



Manual

Interface Converter K-114



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General information

The K-114 interface converter is used to convert a USB signal to a serial RS485 half-duplex signal, for connection to any desired computer with a USB port. The K-114 converter and the connected transmitters are powered via the USB connection. An external power supply unit can also be connected to power multiple instruments. The K-114 converter is preferred for use with KELLER products.

With the K-114 interface converter, you can...

- ...convert a USB signal to RS 485 (half-duplex)
- ...measure the applied signal voltage (0...12 VDC)
 - e.g. the output signal voltage from a pressure transmitter
- ...measure the power consumption of connected end consumers in the 0...40mA range
 - e.g. the power consumption of connected end consumers or the power output signal from a pressure transmitter

The K-114 interface converter offers you...

- ...visual status and configuration displays (LED)
- ...electrical isolation between the computer and the converter
- ...diagnostic tools

K-114






K-114-A



K-114-B



Pin assignment for converter / connections

<p style="text-align: center;">K-114 plug-in screw terminal</p> 	<p style="text-align: center;">K-114-A Fischer plug-in connector S 103 A054-130</p> <p>1: GND 2: +U-IN 3: +Vcc 4: RS485-B 5: RS485-A</p> 	<p style="text-align: center;">K-114-B Binder female cable connector Serie 680 5-pole</p> <p>1: GND 2: +U-IN 3: +Vcc 4: RS485-A 5: RS485-B</p> 
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Technical specifications

Symbol	Parameter	Condition	Min.	typ.	Max.	Unit
Current consumption, K-114		No connection	30	43	55	mA
Power consumption, K-114		No connection	150	215	275	mW
Supply for end consumer(s)	U-Out	No power supply unit	11,2	11,8	12,5	VDC
Supply for end consumer(s)	I-Out	With power supply unit	–	–	150	mA
External supply		Power supply unit	12	15	20	VDC
Input voltage	U-In	K-114-A / K-114-B	0		12	VDC
Accuracy of input voltage	U-In	$R_i \geq 30 \text{ k}\Omega$		0,2	0,3	%FS
Current measurement	I-Out		0		40	mA
Accuracy of current measurement	I-Out			0,2	0,3	%FS
Data transmission rate	slow	Max. transmission distance $\leq 20 \text{ km}$	–	–	250	kbps
	high	Max. transmission distance $\leq 1 \text{ km}$	–	–	3	Mbps
K-114 device	Protection Class		IP40	–	–	–
Device fuse (USB)	F1	No power supply unit		0,5		A
Storage and operating temperatures			-10	20	50	°C

Description

The K-114 communicates with the connected devices via an RS485 (half-duplex mode) bus. The devices connected to the K-114 are supplied via the PC's USB output or via an external power supply unit (K-114 socket).

KELLER products operate with fail-safe drivers that generate a logical «high» at the reception output in case of short-circuited, open or terminated inputs, in order to avoid invalid signal statuses. KELLER products also have a slow rate limitation which limits the edge steepness (i.e. slew rate) of the driver output. This prevents high-frequency emissions from devices and data lines. Up to a maximum of 128 transmitters can be connected to this RS485 master bus.

Typical application



Overview of products

Product	Connection	Product number	Products supported
K-114	Plug-in screw terminal	309010.0074	All digital KELLER products Series 3X, Series 4X, DCX*
K-114A	Fischer plug	309010.0075	DCX-16 /-22-25PVDF / -38, LEO-Record, LEX1, ARC1
K-114B	Binder female cable connector	309010.0076	Series 30X / 40X, LEO3, EV-120, dV22-PP, dV2-PS**, Castello**
K-114M	M12 female cable connector	309010.0077	DCX-18 only (communication and charging cable)

* no voltage input

** requires additional cable option

System requirements for K-114_Config software

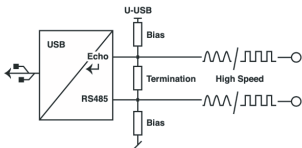
Processor	min. Pentium 75 MHz
Screen resolution	min. 1024 x 768
Main (working) memory	min. 16 MB RAM
Free hard disk space	min. 20 MB (recommended)
Internet connection	recommended (required for support)
Operating system	Windows XP Windows 7

Factory configuration for the K-114

Converter bus address	253 (cannot be changed)
Baud rate	9600 baud
Echo off	off
Bias network	off
Termination	off
High Speed	off

These settings are generally recommended to ensure troublefree operation of KELLER products.

Functional overview for the K-114



Echo off

Data sent from the PC (TX) aren't received by the PC.

Bias network

Prevents undefined bus levels when line drivers are inactive. → Greater immunity to interference

Termination

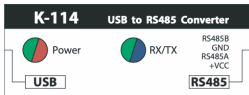
Prevents reflections on the signal lines.

High Speed

Disables the RS485 driver's slew-rate limitation. This allows communication at higher transmission speeds (> 250 kbps). Unlike high speed mode, the standard mode (< 250 kbps) reduces reflections on the signal lines and provides better EMC behaviour.

KELLER devices operate at transmission speeds < 250 kbps, so this function is not activated ex factory.

