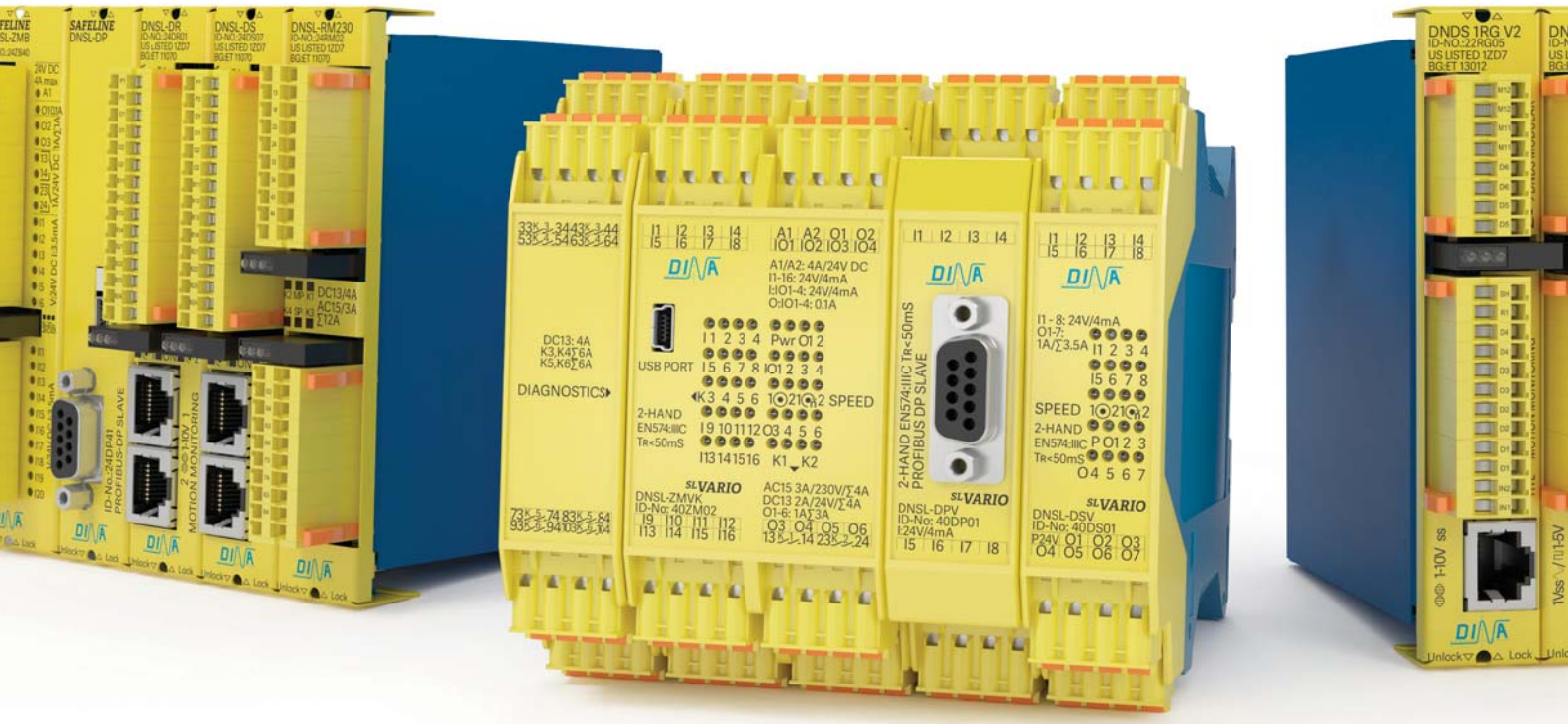
product overview.



we are safety.

DINA Elektronik GmbH has been working successfully in the field of industrial electronics for more than 25 years and is a leader (on the cutting-edge) in the area of safety engineering for machines and plants.
The first product for "safe motion monitoring" was developed and brought to the market already in 1987. Today DINA offers a versatile range of products for safety technology. The product program ranges from simple safe standstill monitoring to multifunctional, free configurable, modular safety systems. With DINA products all safety control related requirements for machines and plants can be fulfilled.

DINA Elektronik GmbH is a competent partner in the area of customised solution. For diverse industrial areas DINA possesses sound knowledge and long time experience.
A perfect customer service has the highest priority for DINA.

SAFELINE – the direct way to safe automation

High performance machines require the maximum possible safety technology to safeguard men and machines.
Flexible solutions are provided by DINA products.

