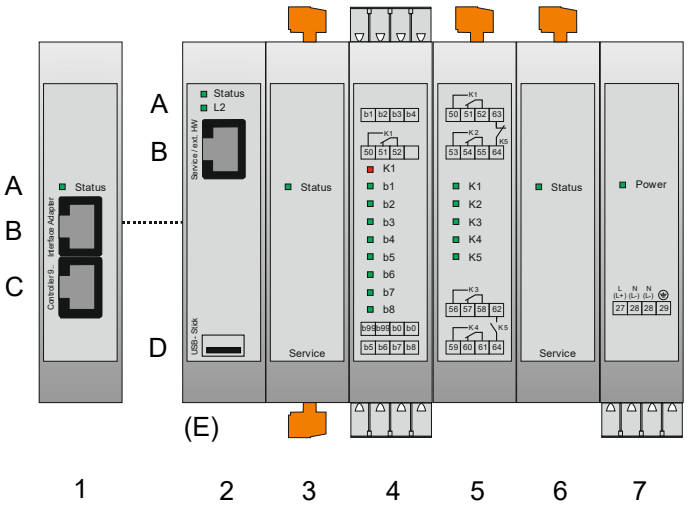
A Status-LEDs (depending on the module)
B Service interface and connection for interface adapter
C Interface for KFM controller 9..
D USB-stick interface and operating button T1
(E) Internal USB-C interface

1 Hardware expansion adapter (852610) alternative
2 CPU- module (852622)
3 Analogue input module (8522..)
4 Binary input module with relay cont. (8523..)
5 Relay output module (8527..)
6 Analogue output module (8528..)
7 Power supply module (8525..)



General description:

The modular hardware expansion modules are used to enlarge the built-in hardware of KFM-devices by adding additional in- and outputs.
For connection to external KFM devices, e.g. controller series 903K, the hardware extension adapter 852610 is required on the module side, which establishes the connection to all other modules. Optionally, a fieldbus adapter can be connected to the hardware expansion adapter (“Interface adapter” interface (B)).
Alternatively, expansion modules can be connected directly to stand-alone function modules, e.g. to the 852620 module (data acquisition only), 852621 and 852622 data processing module, 834.. data logger or 826.. fault indicator.

Module overview:

CPU- modules:

852610	Hardware expansion adapter for KFM-controller
852620	Independent module for data acquisition
852621	Freely configurable data processing module *(old version)*
852622	Freely configurable CPU module with USB interface for memory sticks (Optionally with Ethernet interface for e.g. Profinet or Modbus TCP/IP)

Power supply modules:

852500	Power supply module 100-230V AC
852508	Power supply module 24V AC or DC

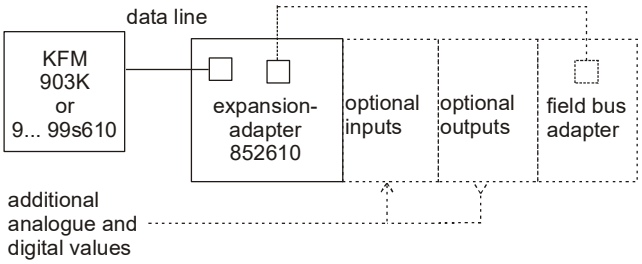
Analogue modules:

852220	Module with 2 analogue inputs Pt100 / stand. signal, range 0..400 / adjustable
852280	same as 852220, but range -200..+800 / adjustable
85228e4m8	Module with 4 anal. inputs stand. signal 0/4..20mA, range adj., connection M8 sockets
852820 (852850)	Module with 2 (5) analogue outputs 0/4...20mA

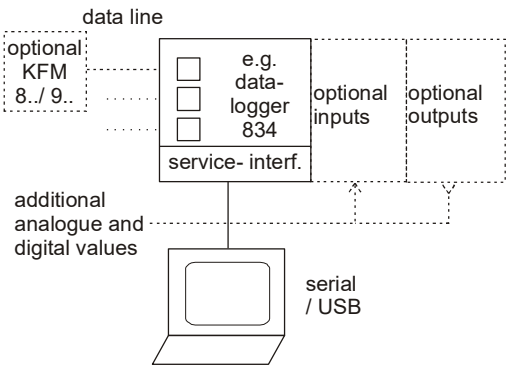
Digital modules:

8523801	Module with 8 binary inputs 230VAC,1 relay contact (pot. free changeover)
8523881	Module with 8 binary inputs 24VDC,1 relay contact (pot. free changeover)
852750	Module with 5 relay outputs (changeover, max. 250V 2A)

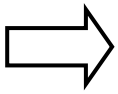
Flowchart: with Hardware expansion adapter



with independent functional module



Content



Reference!
This symbol refers to further information in other sections, chapters or other manuals.

