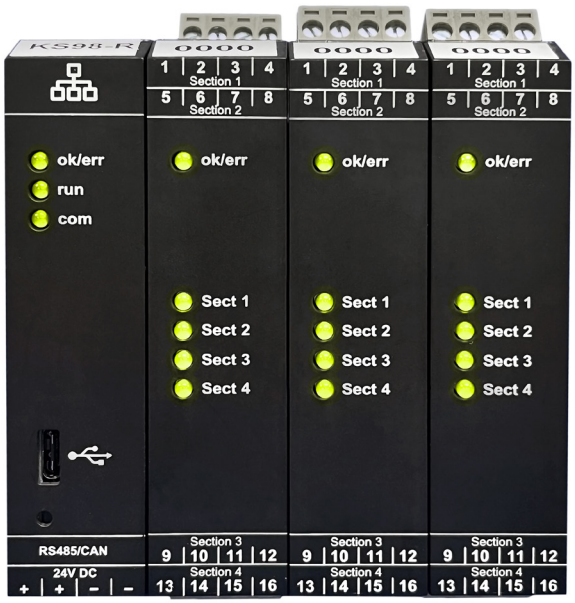
WEST Control Solutions

Datasheet

KS98-Rail

Process Control System



Overview

Our process control and data acquisition system KS98-Rail combines process monitoring, PID control, sequence control and data logging. The modular design allows to compose the hardware to exactly fit a specific application. Application programs can be created and maintained by easily selecting and connecting fully matured reliable function blocks graphically using the “KS98-ET”-utility. This method is ideal for creating individually customized solutions, for sophisticated process control with minimal effort and project risk. Up to date communication interfaces and software utilities ensure easy monitoring and maintenance of your installation even from a remote location.

Our sophisticated function block library offers among other things the features mentioned below.

Key Features

- Scaling and linearization of measured signals
- Controllers with self-tuning, auto/manual, parameter-set and setpoint selection and limitation functions.
- Cascaded control loops.
- Modular programmer with multiple recipes, auto/manual operation, manual or automatic search, master/slave tracks, etc.
- Math and Logic functions
- Datalogger functions to record process values over time
- Event logger to record events with timestamp
- Clock functions

At a Glance

- **Top Hat Rail Mounting**
- **Comprehensive Control Functions**
- **High-Precision Measurement**
- **Library of Proven Control Algorithms**
- **Sophisticated Parameter Control**
- **Superior Process Performance**

System Description

CONCEPT

KS98-Rail is a versatile process automation system for top hat rail mounting. It allows flexible adaption of its in- and outputs to the needs of the application. It is an awesome base for an automation solution that is optimized by means of functionality, reliability, size and cost.

The hardware of KS98-Rail is specifically designed to deal with analog variables in the process industry. Additional signal transmitters and the associated costs for installation can be omitted, as most sensors are directly supported, and galvanic isolations are present as well.

To create application programs KS98-Rail provides an easy-to-use graphical engineering-tool with embedded process simulation. The function-block editor allows to compile, test and optimize an application project by using a library of sophisticated control functions.

Established control function blocks with integrated self-tuning based on years long experience are the fundament to quickly achieve the desired control performance even in complex applications.

A Network connection or a connection via the USB front interface can be used for all time access to the unit with a PC. This supports fast check and adjustment of parameters and helps to identify problems in advance.

Whether you need a process monitoring system or a sophisticated control sub-system in a wider infrastructure KS98-Rail will do the job for you with low risk and investment.

HARDWARE FLEXIBILITY

KS98-Rail offers a comprehensive modularity of in- and outputs.

System Structure

A KS98-Rail System is composed with a CPU and up to 15 I/O units. To individually compile the system to fit the application different I/O-units are available. On top remote stations can be part of the configuration.

CPU Unit

The programmable CPU unit is the heart of the system. It is equipped with Ethernet, USB, CAN and RS485 interfaces to provide data access to the outside world. An embedded datalogger can safe data to an internal SD-card for reporting and diagnosis.

I/O-Module Carrier Unit

Carrier unit with 4 option module slots can be ordered with a free selection of I/O-modules. Each plug-in I/O-module provides one or two in- / output channels.