SAFELINE is a modular multifunctional safety system for use in general machineries, plant constructions and in automation.
It has a huge amount of freely programmable inputs and outputs.
Configuration is done with SAFELINE DESIGNER.
The required number of inputs, outputs and functionality determine the type and number of the needed modules.
SIL CL 3, DIN EN 62061 and 61508

PFH_D:	6,24 x 10^{-8}
$MTTF_d$:	75 years
DC_{avg}:	≥ 90%
CCF according to EN 62061:	85 points
CCF according to ISO 13849-1:	95 points
EC-Type Test Certificate BG-No:	ET 11070

Functions

- Safety-related signal processing according to existing EU guidelines

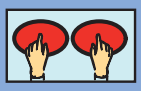
- Safe standstill and motion monitoring of machines and plants in all operation modes
- Safety functions in different safety level as:

Emergency-stop

Protection cover

Permission

Operation mode switch for one of three or one of six switch positions

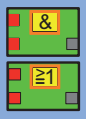


Two-hand function according to EN 574 Type III C

Inputs for the monitoring of one till five safety shutdown mats

- Software elements for:

Timer, off-delayed and on-delayed



Logic modules, Inverter, AND, OR, exclusive OR, RS-Flip-Flop etc.

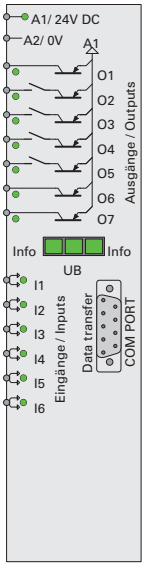
- Change of operation mode via protection cover, operation mode switch and permission key
- Unlocking of protection cover while drives stopping
- Diagnostics via the Data transfer interface or via the field bus

Advantages

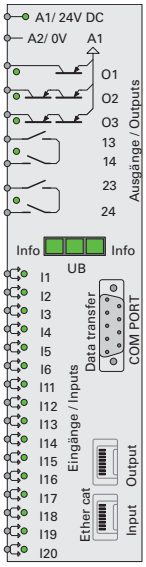
- Programming with symbolic of an existing machine-circuit plan
- Diagnostics and controlling functions via a field bus
- Modular construction
- CNC-independent
- Monitoring of 1 to 28 drives with one device
- High operating state with the employment of machine safety
- Back-fitting on all machine types is possible
- Low wiring overhead
- Cost- and space-saving
- Spring load clamps, pluggable

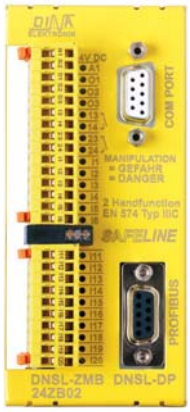
Central modules

DNSL-ZM

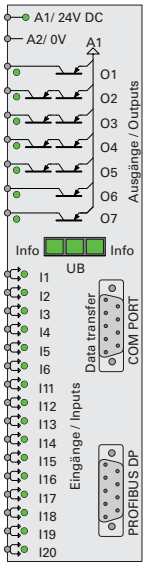


DNSL-ZMB-ECM
DNSL-ZMT-ECM

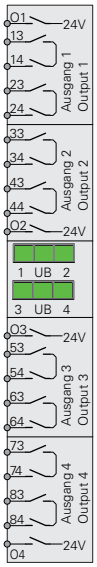




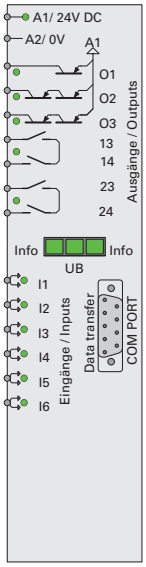
DNSL-ZMR-DP



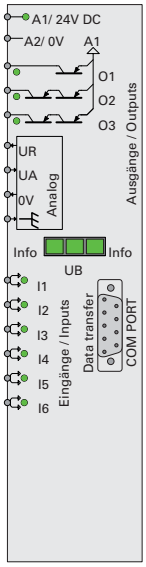
DNSL-KM



DNSL-ZMK



DNSL-ZMA



DNSL-ZM
- 6 digital safe inputs
- 4 safe outputs, positively switching
- 2 outputs, positively switching, free configurable
- 1 output, positively switching for system OK

DNSL-ZMB
- 16 digital safe inputs
- 2 safe outputs, positively switching
- 1 relay output with 2 safe contacts
- 1 output, positively switching for system OK
- standstill and motion monitoring for two drives

DNSL-ZMT
- 11 digital safe inputs
- 5 analogical safe inputs for shutdown mats or current source 4 - 20mA
- 2 safe outputs, positively switching
- 1 relay output with 2 safe contacts
- 1 output, positively switching for system OK
- standstill and motion monitoring for two drives

DNSL-ZMR
- 16 digital safe inputs
- 4 safe outputs, positively switching
- 2 outputs, positively switching, free configurable
- 1 output, positively switching for system OK
- standstill and motion monitoring for two drives

DNSL-KM: Output expansion for DNSL-ZMR
- 4 relay outputs, every with 2 safe contacts and one information contact

DNSL-ZMA
- 6 digital safe inputs
- 1 analogical input for potentiometer
- 2 safe outputs, positively switching
- 1 output, positively switching for system OK

DNSL-ZMK
- 6 digital safe inputs
- 2 safe outputs, positively switching
- 1 relay output with 2 safe contacts
- 1 output, positively switching for system OK

All central modules have a V24 or USB interface (COM PORT) for programming and diagnostic duties.

