KOBUS
KOBOLD-BUS-System

- Simple two-wire connection
- Up to 240 sensors on the BUS
- BUS-length up to 1000 m
- Automatic sensor recognition
- High degree of transmission security

KOBOLD companies worldwide:
ARGENTINA, AUSTRIA, BELGIUM, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, FRANCE, GERMANY, GREAT BRITAIN, INDIA, IRAN, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, SINGAPORE, SLOVAKIA, SPAIN, SWITZERLAND, THAILAND, USA, VENEZUELA, VIETNAM

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Model:
BUS

Save money with KOBOLD-KOBUS

What makes KOBUS stand out in comparison to other systems

- No complicated and extensive advance planning is necessary!
- Very easy installation due to polarity reversal-protected 2-wire connection in bus, star, and tree form
- Reasonably priced, twisted two-pole wires, up to 1 km for simultaneous current supply and signal or transmission
- Up to 240 sensors can be connected
- Cost/performance ratio that is head and shoulders above the competition

Where is KOBUS used? Everywhere that...

- More than 1 sensor is necessary for measurement, control, guidance, monitoring, or long-term recording
- Flexibility is planned for subsequent requirements, expansions, etc.
- Central detection is desired
- The most modern technology will ensure installation with provision for extension

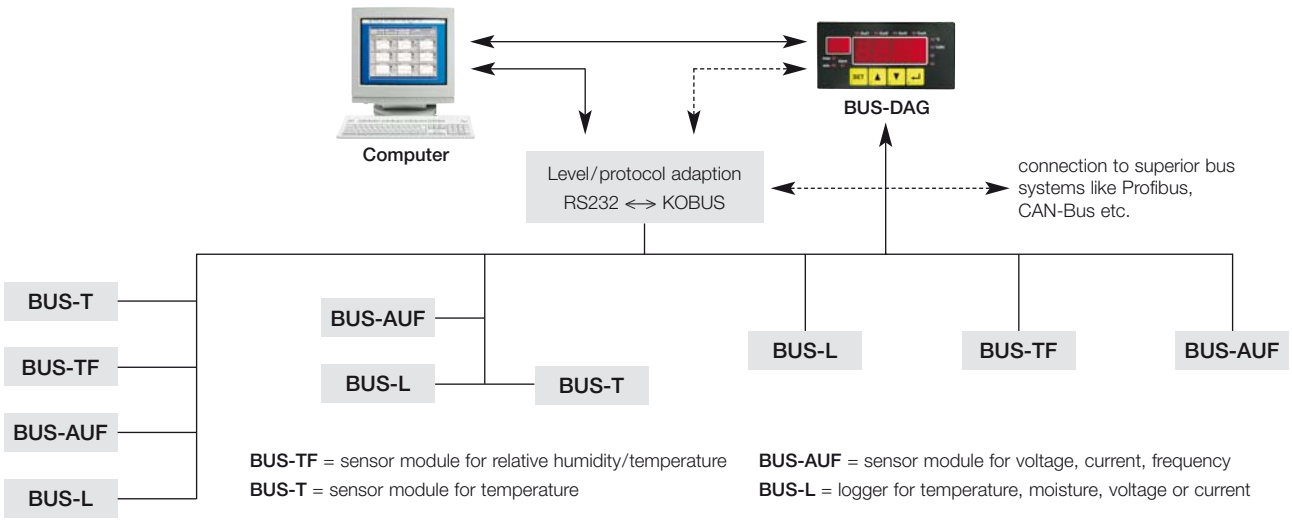
What is innovative about KOBUS?

In contrast to conventional systems (such as current loop 4 - 20 mA), only a single 2-pole cable is laid, to which up to 240 sensors can be attached. In order to get the same effect with 4 - 20 mA, 240 cables would have to be laid. Obviously, the KOBUS system has a giant advantage just in wiring alone.

In addition, it is advantageous that the sensor modules (initially for temperature, moisture, voltage, and current) developed by us are priced comparably to the 4 - 20 mA transducers, which means that there are also no additional expenses – as with other expensive bus systems – for the user.

