



ARC-1

Remote transmitter with data logger

Features

- Battery operated with a lifetime of up to ten years
- High level of data security thanks to internal memory
- Robust stainless metal housing
- IP68 protection (transmission does not work under water)
- Includes licence-free KELLER software
- Available in various versions for ideal integration

Functions

- Remote transmitter: Modules selectable for 2G/3G, 4G or LoRa
- Data loggers: 56,000 measuring points as a buffer for energy-saving data transfer (e.g. only once a day)
- Sensor interfaces: compatible with all KELLER level sensors and pressure transmitters
- Internal measured values: barometer, temperature and moisture sensor and real-time clock (RTC)

Typical applications

- Ground water level monitoring
- Flood early warning system
- Tank level monitoring



ARC-1 Tube

for installation in 2" tubes

ARC-1 Box

for simple wall installation

ARC-1 Box SB

for connecting intrinsically safe level sensors and pressure transmitters



ARC-1 Tube	ARC-1 Box	ARC-1 Box SB
∅ 48 x 330 mm	200 x 100 x 80 mm	180 x 180 x 72 mm
		



ARC-1 – Specifications

Remote transmission

Connectivity	2G: GSM, GPRS/EDGE 3G: UMTS, HSDPA optional: 4G: including 3G/2G, country-specific modules LoRa: country-specific modules (868 or 915 MHz)
Frequency bands	2G: 850, 900, 1,800, 1,900 MHz 3G: 800/850, 900 MHz/AWS: 1,700, 1,900, 2,100 MHz
Transmission types	SMS, e-mail (POP, SMTP), FTP (active, passive)
Encryption protocol	TLS v1.0 (can be activated)
Shortest transmission interval	One minute
Data storage	56,000 measuring values with time stamp (4 megabits)
SIM card	Micro SIM (3FF, 12 x 15 mm)

Electrical data

Energy supply	Lithium battery DD 3.9 V/35 Ah	fitted with robust connector, easily replaceable
Battery service life	Up to ten years with one measurement per hour and one transmission per day	external influences and reception quality can lower battery service life
Configuration interface	RS485	
Configuration plug	Fischer DEE 103A054	
Antenna socket	SMA connector (female)	

Sensor interfaces

Digital interfaces	RS485 with KELLER bus protocol SDI-12 for multi-parameter sensors from third-party providers (compatibility must be checked)
Measuring inputs	2 x voltage input (0...5 VDC, resolution 12 Bit, accuracy (-20...50 °C) ± 0.3 %FS, Ri > 75 kΩ) 2 x digital input (alarm input/counter input), low-active, Ri = 200 kΩ pull-up to 3 V, max. 1 cnt/sec.)
Shortest measuring interval	One minute
Supply for sensors	3.7 V / 5 V / 12 V (switchable, 100 mA continuous current)
Compatibility	Various pressure transmitters and level sensors with RS485 interface or analogue output – preferred by KELLER: See list of "Range of suitable pressure transmitters" on page 6

Internal measured values

Barometer	Measuring range	0.3...1.1 bar abs.
	Resolution	0.016 mbar
	Accuracy (-20...50 °C)	± 1 mbar
	Long-term stability	1 mbar/year
Temperature sensor	Accuracy (-20...50 °C)	± 2 °C
Moisture sensor	Accuracy (20...80% RH)	± 3%
Real-time clock (RTC)	Accuracy (-20...85 °C)	± 3 ppm (± 0.26 s / day)

Temperature range

Operating temperature	-20...50 °C	optional -30...50 °C
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ARC-1 Tube – Specification

For installation in 2" tubes with a level sensor for groundwater monitoring

Mechanical data

Connection options

Cable gland	Cable diameter 3.5...6.5 mm (optional 8 mm), Viton® seal
LEMO connector	EVP.1N.306.CCL, chrome-plated brass, M16x1, nitrile seal

