LANSEN

WMBUS Data format

LAN-WMBUS-MA

Lansen Systems AB

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Verify correct device and version

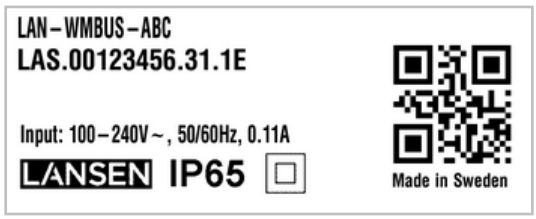
This document applies to MA devices with *protocol version 31 (0x1F)*. Find the protocol version by looking at the label on the device or by inspecting the data packets sent by the device.

Protocol version in data packets

The *protocol version* is included in the data field *A-Field Protocol version*. For more information, see *WMBUS-data format*.

Protocol version in device label

Find the unique device identifier on the device label.



Example 1. The protocol version is the last segment of the unique identifier.

LAN.00123456.31.**1E**

WMBUS-data format

The MBus to wMBus converter can be ordered to use one of the options below. The difference is how the link layer (LLA) and network layer (ALA) is used.

Option 1: (Standard)

This version strictly follows *EN 13757 radio converter handling*. The LLA address is in this case the address of the MBUS converter while the ALA address is the meter address. (See chapter Option 1: Standard address handling)

Option 2: (Alternative)

This is the compatibility mode for receivers/gateways that cannot handle different addresses for LLA and ALA. In this case, the meter address is used both for ALA an LLA, thus making wired meters behave exactly as a wireless meter. (See chapter Option 2: Alternative address handling)

Option 1: Standard address handling

Example of readout from a Lansen wired temperature sensor with serial number 11223344. Note that the LLA address is the address of the MBUS master while the ALA address is the meter address with CI-field set to long header. This alternative fits fewer bytes in each packet compared to the alternative address handling (224 bytes instead of 240 bytes).

Art nr.	LAN-WMBUS-MA-X
Version	31 (0x1F)
Information	Packet is sent every x seconds. Depending on the MBUS readout interval setting
DR1	Last measured temperature value
DR2	Last measured humidity value

Link layer (LLA)

Byte No	Field Name	Content	Info	Byte data
1	L-Field	Length		
2	C-Field	SND-NR		0x44
3	M-Field	Meter Manufacturer code	LAS	0x33
4	M-Field	Meter Manufacturer code		0x30
5	A-Field	Device serial number (LSB)	**Example**: 0001067	0x67
6	A-Field	Device serial number		0x00
7	A-Field	Device serial number		0x01
8	A-Field	Device serial number (MSB)		0x00
9	A-Field	Protocol version	Version 31	0x1F
10	A-Field	Meter type	Radio converter unit	0x37

Network layer

Byte No	Field Name	Content	Info	Byte data
11	CI-Field	Long header		0x72
12	Meter-ID	Connecter meter serial number	**Example**: 11223344	0x44
13	Meter-ID	Connecter meter serial number		0x33
14	Meter-ID	Connecter meter serial number		0x22
15	Meter-ID	Connecter meter serial number		0x11
16	Meter-Man	Meter manufacturer code	**Example:** LAS	0x33
17	Meter-Man	Meter manufacturer code		0x30
18	Meter-Ver	Meter version		0x01
19	Meter-Med	Meter medium	**Example:** Room sensor	0x1B
20	Access.No	Transmission counter		0x02
21	Status	Device status (error/alarms)		0x00
22	Configuration	Number of encrypted blocks	**Example**: 3	0x03
23	Configuration	Encryption		**No encryption**: 0x00 **Encryption mode 5**: 0x05
24	AES-Verify	Encryption Verification		0x2F
25	AES-Verify	Encryption Verification		0x2F

Data record 1: Last measured temperature value

Byte No	Field Name	Content	Info	Byte data
26	DR1	DIF	16-bit integer	0x02 = Value OK 0x32 = Value not OK
27	DR1	VIF	External temperature 0.01°C	0x65
28	DR1	Value (LSB)	**Example**: 0x0011	0x11
29	DR1	Value (MSB)		0x00

