

IUWS B.One

Ultrasonic apartment / domestic water meter for cold water

The IUWS B.One ultrasonic water meter ensures precise consumption data recording in the residential and domestic water sector. The water meter's state-of-the-art ultrasonic technology provides reliable, accurate measurements and enables individual consumption billing. The integrated radio interface for data transmission is pre-configured at the factory to either wireless M-Bus or LoRaWAN®, depending on the customer's requirements. This ensures the highest possible flexibility. The B.One Device Manager App allows utilities to effortlessly switch wireless technology, depending on their infrastructure requirements. The parallel wireless technology is a particular highlight, and enables the IUWS B.One to send measurement data via wireless M-Bus and LoRaWAN® simultaneously. Regardless of the wireless technology used, this feature guarantees future-proof, seamless integration into existing and new data acquisition systems. The IUWS B.One ultrasonic water meter can be installed in any installation position: Riser pipe, downpipe or even overhead installation are possible.

All materials used to produce IUWS B.One for the drinking water sector comply with the latest standards, guidelines, the strict requirements of Germany's regulation for drinking water, and the assessment principles of Germany's Federal Environment Agency (UBA).

B.
One



Performance characteristics in overview

- Water meter with ultrasonic flow measurement
- Any installation position (even "head down")
- Parallel operation of wM-Bus & LoRaWAN® radio possible
- Switchable radio technology
- Transmission of the medium and ambient temperature in the wM-Bus radio protocol (depending on the selected radio scenario)
- Body made of lead-free brass
- Highest precision and reliability even in case of low flow rates
- Insensitive to deposits and particles
- Battery-operated, electronic LCD register with galvanically isolated NFC interface
- Smart Metering functions (Warnings, alarms)
- Retrofitting of an external NDC radio module (e.g. for shaft meters) possible
- Certified according to DVGW guideline W 406
- OMS certification for BSI-compliant smart meter gateway connection

Applications

- For the consumption measurement of cold and clean drinking water or service water up to 50 °C

AMR options

- Integrated wM-Bus or LoRaWAN® radio interface
- NFC interface (= Near Field Data Capture) for connecting an external NDC module and for device configuration
- Readout and configuration app (B.One Device Manager App)

Readout options of the measuring device via the NFC interface (Near Field Communication)

- Measuring instrument ID (serial number)
- Current (netted) consumption display or total volume in the event of an overflow
- Date / time
- Firmware version
- Up to 15 previous month's values
- Temperature
- Key date / Key date volume
- Forward flow volume / Return flow volume
- Alarms or error messages
- Battery end

Technical data

Nominal diameter	DN	mm	15	15	15	15	20	20	25
Permanent Flowrate	Q ₃	m ³ /h	1.6	1.6	2.5	2.5	2.5	4	4
Attainable measuring range	Q ₃ /Q ₁	R	315	315	500	500	315	500	315
Standard measuring range ¹	Q ₃ /Q ₁	R	250	250	250	250	250	250	250
Overload Flowrate	Q ₄	m ³ /h	2.00	2.00	3.13	3.13	3.13	5.00	5.00
Minimum Flowrate ²	Q ₁	l/h	6.40	6.40	10.00	10.00	10.00	16.00	16.00
Transitional Flowrate ²	Q ₂	l/h	10.24	10.24	16.00	16.00	16.00	25.60	25.60
Lower measuring limit	-	l/h	2.0	2.0	2.0	2.0	2.0	3.2	3.2
Upper measuring limit	-	m ³ /h	5.7	5.7	5.7	5.7	5.7	8.0	8.0
Display range	min	l	1	1	1	1	1	1	1
	max	m ³	999.999.999	999.999.999	999.999.999	999.999.999	999.999.999	999.999.999	999.999.999
Medium temperature	-	°C	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50
Storage / Transport Temperature ⁵	-	°C	-10 - +70	-10 - +70	-10 - +70	-10 - +70	-10 - +70	-10 - +70	-10 - +70
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16
Pressure loss class at Q ₃ (with rectifier)	Δp	bar	0.16	0.16	0.25	0.25	0.16	0.25	0.10
Pressure loss class at Q ₃ (with rectifier)	Δp	bar	0.16	0.16	0.25	0.25	0.25	0.40	0.10
Mechanical ambient conditions	-	-	M2	M2	M2	M2	M2	M2	M2
Electromagnetic ambient condition	-	-	E1	E1	E1	E1	E1	E1	E1
Climatic ambient conditions ³	-	°C	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0
Protection class (flood-proof)	-	-	IP68	IP68	IP68	IP68	IP68	IP68	IP68