Housing

Dimensions	ø 48 x 330 mm (without antenna)
Material	Stainless steel 316L (DIN 1.4435)
Seal	Nitrile

Further details

Protection	IP65
	IP68 optional: Max. immersion depth 2 m, Max. immersion time 24 h IP68 can only be guaranteed when installed professionally. Transmission does not work under water.
Weight	approx. 1.5 kg including battery



ARC-1 Box – Specification

For simple wall installation with up to five pressure transmitters or level sensors

Mechanical data

Connection options

Cable gland	Cable diameter 3.5...6.5 mm, Viton® seal
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Housing

Dimensions	200 x 100 x 80 mm (without antenna)
Material	Powder-coated aluminium
Seal	EPDM

Further details

Protection	IP65
	IP68 optional: Max. immersion depth 2 m, Max. immersion time 24 h IP68 can only be guaranteed when installed professionally. Transmission does not work under water.
Weight	approx. 1.5 kg including battery





ARC-1 Box SB – Specification

With additional safety barriers for connecting an intrinsically safe level sensor or an intrinsically safe transmitter

Mechanical data

Connection options

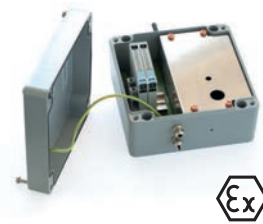
Cable gland	Cable diameter 3.5...6.5 mm, Viton® seal
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Housing

Dimensions	180 x 180 x 72 mm
Material	Powder-coated aluminium
Seal	EPDM

Further details

Protection	IP65
	IP68 optional: Max. immersion depth 2 m, Max. immersion time 24 h IP68 can only be guaranteed when installed professionally. Transmission does not work under water.
Weight	approx. 3 kg including battery



Explosion protection ARC-1 Box SB

Version with safety barriers (SB) in accordance with 2014/34/EU	In conjunction with an intrinsically safe pressure transmitter or an intrinsically safe level sensor, the ARC-1 Box SB allows for pressure measurement in areas where there is a risk of gas explosion.
System description	The system description 81902.31 is part of the ARC-1 Box SB operating instructions and specifies the built-in safety barriers. Download: www.keller-druck.com
Safety note	The ARC-1 Box SB must only be installed outside the zone at risk of explosion. The ARC-1 Box SB operating instructions must be observed!



ARC-1 – Variants and options

Order information

Variant	Scope of delivery/Description	Transmission technology			Illustration
		Standard	Options (country-specific)		
		3G/2G	4G/3G/2G	LoRa	
ARC-1 Tube 2" tube	Without accessories (no stub antenna, no screw fittings, no plug, no level sealing cap)	ARC-1 Tube 3G PN 320020.0094	ARC-1 Tube 4G <i>On request</i>	ARC-1 Tube LR868 ARC-1 Tube LR915 <i>On request</i>	
	Stub antenna, cable gland pre-installed	ARC-1 Tube 3G PN 320020.0099	ARC-1 Tube 4G <i>On request</i>	ARC-1 Tube LR868 PN 320020.0108 ARC-1 Tube LR915 <i>On request</i>	
	Stub antenna, cable gland pre-installed, level sealing cap 2"	ARC-1 Tube 3G PN 320020.0105	ARC-1 Tube 4G <i>On request</i>	ARC-1 Tube LR868 PN 320020.0116 ARC-1 Tube LR915 <i>On request</i>	
	Stub antenna, LEMO plug pre-installed	ARC-1 Tube 3G PN 320020.0102	ARC-1 Tube 4G <i>On request</i>	ARC-1 Tube LR868 ARC-1 Tube LR915 <i>On request</i>	
	Stub antenna, LEMO plug pre-installed, level sealing cap 2"	ARC-1 Tube 3G PN 320020.0103	ARC-1 Tube 4G <i>On request</i>	ARC-1 Tube LR868 ARC-1 Tube LR915 <i>On request</i>	
ARC-1 Box	Stub antenna, cable glands pre-installed	ARC-1 Box 3G PN 320020.0104	ARC-1 Box 4G <i>On request</i>	ARC-1 Box LR868 PN 320020.0109 ARC-1 Box LR915 <i>On request</i>	
ARC-1 Box SB	With integrated Zener barriers (ATEX), stub antenna, cable gland pre-installed	ARC-1 Box 3G SB PN 320022.0003	ARC-1 Box 4G SB <i>On request</i>	ARC-1 Box LR868 SB ARC-1 Box LR915 SB <i>On request</i>	
ARC-1 Boards	For upgrading existing GSM-2 remote transmitters	ARC-1 Boards 3G PN 320020.0097	ARC-1 Boards 4G PN 320020.0107	ARC-1 Boards LR868 PN 320020.0106 ARC-1 Boards LR915 <i>On request</i>	