Technical Overview

- Up to 240 slaves (measuring points) can be connected
- Cable laying as desired (strand, spur lines with free length, ring etc.)
- Bus length up to approx. 1000 m
- Connection by means of 2-core, twisted cable
- Connection is polarity-free
- Sensor module supply from the bus cable or externally (battery, 24 V_{DC}, 230 V_{AC} etc.)
- Interface supply always from the bus cable
- The bus remains completely functional, even with the failure of sensor modules
  (short-circuit of the coupling module: 1 sensor module, with all other faults: any number of sensor modules)
- Very little planning effort
- Software-controlled, fully automatic initial installation is possible
- Automatic recognition of a new sensor module
- The sensor modules can be changed, removed, or added during operation
- The scan time per sensor module is approx. 55 ms
- Very high degree of transmission security due to CRC-Check (CRC-Byte after two data bytes each)



BUS-TF = sensor module for relative humidity/temperature
BUS-T = sensor module for temperature
BUS-AUF = sensor module for voltage, current, frequency
BUS-L = logger for temperature, moisture, voltage or current

No responsibility taken for errors;
subject to change without prior notice.

BUS-AUF...

Description

The KOBUS-BUS-AUF plug-on display upgrades devices with DIN-plug connection to have a four-digit display and a KOBUS-interface.

The module is simply placed between the plug and plug socket and is immediately ready for operation. By means of the two-core bus cable, this can be connected to a COM-interface of a PC by means of a level converter or simply integrated into an existing KOBUS. The devices are configured and the measured data is read out by means of special KOBUS-software.

The KOBUS-module BUS-DAG can display the measured values of up to twenty KOBUS-modules and operates the KOBUS without the use of a PC.

Configuration of the device

The device is configured with the BUS-SKON software. The display range, the decimal point position, and the display unit and display measurement type can be set with the aid of this software. Minimum/maximum alarm points with an adjustable alarm delay (0...166 min) upgrades the sensor to a process monitor.

In addition, the sensor data (device type, series number, address, etc.) can be read out.

Technical Details

Measurement input:	4 - 20 mA (2-conductor), 0 - 20 mA (3-conductor), 0 - 10 V, 0.5...1000 Hz
Display:	4-digit, red LED-display
Character height:	7 mm
Display range:	-1999 ... 9999
Precision:	< 0.2 % ±1 digit (at 25 °C)

Technical Details (continued)

Configuration by means of KOBUS:	decimal point, beginning and end value, unit, address, alarm limits, alarm delay
Measurement rate:	approx. 50 measurements/sec. 2 measurements/sec. (frequency input)
Interface:	KOBUS, galvanically separated from the measurement and supply circuit
Electrical connection:	plug DIN 43650 (measurem. input) approx. 1 m cable (KOBUS)
Voltage supply:	2-conductor: from current loop 3-conductor: 24 V_{DC} ± 20 %
Voltage drop:	≤ 5.5 V (BUS-AUF LK42)
Protection resistance:	approx. 75 Ω, max. 25 mA (BUS-AUF LK03)
Input resistance:	R_i > 100 KΩ (BUS-AUF LK13)
Degree of protection:	IP 65
Nominal temperature:	25 °C
Working temperature:	0 ... +60 °C
Relative humidity:	10 ... 80 % (not condensing)
Storage temperature:	-30 ... +80 °C
Dimensions:	42 x 42 x 48 mm
Housing material:	plastic

Ordering Details

Input	Model
4-20 mA, 2-conductor	**BUS-AUF LK42**
0-20 mA, 3-conductor	**BUS-AUF LK03**
0-10 V, 3-conductor	**BUS-AUF LK13**
Frequency, 3-conductor*	**BUS-AUF FK03**

* for DTK-...0400 and DRZ-...0000 only

Electrical Connection

	BUS-AUF LK42	BUS-AUF LK03	BUS-AUF LK13	BUS-AUF FK03
PIN 1 (plug/socket)	+V_S / S+	+V_S / +V_S	+V_S / +V_S	+V_S / +5 V (Hall sensor)
PIN 2 (plug/socket)	GND / S-	GND / GND	GND / GND	GND / GND
PIN 3 (plug/socket)	-	- / signal 0 - 20 mA	signal / signal 0 - 10 mA / 0 - 10 mA	- / pulse signal 0,5 bis 1000 Hz