Dimensions and weights:

Nominal diameter	DN	mm	15	15	15	15	20	20	25
		Inch	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	1"
Overall length without connectors ¹	L2	mm	110/115	145/165/ 170/190	110/115	145/165/ 170/190	130/160/ 165/190	130/160/165/ 190/220	175
Overall length with connectors approx.	L1	mm	190/195	225/245/ 250/270	190/195	225/245/ 250/270	226/256/ 261/286	226/256/261/ 286/316	293
Thread meter G x B	D1	Inch	3/4"	3/4"	3/4"	3/4"	1"	1"	1 1/4"
Thread connector R x	D2	Inch	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	1"
Width	B	mm	98.00	98.00	98.00	98.00	98.00	98.00	98.20
Width	B1	mm	53.00	53.00	53.00	53.00	53.00	53.00	56.00
Width	B2	mm	45.00	45.00	45.00	45.00	45.00	45.00	42.20
Height (total)	H1	mm	80.00	80.00	80.00	80.00	80.00	80.00	80.00
Height	H2	mm	25.30	25.30	25.30	25.30	25.30	25.30	22.70
Weight approx.	-	kg	0.80/0.81	0.90/0.85/ 0.86/0.90	0.80/0.81	0.90/0.85/ 0.86/0.90	0.80/0.84 0.85/0.90	0.80/0.84/0.85/ 0.90/0.95	0.87

1: Other measuring ranges and overall lengths on request

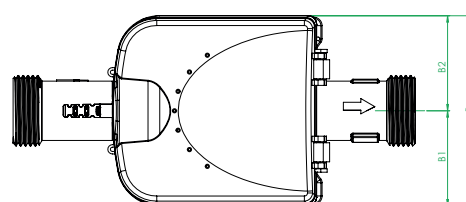
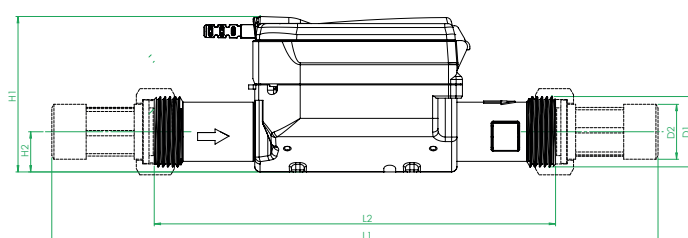
2: The data refer to the standard measuring range

3: Condensation possible

4: Flange according to ISO 7005-2

5: >35°C for up to 4 weeks

*Attention: not all versions are available in all markets



Dimensions

Technical data

Nominal diameter	DN	mm	25	25	25	32	40	50
Permanent Flowrate	Q_3	m ³ /h	6.3	10	10	10	16	25
Attainable measuring range	Q_3/Q_1	R	500	800	800	800	500	800
Standard measuring range ¹	Q_3/Q_1	R	250	250	250	250	250	250
Overload Flowrate	Q_4	m ³ /h	7.88	12.50	12.50	12.50	20.00	31.25
Minimum Flowrate ²	Q_1	l/h	25.20	40.00	40.00	40.00	64.00	100.00
Transitional Flowrate ²	Q_2	l/h	40.32	64.00	64.00	64.00	102.40	160.00
Lower measuring limit	-	l/h	5.1	5.1	5.1	5.1	13.0	20.0
Upper measuring limit	-	m ³ /h	13.8	13.8	13.8	13.8	27.3	34.5
Display range	min	l	1	1	1	1	1	1
	max	m ³	999.999.999	999.999.999	999.999.999	999.999.999	999.999.999	999.999.999
Medium temperature	-	°C	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50
Storage / Transport Temperature ⁵	-	°C	-10 - +70	-10 - +70	-10 - +70	-10 - +70	-10 - +70	-10 - +70
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16
Pressure loss class at Q_3 (with rectifier)	Δp	bar	0.16	0.40	0.40	0.40	0.25	0.25
Pressure loss class at Q_3 (with rectifier)	Δp	bar	0.40	0.63	0.63	0.63	0.40	0.63
Mechanical ambient conditions	-	-	M2	M2	M2	M2	M2	M2
Electromagnetic ambient condition	-	-	E1	E1	E1	E1	E1	E1
Climatic ambient conditions ³	-	°C	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0	U0/D0
Protection class (flood-proof)	-	-	IP68	IP68	IP68	IP68	IP68	IP68