Data record 2: Last measured humidity value

Byte No	Field Name	Content	Info	Byte data
30	DR2	DIF	16-bit integer	0x02 = Value OK 0x32 = Value not OK
31	DR2	VIF	Extension table	0xFB
32	DR2	VIFE	Relative humidity 0.1%RH	0x1A
33	DR2	Value (LSB)	**Example**: 0x0102	0x02
34	DR2	Value (MSB)		0x01

Option 2: Alternative address handling

Example of readout from a Lansen wired temperature sensor with serial number 11223344. Note that the LLA address is a copy of the ALA address and that the CI-field is set to short header with this alternative. By using this alternative, more MBUS data can fit into each packet (maximum 240 bytes of data).

Art nr.	LAN-WMBUS-MA-X
Version	Version from meter
Information	Packet is sent every x seconds. Depending on the MBUS readout interval setting
DR1	Last measured temperature value
DR4	Last measured humidity value

Link layer (LLA)

Byte No	Field Name	Content	Info	Byte data
1	L-Field	Length		.
2	C-Field	SND-NR		0x44
3	M-Field	Meter Manufacturer code	LAS	0x33
4	M-Field	Meter Manufacturer code		0x30
5	A-Field	Device serial number (LSB)	**Example**: 11223344	0x44
6	A-Field	Device serial number		0x33
7	A-Field	Device serial number		0x22
8	A-Field	Device serial number (MSB)		0x11
9	A-Field	Protocol version		0x01
10	A-Field	Meter type		0x1B

Network layer (ALA)

Byte No	Field Name	Content	Info	Byte data
11	CI-Field	Short header	Example: 7	0x7A
12	Access no.	Transmission counter from Meter		0x07
13	Status	Device status (error/alarms) From Meter		0x00
14	Configuration	Number of encrypted blocks	Example: 7	0x07
15	Configuration	Encryption	Encryption mode 5	0x05
16	AES-Verify	Encryption Verification		0x2F
17	AES-Verify	Encryption Verification		0x2F

Data record 1: Last measured temperature value

Byte No	Field Name	Content	Info	Byte data
18	DR1	DIF	16-bit integer	0x02 = Value OK 0x32 = Value not OK
19	DR1	VIF	External temperature 0.01ºC	0x65
20	DR1	Value (LSB)	**Example**: 0x0011	0x11
21	DR1	Value (MSB)		0x00

Data record 4: Last measured humidity value

Byte No	Field Name	Content	Info	Byte data
22	DR4	DIF	16-bit integer	0x02 = Value OK 0x32 = Value not OK
23	DR4	VIF	Extension table	0xFB
24	DR4	VIFE	Relative humidity 0.1%RH	0x1A
25	DR4	Value (LSB)	**Example**: 0x0102	0x02
26	DR4	Value (MSB)		0x01

No response from meter

This packet is sent out if a meter which has previously been found did not respond to the last request. Note that the LLA-address in this packet contains the meter address. This packet is transmitted so that the receiver/gateway can detect that the meter has stopped responding.

For this packet, the Status-byte in the network layer is set to 3 and the data block is filled with filler bytes (0x2F). Note that the sequence number for meters that do not respond is randomized for this packet.

Art nr.	LAN-WMBUS-MA-X
Version	31 (0x1F)
Information	Packet is sent every x seconds in T-mode. Depending on the MBUS readout interval setting

Link layer (LLA) and Network layer (ALA)

Field name	Content	Info	Byte data
L-Field	Length		
C-Field	SND-NR		0x44
Information according to **Opt 1: Standard address handling** or **Opt 2: Alternative address handling**.			

DATA blocks

Field name	Content	Info	Byte data Link layer (LLA) + Network layer (ALA)
AES-Verify	Encryption Verification		0x2F
AES-Verify	Encryption Verification		0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F
Filler bytes			0x2F

Status packet

In addition to the converted Wired MBUS packet, the MBus to wMBus converter also transmits its status in set intervals defined by the setting "MBUS readout interval", by default every 60 minutes. This packet contains important diagnostic information and is always sent non-encrypted.

