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WMBUS DATA FORMAT

OCCUPANCY DETECTOR: LAN-WMBUS-OD-EQ

Rev 5.0

Verify correct device and version

This document applies to the device LAN-WMBUS-OD-EQ with protocol version 5. There are two ways of finding out the protocol version of the device; either by looking at the label on the device or by looking at the data packets sent out by the device. See chapters **Protocol version in data packets** and **Protocol version in label** below for more information.

Protocol version in data packets

If it is possible to check the information in the data packets sent out by the device, then the protocol version is included in the data field called *A-Field Protocol version*. For more information, see chapter Fel! Hittar inte referenskälla..

Protocol version in label

The protocol version can be found on the label. An example of a label is shown in the figure below. Scanning the QR-code reveals the information regarding the device, in this case LAS.00037352.1F.05, where

- **Manufacturer code**: LAS
- **Serial number**: 00037352
- **Device type**: 1F
- **Protocol version**: 05

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WMBUS-format

Art nr.	LAN-WMBUS-OD-EQ
Version	5 (0x05)
Information	Packet is sent synchronous every 120 seconds in C-mode, format A (T-mode, format A on request). Packet is also sent asynchronous if device detects movement for the first time in 10 minutes.
DR1	**Alarm status:** Motion will always be 1 if there is an alarm and will stay active as long as motion is detected. However, the alarm will be active maximum 5 minutes if no new motion is detected, even if sound is detected. Sound and LUX alarm can only be active if there first has been a motion alarm.
DR2	**Current alarm status:** Shows extended alarm status information on how long ago motion, sound, and lux was detected. **Note**: Lux alarm means the lux has increased more than 50 lux compared to the value measured last time motion was detected.
DR3	**Activity (minutes):** Number of minutes with activity in a row. If there has been any activity during a 10-minute period, this counts as activity. Will only count motions (PIR) as occupancy.
DR4	**Number of minutes since last alarm:** Stops counting at 65535 minutes (approximately 64 days).
DR5	**Total number of motion detections (slow):** Increments maximum every 5 minutes. In other words, a new valid movement can be detected after 5 minutes has passed since the last movement. **Note**: This counter will wrap when the value 65535 is reached.
DR6	**Total number of motion detections (fast):** Increments maximum every 10 seconds. In other words, a new valid movement can be detected after 10 seconds has passed since the last movement. **Note**: This counter will wrap when the value 65535 is reached.
DR7	**On time:** Number of days since last startup. Resets if batteries are removed and reinserted.
DR8	**Total on time:** Number of days since first startup. Does not reset if batteries are removed.
DR9	**Software version**
DR10	**Current sound level**
DR11	**Max sound level past 20 minutes**
DR12	**Max sound level past 60 minutes**
DR13	**Current lux value**
DR14	**Average lux level last 60 minutes**
DR15	**Current temperature**
DR16	**Average temperature last 60 minutes**
DR17	**Current humidity**
DR18	**Average humidity last 60 minutes**

Byte No	Field Name	Content	Info	Byte Data	
1.	L-Field	Length			Link layer
2.	C-Field	SND-NR		0x44	
3.	M-Field	Meter Manufacturer code	LAS	0x30	
4.	M-Field	Meter Manufacturer code		0x33	
5.	A-Field	Meter serial number (LSB)	**Example**: 0001067	0x67	
6.	A-Field	Meter serial number		0x00	
7.	A-Field	Meter serial number		0x01	
8.	A-Field	Meter serial number (MSB)		0x00	
9.	A-Field	Protocol version		0x0A	
10.	A-Field	Meter type	Motion sensor	0x1F	
11.	CI-Field	Short header		0x7A	Network layer
12.	Access no.	Transmission counter	Example: 7	0x07	
13.	Status	Device status (error/alarms)	Refer to **Table 1** for possible values	0x00	
14.	Configuration	Number of encrypted blocks	Example: 3	0x03	
15.	Configuration	Encryption	Encryption mode 5 + Synchronized: 0x25	0x25	
16.	AES-Verify	Encryption Verification		0x2F	
17.	AES-Verify	Encryption Verification		0x2F	
18.	DR1	DIF	8-bit integer	0x01	Alarm
19.	DR1	VIF	Extension table	0xFD	
20.	DR1	VIFE	Digital Input	0x1B	
21.	DR1	Value	Refer to **Table 2** for possible values	0x01	
22.	DR2	DIF	16-bit integer + Storage 1	0x42	Alarm status (extended)
23.	DR2	VIF	Extension table	0xFD	
24.	DR2	VIFE	Digital Input	0x1B	
25.	DR2	Value (LSB)	Refer to **Table 3** for possible values	0x00	
26.	DR2	Value (MSB)		0x00	
27.	DR3	DIF	16-bit integer + storage 2	0x82	PIR: Active minutes in a row
28.	DR3	DIFE	Storage 2	0x01	
29.	DR3	VIF	Extension	0x02	
30.	DR3	VIFE	Dimensionless	0xFD	
31.	DR3	Value (LSB)	**Example**: See bytes to the right	0x20	
32.	DR3	Value (MSB)		0x01	