Option Modules

Analog Inputs

U: 1x Universal Input
R: 2x Resistive Measurements
T: 2x Thermocouples, mV, mA
V: 2x Voltage (Rin >> 1GΩ)
P: 1x 0/4…20mA with Transmitter Power Supply

Analog Outputs

L: 2x Linear Output (0/4…20mA)
B: B: 2x Bipolar Output (-10V…10V, 0/2…10V)

Digital-In-/Outputs

D: 2x 24V Digital I/O
A: 2x SSR Driver

Both channels of the D-Module can be configured separately for input or output usage. Signal state can be reversed.

Relay Output Unit

Unit with 4 SPDT Relay Outputs (Not available within the standard program. Can be ordered in batches with extended lead times.)

Digital I/O Unit

Unit supporting 12 24V Digital I/O Signals (Not available within the standard program. Can be created for OEM applications to optimize cost compared to the use of modular carriers with D-modules.)

CAN Extension

The optional CANopen Interface allows to extend the I/O of the KS98-Rail system even more.

- Easy to use cross communication to other KS98-2 or KS98-Rail systems.
- CANopen conformal components can be connected by using basic communication blocks.
- Dedicated function blocks allow to easily integrate the known RM200 Remote-I/O System

Depending on the system structure, the number of nodes, the amount of data and the selected transmission speed refresh times will vary. It needs to be checked that the setup fulfills the requirements of the application.

A detailed description of the communication functions is provided in the KS98-2 full manual. Details of I/O-systems can be found in the related data sheets.

FUNCTION BLOCK LIBRARY

The Function block library offers a variety of practice-proven building bricks from the following areas:

- Scaling, linearization and calculation
- Monitoring and alarming
- Process and logic control
- Recording

To create application programs, the blocks can be selected and interconnected with the graphical engineering tool ET/KS98-2. The tool automatically monitors the use of program memory and execution time.

COMMUNICATION

Each KS98-Rail CPU provides a front accessible USB Device Interface. This interface is designed primarily to be used for programming and diagnosis. The CPU also provides Ethernet to embed the system in network infrastructures. Process data and parameters are accessible via Modbus-TCP protocol. Ftp can be used to upload logger files. Full access for remote

maintenance and diagnosis with the engineering utilities is provided as well. A RS485 Interface can be used to access data via Modbus RTU protocol.

For ease of maintenance a USB Host interface can be used to store data to a USB pen or to upgrade a unit based on data provided via the USB pen.

Technical Data

CPU UNIT

Power Supply

Low Voltage Supply 24 VDC: 24VDC (+25%-20%)
Power Consumption: Approx. 20W (fully equipped)

Data Storage

- **User program & configurations** are permanently stored in Flash.
- **Parameter and active setpoints** are permanently stored in EEPROM.
- **Working data of functions (programmer, integrator, counters) a**re stored in a capacitor buffered RAM (typically >> 15 Minutes).
- **Real Time Clock:** Backed up with a Lithium battery.

USB Interface For Programming

USB Device interface to connect PC with programming and maintenance tools. Uses a standard USB-C cable.

Ethernet

Network interface for data access, programming and maintenance. **(Protocols: Modbus TCP, FTP)**

USB Host Interface

USB Host Interface to connect USB pens for data extraction and user program update.

RS485 Fieldbus Interface

Galvanically isolated RS 485 interface for data access.
(Protocol: Modbus)

CAN Interface (CANopen)

Galvanically isolated CAN interface for Remote I/O and cross communication.

Transmission Speeds

Com. Speed	Max. Cable Length
10 kbit/s	1200 m
20 kbit/s	1000 m
50 kbit/s	1000 m
100 kbit/s	500 m
125 kbit/s	250 m
250 kbit/s	250 m
500 kbit/s	100 m
800 kbit/s	50 m
1000 kbit/s	25 m

RELAY OUTPUT UNIT

Provides 4 SPDT Relays

Relay Outputs

Relays have potential free change-over contacts

Contact Rating

Maximum: 500 VA, 250 V, 2 A at 48...62 Hz, cosφ ≥ 0,9
Minimum: 12 V, 10 mA AC/DC

Switching Cycles

- Electrical for I = 1A/2A (resistive load)
- ≥ 800.000 / 500.000 at ~ 250V

If the relays operate external contactors, these must be fitted with RC snubber circuits to prevent excessive switch-off voltage peaks! Varistor protection is not recommended!