Intended use

The device is intended, in accordance to the technical data, for measuring- and control functions in industrial environments.
Any other use or usage beyond this scope is not considered as intended.
The device is constructed in accordance to the current standards and directives and complies with safety regulations.
Nevertheless, improper use can result in danger to life or property damages.
In order to avoid risks, the device must be used for the intended use in a proper safety condition and in compliance with the delivered technical documentation. Application- related dangers can occur also if the device is appropriate or intended used caused for example by missing safety devices or wrong adjustments.

Personnel qualification

This document includes all information necessary for the intended use of the device described therein.
It has been written exlusively for technically qualified personnel who have been specially trained with expertise in automation technology. Understanding these informations and the technically correct implementation of the delivered documentation are required for safe installation, commissioning as well as for safety during operation. Work on the device and the electrical wiring must only be carried out to the extent described by qualified personell.

Installation

Before installation: Check the appliance for externally visible transport damage.
Check the supply voltage against the rating plate.
Devices in modular design are supplied fully assembled on a mounting rail.
This can be mounted directly in the switch cabinet. Alternatively, after loosening the end pieces and sliding the module housings apart, the modules can be snapped individually and in the specified order onto the standard rail intended for use. The module housings must then be pushed together. The plug connectors then connect the individual modules together. Finally, the end pieces must be fitted on both sides of the module housings.

Electrical safety

- All electrical lines of the device must be disconnected during installation/dismantling, service- and repair work.
- Load circuits must be fused for the maximum load (see technical data).
- The device is not suitable for installation in areas with an explosion hazard.
- In addition to a faulty installation, also incorrectly (for example by self- adaption) or wrong set parameter values on the device could affect the correct process.
- Safety devices independently from the device should be provided always.
  The corresponding safety regulations must be observed.
- The operator must be electrostatic discharged (for example by touching a grounded metal object) before plugging or pulling of the connecting cables.
- During commissioning, the delivery defaults of the device can be different from the designated application. The plant constructor is generally responsible for commissioning.

Electrical wiring

- Pluggable terminal block; connection according to the connection diagram on the device.
- Only use the terminal blocks supplied in each case. Replace existing old terminal blocks.
- When connecting the power supply, do not mix up the phase and neutral conductors.
- Use cables with a wire cross-section of max. 1.5 mm2.
- Keep the input, output and supply lines separate from each other and do not lay them parallel to each other.
- Use shielded and twisted cables for the measuring, control and interface lines to avoid interference; ground the shielding properly. Do not run cables in the vicinity of live components or cables.
- Do not loop earthing cables through, but route them individually to a common earthing point in the switch cabinet; ensure that the cables are as short as possible and that potential equalization is carried out correctly.
- The regulations of DIN VDE 0100 “Installation of low-voltage systems” or the respective national regulations (e.g. based on IEC 60364) must be observed for the cable material, during installation and also for the electrical connection of the device.
- Depending on the version and application, install any enclosed RC combinations (external) or bridges (internal RC combinations) according to the circuit diagram.
- To protect the relays, e.g. in the event of a short circuit, fuse the output lines externally.
- Depending on the version, establish a connection between the modular device and the controller using the supplied patch cable

Putting into operation:

Switch on the mains supply. All indicator lamps light up for approx. 1-2 seconds. No further action is required on the appliance.

Maintenance:

All electronic devices in the KFM range are practically maintenance-free. If installed and commissioned correctly and protected against mechanical damage and impermissible operating conditions, years of trouble-free operation can be expected. In the event of malfunctions, interventions should only be limited to elements that are accessible outside the device or have been expressly approved for this purpose (connections, jumpers, fuses).

Any further tampering, especially inside the appliance, will invalidate the warranty, make it more difficult to check and rectify the fault at a later date and can cause considerable damage to the circuit if not carried out correctly.

To send in for repair, disconnect the patch cables and terminal blocks with the connected supply lines, release the mounting rail and remove with devices. Alternatively, the modules can be removed individually after loosening the end pieces and **sliding** the module housings **apart**.

In the interest of the quickest and most cost-effective repair possible, it is essential that the faults detected are specified as precisely as possible when the device is sent in.