Dimensions and weights:

Nominal diameter	DN	mm	25	25	25	32	40	50
	Inch		1"	1"	1"	1 1/4"	1 1/2"	2"
Overall length without connectors ¹	L2	mm	160/260	175	260	160/260	300	300
Overall length with connectors approx.	L1	mm	278/378	293	378	284/384	428	444
Thread meter G x B	D1	Inch	1 1/4"	1 1/4"	1 1/4"	1 1/2"	2"	2 1/2"
Thread connector R x	D2	Inch	1"	1"	1"	1 1/4"	1 1/2"	2"
Width	B	mm	98.20	98.20	98.20	98.20	116.40	116.40
Width	B1	mm	56.00	56.00	56.00	56.00	63.80	63.80
Width	B2	mm	42.20	42.20	42.20	42.20	52.60	52.60
Height (total)	H1	mm	80.00	80.00	80.00	81.20	93.20	101.00
Height	H2	mm	22.70	22.70	22.70	23.90	29.80	37.60
Weight approx.	-	kg	1.1/1.30	0.87	1.30	1.2/1.4	1.50/1.90	2.30

1: Other measuring ranges and overall lengths on request

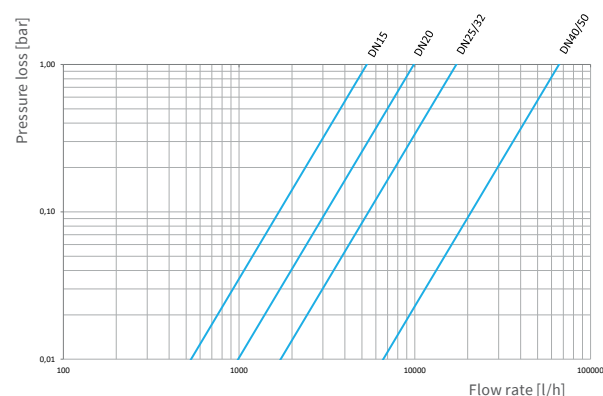
2: The data refer to the standard measuring range