OPTION MODULE CARRIER UNIT

Carrier unit with 4 option module slots can be ordered with a free selection of I/O-modules. All module types are supported. Each module is galvanically isolated from the rest of the unit. Details of available modules see chapter „In-/Output Modules".

DIGITAL IN--/OUTPUT UNIT

Control Inputs

Current Sink (IEC 61131 Type 1)

Nominal Voltage: 24 V DC external
Residual Ripple: ≤ 5%ss
Logic „0": -3...5 V
Logic „1": 15...30 V
Current: Approximately 6 mA

Control Outputs

- Galvanically isolated opto-coupler outputs
- Grounded load (common positive control voltage)

Supply Voltage: 24 V DC external
Residual Ripple: ≤ 5%ss
Switching Capacity: 18...32 VDC; ≤ 70mA
Internal Voltage Drop: ≤ 0,7V
Refresh-Rate: 100 ms
Protective Circuit: Thermal against short circuit; Overload cut-off

IN-/OUTPUT MODULES

Analog Inputs

U-Module

Module Type: Universal input module
No. of Channels: 1
Resolution: 16-bit
Measurement Cycle: 100 ms

Thermocouples

Temperature: Linear in °C or °F
Input Resistance: ≥ 1 MΩ
Cold Junction Compensation: Internal/External

According to DIN IEC 584

Type	Range	Error	Resolution
L[1)]	-200...900°C	≤ 2K	0,05 K
J[1)]	-200...1200°C	≤ 2K	0,05 K
K[1)]	-200...1350°C	≤ 2K	0,072 K
N[1)]	-200...1300°C	≤ 2K	0,08 K
S	-50...1760°C	≤ 3K	0,275 K
R	-50...1760°C	≤ 3K	0,244 K
B[2)]	0...1820°C	≤ 3K	0,132 K
T[1)]	-200...400°C	≤ 2K	0,056 K
C[3)]	0...2300°C	≤ 2K	0,18 K
E[1)]	-200...900°C	≤ 2K	0,038 K

[1)] accuracy valid from -100 °C; [2)] accuracy valid from 400 °C; [3)] C(W) W5Re/W26Re

Sensor Monitoring

Current Through Sensor: ≤ 1 µA

Reverse polarity detection triggered at 30 °C below start of range. Sensor status information is available to be used in the application program.

Influence of Internal CJC

≤ 0,5 K per 10 K terminal temperature

External CJC

Selectable: 0...60 °C or. 32...140 °F

Resistance Thermometer

Pt 100 DIN IEC 751 and Temperature Difference: 2x Pt 100

Connection: 3-wire
Linearization: in °C or °F
Lead Resistance: ≤ 30 Ω per lead
Sensor Current: ≤ 1 mA

Range	Error	Resolution
-200,0...250,0°C	≤ 0.5K	0,024 K
-200,0...850,0°C	≤ 1.0K	0,05 K

Input circuit monitoring for sensor/lead break and short circuit

Potentiometers

Resistance: Linear
Sensor Current: ≤ 1 mA

Range	Error	Resolution
0...500 Ω[1)]	≤ 0.1%	≤ 0.02Ω

[1)] Rtotal incl. 2 x RL

- Adjustment/scaling with sensor connected
- Input circuit monitoring for sensor/lead break and short circuit

Resistance Measurement

Range	Error	Resolution
0...250 Ω	≤ 0.25Ω	≤ 0.01Ω
0...500 Ω	≤ 0.5Ω	≤ 0.02Ω

Direct Current 0/4...20 mA

Input Resistance: 5 Ω
Input Circuit Monitoring 4...20 mA: I ≤ 2 mA

Range	Error	Resolution
0/4...20 mA	≤ 0.1%	≤ 0.8µA

Direct Voltage

Input Resistance: ≥ 50 kΩ

Range	Error	Resolution
0/2...10 V	≤ 0.1%	≤ 0.4mV

The technical design corresponds to the universal input of the basic unit

R-Module

Module Type: RTD module (resistance thermometer)
No. of Channels: 2 (with 3- or 4-wire- connection just one)
Sensor Current: ≤ 0,25 mA

