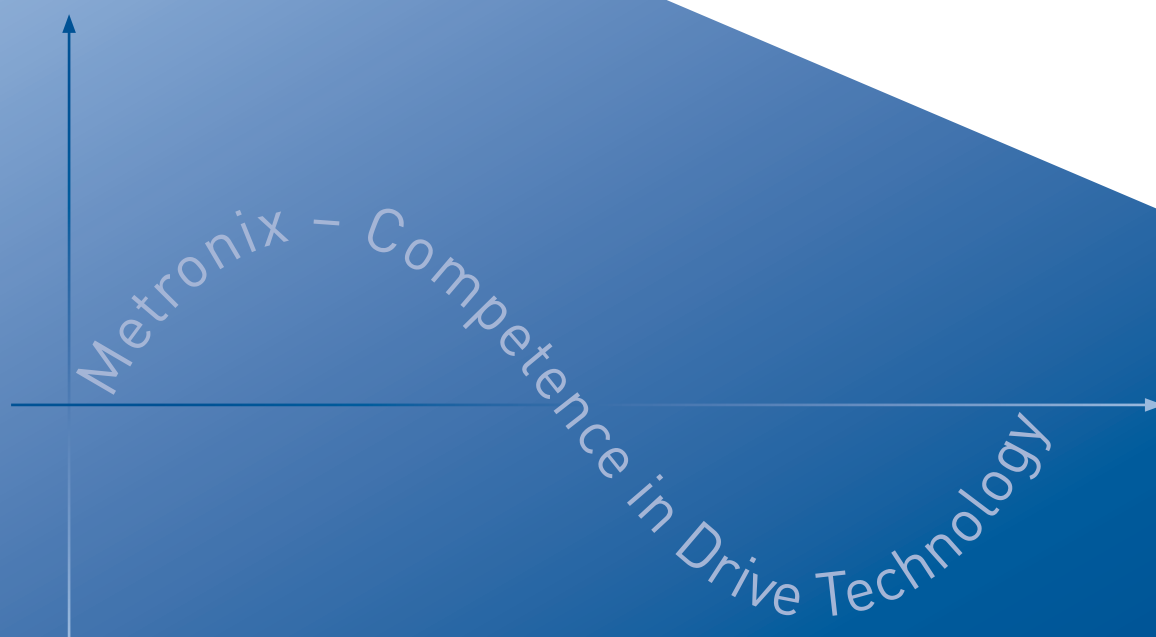
→ Universal in applications

→ Rugged in use

→ Flexible in the connection of motors and fieldbuses



- ▶ has developed, produced, and distributed innovative drive technology for industrial machines and automotive applications for more than 30 years with the focus placed on intelligent servo drives.
- ▶ with its highly-qualified staff finds an optimal solution for your application.
- ▶ stands for universal products with open standards. They are flexible and can be easily adapted to a number of different applications.
- ▶ is part of the Apex Tool Group, LLC, which is headquartered in Sparks, Maryland, USA. The Apex Tool Group has more than 8,000 employees in over 30 countries worldwide.






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## Metronix – openconcepts

### openconcepts

- ▶ Stands for universal interfaces, open standards, and modular extension options for our products that enable maximum flexibility in machinery concepts.
- ▶ Intelligent drive solutions require optimised concepts. Together with you, our experts develop the perfect drive solution for your application. We can use our series products or something unique to create the solution that precisely meets your requirements.
- ▶ For our engineers, this means more than just supporting our products. It means being open to your questions. Our experts help you to analyse an application and advise and help with its adjustment and the selection of the required components.
- ▶ We develop long-lasting business relationships through close and confident co-operation with our customers.

<b>Universal motor control</b>	▶ Synchronous motors
<b>Universal encoder interface</b>	<ul style="list-style-type: none"> <li>▶ Resolver, high control quality due to extremely good sensor technology</li> <li>▶ Analogue and digital incremental encoder with commutation signals</li> <li>▶ High resolution Stegmann incremental encoders, absolute encoders with HIPERFACE®</li> </ul>
<b>Universal connectivity to different fieldbuses via a universal configuration tool:</b>	<p>Fast drive parameterisation with the comfortable configuration tool DIS-2 ServoCommander®.</p>   

# Advantages

The number of applications with decentralised servo drive technology is growing constantly and there is good reason for it. The decentralised servo drive DIS-2 provide a set of advantages that range from machine/automation system planning, machine/automation system assembly and commissioning to the use in the particular application.