The central modules DNSL-ZMB, ZMT may be used to monitor the safe stand-still and safe speeds for two drives. Two proximity switches have to be used to measure the speed for every drives. An integrated field bus is deliverable with DNSL-ZMB, ZMT and ZMR. The field bus is also available as a separately module with the central modules DNSL-ZM, ZMA and ZMK.

Function modules

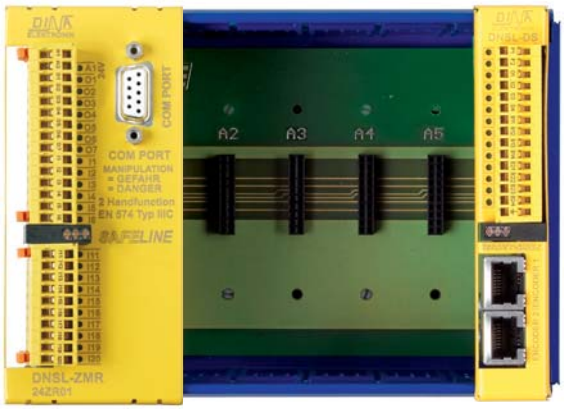
DNSL-DS
DNSL-DR

DNSL-IN

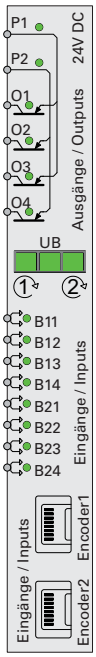
DNSL-IO

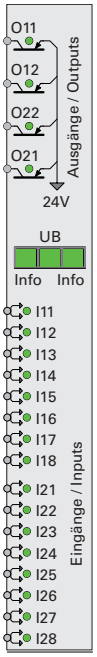
DNSL-RM 230

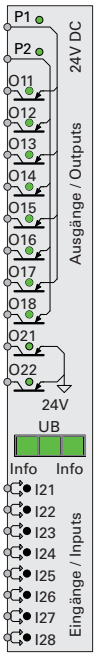
DNSL-DP

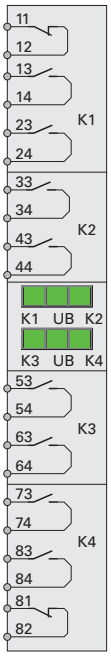


Assembly rack for the SafeLine modules









DNSL-DS, DNSL-DR: Standstill, position, motion and direction monitoring for two drives
- 8 digital safe inputs
- 2 encoder inputs
- DNSL-DS: 4 outputs, positively switching, free configurable
- DNSL-DR: 2 outputs, positively switching, free configurable

DNSL-IN: Input module
- 16 digital safe inputs
- 4 outputs, positively switching, free configurable

DNSL-IO: Input / output module
- 8 digital safe inputs
- 10 outputs, positively switching, free configurable

DNSL-RM 230: Relay module
- 4 relay outputs, free configurable
- 8 NO contacts

Field bus modules
DNSL-DP: Profibus DP
- Interface, 24 byte input and output data for diagnostic duties

DNSL-EC: Ether CAT
- Interface, 24 byte input and output data for diagnostic duties

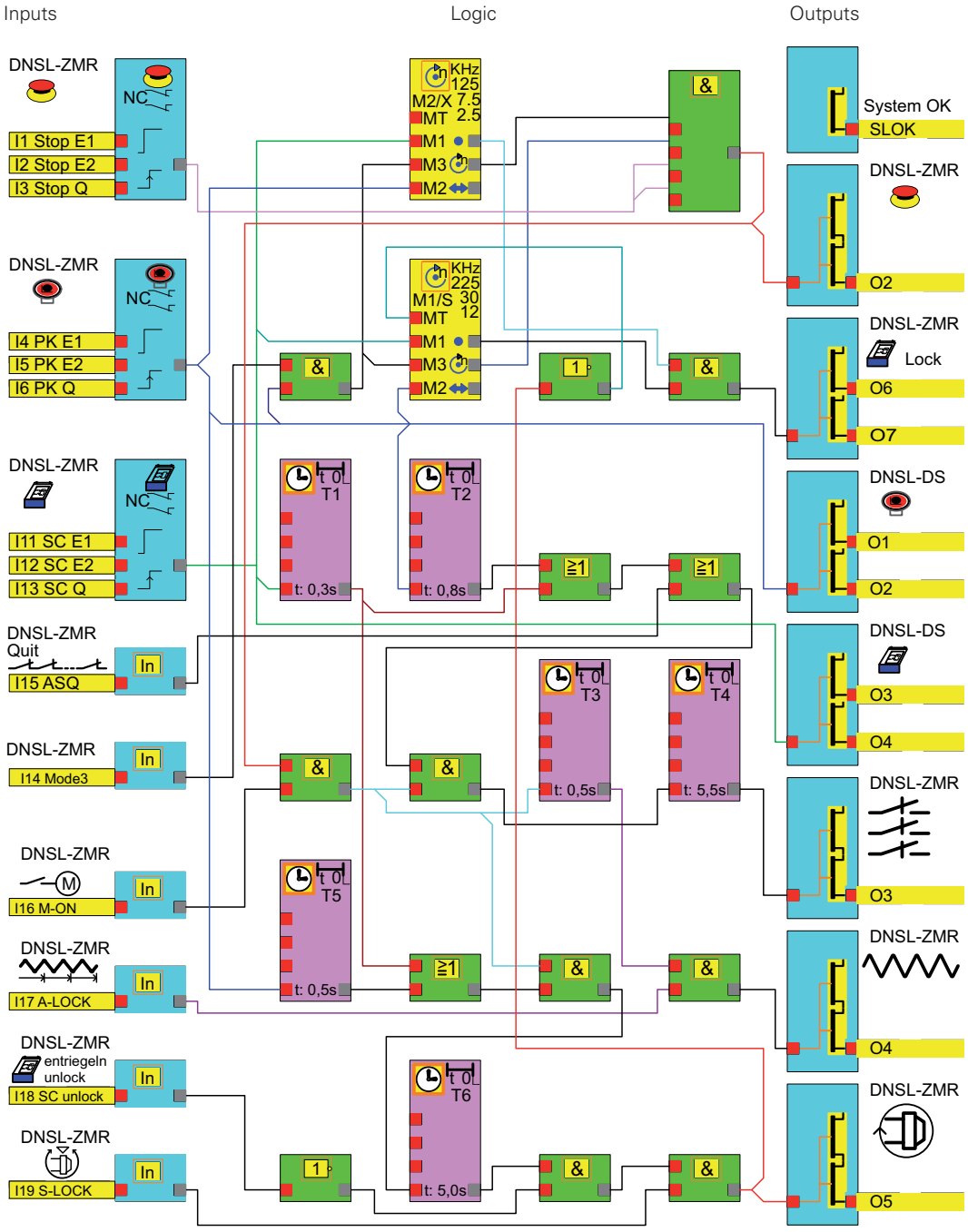
Other field buses on enquiry.