Art nr.	LAN-WMBUS-MA-X
Version	31 (0x1F)
Information	Packet is sent every on every readout on wM-Bus
DR1	Used bus loads (mA).
DR2	Max supported meters. The number of logical meters that this version of MBUS master support
DR3	Detected meters on the bus
DR4	Number of meters that have not responded on the last request. (TBI)
DR5	Battery voltage 12V for ACDC version.
DR6	Software version. Major. Minor. Build Example 1.1.18.
DR7	Hardware Model
DR8	Hardware Version
DR9	Meters on the bus communicating on 9600 baud.
DR10	External temperature value updated on each readout from bus. (Celsius)
DR11	Remaining battery lifetime TBI (current always -32768) (months)
DR12	Time the bus was on during last readout in ms (milli seconds)
DR13	Total time the bus has been on. (hours)
DR14	Total operating time (days)
DR15	Operating time since battery change(days)

Link layer (LLA)

Byte No	Field Name	Content	Info	Byte data
1	L-Field	Length		
2	C-Field	SND-NR		0x44
3	M-Field	Meter Manufacturer code	LAS	0x33
4	M-Field	Meter Manufacturer code		0x30
5	A-Field	Device serial number (LSB)	**Example**: 11223344	0x44
6	A-Field	Device serial number		0x33
7	A-Field	Device serial number		0x22
8	A-Field	Device serial number (MSB)		0x11
9	A-Field	Protocol version	Version 31	0x1F
10	A-Field	Meter type		0x37

Network layer (ALA)

Byte No	Field Name	Content	Info	Byte data
11	CI-Field	Short header		0x7A
12	Access no.	Transmission counter		0x10
13	Status	Device status		0x00
14	Configuration	Number of encrypted blocks		0x00
15	Configuration	Encryption	Encryption mode 5	0x05
16	AES-Verify	Encryption Verification		0x2F
17	AES-Verify	Encryption Verification		0x2F

Data record 1: Used bus loads (mA).

Byte No	Field Name	Content	Info	Byte data
18	DR1	DIF	16-bit integer	0x02
19	DR1	VIF	Extension table	0xFD
20	DR1	VIFE	Current on the BUS (0.1) mA	0x58
21	DR1	Value (LSB)	Used bus loads mA	0x0D
22	DR1	Value (MSB)		0x00

Data record 2: Max supported meters.

Byte No	Field Name	Content	Info	Byte data
23	DR2	DIF	16-bit integer + Storage 1	0x42
24	DR2	VIF	Extension table	0xFD
25	DR2	VIFE	Dimensionless	0x3A
26	DR2	Value (LSB)	**Example**: 2	0x02
27	DR2	Value (MSB)		0x00

Data record 3: Number of meters found by the MBus to wMBus converter.

Byte No	Field Name	Content	Info	Byte data
28	DR3	DIF	16-bit integer	0x02
29	DR3	VIF	Extension table	0xFD
30	DR3	VIFE	Dimensionless	0x3A
31	DR3	Value (LSB)	**Example**: 2	0x02
32	DR3	Value (MSB)		0x00

Data record 4: Number of meters with no response on previous request.

Byte No	Field Name	Content	Info	Byte data
33	DR4	DIF	16-bit integer + Extension	0x82
34	DR4	DIFE	Subunit 1	0x40
35	DR4	VIF	Extension table	0xFD
36	DR4	VIFE	Dimensionless	0x3A
37	DR4	Value (LSB)	**Example**: 1 (0x0001)	0x01
38	DR4	Value (MSB)		0x00

Data record 5: Last measured battery voltage.

Byte No	Field Name	Content	Info	Byte data
39	DR5	DIF	16-bit integer	0x02
40	DR5	VIF	Extension table	0xFD
41	DR5	VIFE	Voltage (mV)	0x46
42	DR5	Value (LSB)	**Example**: 2900 mV (0x0B54)	0x54
43	DR5	Value (MSB)		0x0B

Data record 6: Software version. Major. Minor. Build Example 1.1.18.