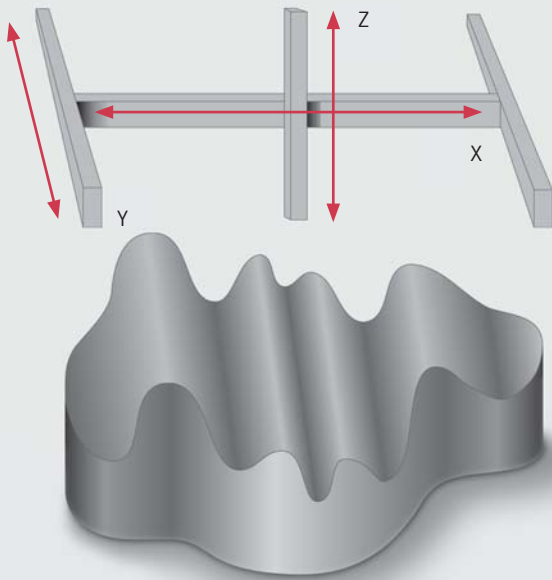
## Advantages of the decentralised servo drive technology

- ▶ Technologically speaking, the DIS-2 is in spite of its small size a **fully fledged servo drive**. It can be used for simple applications such as speed, torque, and positioning control and likewise in drive and controlled applications. The DIS-2 can **synchronise with the master cycle of a control** and supports applications where a multi-axis coordinated and interpolated position mode is required.
- ▶ The major advantage of the decentralised servo drive technology is the motor-controller-configuration. Since the electronic system is **directly mounted on the motor**, expensive shielded motor and encoder cables are not required.
- ▶ Further advantages result from the **decentralised configuration of the drive**. The servo drive DIS-2, including the motor, is located outside of the control cabinet and **saves thereby on expensive control cabinet space**. Furthermore, the power loss of the drive unit is emitted outside of the control cabinet. This leads to **lower investment and operating costs** for the cooling of the control cabinet.
- ▶ In spite of the rugged design of the DIS-2 (up to IP67 is possible), you do not have to do without the familiar comfort during the installation, commissioning, and service of the device. The DIS-2 is equipped with **commercial plug-in connectors for a fieldbus connection** as well as a separate **service interface**. **This ensures the fast and economical installation of the device.**
- ▶ **From an economic point of view, the late assembly of the decentralised servo drive equipment also has a positive effect on the capital tie-up.** In contrast to control cabinet servo drives, which are tied-up capital from the beginning of the control cabinet manufacturing, the decentralised servo drive systems are **not installed until shortly before the completion of a machine**. As a result, the capital tie-up is extremely short.
- ▶ **By means of a synchronised drive unit**, consisting of the motor and servo drive, the frequently time-consuming motor commissioning process is not necessary. The drive unit is purchased completely installed and parameterised, ready for the integration into the automation system.

### Advantages at a glance:

- ▶ Saving of control cabinet space
- ▶ Reduced control cabinet cooling
- ▶ Saving of 70% of the cables compared to conventional cabling
- ▶ Low capital tie-up
- ▶ Synchronised motor-servo drive unit
- ▶ Fully fledged servo drive in a compact and rugged design

# Features



Interpolated position mode



DIS-2 with an integrated brake resistor

## Flexible

### Can be mounted to various motor types

- ▶ Synchronous motors
- ▶ Brushless DC motors
- ▶ DC motors with brushes

### Evaluation with several feedback encoders

- ▶ Hall sensors (analogue and digital)
- ▶ Resolvers
- ▶ Single, multi-turn absolute-value encoders with HIPERFACE®
- ▶ Incremental encoders (with Hall sensors)

### Versatile fieldbus options

- ▶ CANopen
- ▶ PROFIBUS
- ▶ EtherCAT

## Intelligent

- ▶ Speed, torque and positioning control
- ▶ Point-to-point positioning and interpolated position
- ▶ Integrated sequence control