Racks with different sizes are available to assemble the SafeLine modules.
In one rack up to 15 modules may be mounted.
One central module is always necessary.
The number and the types of the function modules are depending of the requirements of the user application.
If the motion monitoring DNSL-DS or DR is used, a lot of inputs and outputs are available for safety functions.

The switching status of all inputs, outputs and power supply is displayed via LED.

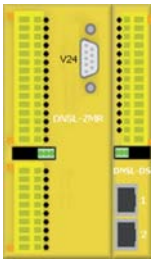
Safety for plants and machines according to EU-Guidelines

Application for monitoring all safety relevant components and signals



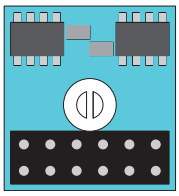
Description of symbols

- Emergency stop
- Permission
- Protection cover
- Drives interlock quit
- Machine ON
- Enable machine net
- Axis interlock
- Axis enable
- Spindle interlock
- Spindle enable



Assembling

Data medium with programming device



DNSL-MC

DNSL-PR

DNSL-MC
is a data medium for the user application. This medium is internally plugged on the central modules DNSL-ZMB, ZMT and ZMR. DNSL-MC is a part of the central module.

DNSL-MC can be also ordered separately.

To transfer the Data of the user application to DNSL-MC the programming device DNSL-PR can be used.

Control device

DNCO1

DNCO1
The inputs of DNDS or SafeLine can be controlled via the DNCO1 outputs to select a speed.

- 63 different speeds are available. The selection will be executed via the up and down buttons.
- The selected speed appears at the DNCO1 display.
- DNCO1 can be used to disable and enable the monitoring of a spindle, if it is disposed of SafeLine. One to eight spindles can be disabled or enabled.
- The unit is provided to be mounted in a control board.

DNDSmodular – Safety for men and machines

Safe drive monitoring in reliable technology in all operation modes according to EU-guidelines.

Modular Control is a modular safety system for use in general machineries, plant constructions and in automation. To monitor a drive an input module, an output module and a rack are necessary. The number of drives determine the number of input modules and the size of the rack.

DIN EN ISO 13849-1 Safety category 4
$MTTF_d$: 100 years
DC_{avg}: ≥ 99%
CCF: 95 points
PFH_D: 2.47×10^{-8}
PLe
EC-Type Test Certificate BG-No: ET 13011
BG Test Certificate: ET 13012

Functions

- Safe motion monitoring of machines and plants in all operation modes

- Safety function: Emergency stop
- Change of operation mode via protection cover, operation mode switch and permission key
- 1 safe contact output to unlock the protection cover while drives stopping
- 1 safe contact output to stop the monitored machine to avert danger
- 2 diagnostic outputs, positively switching at the monitoring modules DNDS 1EG V7C and 1RG V3C

Advantages

- Modular construction
- CNC independent
- 1 to 8 drives monitoring in one device
- High operating state by the use of machine safety
- Easy configuration
- Back-fitting on all machine types is possible
- Low wiring overhead
- Cost- and space-saving
- Spring load clamps, pluggable