Sensor type can be selected separately for each channel

Resistance Thermometers

Connection: 2-, 3- or 4-wire
Linearization: in °C or °F
Lead Resistance: Pt (-200...850°C): ≤ 30 Ω per lead
Pt (-200...100°C), Ni: ≤10 Ω per lead

Type	Range	Error	Resolution
Pt100	-200...850°C	≤ 1K	0,071
Pt100	-200...100°C	≤ 0,5K	0,022
Pt1000	-200...850°C	≤ 1K	0,071
Pt1000	-200...100°C	≤ 0,5K	0,022
Ni100	-60...180°C	≤ 1K	0,039
Ni1000	-60...180°C	≤ 0,5K	0,039

- Lead resistance compensation not necessary with 3- and 4-wire connection.
- For 2-wire connection with short-circuited sensor via the front user interface.
- Influence of lead resistance negligible with 3 or 4-wire connection
- Input circuit monitoring for break of sensor or lead and short circuit.

Resistance Measurement / Potentiometers

Connection: 2-, 3- or 4-wire
Potentiometer: 2-wire connection
Characteristic: Linear

Range	Error	Resolution
0...160 Ω	≤ 1%	≤ 0.012
0...450 Ω	≤ 1%	≤ 0.025
0...1600 Ω	≤ 1%	≤ 0.089
0...4500 Ω	≤ 1%	≤ 0.250

- Cable compensation or Calibration (0%/100%) can be carried out via the user interface with sensor connected.
- 0% calibration for 2-wire resistor measurement
- 0% and 100% calibration for potentiometer
- Influence of lead resistance negligible with 3 or 4-wire connection.
- Input circuit monitoring for break of sensor or lead and short circuit.

T-Module

Module Type: Thermo coupler module (TC, mV, mA)
No. of Channels: 2 (Differential input)

Sensor type can be selected separately for each channel

Thermocouples

According to DIN IEC 60584 (not Type L, W(C) und D)

Type	Range	Error	Resolution
L[1)]	-200...900°C	≤ 2 K	0,080
J[1)]	-200...1200°C	≤ 2 K	0,082
K[1)]	-200...1350°C	≤ 2 K	0,114
N[1)]	-200...1300°C	≤ 2 K	0,129
S	-50...1760°C	≤ 3 K	0,132
R	-50...1760°C	≤ 3 K	0,117
B[2)]	0...1820°C	≤ 3 K	0,184
T[1)]	-200...400°C	≤ 2 K	0,031
C[3)]	0...2300°C	≤ 2 K	0,277
D	0...2300°C	≤ 2 K	0,260
E[1)]	-200...900°C	≤ 2 K	0,063

[1)] accuracy valid from -100 °C; [2)] accuracy valid from 400 °C; [3)] C(W) W5Re/W26Re

Linearization: in °C or °F
Linearity Error: Negligible
Input Resistance: ≥ 1MΩ
Internal Temperature Compensation (CJC) Error: ≤ 0,5K/10K
External JCC Possible: 0...60 °C or. 32...140 °F
Effect of Source Resistance: 1mV/kΩ
Sensor Current: ≤ 1µA

Reverse polarity detection triggers at 30K below range min.

mV-Input

Input Resistance: ≥ 1 MΩ
Sensor Break Monitoring: Built-in
Sensor Current: ≤ 1 µA

Range	Error	Resolution
0...30 mV	≤ 45 µV	1,7 µV
0...100 mV	≤ 150 µV	5,6 µV
0...300 mV	≤ 450 µV	17 µV

mA-Input

Input Resistance: 5 Ω
Sensor Alarm: << 2 mA (with 4...20 mA)
Over Range Alarm: >> 22 mA

Range	Error	Resolution
0/4...20 mA	≤ 0.1 %	≤ 0.8µA

V-Module

Module Type: High impedance voltage input module
No. of Channels: 2

Range can be selected separately for each channel!

