

INSTALLATION MANUAL

LAN-WMBUS-SMK2



Document Revision

Rev	Date	Issued by	Changes
1.0	2020-05-13	Patrick Simpson	First Revision
1.1	2021-05-29	Martin Stanic	Updated test (SMK-1 -> SMK2) and updated information.
1.2	2021-06-05	Martin Stanic	Updated wMBUS-data format with new protocol.
1.3	2021-06-05	Martin Stanic	Updated some spelling errors.
1.4	2022-08-23	Martin Stanic	Adjusted description for DR8. It's number of tests performed, both manual AND automatic and not number of times test button has been pressed.

1 Overview

This documentation describes the general performance of the LAN-WMBUS-SMK2 and more in detail how the detector should be installed and used referring to the wireless functionality. The radio, battery performance as well as the transmitted data from the device are explained in detail. For mounting and handling of the LAN-WMBUS-SMK2 please refer to the User manual of the SMK2 smoke detector; UM-EN_LAN-WMBUS-SMK2-V1.2.

1.1 Manufacturer

Lansen Systems AB
Skallebackavägen 3
302 41 Halmstad, Sweden

2 Description

Lansen's advanced single station photoelectric smoke detector SMK2 is designed to sense smoke that comes into the sensing chamber. It does not sense gas or flame. This smoke detector is designed to give early warning of developing fires by giving sound alarm from its built-in alarm horn.

In addition, this smoke detector also integrates a high-performance radio transmitter that send status messages via the Wireless M-BUS & OMS (Open Metering Standard) protocol. The integrated radio module is only used for monitoring and transmitting the performance and functionality of the smoke detector.

This smoke detector is designed for use in a single residential unit only, which means it should only be used inside a single-family apartment or home. The detectors are stand-alone units and have no interconnections to other smoke detectors.



Main function	Smoke detector	
Sensitivity standard	EN14604	
Method of mounting	Ceiling	
Alarm audibility	Over 85 dB/3m	
Interconnectable	No (Single station)	
Communication	868.95 MHz	
Indicator	Alarm	Red LED flashing 3 times and horn emit 3 tones every 4 second
	Malfunction	Yellow LED flashing every 48 second
	Power	Green LED flashing every 48 second
Temporary deactivation facility	No	
Temporary muting facility	Silence alarm about eight minutes	
	Silence malfunction (error) about one hour	
Operation temperature	0°C~50°C (32°F~122°F)	
Relative Humidity	5~90%	
Size	120mm diameter x 52.45mm depth	

The main purpose of the smoke detector, LAN-WMBUS-SMK2, is to warn with the siren if smoke is present in the area. The device is also used in a wireless MBUS/ OMS compatible system for monitoring the performance and function of the smoke detector.

The device uses photoelectric technology and has an aesthetically appealing professional design and functionality which allows for discrete integration in home environment and apartments. The device on its own is fully supervised and checks for low battery and malfunction.

The smoke detector comes with two different batteries, one to power the radio (replaceable) and one to power the smoke detector (non-replaceable). The radio is started by removing the battery pull tab on the back while the smoke detector is automatically powered on when mounted on the bracket for fast and efficient installation.

The field DR3 shows the number of minutes since manual test was performed. This value is set to 0 every time a test has been performed. If the manual test has NOT been performed for 28 days, an automatic manual test is performed by the device. During this test, a short sound could be heard. If the manual test fails, the malfunction bit will be set in the status information bytes.

Important: *Since the Wireless MBUS protocol does not guarantee delivery of information in a network the radio of the device should not be used as a reliable way of transmitting smoke alarms, but only for monitoring the performance and functionality of the smoke-detector.*

2.1 Radio performance

Frequency	868,95 MHz
MBUS mode	T
Encryption	YES, OMS mode 5
Transmission interval	3 minutes typical
Maximum radiated output power	14 dBm

2.2 Power sources and battery lifetime

The battery lifetime of the device is stated as with one manual test every week.

Model	LAN-WMBUS-SMK2
Power supply (Radio communication)	Panasonic CR123A or Duracell DL123A 3V Lithium battery (Replaceable)
Battery lifetime	More than ten (10) years
Power supply (Smoke detection)	Energizer L91 2x1.5V Lithium battery (NOT replaceable)
Autonomy	More than ten (10) years

2.3 Warnings and indications

BATTERY	Low battery (smoke or radio)
SMOKE	Smoke present
END OF LIFE	Device is ending its max service time of 10 years
MALFUNCTION	Malfunction warning
NO CONNECTION	No working connection between the radio and smoke detector
MANUAL TEST	Manual test performed
HARDWARE ERROR	Hardware error smoke detector
SILENCE MODE	Smoke detector has been silenced manually
CLEAN ME	Smoke detector needs to be cleaned
LOW SENSITIVITY	Smoke detector sensitivity is too low and needs to be cleaned or repaired
NO SOUND	No sound was heard from buzzer