Other possible variants

ARC-1 Mini	Project-based customer-specific solutions
Battery D 3.9 V/17 Ah 185 x 57 x 80 mm <i>Specifications available on request</i>	<ul style="list-style-type: none"> • External power supply • Application-specific connections • Reduced range of functions • Exposed plastic materials for increased chemical resistance in wastewater applications



ARC-1 – Accessories and components

Accessories

Level sealing cap (2...6")	Adapter ring (3...6")	Spare battery DD 3.9 V/35 Ah	K-114 A interface converter
			

Additional accessories with product numbers can be found in the ARC-1 operating instructions (see www.keller-druck.com).

Range of suitable level sensors and pressure transmitters

Level sensors – Series 36 Xi W		
highest accuracy and resolution	<ul style="list-style-type: none"> • Pressure ranges for 3, 10, 30, 100 and 300 mH₂O • Accuracy 0.02 %FS • RS485 (and SDI-12) interface 	
Multi-parameter sensors – Series 36 Xi W CTD		
with conductivity sensor and maximum temperature accuracy	<ul style="list-style-type: none"> • Pressure ranges for 3, 10, 30 and 100 mH₂O • Accuracy 0.02 %FS • RS485 (and SDI-12) interface • Conductivity measuring ranges 0 µS/cm...200 mS/cm • Temperature accuracy 0.1 °C 	
Intrinsically safe level sensors – Series 36 XW Ei		
for installation in explosive atmospheres	<ul style="list-style-type: none"> • Pressure ranges for 3, 10, 30, 100 and 300 mH₂O • Accuracy 0.02 %FS • RS485 and analogue interfaces 	
Level sensors with plastic membrane – Series 36 XKY		
with Kynar membrane for brackish water and wastewater	<ul style="list-style-type: none"> • Pressure ranges for 10, 30 and 100 mH₂O • Accuracy 0.3 %FS • RS485 and analogue interfaces 	
Capacitive level sensors – Series 46 X		
with measuring cell for low pressure ranges	<ul style="list-style-type: none"> • Pressure ranges for 0.3, 1 and 3 mH₂O • Accuracy 0.1 %FS • RS485 and analogue interfaces • Intrinsically safe series 46 X Ei 	
Pressure transmitter – 33 X/35 X series		
with thread connection for pressure-retaining systems	<ul style="list-style-type: none"> • Pressure ranges from 0.3 to 1,000 bar • Accuracy 0.02 %FS • RS485 and analogue interfaces • Intrinsically safe series 33 X Ei/35 X Ei 	

