



ARC1

Remote transmitter with data logger

Features

- Battery operated with a lifetime of up to ten years
- High level of data security thanks to internal solid-state memory
- Robust stainless metal housing
- Degree of protection up to IP68
- Includes licence-free KELLER software
- Optional cloud-based data display with KOLIBRI Cloud
- Documented interfaces for integration into your own system

Functions

- Remote transmitter: Modules selectable for 2G/3G/4G, 2G/NB-IoT/LTE-M or LoRa
- Data Loggers: 56'000 measuring point capacity reduces data transmission interval requirements to save energy. (e.g. transfer measurement points collected only once a day)
- Sensor interfaces: compatible with all KELLER level sensors and pressure transmitters
- Internal measured values: barometer, temperature and moisture sensor, real-time clock (RTC) and battery capacity/voltage

Typical applications

- Ground water level monitoring
- Flood early warning system
- Tank level monitoring
- Pressure monitoring in the IoT environment

ARC1-Tube

for installation in 2" tubes

ARC1-Box

for simple wall installation

ARC1-Box-SB

for connecting intrinsically safe level sensors and pressure transmitters



ARC1-Tube	ARC1-Box	ARC1-Box-SB
ø 48 x 330 mm	200 x 100 x 80 mm	180 x 180 x 72 mm
		



ARC1 – Specifications

Remote transmission

Connectivity	Available modules: 4G: valid for Europe only, including 3G/2G M1 & NB: NB-IoT/LTE-M incl. 2G LR868: LoRa 868 MHz (915 MHz on request)	2G: GSM, GPRS/EDGE 3G: UMTS, HSDPA 4G: LTE NB-IoT: LTE Cat NB LTE-M: LTE Cat M1 LoRa: LoRaWAN
Frequency bands	4G: valid for Europe only, including 3G/2G 2G: B3 (1800 MHz), B8 (900 MHz) 3G: B3 (1800 MHz), B8 (900 MHz) 4G: B1 (2100 MHz), B3 (1800 MHz), B7 (2600 MHz), B8 (900 MHz), B20 (800 MHz) M1 & NB: NB-IoT/LTE-M inkl. 2G 2G: B2 (1900 MHz), B3 (1800 MHz), B5 (850 MHz), B8 (900 MHz) NB-IoT/LTE-M: B1 (2100 MHz), B2 (1900 MHz), B3 (1800 MHz), B4 (AWS 1700 MHz), B5 (850 MHz), B8 (900 MHz), B12 (700 MHz), B13 (700 MHz), B18 (800 MHz), B19 (800 MHz), B20 (800 MHz), B26 (850 MHz), B28 (700 MHz) LR868: 863...870 MHz LR915: 902...928 MHz	Detailed information about the output power can be found in the «ARC1 Information» document.
Transmission types	SMS, e-Mail (POP, SMTP), FTP (active, passive)	
Encryption protocol	TLS	
Data storage	56'000 measuring values (4 MBit)	incl. time stamp
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 LoRa: Up to 10 years with measurement and transmission every 10 minutes.	external influences and reception quality can lower battery service life
Configuration interface	RS485	
Configuration plug	Fischer DEE 103A054	
Antenna socket	SMA connector (female)	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

Radio Equipment Directive (RED)

4G: CE conformity as per 2014/53/EU	EN 301489-1 / EN 301489-52 / EN 301511 / EN 301908-1 / EN 301908-2 / EN 301908-13
M1 & NB: CE conformity as per 2014/53/EU	EN 301489-1 / EN 301489-19 / EN 301489-52 / EN 301511 / EN 301908-1 / EN 301908-13 / EN 303413
LR868: CE conformity as per 2014/53/EU	EN 301489-1 / EN 301489-3 / EN 300220-1 / EN 300220-2



ARC1 – Specifications

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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ARC1-Tube – Specification

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

Mechanical data

Connection options

Cable gland	Cable diameter 3,5...6,4 mm (optional up to 8 mm), FKM 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 AISI 316L
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



ARC1-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, FKM 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





ARC1-Box-SB – Specification

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

Mechanical data

Connection options

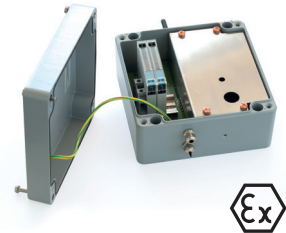
Cable gland	Cable diameter 3,5...6,5 mm, seal FKM
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Housing

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 ARC1-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 ARC1-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 ARC1-Box-SB operating instructions and specifies the built-in safety barriers. Download: www.keller-druck.com
Safety note	The ARC1-Box-SB must only be installed outside the zone at risk of explosion. The ARC1-Box-SB operating instructions must be observed!