## Safe

- ▶ Optional integrated safety function STO according to DIN EN ISO 13849-1, Kategorie 3 / PL e

## Rugged

- ▶ High protection (up to IP67)
- ▶ EMC improved metal plug connectors
- ▶ Plug-in connectors for RS232 and fieldbus cascading

The fully digital DIS-2 servo drive can be easily integrated into decentralised drive concepts at a favourable price. Its compact design allows direct mounting to the motor, which reduces the wiring to a minimum. Neither a control cabinet nor additional RFI suppression is required. They are controlled via I/O, RS232, or fieldbus. CANopen is available as a standard for all DIS-2 variants. Alternatively, the DIS-2 FB can be provided with PROFIBUS or EtherCAT. Because of the shortest connection between the motor and servo drive, the wiring is minimised and a cabinet or additional EMC interference elimination are not necessary. Several DIS-2 FB can be economically networked by using two plugs for bus IN/bus OUT. The fieldbus is simply and directly cascaded from one DIS-2 FB to the next.

# Overview of the DIS-2 product family

## Decentralised intelligent servo drive DIS-2

### Extra-low voltage 48 VDC

DIS-2 48/10  
Available fieldbus:  
▶ CANopen

DIS-2 48/10 FB  
Available fieldbuses:  
▶ CANopen  
▶ PROFIBUS  
▶ EtherCAT

### Low voltage 230 VAC

DIS-2 310/2 FB  
Available fieldbuses:  
▶ CANopen  
▶ PROFIBUS  
▶ EtherCAT



with 16 pin  
crimp connector



with 18 pin  
terminal connector and  
plug-in connector  
bus IN/bus OUT and RS232



with 22 pin  
terminal connector and  
plug-in connector  
bus IN/bus OUT and RS232



# NEW with STO functionality

## Extra-low voltage 48 VDC

### DIS-2 48/10 FB FS STO

Available fieldbuses:

- ▶ CANopen
- ▶ PROFIBUS
- ▶ EtherCAT



## Low voltage 230 VAC

### DIS-2 310/2 FB FS STO

Available fieldbuses:

- ▶ CANopen
- ▶ PROFIBUS
- ▶ EtherCAT



# STO

The integrated safety function STO, Safe Torque Off, meets the requirements according to EN ISO 13849-1, PL e / Category 3. The STO functionality, integrated in the

decentralised servo drive DIS-2, permits an all-round slim and economic machine design for machine and plant engineering in consideration of risk reduction and safety technology.



DIS-2  
mounted  
to servo motor



with 18 pin  
terminal connector and  
plug-in connector  
bus IN/bus OUT and RS232



Example:  
DIS-2 with adapter  
plate and STO  
connection



with 22 pin  
terminal connector and  
plug-in connector  
bus IN/bus OUT and RS232