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Description

Up to 9 KOBUS-modules can be connected to the KOBUS-BUS-DAG2 display device. The KOBUS modules in the bus system are automatically recognized and displayed in the correct dimensions. The BUS-DAG2 monitors the proper function and cable and sensor breakage of the KOBUS-modules. The sensor modules and loggers are supplied and data transferred by means of a single 2-wire cable. The display device can be easily programmed by means of the standard RS232-interface. The BUS-DAG2 can additionally be used as a level converter RS232-KOBUS. This allows all data of the KOBUS-modules to be displayed, monitored, and saved on a PC. The matching software is available as an accessory.

The devices are equipped standard as follows:

- Interface RS232
- KOBUS-RS232 level converter
- Alarm output: 2 closers
- MINIMUM/MAXIMUM memory for 9 channels

Model	Voltage supply
BUS-DAG 20B0	230 V_{AC}
BUS-DAG 24B0	115 V_{AC}
BUS-DAG 23B0	24 V_{DC}

Technical Details

Display range:	-1999 to +9999 Digit
Resolution:	automatic resolution recognition of the connected sensor module. The decimal point is set automatically
Display:	4-digit red, 13 mm high LED-display. 16 additional LED's for display and monitoring functions
Precision:	depending upon the respective sensor module; The BUS-DAG2 transfers this value digitally without additional errors
Input:	KOBUS-signals
Bus connection:	max. 9 sensors, polarity reversal-protected, 2-pole cables in ring, tree, or star form
Sensor supply:	by means of the BUS-DAG
Permissible cable length:	200 m (depending upon type of cable and wiring)
Error notifications:	sensor breakage, sensor short-circuit, falling below and rising above the range
Self-diagnosis:	the device constantly monitors itself for proper function
Interface:	RS232 for easy device configuration, or as a level converter RS232 - KOBUS
Minimum/maximum value memory:	for max. 9 different sensor modules that can be called up by means of buttons on the front
Minimum/maximum alarm:	2 potential-free relay (closers), 10 A (ohm resistive load), 250 V, 50/60 Hz, for minimum/maximum alarm, programmable by means of buttons on the front or RS232-interface
Alarm delay:	0...9999 min, adjustable for each channel extra
Voltage supply:	230 V_{AC} 50/60 Hz (standard) 115 V_{AC}; 24 V_{DC}
Power consumption:	approx. 3.5 VA
Degree of protection:	sealed keypad IP 65 incl. housing seal for IP 65 installation
Housing:	standard rack-mounted housing 48 x 96 x 100 mm (H x W x D)
Panel cutout:	43 x 90.5 mm (H x W)
Supply terminals:	screw terminals/plug-in terminals
Environmental temperature:	0 to 50 °C (permissible environmental temperature)

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Description

Up to 20 sensor modules or loggers can be connected to the KOBUS-display device BUS-DAG3. The sensor module is supplied and data transferred by means of a single 2-wire cable. As a result, no additional voltage supply is necessary for the sensors.

The devices are equipped standard as follows:

- elay outputs (4 x control, 1 x alarm)
- two calculated channels for the display
- MINIMUM/MAXIMUM value memory
- Alarm monitoring of all connected sensors. Easy configuration by means of the front buttons or KOBUS-interface

Technical Details

Display range:	-1999 to +9999 digit
Resolution:	automatic resolution recognition of the connected sensor module. The decimal point is set automatically.
Display measured value:	4-digit red, 13 mm high LED-display
Channel display:	2-digit red, 7 mm high LED-display
Unit, switching condition, and alarm display:	11 LED's
Precision:	depending upon the respective sensor module; reception without additional errors
Input:	KOBUS-signals
Bus connection:	max. 20 sensors, polarity reversal-protected, 2-pole cables in ring, tree, or star form
Sensor supply:	by means of the BUS-DAG
Permissible cable length:	200 m (depending upon type of cable and wiring)

Technical Details (continued)