Modules description

1EG V7A
1RG V2

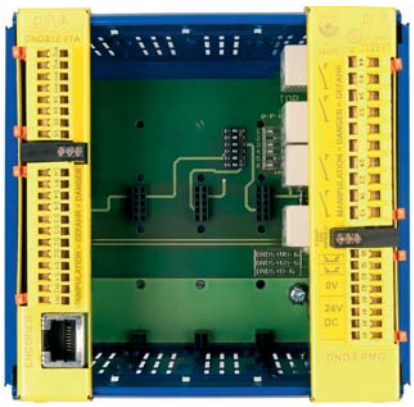
1EG V7C
1RG V3C

1EG V9
1RG V1

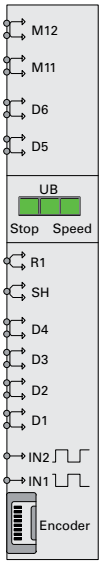
PMG

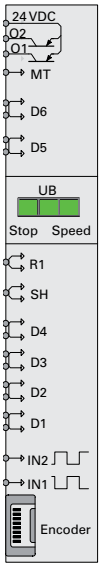
VMG

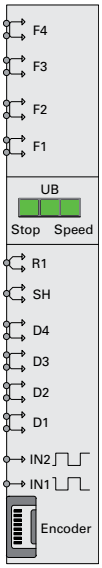
GMG

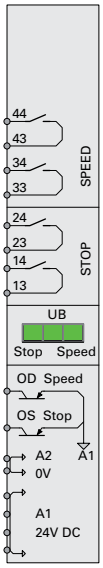


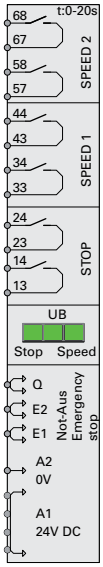
Assembly rack for DNDS modules

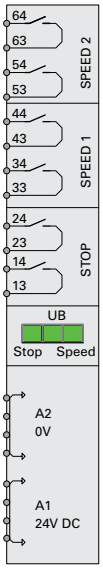












Input modules
DNDS 1EG V7A, V7C and V9

Modules to measure the speed of a drive via an incremental encoder or two proximity switches.

DNDS 1RG V1, V2 and V3C

Modules to measure the speed of a drive via a resolver or two proximity switches. The adjustment of the speed for the respective function mode must be done via the inputs of the input modules.

Description of the inputs at the input modules

IN1, IN2
Inputs to detect the drive movement via proximity switches. 2 PNP switches are necessary.

Encoder
Input to detect the drive movement via an encoder / resolver of the drive measurement system.

SH
Input to select the tool setting function mode, if the protection cover is open.

R1
Input to select the semi automatic function mode, if the protection cover is open.

Description of the inputs at the input modules DNDS 1EG V7A, 1EG V7C and 1RG V2, V3C

D1 to D6
Inputs to adjust the speed of the automatic function mode and to switch over between automatic mode and standstill.

M or MT
Inputs to switch over between automatic mode and standstill, if the automatic mode must not be monitored.

Description of the inputs at the input modules DNDS 1EG V9 and 1RG V1

D1 to D4
Inputs to adjust the speed of the automatic function mode.

F1 to F4
Inputs to reduce the adjusted speed of the automatic mode (100 to 25%) and to switch over between automatic mode and standstill.

Description of the outputs at DNDS 1EG V7C and 1RG V3C

O1 and O2 are diagnostic outputs.
O1 switches off, if there is an error at the encoder input, respectively at the inputs IN1 and IN2.
O2 switches off, if the monitored speed is increased.

Output modules
DNDS PMG

STOP: 1 safe contact output to unlock the protection cover while drives stopping.
SPEED: 1 safe contact output to stop the monitored machine at a dangerous speed.
OS: diagnostic output for STOP
OD: diagnostic output for SPEED