Range	Error	Resolution
-50...1500 mV	≤ 1,5 mV	0,09 mV
0...10 V	≤ 10 mV	0,56 mV

Input Resistance: >> 1 GΩ
Effect of Source Resistance: 0,25 mV/MΩ
Sensor Monitoring: Not available

P-Module

Module Type: Input module with transmitter supply
No. of Channels: 1

The technical design of the input corresponds to the T-Module

Transmitter-Supply

To energize a 2-wire transmitter or up to 4 opto-coupler inputs. Galvanically isolated, Short-circuit proof

Module Type: High impedance voltage input module
No. of Channels: 2
Output: 22 mA / ≥ 17,5 V

Analog Outputs

L-Module

Module Type: Linear output module
No. of Channels: 2
Resolution: 16-Bit
Refresh-Rate: 100ms
Signal Ranges: 0/4...20mA (configurable by channel)
Resolution: Approx. 5 µA/Digit
Error: ≤ 0,2%
Load: ≤ 500 Ω / ≤150 Ω (selectable)
Influence of Load: ≤ 0,05% / 100 Ω

Used As Logic Signal

0 / ≥ 20 mA

B-Module

Module Type: Bipolar linear output module
No. of Channels: 2
Resolution: 16-Bit
Refresh-Rate: 100ms
Signal Ranges: 0/2...10V, -10...10V (configurable by channel)
Resolution: Approx. 5 mV/Digit
Error: ≤ 0,2%
Load: ≥ 2k Ω
Influence of Load: ≤ 0,05% / 100 Ω

Used As Logic Signal

0 / ≥ 10 V

Digital In-/Outputs

D-Module

Module Type: Digital I/O module
No. of Channels: 2 (configurable as input or output per channel)

Reverse polarity protection.

Input

- Current Sink (IEC 61131 Type 1)
- Galvanically isolated

Nominal Voltage: 24 V DC external
Residual Ripple: ≤ 5%pp
Logic „0“: -3...5 V
Logic „1“: 15...30 V
Cycle Time: 100 ms
Input Resistance: 5 kΩ

Output

- Grounded load (common positive control voltage)
- Galvanically isolated

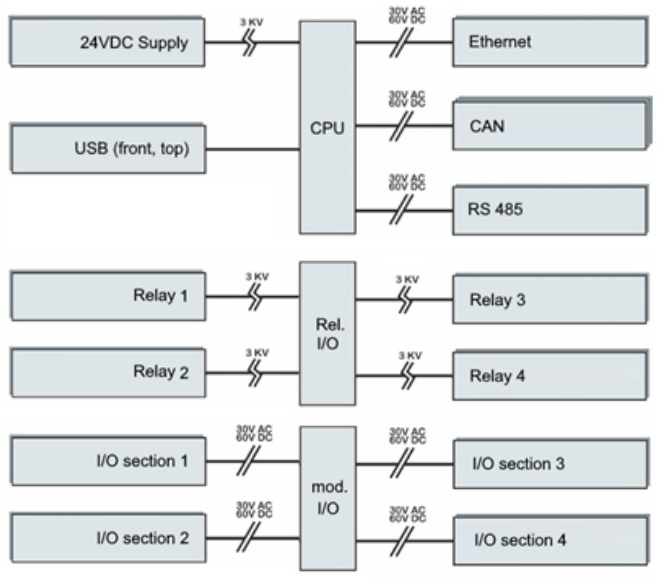
Supply Voltage: 24 V DC external
Residual Ripple: ≤ 5%ss
Switching Capacity: 18...32 VDC; ≤ 70mA
Internal Voltage Drop: ≤ 1,5V
Refresh-Rate: 100 ms
Protective Circuit: Thermal against short circuit; Overload cut-off

A-Module

Module Type: SSR driver module
No. of Channels: 2
Logic „0“: 0V
Logic „1“: ≥10 V
Load: ≥ 500 Ω

GALVANIC SEPARATION

Galvanically isolated areas are visualized in the diagram underneath. In general, each of the I/O modules is galvanically isolated from the rest of the unit. Channels inside a module are not separated.