# Technical data DIS-2 48/10

Range \ Type	DIS-2 48/10	DIS-2 48/10 FB	DIS-2 48/10 FB FS STO
<b>Admissible temperature ranges</b>	Storage temperature: -25 °C to +70 °C		
	Operating temperature: 0 °C to +50 °C +50 °C to +70 °C at reduced power 2% / K Temperature switch-off at approx. 80 °C		
<b>Admissible installation height</b>	Mounting height maximum 2000 m above m.s.l., above 1000 m above m.s.l. with power reduction 1 % per 100 m		
<b>Humidity</b>	Rel. humidity up to 90%, non-condensing		
<b>Protection degree</b>	IP54, depending on the type of installation up to IP67		
<b>Protection class</b>	III		
<b>Pollution degree</b>	2		
<b>CE conformity: Low voltage directive: EMC directive:</b>	Not applicable Directive 2004/108/EG (Standard DIN EN 61800-3)		
<b>Inputs</b>	maximum: 10 DIN (24 V) 2 AIN (± 10 V, 12 bit, differential)		
<b>Outputs</b>	maximum: 3 DOUT (24 V) 1 DOUT for holding brakes 1 AOUT (0...10 V, 8 bit)		
<b>Voltage supply</b>	0...60 VDC (48 VDC <sub>rated</sub> , 15 A <sub>rated</sub> )		
<b>Control voltage</b>	24 VDC (± 20 %), 0.20 A <sup>1)</sup> , internally protected by a poly-switch triggers at approx. 1 A		
<b>Clock frequency</b>	10 kHz / 20 kHz		
<b>Output power</b>	500 VA		
<b>Max. output power for 2 s</b>	1500 VA		
<b>Rated output current</b>	15 A <sub>rms</sub>		
<b>Max. output current for 2 s</b>	40 A <sub>rms</sub>		
<b>Brake chopper (integrated)</b>	-	U <sub>chop</sub> 63 V	
<b>Brake resistor (optional)</b>	5 Ω, can be screw-fastened to the mounting plate		
<b>Continuous / pulse output brake resistor</b>	-	30 W / 750 W	
<b>Holding brake</b>	24 VDC, max. 700 mA		
<b>Dimensions of the basic unit (W × H × D)<sup>2)</sup></b>	56 × 80 × 112 mm		
<b>Weight</b>	0.5 kg		
Order numbers and accessories	DIS-2 48/10	DIS-2 48/10 FB	DIS-2 48/10 FB FS STO
<b>CANopen</b>	<b>9019-0248-00</b>	<b>9019-0248-03</b>	<b>9019-0248-13</b>
<b>PROFIBUS</b>	-	<b>9019-0248-04</b>	<b>9019-0248-14</b>
<b>EtherCAT</b>	-	<b>9019-0248-05</b>	<b>9019-0248-15</b>
<b>Accessories:</b> Brake resistor 5 Ω	-	9519-0001-00	
Set of mating connectors (X1)	9019-0200-00	9019-3120-01	
Set of mating connectors (X2, X3, X301-X303)	9019-0210-01		
RS232 connecting cable	-	9019-0221-00	
Operator panel including cable	9019-0300-00	9019-0320-00	
Parameter setting program DIS-2 ServoCommander®	9019-0900-00		



# Technical data DIS-2 310/2 FB

Range \ Type	DIS-2 310/2 FB	DIS-2 310/2 FB FS STO
<b>Admissible temperature ranges</b>	Storage temperature:	-25 °C to +70 °C
	Operating temperature (Housing):	0 °C to +80 °C Temperature switch-off at approx. 85 °C
	Ambient temperature at nominal power:	0 °C to +30 °C With power derating respectively output current derating of 3 % / K from 30 °C
<b>Admissible installation height</b>	Mounting height maximum 2000 m above m.s.l., above 1000 m above m.s.l. with power reduction 1 % per 100 m	
<b>Humidity</b>	Rel. humidity up to 90%, non-condensing	
<b>Protection degree</b>	IP54, depending on the type of installation up to IP67	
<b>Protection class</b>	I	
<b>Pollution degree</b>	2	
<b>CCE conformity: Low voltage directive: EMC directive:</b>	Directive 2006/95/EG (Standard EN 61800-5-1) Directive 2004/108/EG (Standard EN 61800-3) (with external line filter, for example Epcos B84111)	
<b>Inputs</b>	maximum:	10 DIN (24 V) 2 AIN (± 10 V, 12 bit, differential)
<b>Outputs</b>	maximum:	3 DOUT (24 V) 1 DOUT for holding brake 1 AOUT (0...10 V, 8 bit)
<b>Voltage supply</b>	1 × 230 VAC [± 10 %], approx. 2.0 A	
<b>Control voltage</b>	24 VDC [± 20%], 0.20 A <sup>1)</sup> , internally protected by a poly-switch, triggers at approx. 1 A	
<b>Clock frequency</b>	10 kHz	
<b>Output power</b>	300 W	
<b>Rated output current</b>	2 A <sub>rms</sub>	
<b>Max. output current 1 s</b>	6 A <sub>rms</sub>	
<b>Brake chopper (integrated)</b>	U <sub>chop</sub> 390 V	
<b>Brake resistor (optional)</b>	100 Ω, can be screw-fastened to the mounting plate	
<b>Continuous / pulse output brake resistor</b>	30 W / 1450 W	
<b>Holding brake</b>	24 VDC, max. 700 mA	
<b>Dimensions of the basic unit (W × H × D)<sup>2)</sup></b>	56 × 80 × 112 mm	
<b>Weight</b>	0.55 kg	
Order numbers and accessories	DIS-2 310/2 FB	DIS-2 310/ 2 FB FS STO
<b>CANopen</b>	<b>9019-3103-00</b>	<b>9019-3103-10</b>
<b>PROFIBUS</b>	<b>9019-3103-04</b>	<b>9019-3103-14</b>
<b>EtherCAT</b>	<b>9019-3103-05</b>	<b>9019-3103-15</b>
<b>Accessories:</b>		
Brake resistor 100 Ω	9519-0002-00	
Set of mating connectors (X1)	9019-3120-01	
Set of mating connectors (X2, X3, X6)	9019-3120-02	
RS232 connecting cable	9019-0221-00	
Operator panel including cable	9019-0330-00	
Parameter setting program DIS-2 ServoCommander®	9019-0900-00	