LED display



Power

- Ready to operate
- Flashing rapidly, error → U-USB < 4,5 VDC → Connect power supply unit
- Flashing slowly, error → U-UOUT < 11,2 VDC → Connect power supply unit
- Error

RX/TX

Shows the status of the transmission line (TX) and the reception line (RX).

- TX, sending data via the RS485 bus
- RX, receiving data via the RS485 bus

Echo off

Shows the status of the Echo off function.

- Echo off disabled (→ echo switched on)
- Echo off enabled (→ echo switched off)

Bias on

Shows the status of the Bias on function.**

- Bias resistors (560 Ω) for RS485A and B are enabled
- No bias resistors are connected

KELLER products use fail-safe RS485 drivers which output a valid signal even with an undefined level. For this reason, it is not mandatory to enable this function.

Termination on

- Termination resistor (120 Ω) connected**
- Termination resistor not connected

High Speed

Shows the status of the High speed function.**

- High speed enabled
- High speed disabled

****IMPORTANT:** On battery-powered devices, this function can lead to operating errors
→ Recommendation: do not enable the function.

RoHS

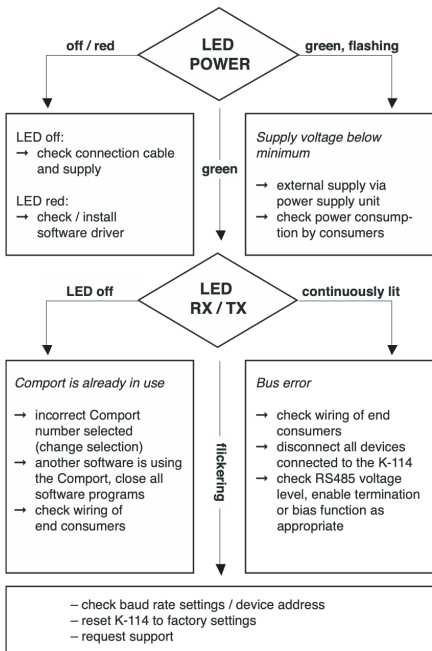
This product is compliant with EC directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).



Disposal

This symbol on the product or the product documentation indicates that the product must not be disposed of as normal household waste at the end of its useful life. In order to prevent potential damage to the environment or to health as a result of uncontrolled waste disposal, this product must be separated from other waste and must be correctly recycled in order to ensure the sustainable use of the raw materials.





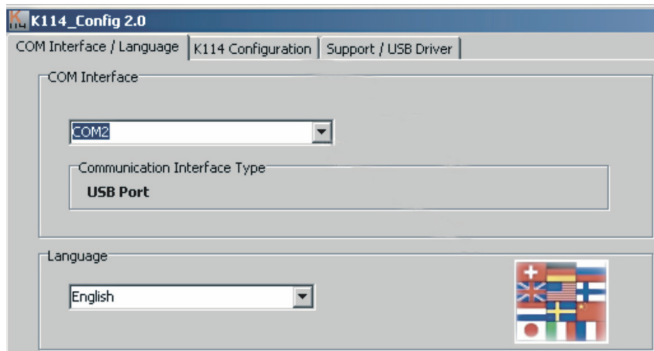
Installing the K-114_Config software

First, install the K-104 / K-114 driver on your computer and then run the K-114_Config software.
(The software can be downloaded free of charge at www.keller-druck.com)

Running the K-114_Config software

Run K-114_Config and select the appropriate COM port. Then go to the K-114 Configuration view (top right).

Tip: When the program is open, Comport is selected automatically as soon as the K-114 is plugged into the computer.



Voltage and current measurements with K-114_Config

The screenshot displays the K114_Config 2.0 software interface. The main window is titled "K114_Config 2.0" and contains several sections:

- Top Bar:** "COM Interface / Language | K114 Configuration | Support / USB Driver |"
- External Power Supply:** "12...20 VDC" with a power supply symbol.
- K114 Device:**
 - Controller:** Bus Address: 253, Baud rate: 9600 (selected) or 115200.
 - Settings RS485:** Echo Off, Bias On, Termination On, Highspeed >250kbps.
 - Calibration:** A button labeled "Calibration".
- Circuit Diagram:** Shows the internal connections of the K114. It includes:
 - 1 (I-OUT [mA]):** A current output terminal connected to a diode and a resistor.
 - 2 (U-USB [VDC]):** A voltage output terminal connected to a 12V/5V regulator.
 - 3 (U-OUT [VDC]):** A voltage output terminal connected to a diode.
 - 4 (U-IN [VDC]):** A voltage input terminal connected to a diode.
 - RS485 A and B:** Two communication lines.
- Connected External Device:**
 - Power Supply (DC): Signal 0...12VDC, Ground.
 - Check Communication
 - BUS Address of Device: 250
 - DeviceID: *****
 - SN: *****
 - Baudrate: *****
 - Channels: P1 : ***** [bar], T0B1 : ***** [°C]
- Bottom Bar:** "Device | Device Type : 20-1.12-11 | SN:129"

