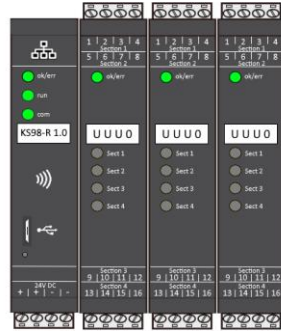


KS98-R PROCESS CONTROL SYSTEM CONCISE MANUAL (59662-2)

CAUTION: Installation should be only performed by technically competent personnel. It is the responsibility of the installing engineer to ensure that the configuration is safe. Local regulations regarding electrical installation & safety must be observed - e.g. US National Electrical Code (NEC) and/or Canadian Electrical Code. Impairment of protection will occur if the product is used in a manner not specified by the manufacturer.

Installation

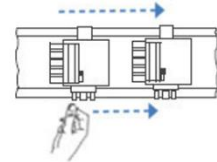


KS98-R units are designed for vertical mounting on 35 mm top-hat rails to EN 50022. The place of installation should be exempt of vibration, aggressive media (e.g. acid, lye), liquid, dust or aerosol. A CPU and up to 15 I/O units can be mounted directly side by side to form a system. For mounting and dismounting, min. 80 mm free space above and below the units should be provided.



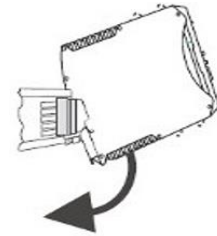
Ventilation slots must not be covered, and adequate air circulation must be allowed.

Bus Connector



A bus connector needs to be mounted into the top-hat rail first to provide communication between the CPU and the I/O-units.

Mounting



For mounting, simply clip the unit onto the top-hat rail from top and click it in position. Check addressing of I/O units before installation.

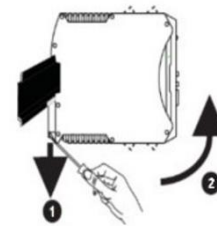
I/O Addressing



There is a DIP Switch assessable through a cut-out in the side wall of each I/O unit with the following digits:

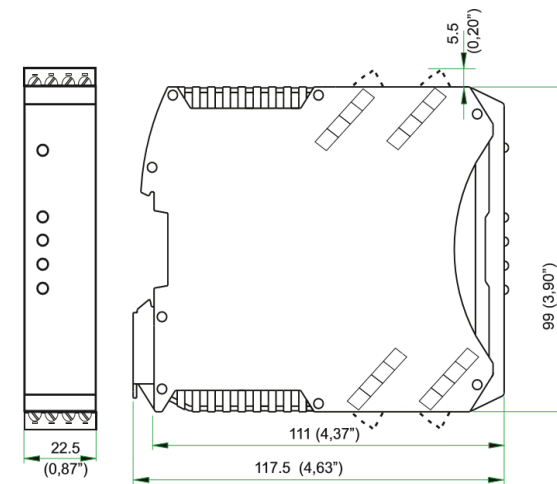
- 1..4 Addressing (binary 1,2,4,8) (preferably address in order of modules / 1 at the left)
- 6..8 Bus speed (leave at default)
- 9..10 Bus termination (switch on at last module)

Disassembly



To dismount the unit, pull the bottom catch down using a screwdriver and remove the unit upwards.

Dimensions



Available Units and I/O Modules

CPU unit (KS98-RX1-XX00X-X00)

This unit provides the free programmable heart of a KS98-R system. It is able to drive up to 15 direct connected I/O units.

Supply Voltage 24V DC (+25%-20%), max. 20W (incl. connected I/O units)

Modular I/O unit (IO98-1X0-1XXXX-X00)

The modular I/O unit can be ordered with a selection of up to 4 I/O modules. Each module provides 1 or 2 I/O channels. Available modules see below:

U-Module: *
Single channel universal input module
Thermocouples, resistance thermometers, temperature difference, resistance sensors, DC current and DC voltage.

