

smart ideas
for **great** projects

DIS-2

Decentralized
servo drives



metroniX
servo drives



> AUTOMOTIVE

> ENERGY

> FACTORY AUTOMATION

metronix

servo drives

Innovation, sustainability and the passion of further improving high-quality products is motivating the company Metronix for more than 30 years. As a pioneer in the field of servo drive technology, Metronix has a host of experience. With our servo drives we deliver an important component for modern factory automation and many other areas.

When applications require highest dynamics, precision and power reserves, the Metronix products are in use. More than 70,000 servo drives are leaving the plant in Braunschweig every year. The focus is on central switch cabinet servo drives and decentralize servo drives.

All products are built-up on a main hardware platform and, based on the Metronix standard devices, can be quickly adapted to customer-specific requirements. This customizing offers the user a high level of freedom. Motivated teams in all areas ensure the future success. Embedded in the worldwide operating Apex Tool Group with more than 8,000 employees in 30 countries Metronix is supporting its customers with the global sales and service structure.

The future is smart and decentralized

Direct integration of drive components into the machine is one of the basic requirements for modular machine and drive concepts. Today intelligent servo drives are the backbone of modern machines. These drives take on format changes or dynamic changes in the motion profile. This reduces the changeover times of machines. However, the increasing number of servo drives in the machines automatically leads to ever larger control cabinet units and unproductive areas in the entire value chain.

Today, users are facing major challenges, as product life cycles in almost all industries are getting shorter. The existing production lines are continuously adapted to new tasks and supplemented by new, more flexible processing stations. These necessary expansions can be made much faster and more cost-effective by a consistent modularization. Metronix has contributed its long-term experiences into the development of high-performance DIS-2 servo drives. The DIS-2 platform consists of a 48 V DC and a 230 V AC variant with different specifications to the connectivity of the motor and encoder connections. The compact drives with high degree of protection for rough environmental conditions can be mounted directly onto the motor. This turns a normal motor into an intelligent and smart machine component that can be quickly adapted to different conditions and assembly situations.

Smart ideas for great projects

To visualize the extreme performance of the DIS-2 servo drive, we have chosen an example from the nature. The ant can move items that exceed a multiple of its own body weight. Just like the decentralized DIS-2 servo drive that moves for example a machine tool, a packaging machine or a robot precisely, dynamically and controlled. This is an important component for your future and current projects. In this way, together with you, we want to sum up your ideas to big, new projects.





Model variants



with 16 pin crimp plug



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

DIS-2-MOUNT

Pure flexibility – for decentralized DRIVE

The DIS-2-MOUNT is very easy to mount on any servo motor by the universal Metronix adapter plate system. This turns a „standard“ servo motor to a decentralized intelligent servo drive.

Now, the complete compact electronic unit is housed, where normally the motor terminal box or the motor power and encoder plugs connect the motor to the servo drive. This saves space in the control cabinet and also expensive shielded cables incl. the installation effort. The DIS-2 is connected to the required power supply of 230V AC or 48 V DC and receives the drive commands directly via field bus interface or the I/O level and performs your drive tasks.

- › Power section supply: 48 V DC or 230 V AC (depending on the version)
- › Three modes of operation: speed-, torque- and position control
- › Compact five-sided closed EMC-optimized metal housing – protection degree IP54 to IP67 possible
- › High control accuracy through high-grade current measurement
- › Integrated universal encoder interface for following encoders:
 - › Resolver
 - › Analogue hall encoders with SIN-/COS-signals
 - › High resolution Stegmann incremental encoder, absolute encoder with HIPERFACE®
 - › Six Step hall encoders
 - › Incremental encoder with commutation signals
- › Connectivity via CANopen, EtherCAT or PROFIBUS to a superordinate PLC
- › Integrated position control according to CiA DS402 standard
- › Integrated path program for simple automatic processes
- › Integrated driver stage for 24 V DC holding brakes
- › Integrated brake chopper
- › I²t-observation for the protection of power stage and motor
- › Automatic motor identification
- › Variable DIN / DOUT configuration
- › Two variable 12-bit analogue inputs
- › Variable 8-bit analogue outputs
- › User-friendly parameterization with the PC-Program DIS-2 ServoCommander®





Model variants



with 16 pin crimp plug



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

DIS-2-CORD

The robust kind for decentralized DRIVE

The DIS-2-CORD can be adapted very easily to different mounting requirements by the robust mounting plate. Due to the high degree of protection, the DIS-2-CORD version adapts to every assembly situation.