Switching outputs:	4 relay outputs (closers), switching on the same connection; outputs can be assigned to any channel
Switching capacity:	230 V_{AC}, 5 A, ohm resistive load
Switching functions:	2-position controller, 2-position controller inverse, switchpoints, the switching delay is freely adjustable for each output separately
Alarm output:	1 relay output (change-over contact)
Alarm functions:	collective alarm for all sensors
Configuration:	all standard functions by means of keyboard, extended configuration by means of software and interface converter
Minimum/maximum value memory:	of all connected sensors
Calculation functions:	In addition to the sensor channels, there are also two »virtual« channels. Here, a calculated measured value can be displayed for each. Possible calculation functions: sensor difference, average value formation by means of x sensors, etc.
Self-diagnosis:	The device constantly monitors itself for proper function, sensor disruption, etc. and emits an appropriate error notification, if necessary.
Voltage supply:	230 V_{AC} 50/60 Hz
Power consumption:	approx. 9 VA
Supply terminals:	screw terminals/plug-in terminals
Environmental temperature:	-25 to +50 °C
Standard rack-mounted housing:	48 x 96 x 100 mm (H x W x D)
Panel cutout:	43 x 90.5 mm (H x W)
Degree of protection:	sealed keypad IP 65 incl. housing seal for IP 65 installation

Ordering designation: BUS-DAG30B0

Description

The KOBUS-loggers are ideal for monitoring rooms according to legal stipulations without cable laying and a lot of paperwork. The KOBUS-loggers are simply hung in place and started. They record a measured value and save up to 48 000 measured values. This is sufficient for 500 days with the legally stipulated cycle time of 15 minutes, which is clearly more than the required twelve months. Here, a battery life of approx. six years should be expected. With faster measuring sequences, we recommend the option »double measuring capacity«. The loggers have a digital display, which displays the measured value or the status of the device.

Technical Details

Sensor/measurement input

BUS-LT...:	Pt1000, 2-conductor
BUS-L*F...:	capacitive polymer-moisture sensor screw-off plastic-protective head for fast activation
BUS-L*F1...:	capacitive polymer-moisture sensor (diameter) 14 x 68 mm aluminum housing with 1 m PTFE-cable
BUS-L01...:	0-10 V / plug DIN 43650
BUS-L02...:	0-2 V / plug DIN 43650
BUS-L20...:	0-20 mA / plug DIN 43650
BUS-L24...:	4-20 mA / plug DIN 43650
Display:	10 mm high LCD-display
Resolution:	0.1 °C or 0.1 % r.H.

Technical Details (continued)

Display range:	-1999...9999 Digit (standard signals)
Precision (at 25 °C):	± 0.5 °C ± 3 % (in the range 11 - 90 % r.H.)

Display options

Wet-bulb temp.:	-27.0...+60.0 °C
Dew point temp.:	-40.0...+60.0 °C
Enthalpy:	-25.0...+999.9 kJ/kg
Moisture content of the air:	0...640.0 g/kg
Working temperature (electronics):	-25...+60 °C
Storage temperature:	-30...+85 °C
Alarm output (option):	open collector output 4-pole miniature built-in plug incl. 1 m connection cable
Recording rate:	2 s...5 h 4 s...5 h (moisture logger BUS-L*F) (freely programmable by means of BUS-SG40)
Recording time:	500 days with 15 min recording rate
Measured value memory:	48 000 measured values per channel
Battery life:	approx. 6 years (standard battery, 15 min recording)
Interface:	KOBUS, by means of 3-pole miniature built-in plug (matching BUS-KAB01 not in the scope of delivery)
Housing:	48.5 x 48.5 x 35.5 mm (L x W x H)
Degree of protection:	IP 65

Ordering Details (Example: **BUS-LT00S0**)