DNDS VMG

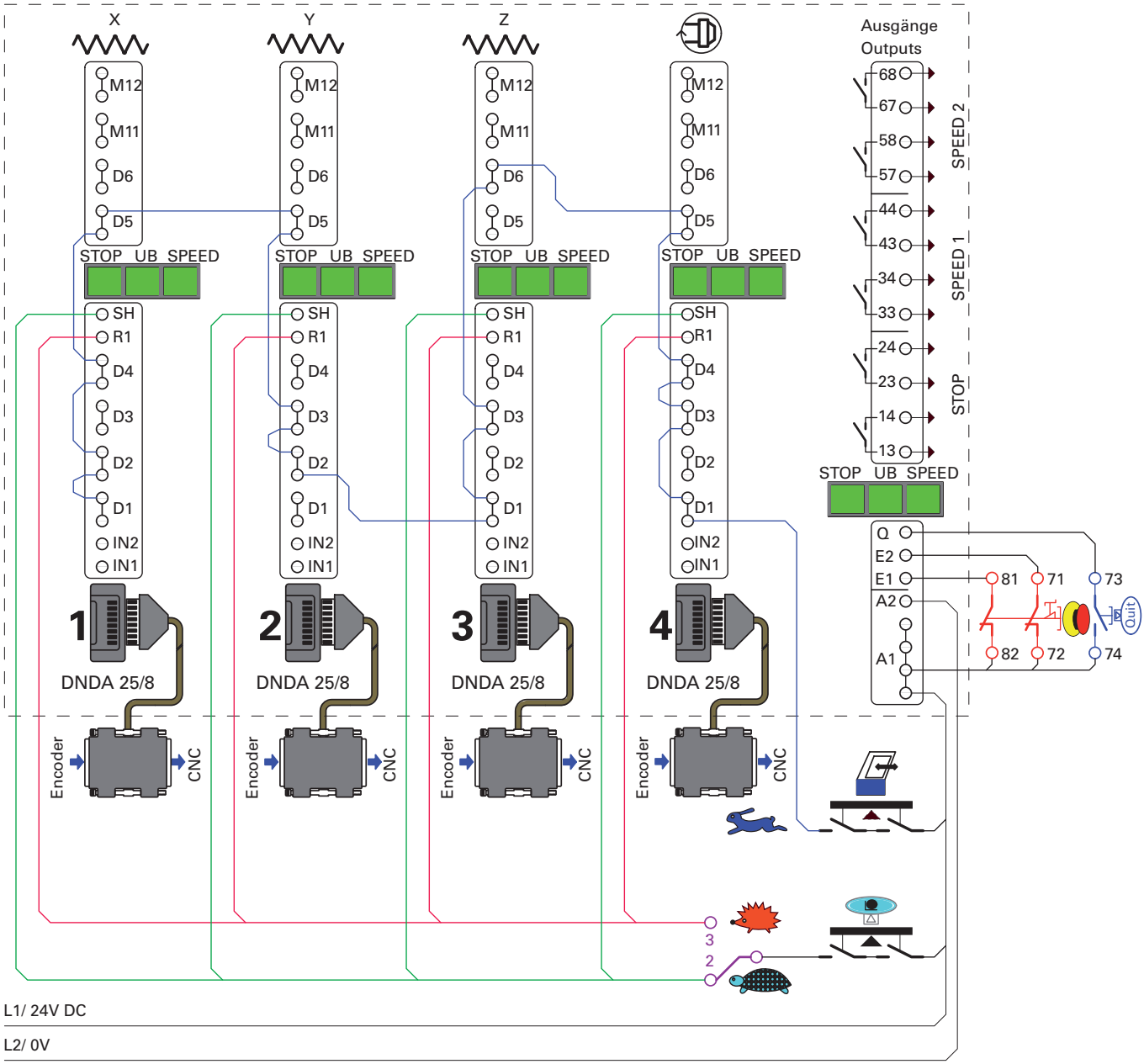
STOP: See DNDS PMG,
SPEED1: Safe contact output to disable the closed loop control at a dangerous speed or emergency stop.
SPEED2: Safe contact output, off-delayed, to enable the machine net at a dangerous speed or emergency stop.
E1, E2 and Q: Inputs for emergency stop key

DNDS GMG

STOP: See DNDS PMG
SPEED1 and SPEED2: Safe contact outputs to stop the monitored machine at a dangerous speed.
2 drive groups may be made, because 2 SPEED outputs are available. The drive groups can be disconnected separately

Safety for machines and plants according to the EU standards

An application to monitor the standstill, setting tool-, semi automatic- and automatic function mode for 3 axis and 1 spindle.



Automatic function mode

Semi automatic mode

Tool setting mode

Cable adaptor for standstill and motion monitoring at SafeLine and DNDS

DNDA 9/8

DNDA 15/8

DNDA 25/8

The cable adaptor DNDA is used as an interconnection between the measurement system of the movement detection and the motion monitoring system. The adaptor is equipped with all necessary connection plugs.

- It is available for all CNC variations.
- It is equipped at the side of the measurement system with a male and female plug. At the monitoring side (SafeLine or DNDS) there is a RJ45 plug.
- DNDA has a standard cable length of 2,5m; other lengths are available.

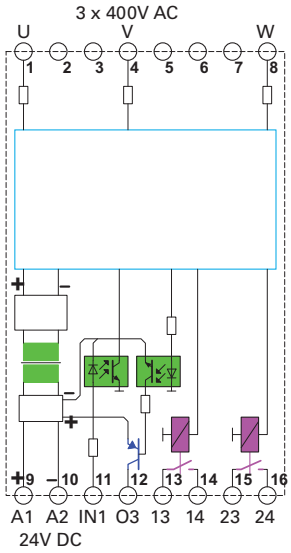
DNRJ45 is provided with a RJ45 plug and at the other end there are single wires equipped with cable-end sleeves.

Phase- and standstill monitors

DN3PW: 3-phase monitor with very short reaction time

Description of functions:

- DN3PW monitors the 3 phases of the supply voltage at an electric installation.
- The reaction time is less than 10ms.
- The unit is placed in a 22,5mm housing.
- It can be mounted to a 35mm DIN rail.