Via the EMC-optimized metal circular connectors the required cables (CORD) are connected to the servomotor, power supply and other system components.

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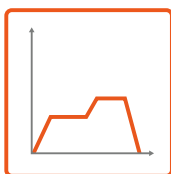


Technology & Connectivity

DIS-2 the drive all-rounder

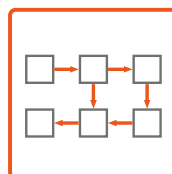
Numerous integrated technology functions make the decentralized DIS-2 servo drive a real all-rounder in drive technology.

Thus, the DIS-2 servo drives not only support numerous motor types and many common position encoders, but also a large number of application tasks can be implemented extremely flexible via simple parameterization of the integrated technology functions. The precise and highly accurate evaluation of external signals in the drive achieves the shortest possible cycle times for your application. The connectivity options of the DIS-2 for communication and encoder interfaces offer a high standard in the decentralized market segment for your drive tasks.



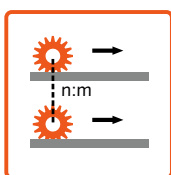
› Positioning

Whether linear, jerk-free or torque-limited: With the integrated positioning control every motion task can be easily realised.



› Path program/Chaining

An integrated path program editor with up to 32 rows is available. This allows an interconnection between position sets to solve complex positioning tasks without PLC. Moreover situation-related branches are possible e.g. via digital inputs.



› Electronic gear / Synchronization

The position- or speed-synchronous motion of various drives with variable gear ratios can be quickly parameterized via the software assistant.



› SAFETY configuration

An additional pop-up menu allows a very comfortable check of the safety status for the application.

PRECISION

Encoder interfaces

DIS-2 ready for IoT



> CANopen

The CANopen interface is provided according to the CAN in Automation (CiA) protocol DS301 with the application profile DSP402.



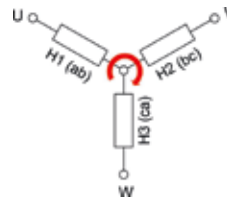
> EtherCAT

The EtherCAT interface supports the CoE-protocol (CANopen over EtherCAT) by the FPGA Image ESC10. Characteristics: EtherCAT according to IEEE-802.3u (100Base-TX) with 100Mbps (full-duplex).



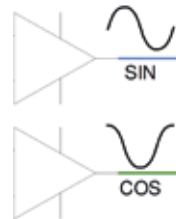
> PROFIBUS

The PROFIBUS-communication is performed according to DP-V0. Functions based on PROFIDRIVE version 3.1 are available for drive technology applications.



> Hall sensors (Six Step)

In order to realize cost-sensitive applications, we also support this type of feedback system.



> Analogue hall sensors

As another cheap alternative, with good angle accuracy of rotor position, the connection of analogue hall sensors is also possible.



> HIPERFACE®

Our decentralized unit supports high resolution Stegmann-incremental encoders or absolute encoders with HIPERFACE interface.



> Incremental encoders with commutation signals

The standard quadrature evaluation of the A,B,N tracks is also possible. In conjunction with six-step commutation signals, here a high-quality motor control can be guaranteed.



> Resolver

The support of the most frequently used encoder system for synchronous servomotors is guaranteed.

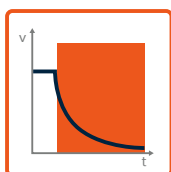
SAFETY

Safety

Functions for safe sequences

Short cycle times, maximum accuracy and productivity – this is what machine users demand from a decentralized servo drive in a modern and innovative factory.

Lifting, lowering and positioning: The DIS-2 enables a smooth material flow in modern, efficient conveyor systems with connection to up- and down stream systems. Intelligent, driverless, self-sufficient transport systems that carrying independently piece goods from the loading point to the destination place complement the complex drive tasks. In addition to these high demands on drive performance, the safety of the operating staff must never missed out. Thus, the basic safety features are supported by the DIS-2.