Byte No	Field Name	Content	Info	Byte data
44	DR6	DIF	Variable length	0x0D
45	DR6	VIF	Extension table	0xFD
46	DR6	VIFE	Other software version number	0x0F
47	DR6	Length	ASCII length	0x0D
48	DR6	Value	ASCII data	0x38
49	DR6	Value		0x37
50	DR6	Value		0x34
51	DR6	Value		0x38
52	DR6	Value		0x31
53	DR6	Value		0x2E
54	DR6	Value		0x34
55	DR6	Value		0x32
56	DR6	Value		0x31
57	DR6	Value		0x2E
58	DR6	Value		0x39
59	DR6	Value		0x35
60	DR6	Value		0x31

Data record 7: Hardware model.

Byte No	Field Name	Content	Info	Byte data
61	DR7	DIF	8-bit integer	0x01
62	DR7	VIF	Extension table	0xFD
63	DR7	VIFE	Hardware model	0x0C
64	DR7	Value	**Example**: 1	0x01

Data record 8: Hardware version.

Byte No	Field Name	Content	Info	Byte data
65	DR8	DIF	8-bit integer	0x01
66	DR8	VIF	Extension table	0xFD
67	DR8	VIFE	Hardware version	0x0D
68	DR8	Value	**Example**: 1	0x01

Data record 9: Meters on the bus communicating on 9600 baud.

Byte No	Field Name	Content	Info	Byte data
69	DR9	DIF	16-bit integer	0x02
70	DR9	VIF	Manufacturer specific	0xFF
71	DR9	VIFE	Meters on the bus communicating on 9600 baud.	0x0B
72	DR9	Value (LSB)	**Example**: 1	0x01
73	DR9	Value (MSB)		0x00

Data record 10: External temperature value updated on each readout from bus. (Celsius).

Byte No	Field Name	Content	Info	Byte data
74	DR10	DIF	8-bit integer	0x01
75	DR10	VIF	External temperature (°C)	0x67
76	DR10	Value	**Example**: 24°C	0x18

Data record 11: Remaining battery lifetime TBI (current always -32768) (months)

Byte No	Field Name	Content	Info	Byte data
77	DR11	DIF	16-bit integer	0x02
78	DR11	VIF	Extension table	0xFD
79	DR11	VIFE	Reserved / storage	0xFD
80	DR11	Value (LSB)	No data /reserved	0x01
81	DR11	Value (MSB)		0x00

Data record 12: Time the bus was on during last readout in ms.

Byte No	Field Name	Content	Info	Byte data
82	DR12	DIF	16-bit integer	0x02
83	DR12	VIF	Manufacturer specific	0xFF
84	DR12	VIFE	Time the bus was on during last readout	0x0A
85	DR12	Value (LSB)	**Example**: 10 ms	0x0A
86	DR12	Value (MSB)		0x00

Data record 13: Total time the bust have been on. (hours)

Byte No	Field Name	Content	Info	Byte data
87	DR13	DIF	16-bit integer	0x02
88	DR13	VIF	Time (h)	0x26
89	DR13	Value (LSB)	**Example**: 10 h	0x0A
90	DR13	Value (MSB)		0x00

Data record 14: Total operating time (days)

Byte No	Field Name	Content	Info	Byte data
91	DR14	DIF	16-bit integer	0x02
92	DR14	VIF	Extension table	0xFD
93	DR14	VIFE	Operating time (days)	0x6D
94	DR14	Value (LSB)	**Example**: 10 days	0x0A
95	DR14	Value (MSB)		0x00

Data record 15: Operating time since battery change (days)

Byte No	Field Name	Content	Info	Byte data
96	DR15	DIF	16-bit integer	0x02
97	DR15	VIF	Extension table	0x27
98	DR15	Value (LSB)	**Example**: 10 days	0x0A
99	DR15	Value (MSB)		0x00