2.4 Standards

The device complies with the following standards:

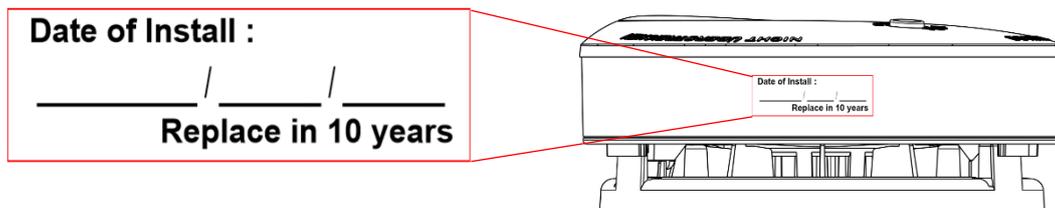
EN 14604:2005/AC:2008
EN 300 220-1 V3.1.1
EN 300 220-2 V3.1.1
EN 13757-3/4:2018/2019
ETSI EN 301 489-1 v.2.2.3
ETSI EN 301 489-3 v2.1.1
EN IEC 61000-6-1: 2019
OMS 4.0.2 (TR05 V1.0.6)

2.5 Performance

TEMPERATURE	0°C~49°C
SOUND LEVEL	Min. 85 dB/3m
SENSITIVITY	0,08~0,12 dB/m
RELATIVE HUMIDITY	5~90% (non-condensing)
COLOR	White
SIZE (W x H x D)	120mm diameter x 52.45mm height
MATERIAL	ABS+PC

2.6 Installation

When the detector is being installed, do not forget to type down the date for installation of the label packed with the detector. Attach the label on the side of the detector during installation.



2.7 Serial number

All LAN-WMBUS-SMK2 have their unique serial number. The serial number is written on a label placed on the device, please refer the pictures below.

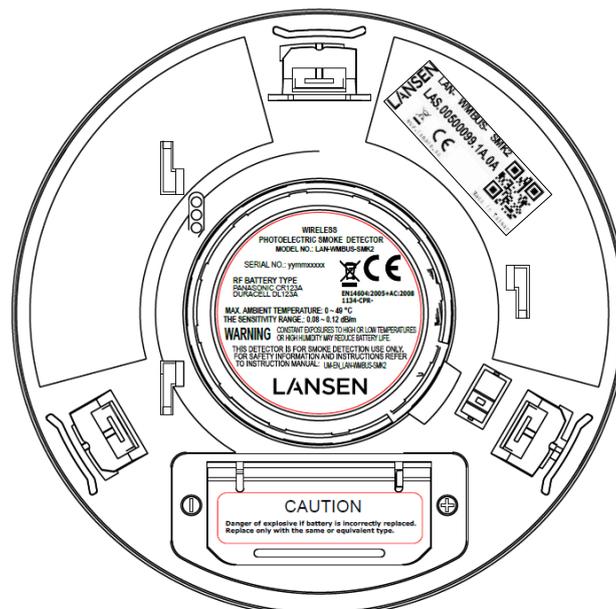
The following information is available on the label according to the Wireless MBUS protocol:

LAS: Manufacture code for Lansen Systems AB

00500099: The serial number of the device, this number is unique for every device

1A: Device type (Smoke detector)

0A: Protocol version



Note: LAS.xxxxxxx.1A.0A is the radio serial number of the device that is transmitted in the wMBUS data.