No.	Symbol	Function	Description
1	I-OUT	Current supply – external consumer	No valid display during operation with external current supply
2	U-USB	USB voltage supply	
3	U-OUT	Voltage supply – external consumer	Switched-in voltage supply is indicated via U-OUT
4	U-IN	Voltage input	Range: 0...12 VDC

Warnings and other messages in the software

The screenshot shows the K114_Config 2.0 software interface. At the top, it displays 'External Power Supply: 12.00 VDC'. The main area is divided into several sections:

- Controller:** Shows 'Bus Address : 253' and two baud rate options: '9600 baud' (selected) and '115200 baud'. Below this, there are three warning messages: 'U-USB below Minimum' (highlighted in red), 'U-Out Out of Range', and 'U-In Out of Range of Recommended Connect PowerSupply'. A 'Calibration' button is located below these messages.
- Settings RS485:** Includes checkboxes for 'Echo Off', 'Bias On', and 'Termination On', and a checkbox for 'Highspeed >250kbaud'. A 'Factory Settings' button is at the bottom.
- Connected External Device:** A panel on the right showing 'Power Supply (DC)' with 'Signal 0.12VDC' and 'Ground'. It has a 'Check Communication' checkbox which is checked. Below this, it shows 'BUS Address of Device' set to '250', and fields for 'DeviceID', 'SN', and 'Baudrate', all containing asterisks. At the bottom, it shows 'Channels : P1 : ***** [bar]' and 'TOB1 : ***** [°C]'.
- Diagram:** A schematic diagram in the center shows the internal circuitry. It includes a USB port on the left, a 12V 5V regulator, an I-Out [mA] meter showing 0.57, and three U-Voltage meters: U-USB [VDC] at 4.6 (with a red warning icon), U-OUT [VDC] at 1.88 (with a red warning icon), and U-IN [VDC] at 16.50 (with a yellow warning icon). The diagram also shows an RS485 A and B interface.

At the bottom of the window, there is a status bar with the following information:

- Device
- Device Type : 20-1.12-11
- SN : 129

U-USB is below minimum

This message appears if the U-USB voltage is below 4,8 VDC. Fault-free functioning of the converter is no longer guaranteed. Supply the converter from an external power supply unit.

U-OUT outside of range

This message appears if U-OUT is less than 11,2 VDC. Supply the converter from an external power supply unit.

U-IN outside of measurement range

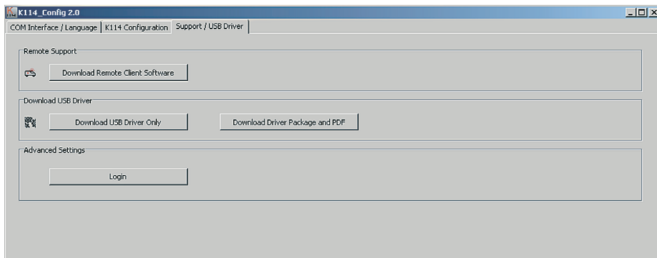
The U-IN measurement range is from 0...12 VDC. The exclamation mark warns you that the upper limit of the measuring range that can be displayed (> 16 VDC) has been reached.

The voltage for measurement that is actually applied (U-IN) can therefore be greater than the value for U-IN that is displayed.

Connect power supply unit

If the difference between U-OUT and U-IN is less than 3 VDC, the «Connect power supply unit» message appears.

Getting support



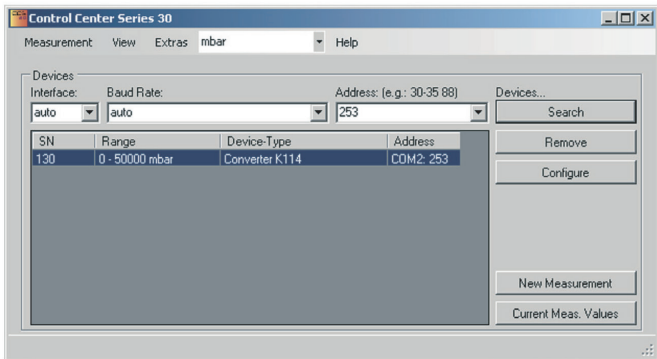
If faults or errors occur while you are working with the converter, use the **Help with fault analysis** section to rectify the problem. If problems persist after you have worked through this section, you can request assistance from KELLER by telephone. For contacts, visit: www.keller-druck.com

The «Download remote maintenance software» function automatically launches the download of a Remote Desktop Program. Once the download has completed, run the program. After you enter the connection code, our technical support team will log into your computer and offer you on-the-spot help directly on your screen.

Recording K-114 measurement data

The values measured for I-OUT, U-IN, U-OUT and U-USB can be recorded and saved via Software ControlCenter-Series30 (CCS30). (Read the CCS30 manual on this subject.)

To view the K-114 controller's measured values via the software, you must enter bus address 253 in the CCS30 and let the device search. Use the «New measurement» function key to view and save the measurement data.



EU Declaration of Conformity

The device supplied complies with the legal requirements. The relevant directives and harmonised standards are listed in the EU / UK Declaration of Conformity applicable to the product. You can find the EU / UK Declarations of Conformity by the relevant product at www.keller-druck.com.