T-Module: *
Dual channel thermocouple and standard signal module
Thermocouples, DC current and DC voltage.

R-Module:
Resistance measurement module (single or dual channel)
PT100, PT1000, Ni100, Ni1000 resistance thermometers, potentiometer transducer.

V-Module:
Dual channel high impedance voltage measurement module
mV- DC voltage (eg. Zirconia-probe).

P-Module:
Single channel input module with transmitter power supply.
For direct connection of measuring transducers.

L-Module:
Dual channel linear current output module.
0..20mA, 4..20mA.

B-Module:
Dual channel bipolar voltage output module.
0..10V, 2..10V, ± 10V.

D-Module:
Dual channel digital in-/outputs (configurable by channel).
Optocoupler isolated input for 24V DC, current sink according to IEC 1131 Type1 (Logic "0" = -3...5 V, Logic "1" = 15...30 V, approx. 5mA).
Optocoupler isolated output, "Grounded load" with common positive control voltage, Power 18...32V DC ≤ 70 mA.

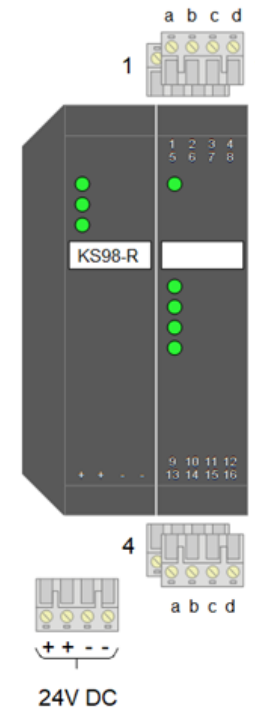
A-Module:
Dual channel digital output module for driving Solid-State Relays,
0V/±10V, Load ≥500Ω.

*Note - This module is intended to be used with isolated thermocouples.

Relay Output Unit (IO98-1X0-30000-X00)

The Relay output unit provides 4 SPDT relay outputs.
Switching power of the relays:
250V, 2A at 48... 62 Hz, 500 VA (resistive load).

Connections



There are 4 plug-in connectors at each I/O unit. They can easily be plugged into the housing from the top and bottom. Releasing the connectors should be done by means of a screwdriver.

Two connector types are available:
- Screw terminals for max. 2,5 mm² conductors
- Spring-clamp terminals for max. 2,5 mm² conductors

Each connector represents one I/O section. Connections are based on the module installed in this section. (see corresponding digit within the order code)

The recommended wire size is 24 to 14 AWG with a strip length of 12 to 13mm. The minimum temperature rating of electrical wiring must be 80°C.

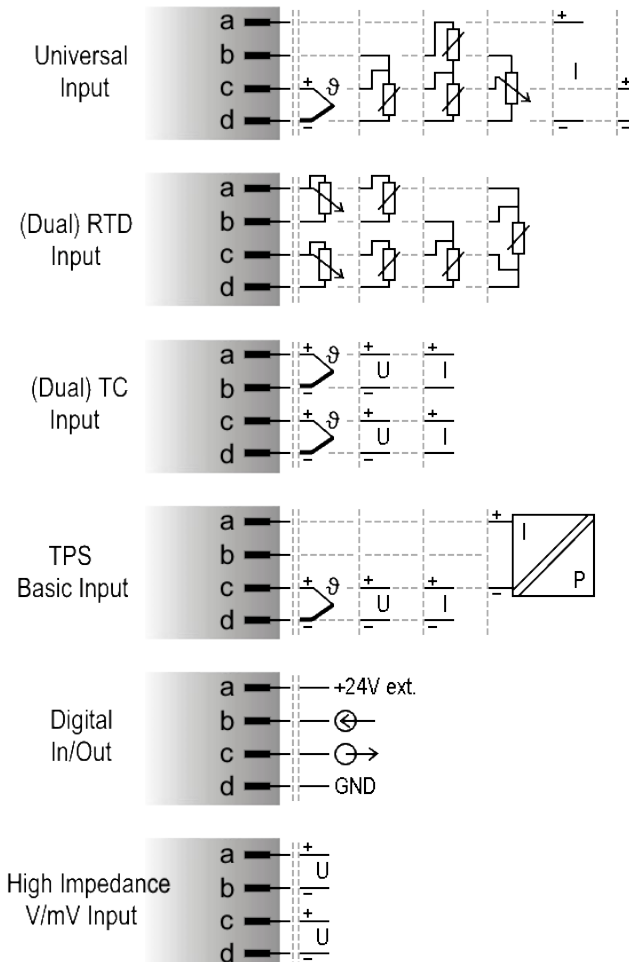
There is a limit of max 20 high current outputs (mA out or TPS) per system.