Input	Sensor design	Type	Display options	Options
0...10 V, 3-conductor	St. DIN 43650	**BUS-L010**	**S** = Standard	**0** = Without **A** = Alarm output **B** = Double battery capacity **C** = Alarm output / double battery capacity
0...2 V, 3-conductor	St. DIN 43650	**BUS-L020**		
0...20 mA, 3-cond.	St. DIN 43650	**BUS-L200**		
4...20 mA, 2-cond.	St. DIN 43650	**BUS-L240**		
-25.0...+60.0 °C	Pt1000	**BUS-LT00**		
-50.0...+150.0 °C	Pt1000 with 1 m cable	**BUS-LT10**		
0.0...100.0 % r.H.	on the housing	**BUS-L0F0**		
0.0...100.0 % r.H.	with 1 m PTFE-cable	**BUS-L0F1**		
0.0...100.0 % r.H. -25.0...+60.0 °C	moisture sensor on the housing	**BUS-LTF0**	**S** = Standard **F** = Wet-bulb temp. **T** = Dew point temp. **E** = Enthalpy **G** = Moisture content of the air	
0.0...100.0 % r.H. -25.0...+60.0 °C	moisture sensor with 1 m PTFE-cable	**BUS-LTF1**		

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KOBUS-logger

Moisture/temperature sensor with KOBUS-output

Technical Details

Measuring range moisture:	0.0...100.0 % r.H.
Recommended measuring range:	30...80 % r.H. (BUS-TF8)
Recommended measuring range:	11...90 % r.H. (BUS-TF9)
Measuring range temp.:	-25.0...+50.0 °C or -13.0...+122.0 °F (adjustable)
Resolution:	0.1 % r.H. or 0.1 °C / 0.1 °F

Precision (with nominal temp. = 25 °C, recommended measuring range)

Moisture:	±1 % linearity, ±2 % hysteresis
Temperature:	±0.4 % of the measured value ±0.3 °C
Display:	10 mm high LCD (option)
Output:	KOBUS, 2-conductor
Electrical connection:	2-pole screw terminal, polarity reversal-protected Montage, max. 1.5 mm²
Degree of protection:	IP 20
Environmental temperature:	-25...+50 °C
Housing:	70 x 70 x 26 mm (L x W x H), material ABS, attachment to a flush-mounted receptacle is also possible

Ordering Details (Example: **BUS-TF8 00**)

Measuring range	Model	Display
30...80 % r.H. -25...+50 °C	**BUS-TF8**	**00** = without **L0** = LCD-display
11...90 % r.H. -25...+50 °C	**BUS-TF9**	

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Temperature sensor with KOBUS-output

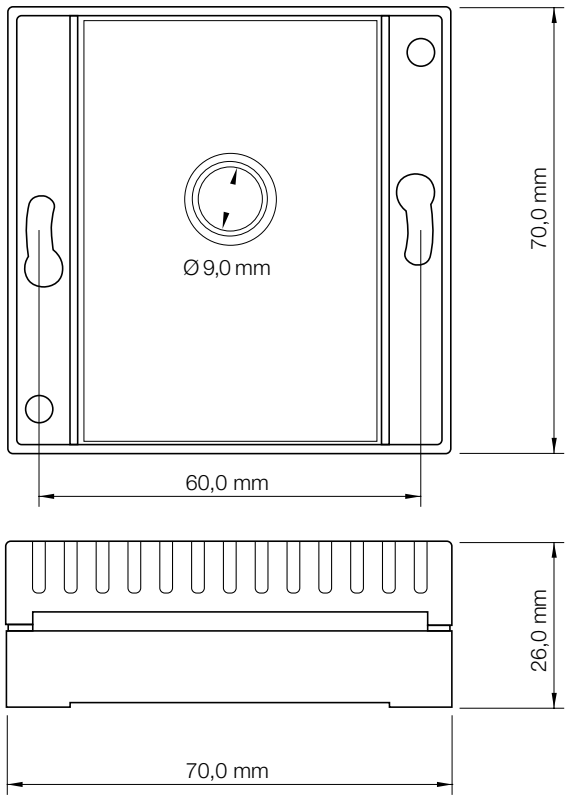
Technical Details

Sensor:	semi-conductor
Measuring range:	0,0...70.0 °C
Resolution:	0.1 °C

Precision (at nominal temp. = 25 °C

Temperature:	±0.5 °C
Display:	10 mm high LCD (option)
Output:	KOBUS, 2-conductor
Electrical connection:	2-pole screw terminal, polarity reversal-protected fitting, max. 1.5 mm²
Degree of protection:	IP 20
Environmental temperature:	-25...+70 °C
Housing:	70 x 70 x 26 mm (L x W x H), material ABS, attachment to a flush-mounted receptacle is also possible