See chapter error messages on page 5

Status and error messages:

module	LED	explanation
Hardware-expansion adapter / CPU module (8526..)	green permanent**	Normal operation
	green flashing**	Fault on measuring input (together with 85228e4m8)
	red permanent	Internal error Contact *KFM or remit device for repair!*
	red flashing	Communication error to in.- and output modules *
	LED off	No operating voltage present *Check mains connection for short-circuit or broken wire and ensure that the modules are correctly seated!*
(not valid for type 85228e4m8)	green permanent**	Normal operation
	green flashing**	Fault on measuring input
	red flashing	Communication error to the hardware expansion adapter or data logger * *Does not apply to device variant .0i1 with single-sided connection for internal bus connection*
	red permanent	Internal error Contact *KFM or remit device for repair!*
Bin. input module with relay (8523..), Status-LED	red flashing	Communication error to the hardware expansion adapter, data logger or malfunction alarm display *
	red permanent	Collective relay actuated, switched on or switched off depending on the configuration
Bin. input module with relay (8523..), Message-LEDs	green permanent**	operating indication
	red flashing	unaccepted malfunction indication
	red permanent	accepted malfunction indication
Relay output module (8527..)	green permanent**	Collective relay actuated, switched on or switched off depending on the configuration
	red flashing	Communication error to the hardware expansion adapter *
Analogue output module (8528..)	green permanent**	Normal operation
	red flashing	Communication error to the hardware expansion adapter *
	red permanent	Internal error Contact *KFM or remit device for repair!*
Power supply module (8525..)	green permanent**	Supply voltage on, normal operation

** Disconnect the device from the power supply for a short time and ensure that the modules are correctly seated!*
*** alternative yellow, depending on version*

Error messages at the controller:
ERR 63 Connection to the ext.hardware interrupted, check cables and parameter ExHW

Firmware-Update (LED L2 blue) of CPU- module 852622:

1. Copy the firmware file “MSW_852_...” to the main directory of the USB stick.
2. Insert the USB stick.
3. Briefly press the button (bottom side) until the bottom **LED (L2) lights up blue**.
4. Then press the button for 5 seconds until the blue LED starts to flash.
5. the update is carried out; if the update is successful, a restart is carried out automatically.

Error during update: If the LED does not flash blue but lights up red, see section “Error...” below:

Configuration-Update (LED L2 green) of CPU- module 852622:

1. Copy the configuration file “ConfigurationUpdate.kfg” to the main directory of the USB stick.
2. Insert the USB stick.
3. briefly press the button (bottom side) until the bottom **LED (L2) lights up green**.
4. then press the button for 5 seconds until the green LED starts to flash.
5. The update is carried out; if the update is successful, a restart is carried out automatically.

Error during update: If the LED does not flash green but lights up red, see section “Error...” below:

Error during Update (LED L2 red) of CPU- module 852622:

If the lower LED lights up red, the update has failed or there is no configuration file saved on the USB stick. To accept the error message, press the button briefly and the LED goes out. The device continues to work with the original device software in normal operation.

- Copy the correct firmware or configuration file tot he main directory oft he USB stick and carry out the update again; use a different USB stick if necessary.

Parameters: Adjustment possibilities by controller menu (if connected via 852610) resp. by PKS / service- interface (independent functional modules)

Operating indication:

display	purpose	Value range	CODE (HEX)
-	status-/control words 2, 3 (direct query)	structure see manual 99s	1002, 1005
	dito, with indirect query via controller		1003, 1006
IST1 *	Actual value 1..16		1010..1F
Parameter level 2:			
1..16bLo	min. value range input 1..16	-999...bHi	5022..31
1..16bHi	max. value range input 1..16	blo...4000	5032..41
1..6SLo	inform. signal outp. 1..6: start of range	-999...9999	5332..37
1..6SHi	inform. signal outp. 1..6: end of range	-999...9999	5364..69
1..16nst	decimal point input 1..16	0...2 (dep. on the range)	60C0..CF
ExHW**	Interface connection to external hardware	ON, OFF	
Configuration level:			
Ist1..16	correction actual value 1..16	blo...bHi (+/-)	6000..0F
Ain1..16	type of measuring input 1..16	0=4-20, 1=2-10, 2=0-20, 3=0-10, 5=rtd, 20=n100	60D0..DF
Sou1..6	type of information output signals 1..6	0...20, 4...20	5300..05

* (parameter that can only be **sent** by the module)

** The external hardware must be connected and the parameter ExHW set to ON during the transfer of configurations into the controller.