2.8 WMBUS-data format

Art nr.	LAN-WMBUS-SMK2			
Version	10 (0x0A)			
DR1	Smoke status			
DR2	Hours until next automatic test			
DR3	Hours since last test			
DR4	Battery voltage (radio)			
DR5	Battery voltage (smoke detector)			
DR6	Number of days mounted			
DR7	Last measured sensitivity level on smoke detector (updated every hour)			
DR8	Number of times a test, both manual and automatic, has been performed since start			
DR9	Number of times smoke alarm has been triggered since start			
Byte No	Field Name	Content	Info	Byte data
1	L-Field	Length		0x34
2	C-Field	SND-NR		0x44
3	M-Field	Meter Manufacturer code	LAS	0x33
4	M-Field	Meter Manufacturer code		0x30
5	A-Field	Meter serial number (LSB)	Example: 00010067	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	Device type	Smoke detector	0x1A
11	CI-Field	Short header		0x7A
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	Encrypted (OMS mode 5)		0x05
16	AES-Verify	Encryption Verification		0x2F
17	AES-Verify	Encryption Verification		0x2F
18	DR1: Smoke status	DIF	32-bit integer	0x04
19		VIF	Strings in following bytes (length in next byte)	0x7C
20		VIFE	Length of string	0x03
21		VIFE	ASCII = 3	0x33
22		VIFE	ASCII = S	0x53
23		VIFE	ASCII = D	0x44
24		Value (LSB)	Device status for smoke alarm device	0xA0
25		Value		0x81
26	Value	0x08		
27	Value (MSB)	Note: See Table 2 for possible values		0x00
28	DR2: Hours until next automatic test	DIF	16-bit integer	0x02
29		VIF	Extension table	0xFD
30		VIFE	Dimensionless	0x3A
31		Value (LSB)	Example: 0x0168	0x68
32		Value (MSB)		0x01
33	DR3: Hours since last test	DIF	16-bit integer + extension	0x82
34		DIFE	Subunit 1	0x40
35		VIF	Extension table	0xFD
36		VIFE	Dimensionless	0x3A
37		Value (LSB)	Example: 0x0138	0x38
38	Value (MSB)	0x01		
39	DR4: Battery voltage (radio)	DIF	16-bit integer	0x02
40		VIF	Extension table	0xFD
41		VIFE	Voltage (10 ⁻³)	0x46
42		Value (LSB)	Example: 0x0AD0	0xD0
43	Value (MSB)	0x0A		
44	DR5: Battery voltage (smoke detector)	DIF	16-bit integer + extension	0x82
45		DIFE	Subunit1	0x40
46		VIF	Extension table	0xFD
47		VIFE	Voltage (10 ⁻³)	0x46
48		Value (LSB)	Example: 0x0DC5	0xC5
49	Value (MSB)	0x0D		
50	DR6: Number of days mounted	DIF	16-bit integer	0x02
51		VIF	On time (days)	0x23
52		Value (LSB)	Example: 0x0000	0x00
53		Value (MSB)		0x00
54	DR7: Last measured	DIF	16-bit integer + extension	0x82
55		DIFE	Subunit 2	0x80
56		DIFE		0x40

Linklayer

Networklayer

AES encrypted

Applicationlayer (APL)

57	sensitivity level on smoke detector	VIF	Extension table	0xFD		
58		VIFE	Dimensionless	0x3A		
59		Value (LSB)	Example: 0x052D	0x2D		
60		Value (MSB)		0x05		
61	DR8: Number of times test button has been pressed since start	DIF	16-bit integer	0x02		
62		VIF	Strings in following bytes (length in next byte)	0x7C		
63		VIFE	Length of string	0x03		
64		VIFE	ASCII = T	0x54		
65		VIFE	ASCII = F	0x46		
66		VIFE	ASCII = #	0x23		
67		Value (LSB)	Example: 0x0070	0x70		
68		Value (MSB)		0x00		
69	DR9: Number of times smoke alarm has been triggered since start	DIF	16-bit integer	0x02		
70		VIF	Strings in following bytes (length in next byte)	0x7C		
71		VIFE	Length of string	0x03		
72		VIFE	ASCII = L	0x4C		
73		VIFE	ASCII = A	0x41		
74		VIFE	ASCII = #	0x23		
75		Value (LSB)	Example: 0x0145	0x45		
76		Value (MSB)		0x01		

Table 1: Status byte with errors and alerts

Bit	Information
0 (0x01)	X
1 (0x02)	X
2 (0x04)	Low battery
3 (0x08)	Malfunction
4 (0x10)	Silence mode active
5 (0x20)	Smoke alarm
6 (0x40)	No connection to smoke sensor
7 (0x80)	Last test performed was manual

Table 2: Information for bits in DR1

Bit	Information	Notes
0 (0x01)	Device dismantled	Not supported (Always 0)
1 (0x02)	Low Battery (smoke)	
2 (0x04)	Hardware or software error	
3 (0x08)	Smoke sensor fault (e.g., smoke chamber)	
4 (0x10)	Sounder (audible) fault disabled	Always 0
5 (0x20)	Obstacle detection disabled	Not supported (Always 1)
6 (0x40)	Smoke entries blocked detection disabled	Always 0
7 (0x80)	Smoke alarm condition now enabled	Always 1
8 (0x100)	Sounder (audible) fault	
9 (0x200)	Obstacle detection	Not supported (Always 0)
10 (0x400)	Smoke entries blocked	
11 (0x800)	Smoke alarm (alarm condition now)	
12 (0x1000)	Active / storage state	Always 0
13 (0x2000)	Reserved	Always 0
14 (0x4000)	Reserved	Always 0
15 (0x8000)	Manufacturer specific bytes following	Always 1
16 (0x10000)	Battery low (radio)	
17 (0x20000)	Battery low (smoke)	
18 (0x40000)	Manual test performed	
19 (0x80000)	No connection to smoke	
20 (0x100000)	Clean me	
21 (0x200000)	Low sensitivity	
22 (0x400000)	End of life	
23 (0x800000)	Silence mode	
24 (0x1000000)	Not used	Always 0
25 (0x2000000)	Not used	Always 0
26 (0x4000000)	Not used	Always 0
27 (0x8000000)	Not used	Always 0
28 (0x10000000)	Not used	Always 0
29 (0x20000000)	Not used	Always 0
30 (0x40000000)	Not used	Always 0
31 (0x80000000)	Not used	Always 0