Dimensions



Ordering Details (Example: **BUS-T00 00**)

Measuring range	Model	Display
0.0...70 °C	**BUS-T00**	**00** = without **L0** = LCD-display

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Description

The KOBUS-level converters make the connection of the KOBUS-modules to the RS232-interface of a PC possible. Depending upon the design, up to 240 sensor modules can be connected to a bus. Here, the length of the cable can be up to 1000 m depending upon the type of wiring.
A 9-pole D-Sub-connection cable is included in the scope of delivery.

Technical Details

Input:	KOBUS, short-circuit-proof galvanically separated (not with BUS-W002)
Overload display:	LED (only with BUS-W064 and BUS-W240)
Interface:	RS232, 9-pole, D-Sub
Transmission rate:	4800 Baud
Voltage supply.:	230 V_{AC} / 110 V_{AC} / 24 V_{DC} 9 V_{DC} battery (BUS-W002)
Operating temperature:	0...50 °C
Moisture:	20...80 % RF, not condensing
Storage temperature:	-20...+70 °C -20...+60 °C (BUS-W240)

Ordering Details (Example: **BUS-W001 5B0**)

Permissible cable length**	Power consumption	Dimensions	Number of max. permissible sensor modules*	Model	Voltage supply
10 m	approx. 1 W	107 x 62 x 26 mm	1	**BUS-W001...**	**..5B0** = 9 V_{DC} battery
200 m	approx. 5 W	112 x 80 x 45 mm	9	**BUS-W009...**	**..0B0** = 230 V_{AC} **..4B0** = 115 V_{AC} **..3B0** = 24 V_{DC}
1000 m	approx. 15 W	100 x 75 x 110 mm	64	**BUS-W064...**	
1000 m	approx. 30 W	200 x 240 x 55 mm (without mains adaptor)	240	**BUS-W240...**	

*depending upon the sensor modules used
**depending upon the type of cable and the wiring

KOBUS accessories

BUS-KAB01

1 m **connection cable** with special plug for the connection of a BUS-L logger to the KOBUS, for reading or for constant operation.

Note: 1x BUS-KAB01 is already included in BUS-SG40.

BUS-KAB03

3 m **connection cable** with special plug for the connection of a BUS-L logger to the KOBUS, for reading or for constant operation.

BUS-KABV

Twisted special cable for KOBUS, 2 x 0.75 mm²

BUS-KABKL

2 **special branch terminals** for connection to a BUS-KABV

BUS-KABDS

Interface cable
9-pole D-Sub-plug and terminal block for BUS-DAG2

BUS-Z USB

USB-Adapter

Input:	9-pole D-Sub-plug
Output:	USB-connection
Connection cable:	approx. 1 m
Other:	with driver diskette and connection-Adapter

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Software

BUS-SW9M

Version 4.8, Multi-channel software

- 9-channel software for almost all devices with interface
- Recorder function
- Long-term monitoring
- Large display

In conjunction with a PC, a reasonably priced multi-channel measured data recording system can be set up with the software.

BUS-SECO

Windows® display software

for KOBUS-sensor modules and data logger
for recording, monitoring, display, and documentation of max. 240 KOBUS -sensor modules or data loggers

- Minimum/maximum value monitoring
- Overview portrayal in table form
- Arrangement of measuring points by means of drag and drop
- Inquiry cycle is adjustable for each measuring point
- Portrayal of the measured values in a diagram
- Automatic sensor recognition of new modules

BUS-SG40, Version 7.6

Application and control software

for Series BUS-L loggers incl. connection cable BUS-KAB01

- Output of the logger data on a printer
- Saving of the logger data
- Export of the logger data in ASCII-text
- Diagram display of the logger data
- Setting of the alarm function, etc.
- Automated reading / archiving
- Remote inquiry by means of a telephone or mobile telephone network

BUS-SKON

Free configuration program Version 3.4

The BUS-SKON software makes the configuration of KOBUS-modules possible. The data is read in by means of the serial interface of a computer.

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