Signal- and Measurement Circuits

Functional isolation up to a voltage of 33VAC/70VDC against each other and against ground (according EN 61010-1).

24 VDC Supply

Safety isolation up to a voltage of 3kV against each other and against ground (according EN 61010-1).

REMOTE I/O-EXTENSION

Detailed technical data and functional descriptions of remote I/O systems can be found in the related documents.

CAN Communication

Comm. Speed	Max. Cable Length
10 kbit/s	1200 m
20 kbit/s	1000 m
50 kbit/s	1000 m
100 kbit/s	500 m
125 kbit/s	250 m
250 kbit/s	250 m
500 kbit/s	100 m
800 kbit/s	50 m
1000 kbit/s	25 m

Transmission Mode

Cyclic

Error Detection

Automatic node monitoring (“node guarding”).

Addressing:

KS 98-X: 1...24 (Default =1)
RM 200: 2...42 (Default =32)

Refresh Times

Depending on the selected transmission speed and the number of CAN-nodes connected.

RM 200: Typical 100ms
Cross Communication: ≥ 200ms

Maximum Setup RM 200

≤ 16 Analog Inputs and ≤16 Analog Outputs per RM200-Rack! Digital I/O is only limited by the size of the rack

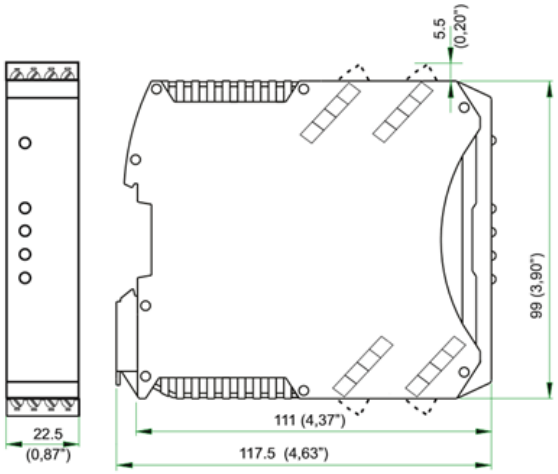
Examples: 72 digital In- /Outputs (without analog modules!), or 16 analog Inputs plus 16 analog Outputs plus 8 digital In- / Outputs.

GALVANIC SEPARATION

KS98-rail units can be programmed and maintained with the following tools:

ET/KS98: from Version 7.6
SIM/KS98: from Version 7.4

DIMENSIONS



ENVIRONMENTAL CONDITIONS

Protection

According DIN EN 60529 (VDE 0470-1)

Front: IP 20
Housing: IP 20
Terminals: IP 00

Ambient Temperature Range

Operation: 0...55 °C
Storage/Transport: -20...60 °C
Humidity: ≤ 75% RH yearly average, non-condensing

Temperature Influence

Reference Temperature: 25°C
Temperature Influence: << 0.05 %/ 10 K

Shock & Vibration

Vibration Test according to DIN EN 60068-2-6

Frequency: 10...150 Hz
Unit In Operation: 1 g / 0,075 mm
Unit Not In Operation: 2 g / 0,15 mm

Shock Test according to DIN EN 60068-2-27

Shock: 15 g
Duration: 11 ms

Electromagnetic Compatibility

Complies with EN 61326-1 “continuous, non-monitored operation”

Safety

According EN 61010-1

- Overvoltage category II
- Contamination class 2
- Working voltage range 300 V
- Protection class II

General

Housing

Front Material

Polyamide PA 6.6

- **Flammability Class:** VO (UL 94)

Connecting Terminals Material

Polyamide PA

- **Screw Terminal Flammability Class:** V2 (UL 94)
- **Spring Clamp Terminals & Bus Connector Flammability Class:** V0 (UL 94)

Weight

Approx. 200 g (per unit)

Mounting

Clip-on rail mounting (35 mm top-hat rail to EN 50 022). Locked by means of metal catch in housing base.