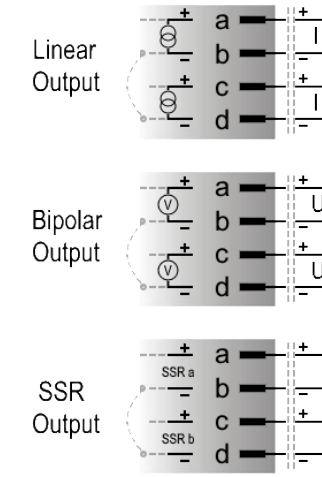
The use of I/O modules is based on the loaded user program. The person providing the user program also needs to provide the corresponding connection diagram.

See module terminal assignment for signal connection to the individual connectors

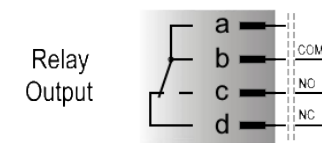
Input modules (Modular I/O unit):



Output modules (Modular I/O unit):

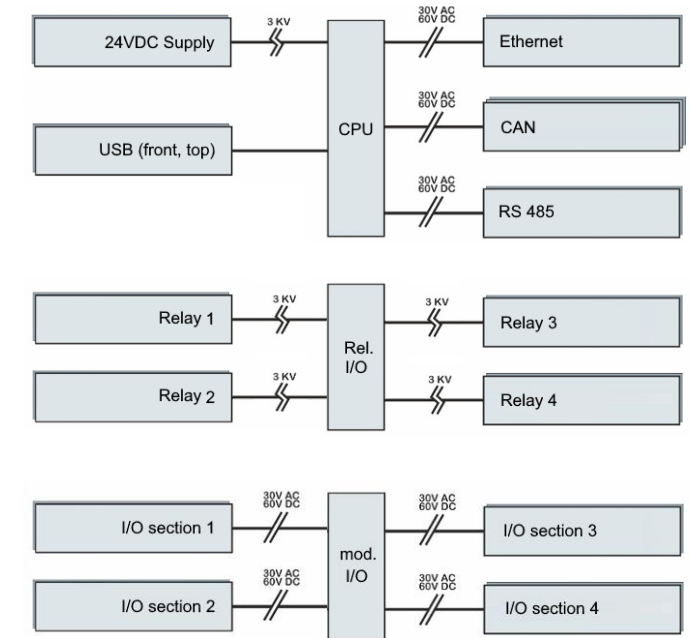


Relays (Relay unit):



Electrical Isolation

The diagram below shows the levels of electrical isolation between all inputs and outputs of the system:



Measuring and signal circuits: functional isolation up to a working voltage ≤ 30 VAC / 60 VDC against earth (to UL 61010-1).

Supply circuits with safety isolation between circuits and against earth up to a working voltage 300V r.m.s. (to EN 61010-1).

All Option Modules are galvanically isolated from each other and to the carrier unit (functional separation). There is no galvanic separation between the channels of an Option Module.



Electrical safety

The user is responsible that the system is operated only by trained and authorized persons. Maintenance and repair may be done only by trained and specialized persons who are familiar with the related hazards.