U, V and V
Measuring inputs
3 x 400V AC

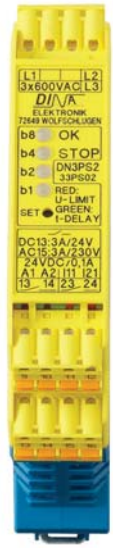
Measuring electronic

A1 / A2
Operating Voltage 24V DC

IN1
Inputs for special functions

O3 PNP-output 1A

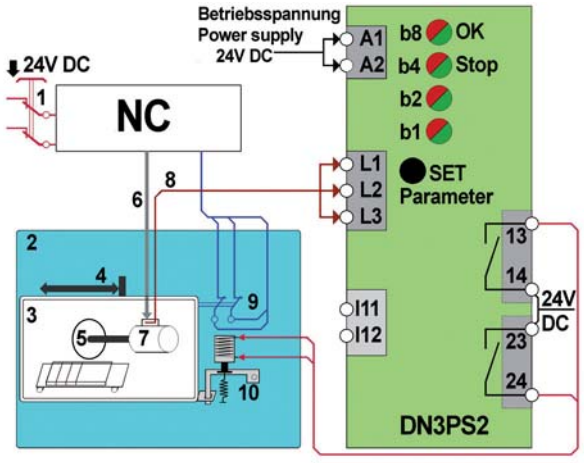
13 - 14, 23 - 24
Output 1A



DN3PS2: standstill monitor for AC motors without sensor system

Description of functions:

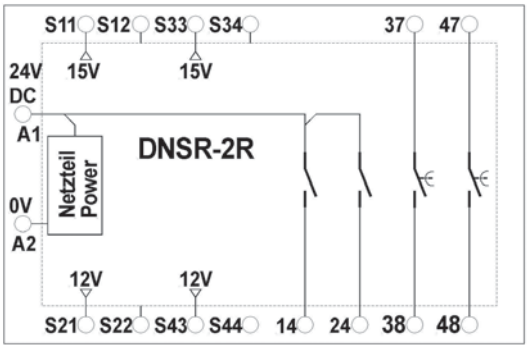
- The unit is monitoring the standstill of 1-phase and 3-phase drives without additional sensors.
- The sensor inputs can be connected directly to the power supply of the motor. The inputs are detecting the electromotive force (EMF) of the motor.
- A star delta-connection or a combination with ac drives is possible.
- The unit is placed in a 22,5mm housing and can be mounted to a 35mm DIN rail.



DNSR-2R: Emergency stop relay

Description of functions:

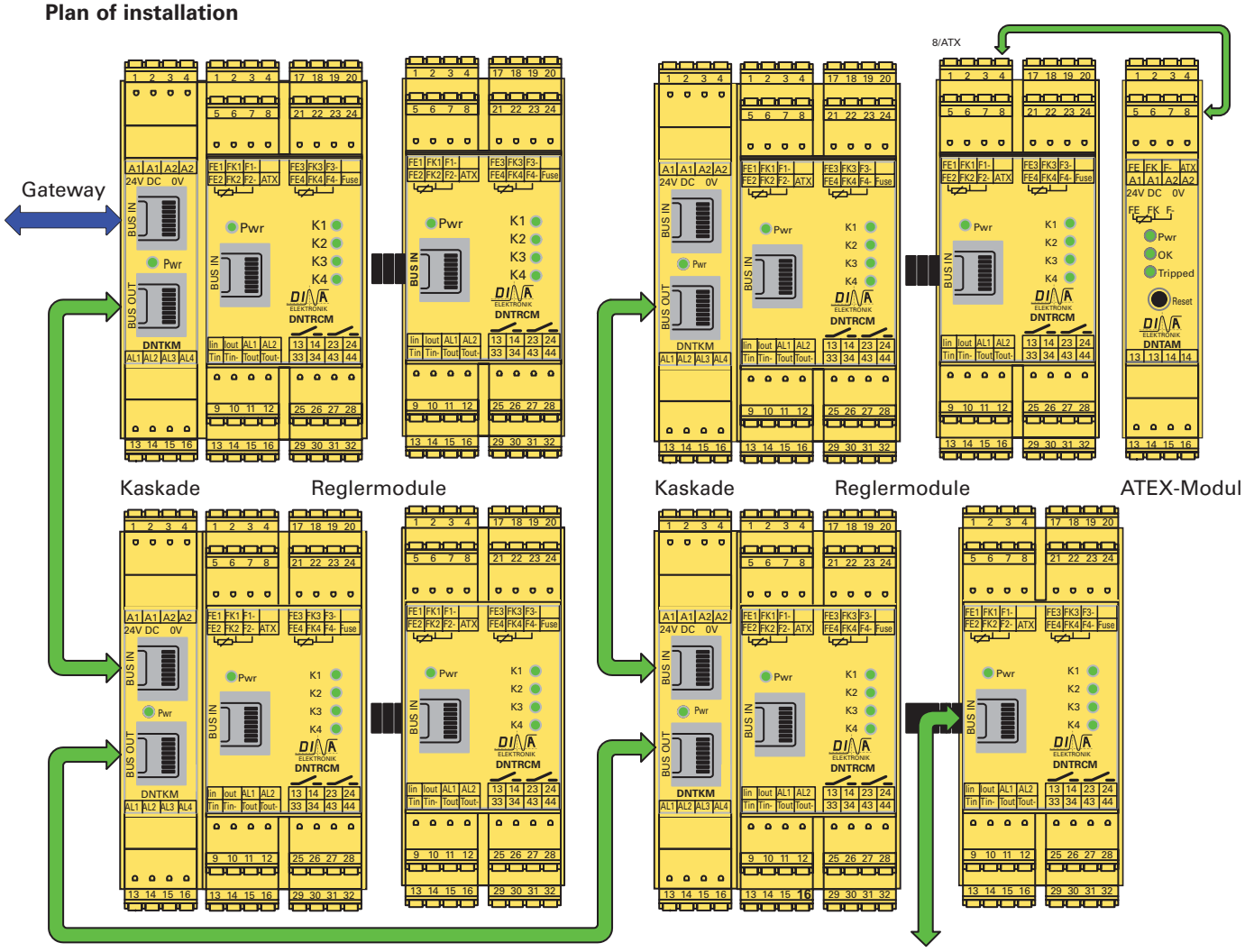
- EMERGENCY STOP mode with one undelayed and one off-delayed contact.
- TIMER mode with on-delayed or off-delayed contacts.
- For applications up to performance level d.
- The unit is placed in a 22,5mm housing and can be mounted to a 35mm DIN rail.