A bus connector needs to be mounted in the top hat rail before to allow system communication.

Orientation: Vertical

Electrical Connections

Depending on order code:

- Plug-in screw terminals for conductor cross-section 0,2 - 2,5 mm2
- Plug-in spring-clamp terminals for conductor cross-section 0,2 - 2,5 mm2

CE Compliance

Meets the European Directives regarding „Electromagnetic Compatibility“ and „Low-voltage equipment“

UL & cUL Compliance

Designed to meet UL requirements but currently no proven compliance.

The following information must be considered:

- Use only 60/75°C copper (Cu) conductors.
- Tighten the terminal-screws with a torque of 0.5 - 0.6 Nm.

Ambient Temperature: ≤ 50 °C
Max. Ratings of Relay Contacts: 250 VAC, 2 A, 500 W (resistive); 250 VAC, 2 A, 360 VA (inductive)

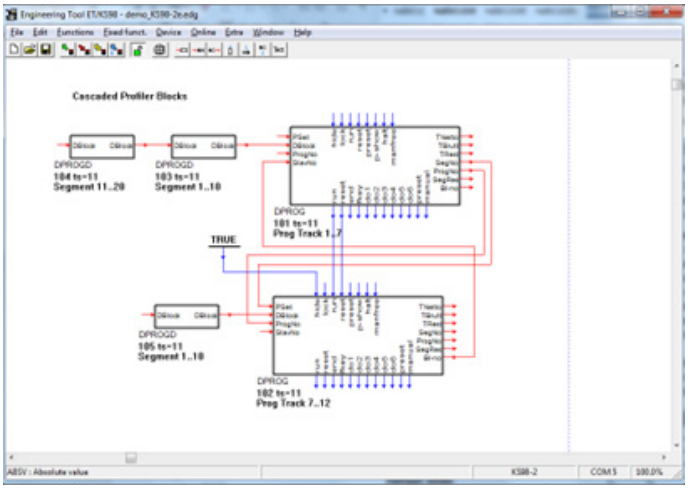
In the Box

- KS98-Rail Unit
- Concise manual (DE/EN/FR)
- Plug-in connection terminals
- Bus connector

ACCESSORIES & SOFTWARE

Engineering Tool ET/KS98-2

The Engineering Tool ET/ KS98-2 is a graphical function-block editor supporting programming, commissioning, and diagnosis.



Its main functions are:

- Selection of function-blocks from a library and placing them in the workspace
- Application specific graphical connection of in- and output signals
- Configuration and parametrization of Functions-blocks via context menus
- Download of user programs into the unit
- Upload of user programs from devices (can be protected via password)
- Recipe creation and administration

Communication to the unit is possible via Front-USB connector or Ethernet.

Simulation SIM/KS98-R

The PC-Simulation allows to fully test a KS98-Rail user program regarding its functionality without a real device. Input signals can be stimulated and resulting output values can be monitored.

Pre-testing and fine-tuning of functionality and user dialogs can be performed at an early stage of a project.

The SIM/KS98-R utility embeds a process simulation with adjustable dynamic behavior. With it, the control performance can be evaluated even before commissioning.

Evaluation Software LOG/KS98-2

This software supports the KS98-Rail datalogger functionality. The utility can upload logged data files via ftp and display the content.

The values displayed as trend graphics can be analyzed in detail by enlarging sections and by using a cursor.

Downloader DL/KS98-2

This utility allows to download a packed user program without the possibility to see the code. It supports field updates of user programs.

BlueFlasher

This utility is to update the Firmware of devices in the field. That way older devices can benefit from new features or performance enhancements developed after they have been manufactured.