3: Condensation possible

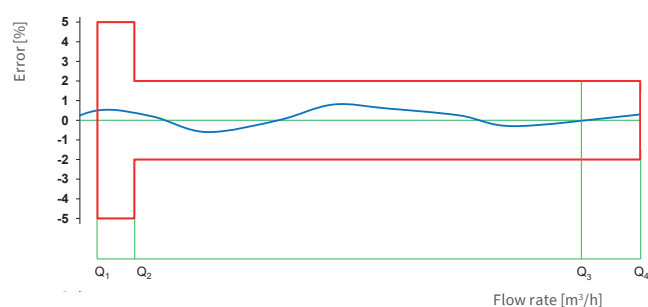
4: Flange according to ISO 7005-2

5: >35°C for up to 4 weeks

*Attention: not all versions are available in all markets



Typical pressure loss curve



Typical error curve

IUWS B.One in flange version

Technical data

Nominal diameter	DN	mm	40	50
Permanent Flowrate	Q_3	m ³ /h	16	25
Attainable measuring range	Q_3/Q_1	R	500	800
Standard measuring range ¹	Q_3/Q_1	R	250	250
Overload Flowrate	Q_4	m ³ /h	20.00	31.25
Minimum Flowrate ²	Q_1	l/h	64.00	100.00
Transitional Flowrate ²	Q_2	l/h	102.40	160.00
Lower measuring limit	-	l/h	13.0	20.0
Upper measuring limit	-	m ³ /h	27.3	34.5
Display range	min	l	1	1
	max	m ³	999.999.999	999.999.999
Medium temperature	-	°C	0.1 - 50	0.1 - 50
Storage / Transport Temperature ⁵	-	°C	-10 - +70	-10 - +70
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16
Pressure loss class at Q_3 (with rectifier)	Δp	bar	0.25	0.25
Pressure loss class at Q_3 (with rectifier)	Δp	bar	0.40	0.63
Mechanical ambient conditions	-	-	M2	M2
Electromagnetic ambient condition	-	-	E1	E1
Climatic ambient conditions ³	-	°C	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0
Protection class (flood-proof)	-	-	IP68	IP68

Dimensions and weights:

Nominal diameter	DN	mm	40	50
		Inch	1 1/2"	2"
Overall length without connectors ¹	L2	mm	270 FL ⁴	270 FL ⁴
Overall length with connectors approx.	L1	mm	-	-
Thread meter G x B	D1	Inch	-	-
Thread connector R x	D2	Inch	-	-
Width	B	mm	116.40	116.40
Width	B1	mm	63.80	63.80
Width	B2	mm	52.60	52.60
Height (total)	H1	mm	125.70	128.7
Height	H2	mm	61	64
Weight approx.	-	kg	4.65	5.7
Flange diameter	F1	mm	150	165
Bolt circle diameter	F2	mm	110	125
Number of screws	-	pcs.	4	4
Screw size	-	mm	M16	M16
Screw hole diameter	F3	mm	19	19

1: Other measuring ranges and overall lengths on request

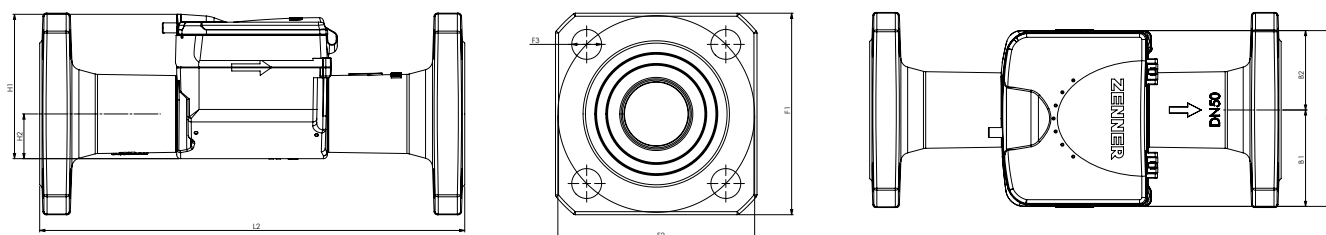
2: The data refer to the standard measuring range