<sup>1)</sup> Plus the supply current of the optional holding brake of 0.7 A

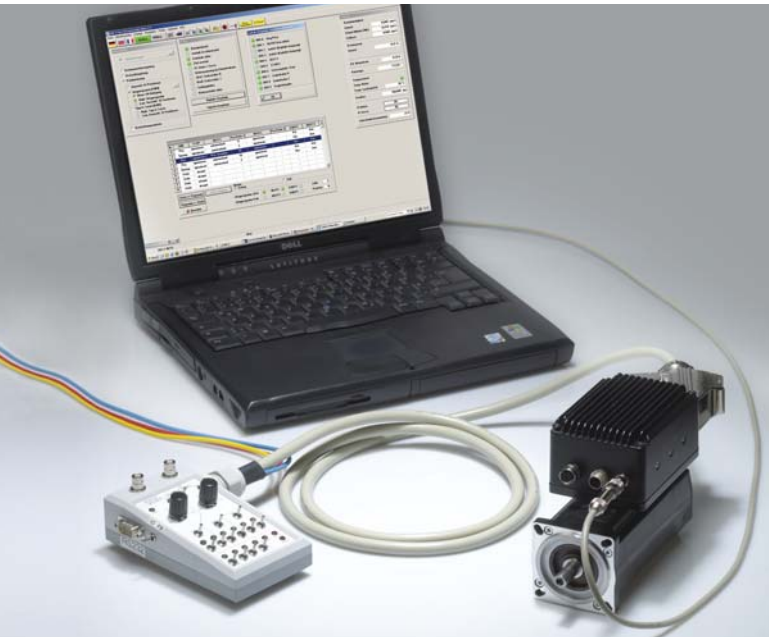
<sup>2)</sup> Without a mating connector and mounting plate

# Parameter setting program

## DIS-2 ServoCommander®

Order number

9019-0900-00



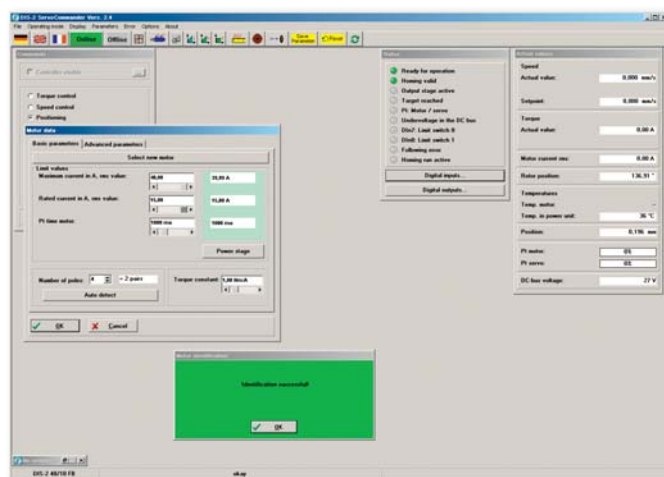
### Easy commissioning

- ▶ Parameter setting with DIS-2 ServoCommander®
- ▶ Configuration of all the parameters
- ▶ Integrated oscilloscope functionality
- ▶ Automatic motor identification

### Further accessories

- ▶ User-friendly operating unit for commissioning and diagnostics including pre-cut connection cable
- ▶ RS232 cable to connect the PC to the DIS-2 FB
- ▶ Single-phase supply unit for DIS-2 48/10
- ▶ Internal brake resistor for DIS-2 FB

Run the drive within the shortest time.