USB-Cable

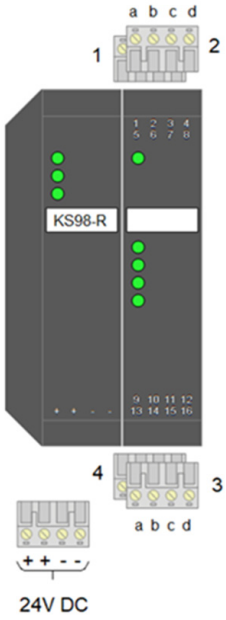
To connect PC with programming utility to the unit. (KS98-Rail Front USB Interface)

DELIVERED CONDITION

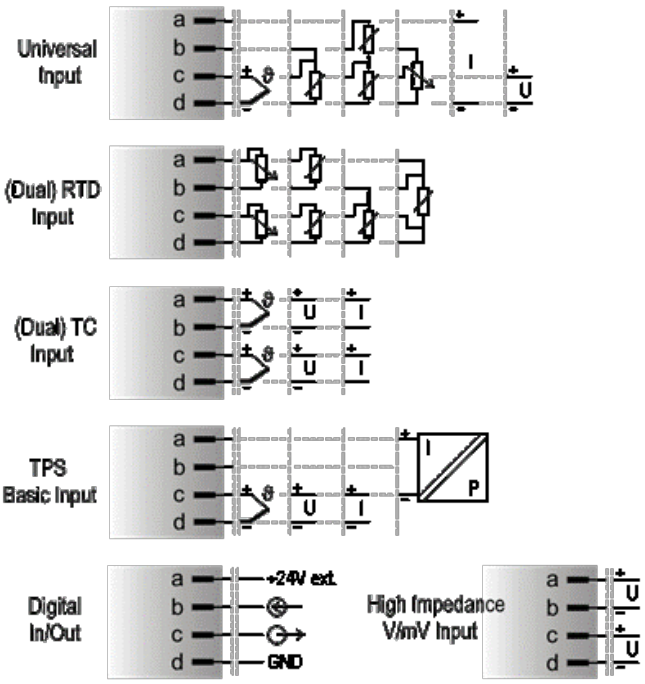
Upon delivery, the device is usually without application program and needs to be programmed before installation. A factory preinstallation of your user programs can be ordered as an option.

TERMINAL CONNECTIONS

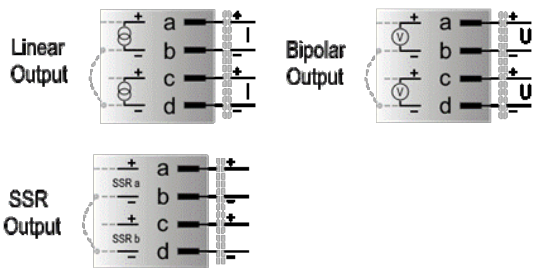
Connector Positioning:



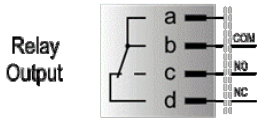
Input Modules:



Output Modules:



Relay Outputs:



VARIANTS / ORDER CODES

KS98-Rail CPU Unit

	KS98 - R X 1 - X X 0 0 X - X 0 0
CPU	
With Connector Set Screw Terminals	1
With Connector Set Spring Clamp	2
Communication Options	
Ethernet and RS485/MODBUS® RTU	0
Ethernet, RS485/MODBUS® RTU, and CAN for Remote I/O	1
Options	
None	0
Datalogger	1
Configuration	
Default Settings	0
Preset to Specification	9
Certification	
Standard (CE-Certified)	C
UL / cUL Certified	U

KS98-Rail I/O Units

	IO98 - 1 X X - 1 X X X X - X 0 0
Modular I/O Unit	
With Connector Set Screw Terminals	1
With Connector Set Spring Clamp	2
Address Preset	
Without	0
Address 1..F = 1..15	X
I/O Modules Fitted	
Not Fitted	0 0 0 0
Universal Input	U U U U
Dual Pt100/1000, Ni100/1000, Resistance	R R R R
Dual Thermocouple, mV, 0/4..20mA	T T T T
Dual -50...1500mV (eg. Zirconia probe). 0...10V	V V V V
0/4...20mA Input with Transmitter Power Supply	P P P P
Dual DC Drive Output for SSR	A A A A
Dual Linear Out (0/4...20mA)	L L L L
Dual Bipolar Linear Out (-10V...10V)	B B B B
Dual Digital I/O	D D D D
Certification	
Standard (CE-Certified)	C
UL / cUL Certified	U

Contact

UK

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