3: Condensation possible

4: Flange according to ISO 7005-2

5: >35°C for up to 4 weeks

*Attention: not all versions are available in all markets



Dimensions

IUWS B.One in riser or downpipe versions

Technical data

Nominal diameter	DN	mm	20	25	25	40
Permanent Flowrate	Q_3	m ³ /h	4	6.3	10	16
Attainable measuring range	Q_3/Q_1	R	400	500	800	500
Standard measuring range ¹	Q_3/Q_1	R	250	250	250	250
Overload Flowrate	Q_4	m ³ /h	5.00	7.88	12.50	20.00
Minimum Flowrate ²	Q_1	l/h	16.00	25.20	40.00	64.00
Transitional Flowrate ²	Q_2	l/h	25.60	40.32	64.00	102.40
Lower measuring limit	-	l/h	5.1	5.1	5.1	13.0
Upper measuring limit	-	m ³ /h	5.7	13.8	13.8	27.3
Display range	min	l	1	1	1	1
	max	m ³	999.999.999	999.999.999	999.999.999	999.999.999
Medium temperature	-	°C	0.1 - 50	0.1 - 50	0.1 - 50	0.1 - 50
Storage / Transport Temperature ⁵	-	°C	-10 - +70	-10 - +70	-10 - +70	-10 - +70
Operating pressure	MAP	bar	0.3 - 16	0.3 - 16	0.3 - 16	0.3 - 16
Pressure loss class at Q_3 (with rectifier)	Δp	bar	0.40	0.16	0.40	0.25
Pressure loss class at Q_3 (with rectifier)	Δp	bar	0.63	0.40	0.63	0.40
Mechanical ambient conditions	-	-	M2	M2	M2	M2
Electromagnetic ambient condition	-	-	E1	E1	E1	E1
Climatic ambient conditions ³	-	°C	5 - 55	5 - 55	5 - 55	5 - 55
Flow profile sensitivity	-	-	U0/D0	U0/D0	U0/D0	U0/D0
Protection class (flood-proof)	-	-	IP68	IP68	IP68	IP68

Dimensions and weights:

Nominal diameter	DN	mm	20	25	25	40
		Inch	3/4"	1"	1"	1 1/2"
Overall length without connectors ¹	L2	mm	105	150	150	150/200
Overall length with connectors approx.	L1	mm	201	268	268	278/328
Thread meter G x B	D1	Inch	1"	1 1/4"	1 1/4"	2"
Thread connector R x	D2	Inch	3/4"	1"	1"	1 1/2"
Width	B	mm	98.00	98.20	98.20	116.40
Width	B1	mm	53.00	56.00	56.00	63.80
Width	B2	mm	45.00	42.20	42.20	52.60
Height (total)	H1	mm	80.00	80.00	80.00	93.20
Height	H2	mm	25.30	22.70	22.70	29.80
Weight approx.	-	kg	0.75	1.00	1.00	1.30/1.50

1: Other measuring ranges and overall lengths on request

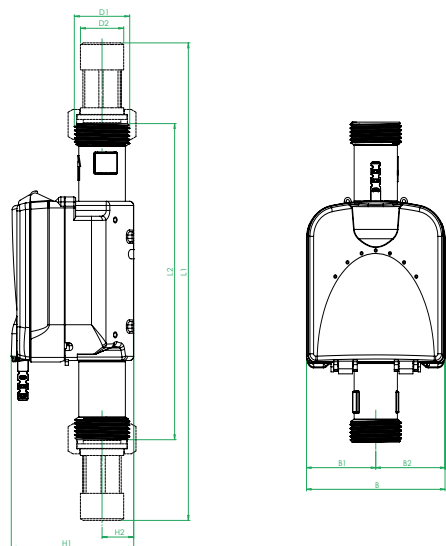
2: The data refer to the standard measuring range

3: Condensation possible

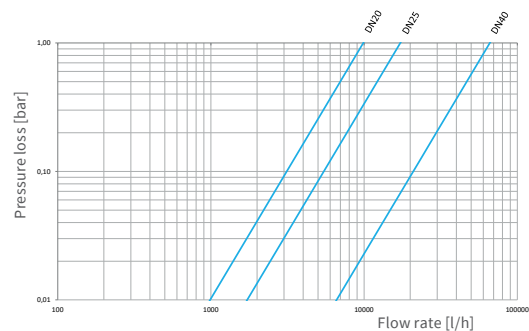
4: Flange according to ISO 7005-2

5: >35°C for up to 4 weeks

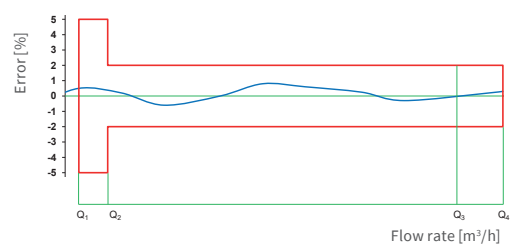
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Dimensions