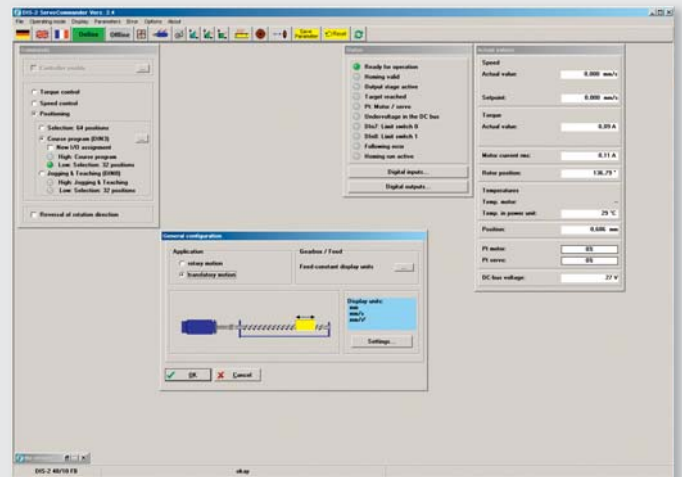


### Automatic motor identification

The commissioning of the servo drive can be carried out within a very short time without reading the manual.

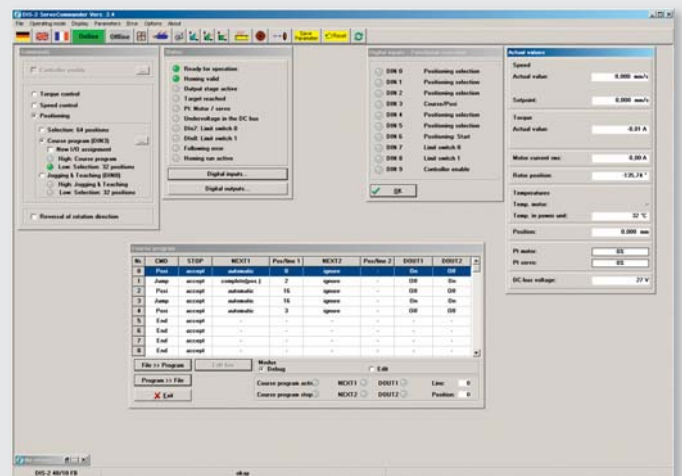
## Graphic visualisation

Pictures and overview graphics help the user to quickly and easily understand the program. All drive-specific settings can be changed by clicking the menu bar.



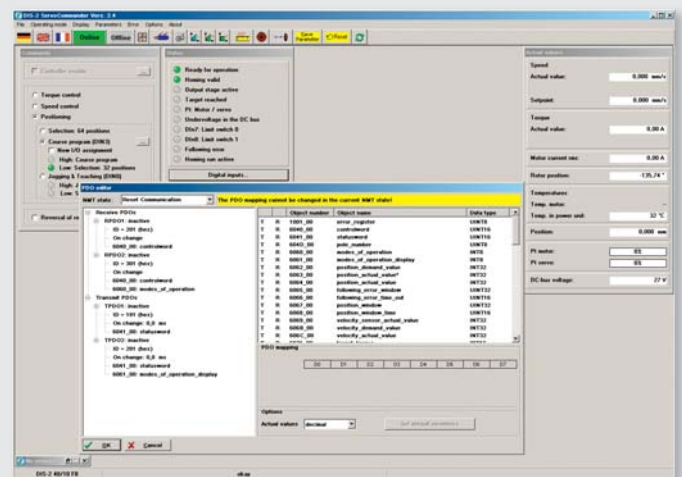
## Multilingual plain text

All windows and parameters are described in plain text. Difficult code lists are no longer required.



## Modern fieldbus configurators

The use of modern fieldbus configurators guarantees an easy and fast fieldbus connection.





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