The insulation of the instrument meets standard EN 61010-1 (VDE 0411-1) with Pollution degree 2, overvoltage category II, working voltage 300V r.m.s. and protection class II.

The electrical wiring must conform to local standards (e.g. VDE 100 in Germany).

Electromagnetic Compatibility

Complies with EN 61326-1 "continuous, non-monitored operation". The unit is suitable for use in industrial areas (in residential areas, RF interference may occur) Installations where IO cables go outside in open air it is necessary to provide surge protection external to the KS98x controller for EMC compliance. USB cable for programming max. length 3m.

The electromagnetic compatibility can be improved considerably by:

Installing the unit in a grounded metal switch cabinet.

Keeping mains supply lines separate from signal and input leads.

Using twisted and screened input and signal leads (connect screening to measurement earth).

Providing connected actuators with RC protective circuits to manufacturer specifications to prevent high voltage peaks which might cause trouble to the instrument

Commissioning

Before switching on the system, ensure that the following points were considered:

- The supply voltage must correspond to the specification on the type label!
- All covers required for contact protection must be fitted.
- Before operation start, check that other equipment in the same signal loop is not affected. If necessary, appropriate measures must be taken.
- The unit may be operated only in built-in condition.
- The specified temperature limits must be met before and during operation.
- The instrument is freely programmable; therefore, the behaviour of the inputs and outputs is determined by the loaded user program. If no user program has been loaded in the device, the device is non-functional.
- Before starting, you must ensure that the correct commissioning instructions for the system and the device are available.
- The effect of the activation of the individual outputs must be known. Necessary protections against unintended activation of system components must be carried out in advance. Before switching on, the plant-specific input and output signal types must be set on the device.

This is the only way to avoid damage to the system and to the unit.

Further technical information for installation is available in the following link: <https://www.west-cs.co.uk/products-uk/models-uk/ks-98-2-multi-function-controller/>

Status Indicators

KS98 Rail units are providing status information with LED indicators. Have a look to these indicators first if anything does not work as you expect.

Address info at power on

Right after power-on the Segment-LEDs of I/O units indicate the address setting for the internal communication. This way DIP switch settings can easily be checked.

Example:

			8
			4
			2
			1
Adr. 1	Adr. 2	Adr. 3	

CPU unit

OK LED

- GREEN when system is in normal operation
- RED when internal problem has been detected
- RED FLASHING when problem with I/O communication

Run LED

- GREEN when user program running
- RED when checksum error in user data

Com LED

- GREEN FLASHING when communicating with host device

Modular I/O unit

OK LED

- GREEN when system is in normal operation
- RED when internal problem has been detected
- RED FLASHING when problem with I/O communication

Segment LEDs

- OFF during normal operation
- GREEN when segment receives a configuration message
- RED when internal problem has been detected (i.e. no module)
- RED FLASHING when problem with measurement

Relay output unit

OK LED

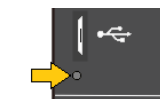
- GREEN when system is in normal operation
- RED when internal problem has been detected
- RED FLASHING when problem with I/O communication

Segment LEDs

- GREEN when segment receives a configuration message
- GREEN when Relay is active

Programmable Button

Below the front USB connector is a hidden button to trigger specific functions. It can be pressed with a pencil lead.



The functionality depends on the user program

Maintenance and Modification

KS98 Rail units do not need particular maintenance.

Modifications, maintenance and repair may be carried out only by trained, authorized persons. For this, the user is invited to contact our service departments

Certifications and Approvals

EC conformity (CE marking)

Meets the European Directives regarding "Electromagnetic Compatibility" and "Low-Voltage Directive".

UL

Complies with UL61010-2-201

The connection diagrams in this manual show all possible options. The actual connections required depends on the exact model and options fitted.



CAUTION: Check information label on housing for correct operating voltage before connecting the mains supply to the Power Input terminals!

CAUTION: This product can expose you to chemicals including arsenic, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov

Installation and Technical Assistance

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