Pressure loss curve



Error curve

IUWS B.One /Technical data LoRaWAN® radio interface

Technical data LoRaWAN® radio interface	
Operating frequency	868 MHz
Max. Transmission power	approx. 14 dBm, 25 mW
Duration of transmission telegrams	up to 1.5 s (depending on spreading factor)
Sending interval	dependent on the respective meter configuration, e.g. daily; optional: monthly, hourly or 8 telegrams with three hourly values each
Data transmission procedure	LoRaWAN® class A (bi-directional communication)
Encryption of radio protocols	yes
Error detection	CRC
Battery status monitoring	yes
Calculated battery life	battery life up to 15 years (depending on configuration and environmental conditions)
CE conformity	according to directive 2014/53/EU (RED)
Activation of the radio interface	- automatically after the meter has been filled with water (> 10s); - via the NFC interface using the corresponding ZENNER NFC coupler, MinoConnectUSB and the MSS configuration software - via the NFC interface using the Android App B.One Device Manager

LoRaWAN® radio telegram

Protocol contents general	Interval
Serial number (DevEUI)	once when logging into the LoRaWAN® network
Device-specific information (firmware version, LoRaWAN®-version, device type)	six-monthly
Changes of status (manipulation, battery warning,...)	event-driven

Scenario 201 (monthly)

Protocol content	Interval
Monthly value (previous month) [liter], status information, actual date and time	monthly (beginning)
Monthly value (previous month) [liter], mid-month value [liter], actual date and time	monthly (middle)
Key date value and date [01.01.]	annually on the key date

Scenario 202 (daily)

Protocol content	Interval
Daily value (previous day) [liter]	daily
Status information, actual date and time	monthly
Key date value and date [01.01.]	annually on the key date

Scenario 203 (every 3 hours)

Protocol content	Interval
3-hour values [litre]	8 x per day
Status information, current date and time	monthly
Device-specific information (firmware version, LoRaWAN® version, device type)	six-monthly
Device-specific information (manufacturer, fabrication number, VIF/VIFE)	once at join

Scenario 204 (hourly)

Protocol content	Interval
Hourly value [litre]	hourly
Status information, current date and time	monthly
Device-specific information (firmware version, LoRaWAN® version, device type)	six-monthly
Device-specific information (manufacturer, fabrication number, VIF/VIFE)	once at join

IUWS B.One / Technical data wireless m-bus interface

Technical data wireless M-Bus-radio interface	
Operating frequency	868 MHz
Transmission power	approx. 14 dBm, 25 mW
Duration of transmission telegram	approx. 10-15 ms
Sending interval	depending on meter configuration
Data transmission procedure	wireless M-Bus (standard C1 mode)
Encryption of radio protocols	depending on the meter configuration; Standard Security Profile A, Encryption Mode 5; Security profile B, mode 7 on request
Error detection CRC	CRC
Battery status monitoring	yes
CE conformity	according to directive 2014/53/EU (RED)
Activation of the radio interface	- automatically after the meter has been filled with water (> 10s); - via the NFC interface using the corresponding ZENNER NFC coupler, MinoConnectUSB and the MSS configuration software via the NFC interface using the Android App B.One Device Manager

wireless M-Bus radio telegram

Possible sending scenarios and related telegram content

Scenario No.:	312	313	318*	319* (OMS)	321	324* (OMS)	329 (OMS)	342
Frequency (MHz)	868	868	868	868	868	868	868	868
Sending interval	120 s	20 s	300 s	432 s	20 s	20 s	20s	20s
Telegram content:								
Current value			✓	✓	✓	✓	✓	✓
Current date	✓	✓						
Actual date and time					✓	✓	✓	✓
Daily value (00:00 h)	✓	✓						
Key date values	✓	✓			✓	✓	✓	✓
Key date								
Date of previous month	✓						✓	✓
Monthly value of previous month	✓	✓			✓	✓	✓	✓
Another 11 previous month's value	✓						✓	✓
Status information	✓	✓	✓	✓	✓	✓	✓	✓
Medium temperature								✓
Ambient temperature								✓
wM-Bus mode	C1	C1	C1	C1	C1	C1	C1	C1
Encryption mode	5	5	7	7	5	7	5	5

* suitable for connection to an SMGW (Smart Meter Gateway)

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