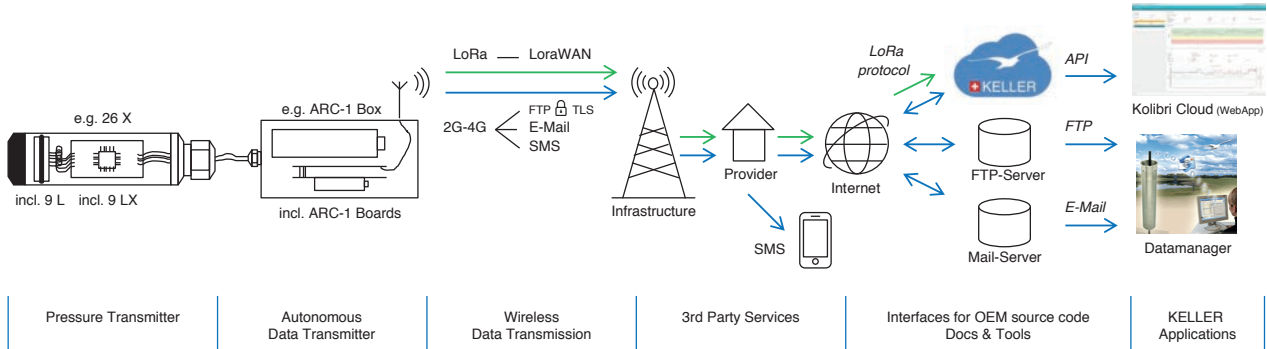
Notes:

- Level sensors and pressure transmitters are not included with the ARC-1
- Low-voltage versions are available for longer battery service life
- All level sensors can be ordered with enhanced lightning protection
- A range of cables is available for application in water, drinking water and fuels



ARC-1 – Software

Use what you need – no more, no less!



KELLER offers a comprehensive solution, from pressure measurement to graphical display on an end device. The ARC-1 remote transmitter sits right in the middle of the data chain and establishes an arc between the pressure transmitter to a receiver station, which forwards the data. For existing transmitters, KELLER can supply a suitable, highly accurate level sensor or subassemblies such as OEM pressure transmitters and pressure transducers. On the software side, the modular concept allows for access to measurements at various points on the data chain. The protocols (LoRa, FTP, e-mail and API) are well documented and offer various options for connecting to the customer's own software solution. In addition, there are aids such as DLLs and example source codes available.

Kolibri Cloud

The Kolibri Cloud from KELLER offers simple and convenient access to your measurement data with your own personal login and SSL encryption. You can enjoy readily available data without the need to set up and maintain a database, FTP or mail server. The measurements can be displayed as graphs in no time at all and the export function allows you to download your data as Excel or CSV files.

Measuring points are effortlessly and efficiently monitored with the integrated alarm system. For instance, a warning can be triggered via e-mail if there is an increase in water level or a battery is running low. The Kolibri Cloud API allows customer-specific software to call up measurements in a standardised JSON format via HTTPS.



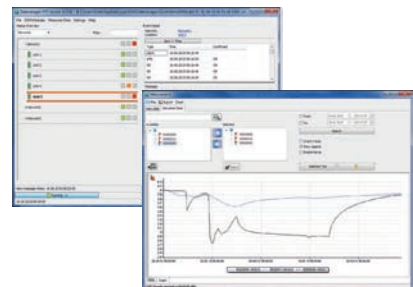
The guest login gives you an insight into the Kolibri Cloud: www.kolibricloud.com

Datamanager

Measurement data transmitted from the ARC-1 is received via the licence-free *Datamanager* software system, which also processes, stores and displays the readings. The software can perform a variety of functions tailored to the given water level monitoring or pressure monitoring task. For example, it can remotely configure the measuring system from the user's workstation, set alarms for predefined events, take continual or event-based measurements, call up data and calculate water levels.

The GSM *Datamanager* stores measurement data in either a local database (SQLite) or in a server database (MySQL). The database also allows data to

be accessed using external software, which means ARC-1 can be incorporated into existing data collection systems. The software can also be used to set up and manage recurring data export operations at selected planned intervals. The collected measurement data can be exported in diverse formats (e.g. ASCII or CSV files) and made available to end customers in Microsoft Excel for viewing and processing. The *Datamanager* only supports Windows operating systems from Windows XP onwards.



Datamanager