TEMPLINE – Cascadable temperature controller with temperature limiter

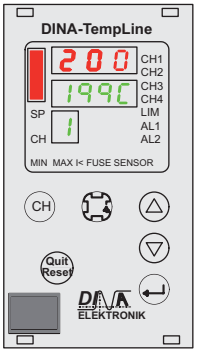
The cascadable temperature controller system consists of a cascade module, controller module, control panel and a field bus gateway.
A temperature limiter (ATEX module) can be added.
The gateway enables a communication between the temperature controller system and a host diagnostic system.

Plan of installation



Control panel type DNTBE

- The control panel provides the configuration of all controller modules.
- Set value, actual value and the status of the system can be displayed via the 7-segment display and a lot of various LED. The control panel is provided to be mounted in a control board.



Cascade module type DNTKM

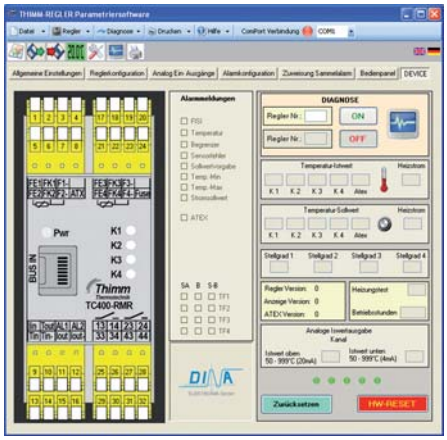
The cascade modules provide the electrical connection between the temperature controller lines.

- 16 temperature controllers can be connected to one cascade module.
- In the whole installation there are 250 controllers possible. The number of the cascade modules is optional.
- The cross linking between the cascade modules will be done via RJ45 plug socket.
- Diagnostic communication results between controller lines and cascade modules.
- Four semi conductor outputs enable error messages. The outputs can be optionally configured.
- The cascade module is placed in a 22,5mm housing. It can be mounted to a 35mm DIN rail.

Controller module type DNTRCM

The controller modules and the cascade modules will be connected via a bus of a 35mm DIN rail. The power supply results via the cascade module.

- The connection from the controller to the control panel will be done via RJ45 plug socket.
- To measure the temperature four PT100 sensors can be connected. Alternative thermo elements are possible.
- Every controller has 4 digital outputs. An analogue output (4-20mA) to drive a power controller is available. 2-point- or PID-controller is available for the temperature regulation.
- The controller can be used to monitor a minimum temperature (anti-freeze protection).
- A stand alone function is also possible.
- The controller module is placed in a 45mm housing. It can be mounted to a 35mm DIN rail.



Configuration software

The configuration software enables an easy programming and an online diagnostic of the controllers via a computer.

ATEX limiter module type DNTAM

- The ATEX limiter works autarkic and can be used with a PT100 sensor. The output contacts open and remain open, if the temperature limit is exceeded. To reset the contacts the temperature limit has to be under-running and a quit button at the module must be activated.
- An unidirectional interface enables a data communication with the controller about the set value, actual value and status information.
- The data can be displayed via the control panel or via the configuration software.
- The module is placed in a 22,5mm housing. It can be mounted to a 35mm DIN rail.

DINA product overview

SLVARIO

– the direct way to safe automation

SAFELINE

– is a modular multifunctional safety system for use in general machineries, plant constructions and in automation. It has a huge number of freely programmable inputs and outputs

DNDSmodular

– is a modular safety system for use in general machineries, plant constructions and in automation. It is expandable from 1 to 8 drives monitoring with one device

DN3PW 3-phase monitoring

– monitors the 3-phases of the supply Voltage at an electric installation with a very short reaction time

DN3PS2 standstill monitoring

– monitors the standstill of 3-phase AC motors without sensor

TEMPLINE

– cascadable temperature controller with temperature limiter

we are safety.

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