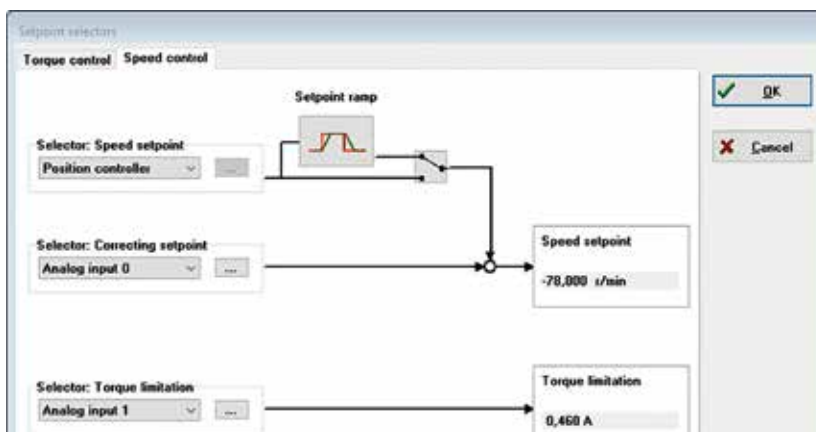
› STO - Safe Torque Off

Disconnection of the energy supply to the drive according to EN 61800-5-2. This safety function ensures that the drive can no longer be supplied with energy and thus no torque is generated to prevent an unwanted startup.



Visualization

The setup software Metronix DIS-2 ServoCommander® allows a quick and easy configuration of the servo drive. Automatic commissioning functions and step-by-step wizards allow the parameterization even without having expert know-how. Thanks to the graphical visualization of the current operating status of the servo drive also complex correlations can be recognized at a glance.



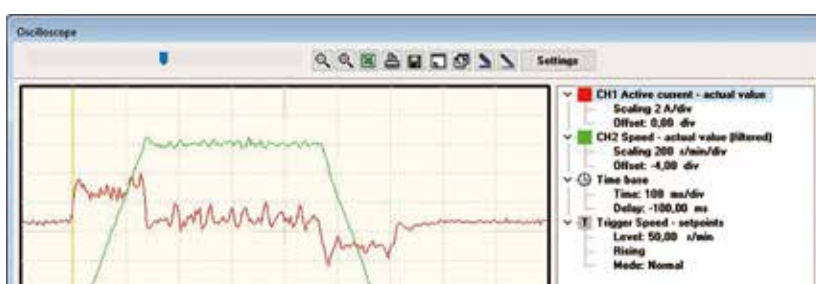
› Setpoint selection

Via the graphical interface of the DIS-2 ServoCommander®, the required set point selectors can be assigned quickly and easily and selected via drop-down menus. With speed control, the chosen selector can be routed via a ramp generator whose ramps can be parameterized directional in acceleration and braking time. Furthermore, an additional torque limitation can be selected.

Object number	Object name	Data type
T R 1001_00	error_register	UINT8
T R 202F_07	synchronization_main	UINT16
T R 6040_00	controlword	UINT16
T R 6041_00	statusword	UINT16
T R 6040_00	pole_number	UINT8
T R 6060_00	modes_of_operation	INT8
T R 6061_00	modes_of_operation_display	INT8
T R 6062_00	position_demand_value	INT32
T R 6063_00	position_actual_value	INT32
T R 6064_00	position_actual_value	INT32
T R 6065_00	following_error_window	UINT32
T R 6066_00	following_error_time_out	UINT16
T R 6067_00	position_window	UINT32
T R 6068_00	position_window_time	UINT16
T R 6069_00	velocity_sensor_actual_value	INT32
T R 6060_00	velocity_demand_value	INT32

› PDO-Editor

The connection to a superordinate control system can be easily performed by „drag and drop" using a comfortable editor. Furthermore the NMT-status of the servo drive can be influenced via drop-down menu at this point.



› Oscilloscope function

The oscilloscope function integrated in the parameterization program allows the display of signal curves and digital states as well as the optimization of physical parameters.