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33.	DR4	DIF	16-bit integer + storage 3	0xC2	PIR: Minutes since alarm
34.	DR4	DIFE	storage 3	0x01	
35.	DR4	VIF	Extension	0x02	
36.	DR4	VIFE	Dimensionless	0xFD	
37.	DR4	Value (LSB)	**Example:** See bytes to the right	0x20	
38.	DR4	Value (MSB)		0x00	
39.	DR5	DIF	16-bit integer + storage 4	0xC2	PIR: Total number of motions (slow)
40.	DR5	VIF	Extension	0x02	
41.	DR5	VIFE	Dimensionless	0xFD	
42.	DR5	Value (LSB)	**Example:** See bytes to the right	0x20	
43.	DR5	Value (MSB)		0x01	
44.	DR6	DIF	16-bit integer + storage 5	0xC2	PIR: Total number of motions (fast)
45.	DR6	VIF	Extension	0x02	
46.	DR6	VIFE	Dimensionless	0xFD	
47.	DR6	Value (LSB)	**Example:** See bytes to the right	0x20	
48.	DR6	Value (MSB)		0x02	
49.	DR7	DIF	16-bit integer	0x02	On time (days)
50.	DR7	VIF	On Time Days	0x23	
51.	DR7	Value (LSB)	**Example:** See bytes to the right	0x01	
52.	DR7	Value (MSB)		0x01	
53.	DR8	DIF	16-bit integer	0x02	Total on time (days)
54.	DR8	VIF	Total Operating Time Days	0x27	
55.	DR8	Value (LSB)	**Example:** See bytes to the right	0x00	
56.	DR8	Value (MSB)		0x01	
57.	DR9	DIF	16-bit integer	0x02	Software version
58.	DR9	VIF	Extension table	0xFD	
59.	DR9	VIFE	Version	0x0F	
60.	DR9	Value (LSB)	**Example:** See bytes to the right	0x04	
61.	DR9	Value (MSB)		0x00	
62.	DR10	DIF	16-bit integer + subunit 1	0xC2	Sound: Current value
63.	DR10	DIFE	Subunit 1	0xC0	
64.	DR10	VIF	Extension	0xFD	
65.	DR10	VIFE	Dimensionless	0x3A	
66.	DR10	Value (LSB)	**Example:** See bytes to the right	0x00	
67.	DR10	Value (MSB)		0x00	
68.	DR11	DIF	16-bit integer + subunit 1 + storage 1	0xC2	Sound: Max level last 20 minutes
69.	DR11	DIFE	Subunit 1	0x40	
70.	DR11	VIF	Extension	0xFD	
71.	DR11	VIFE	Dimensionless	0x3A	
72.	DR11	Value (LSB)	**Example:** See bytes to the right	0x00	
73.	DR11	Value (MSB)		0x00	
74.	DR12	DIF	16-bit integer + subunit 1 + storage 2	0x82	Sound: Max level last 60 minutes
75.	DR12	DIFE	Subunit 1	0x41	
76.	DR12	VIF	Extension	0xFD	
77.	DR12	VIFE	Dimensionless	0x3A	
78.	DR12	Value (LSB)	**Example:** See bytes to the right	0x00	
79.	DR12	Value (MSB)		0x10	
80.	DR13	DIF	8-bit integer + Subunit 2	0x82	Light: Current value
81.	DR13	DIFE	Subunit 2	0x80	
82.	DR13	DIFE	Subunit 2	0x40	
83.	DR13	VIF	Extension	0xFD	
84.	DR13	VIFE	Dimensionless	0x3A	
85.	DR13	Value	**Example:** See byte to the right	0x00	
86.	DR14	DIF	8-bit integer + subunit 2 + storage 1	0xC1	Light: Average last 60 minutes
87.	DR14	DIFE	Subunit 2	0x80	
88.	DR14	DIFE	Subunit 2	0x40	
89.	DR14	VIF	Extension	0xFD	
90.	DR14	VIFE	Dimensionless	0x3A	
91.	DR14	Value	**Example:** See byte to the right	0x00	
92.	DR15	DIF	16-bit integer	0x02	Temperature: Current value
93.	DR15	VIF	External temperature 0.01°C	0x65	
94.	DR15	Value (LSB)	**Example:** See bytes to the right	0x1C	
95.	DR15	Value (MSB)		0x00	
96.	DR16	DIF	16-bit integer + storage 1	0x42 = Value OK 0x72 = Not enough values	Temperature: Average last 60 minutes
97.	DR16	VIF	External temperature 0.01°C	0x65	
98.	DR16	Value (LSB)	**Example:** See bytes to the right	0x1C	
99.	DR16	Value (MSB)		0x00	
100.	DR17	DIF	16-bit integer	0x02	