Interfaces:
1 x KFM-device 903K or 9.. 99s610 (only hardware expansion adapter 852610), connection via the supplied cable, 1x interface adapter

Only 8522../ 8528..: 1 x TTL, protocol KFM 2.0, only for KFM- service

Only 852622..: 1 x Service interface for configuration, alternative for interface adapters;
1 x USB stick, 1 x USB-C (internal), depending on version Ethernet interface

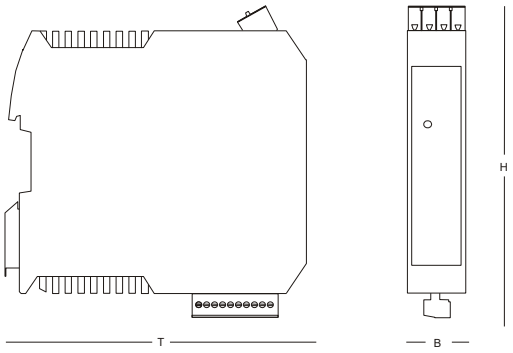
Technical data:

Mains connection:	100..250 VAC, about 12 VA, alternatively 24VDC, about 12 VA
optional: bin. inputs:	230 VAC, about 2 mA, alternatively 24VDC, about 2 mA
optional: anal. inputs:	• Pt100/ standard signal, range 0..400 resp. -200..+800°C / adj. • Potentiometer 0…100/1000Ω / standard signal, range adjustable
optional: relay output:	230 V / max. 2 A
optional: anal. output:	0/4..20mA (load<=500Ω) as control or signal output

Other operating data:

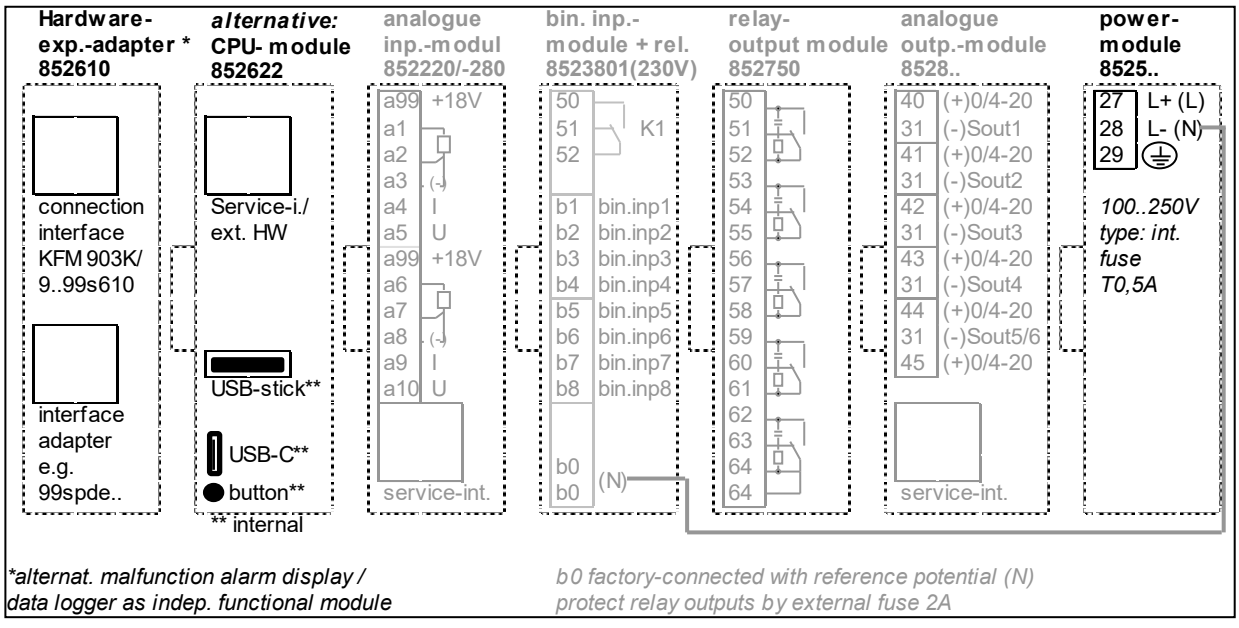
Housing: for fastening to 35mm mounting rail
Installation orientation: vertical, unlocking tab downwards
Type of protection: IP20
Perm. ambient temperature: 0...60°C,
Nominal temperature: 20°C
Climatic category :Relative humidity <= 75 % yearly average, no condensation, KWF to EN 60 529
EMC: refer to EN 61326

Installation dimensions (each module)



H= 124mm, B = 22,5mm, T = 116mm

Wiring diagram: (Example, valid for each delivered device is the wiring diagram on its casing only.)



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