Technical data

Decentralized servo drive DIS-2

» DIS-2 48/10 FB

Features	DIS-2 48/10	DIS-2 48/10 FB	DIS-2 48/10 FB FS STO
Admissible temperature ranges	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. 85 °C		
Admissible installation height	Mounting height maximum 2000 m above msl, above 1000 m above msl with power reduction 1 % per 100 m		
Humidity	Rel. humidity up to 90 %, not bedewing		
Protection degree	IP54, depending on the type of installation up to IP67		
Protection class	III		
Pollution degree	2		
CE conformity low-voltage directive: EMC directive:	Not applicable Directive 2004/108/EG (Standard EN 61800–3)		
Inputs	maximum: 10 DIN (24 V), 2 AIN (± 10 V, 12 Bit, differential)		
Outputs	maximum: 3 DOUT (24 V), 1 DOUT for holding brake, 1 AOUT (0...10 V, 8 Bit)		
Voltage supply	0...60 V DC (48 V DC _{rated} / 15 A _{rated})		
Control voltage	24 V DC [± 20 %], 0.20 A ¹⁾ , internally protected with poly-switch, triggered at approx. 1 A		
Clock frequency	10 kHz / 20 kHz		
Output power	500 VA		
Rated output current	15 A _{rms}		
Max. output current for 2 s	40 A _{rms}		
Brake chopper (integrated)	-	U _{chop} 63 V	
Brake resistor (optional)	5 Ω, can be screw-fastened to the mounting plate		
Continuous / pulse output brake	-	30 W / 750 W	
Holding brake	24 V DC, max. 700 mA		
Dimensions of the basic unit (W x H x D) ²⁾	56 x 80 x 112 mm		
Weight	approx. 0.5 kg		

¹⁾ Plus the supply current of the optional holding brake of 0.7 A

²⁾ Without counter plug and mounting plate



DIS-2 310/2 FB

Features	DIS-2 310/2 FB	DIS-2 310/2 FB FS STO
Admissible temperature ranges	Storage temperature: -25 °C to +70 °C	
	Operating temperature (housing): 0 °C to +80 °C, Temperature switch-off at approx. 85 °C	
	Ambient temperature: 0 °C to +30 °C at nominal power: with power derating respectively output current derating of 3% / K from 30 °C	
Admissible installation height	Mounting height maximum 2000 m above msl., above 1000 m above msl with power reduction 1 % per 100 m	
Humidity	Rel. humidity up to 90 %, not bedewing	
Protection degree	IP54, depending on the type of installation up to IP67	
Protection class	I	
Pollution degree	2	
CE conformity low-voltage directive: EMC directive:	Directive 2006/95/EG (Standard EN 61800-5-1) Directive 2004/108/EG (Standard EN 61800-3)	
Inputs	maximum: 10 DIN (24 V), 2 AIN (± 10 V, 12 Bit, differential)	
Outputs	maximum: 3 DOUT (24 V), 1 DOUT for holding brake, 1 AOUT (0...10 V, 8 Bit)	
Voltage supply	1 \times 240 V AC [± 10 %], ca. 2.2 A	
Control voltage	24 V DC [± 20 %], 0.20 A ¹⁾ , internally protected with poly-switch, triggered at approx. 1 A	
Clock frequency	10 kHz	
Output power	300 W / 500 W	
Rated output current ²⁾	2 A _{rms}	
Max. output current for 1 s	6 A _{rms}	
Brake chopper (integrated)	U _{chop} 390 V	
Brake resistor (optional)	100 Ω , can be screw-fastened to the mounting plate	
Continuous / pulse output brake resistor	30 W / 1450 W	
Holding Brake	24 V DC, max. 700 mA	
Dimensions of the basic unit (W x H x D)	56 x 80 x 112 mm	
Weight	approx. 0.5 kg	

¹⁾ Plus the supply current of the optional holding brake of 0.7 A

²⁾ Without counter plug and mounting plate

ENDURANCE

Special Variety

Servo drive DIS-2 series

Low voltage range 230 V AC





The DIS-2 platform consists of a 48 V DC and a 230 V AC variant with different specifications to the connectivity of the motor and the encoder connections.

Low voltage range 230 V AC



Extra low voltage range 48 V DC



Dimensions identical for all versions



metronix

servo drives

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