101.	DR17	VIF	Extension table	0xFB	Humidity: Current value
102.	DR17	VIFE	Relative humidity 0.1%RH	0x1A	
103.	DR17	Value (LSB)	**Example**: 0x0A78	0x78	
104.	DR17	Value (MSB)		0x0A	
105.	DR18	DIF	16-bit integer + Storage 1	0x42 = Value OK 0x72 = Not enough values	Humidity: Average last 60 minutes
106.	DR18	VIF	Extension table	0xFB	
107.	DR18	VIFE	Relative humidity 0.1%RH	0x1A	
108.	DR18	Value (LSB)	Example: 0x012C	0x78	
109.	DR18	Value (MSB)		0x0A	
110.	AES Filler byte			0x2F	
111.	AES Filler byte			0x2F	

Table 1: Status byte with errors and alerts

Bit	Info
0 (0x01)	X
1 (0x02)	X
2 (0x04)	Low battery
3 (0x08)	X
4 (0x10)	Sound detected last 120-240 seconds
5 (0x20)	Motion detected last 120-240 seconds
6 (0x40)	Motion detected last 10 minutes
7 (0x80)	Motion detected last 24 hours

Table 2: Alarm status

Bit	Info
0 (0x01)	Motion detected
1 (0x02)	Sound detected
2 (0x04)	LUX detected

Table 3: Extended alarm status information

Bit	Info
0 (0x01)	Motion detected last 120-240 seconds
1 (0x02)	Motion detected last 10 min
2 (0x04)	Motion detected last 60 minutes
3 (0x08)	Motion detected last 24 hours
4 (0x10)	Sound above threshold detected
5 (0x20)	Sound detected last 120-240 seconds
6 (0x40)	Sound detected last 10 min
7 (0x80)	Sound detected last 60 min
8 (0x100)	Sound detected last 24 hours
9 (0x200)	LUX detected last 120-240 seconds
10 (0x400)	LUX detected last 10 min
11 (0x800)	LUX detected last 60 min
12 (0x1000)	LUX detected last 24 hours

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Other technical information:

The LED will light up in red when motion is detected for the first 10 minutes after power up.
After 10 minutes the led will never light up if not the device is restarted.

Revision history.

Rev	Date	Name	Info
V4.2	20210809	Martin Hallberg	Corrected that MBUS data format DR1 that it is 8 bit and not 16 bit. Corrected that MBUS data format DR2 value is 2 bytes and not 1. Corrected the DR1 text LUX is 0x100, 0x200, 0x400, 0x800
V 4.3	20210811	Martin Hallberg	Corrected that the alarm reset period for DR1 is 5 minutes and not 10 minutes.
4.4	20210907	Martin Hallberg	Corrected placement

Errata:

Version	
35	DR2 Bit for 24 hour for sound is never cleared Bit for PIR alarm is not set correctly for 10 minutes, 1 hour and 120 sec.
36	No known issues.