ARC1 – Variants and options

Order information

Variant	Scope of delivery/Description	Transmission technology			Illustration
		4G	M1 & NB	LoRa	
ARC1-Tube 2" well head tube	Stub antenna, cable gland pre-installed	ARC1-Tube-4G	ARC1-Tube-M1 & NB	ARC1-Tube-LR868 ARC1-Tube-LR915 <i>On request</i>	
	Stub antenna, LEMO plug pre-installed	ARC1-Tube-4G	ARC1-Tube-M1 & NB	ARC1-Tube-LR868 ARC1-Tube-LR915 <i>On request</i>	
ARC1-Box	Stub antenna, cable glands pre-installed	ARC1-Box-4G	ARC1-Box-M1 & NB	ARC1-Box-LR868 ARC1-Box-LR915 <i>On request</i>	
ARC1-Box-SB	With integrated Zener barriers (ATEX), stub antenna, cable gland pre-installed	ARC1-Box-4G-SB	ARC1-Box-M1&NB-SB	ARC1-Box-LR868-SB ARC1-Box-LR915-SB <i>On request</i>	

Other possible variants

ARC1-Mini	Project-based customer-specific solutions
<p>Battery D 3,9 V/17 Ah 185 x 57 x 80 mm <i>Specifications available on request</i></p>	<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



ARC1 – Accessories and components

Accessories

Well head sealing cap for 2...6" gauge tubes	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 36XiW		
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 36XiW-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 36XW-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 36KyX		
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 46X		
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 46X-Ei 	
Pressure transmitter – 33X / 35X series		
with thread connection for pressure-retaining systems	<ul style="list-style-type: none"> • Pressure ranges from 0,3 to 1000 bar • Accuracy 0,02 %FS • RS485 and analogue interfaces • Intrinsically safe series 33X-Ei / 35X-Ei 	

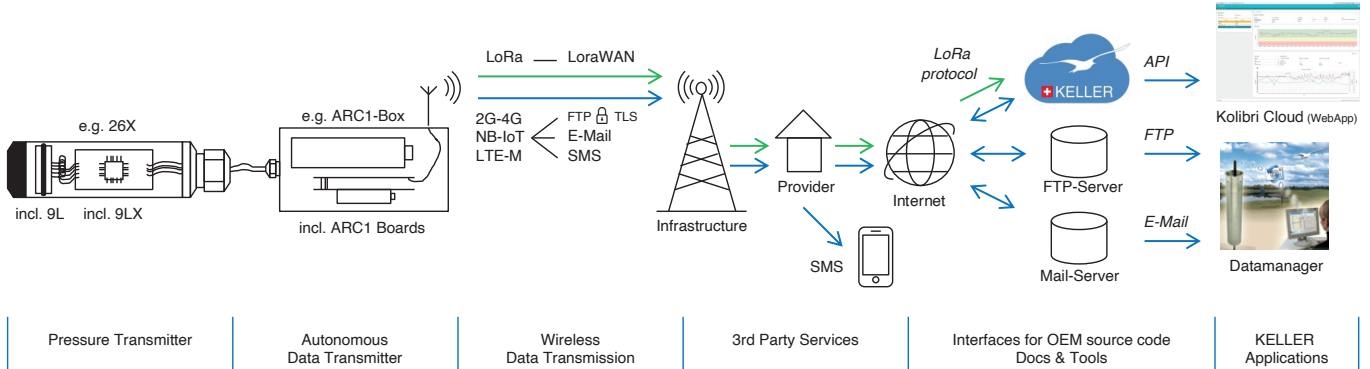
Notes:

- Level sensors and pressure transmitters are not included with the ARC1
- 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



ARC1 – 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 ARC1 remote transmitter sits right in the middle of the data chain and establishes an arc from 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