Panasonic

PANASONIC FIRE ALARM SOLUTIONS

TECHNICAL DESCRIPTION

MEW01764

4611 - WIRELESS PHOTOELECTRIC SMOKE DETECTOR
4620 - ADDRESSABLE BASE STATION FOR WIRELESS UNITS
4613 - WIRELESS SNIFFER

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1. INTRODUCTION

This document describes the Wireless photoelectric smoke detector 4611, the Addressable base station for wireless units 4620, and the Wireless sniffer 4613.

The expression "wireless detector system" is found in this document and refers to one base station and up to 16 Wireless detectors.

“EBL system” refers to either of the two control units EBL 128 or EBL 512 G3.

2. ABBREVIATIONS

C.i.e.	Control and indicating equipment	(=Control Unit)
C.U.	Control Unit	
DIL	Dual-In-Line	
LED	Light Emitting Diode	
IR	Infrared	
SSD	Site Specific Data	

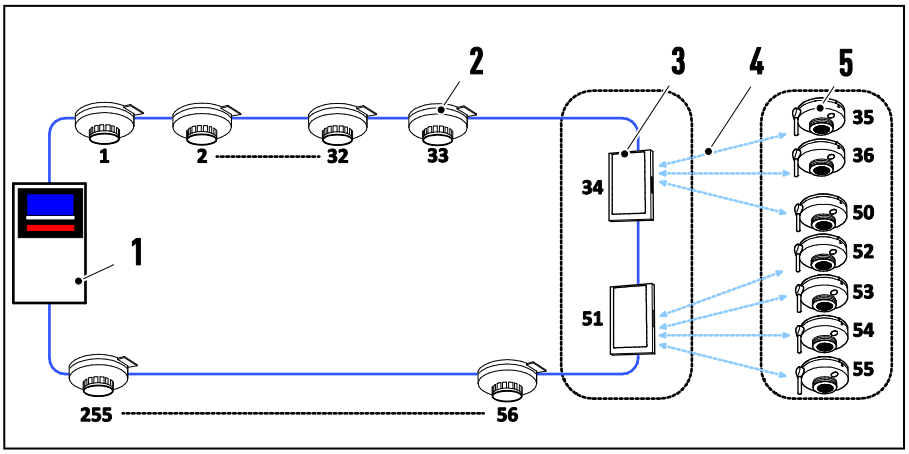
3. GENERAL DESCRIPTION

3.1. COMMUNICATION

The wireless detector system consists of an Addressable Base station for wireless units, type 4620 and Wireless photoelectric smoke detectors, type 4611. Each Base station can communicate with up to 16 Wireless detectors. Up to four Base stations can be connected to each COM loop in an EBL system. The Base station communicates on a selected channel with each Wireless detector every two minutes.

- One transmission channel (0, 1, 2 or 3) is set for each Base station.
- One transmission channel (0, 1, 2 or 3) is set for each Wireless detector (0-15), depending on which Base station it shall communicate with.
- The transmission channel (0, 1, 2 or 3) is set on the DIL-switches in the Addressable base station and the Wireless detector respectively, see section 4.7.SET THE TRANSMISSION CHANNEL and 5.4.SET THE TRANSMISSION CHANNEL.

NOTE! When more than four Base stations are required, see section 3.1.1 TRANSMISSION CHANNEL (0-3).



1) Control unit (c.ie.)
2) Detector on COM loop
3) Base station
4) Wireless communication
5) Wireless smoke detector

The illustration shows two Wireless detector systems on one COM loop. The Base stations, no. 0 and no. 1, are set to transmission channel 0 and 1 respectively.

3.1.1. TRANSMISSION CHANNEL (0-3)

Up to four Base stations can be connected to a COM loop and they shall be set to transmission channel 0, 1, 2 and 3 respectively.
In order to have the wireless detector to communicate with its Base station, the transmission channel (0, 1, 2 or 3) shall be set to the same in the detector as in its Base station.

NOTE! If more than four Base stations shall be used, the distance between the Base stations using the same transmission channel has to be more than 300 meters. The same is valid for the wireless detectors using the same transmission channel.

NOTE! The distance between the Base stations and Wireless detectors using a different transmission channel has to be more than 2 meters. The same is valid for the distance between the Base stations or the distance between the Wireless detectors using a different transmission channel.

3.2. BACKUP CHANNELS (4-7)

Changes in the installation / building could affect the communication between the Base station and its Wireless detectors. If the Base station does not receive a proper answer, it will start communicating on all the four backup channels (4 – 7) as well. The Wireless detector will then answer on the channel with the best signal.
Next time the communication starts it will be on the selected channel again and in case of a not proper answer the "backup" channels will be used again. And so on.
If the Base station does not receive any proper answer when it is communicating on all the five channels, the Base station will directly make a new attempt, and again and again. After approximately 5 minutes, if no proper answer is received, a "no reply" fault will be generated and displayed in the c.i.e.

3.2.1. COMMUNICATION BETWEEN THE WIRELESS DETECTORS, THE BASE STATION, AND THE C.I.E.

Wireless detector	Base station	C.i.e.
Fire alarm →	→	Fire alarm Zone-Address
LED on/off	←	Detector LED on/off
Sounder on/off	←	Detector sounder on/off
Detector removal → (tamper switch activated)	→	Fault: Detector xxx-xx / yyyyyy removed
IR LED fault →	→	Fault: Loop unit xxx-xx / yyyyyy
EEPROM fault →	→	
Battery fault → (voltage <2.8 V)	→	Fault: Battery xxx-xx / yyyyyy
Wireless signal stop → (voltage <2.3 V)	→	Fault: No reply xxx-xx / yyyyyy
	No Detector data →	
Sensor compensation → value >2.0 % per m >18 h	→	Service signal
	EEPROM trouble → Base station yyyyyy	Fault: Loop unit yyyyyy

xxx-xx = Presentation number
yyyyyy = Technical address
NOTE! Due to the Base station's internal priority order, if more than one fault is generated "at the same time", it's depending on the type of faults which will be presented in the c.i.e.

3.2.2. TEMPORARY DISTURBANCES

If the Base station doesn't receive a proper answer, it will start to communicate on "backup" channels (4 – 7) as well. The Wireless detector will answer on the channel with the best signal, either the selected channel or one of the backup channels.
Next time the communication starts it will be on the selected channel again and in case of a not proper answer the "backup" channels will be used again, and so on.
If the Base station does not receive any proper answer when it is communicating on all the five channels, the Base station will directly make a new attempt, and again and again. After approximately 5 minutes, if no proper answer is received, a fault will be generated and displayed in the c.i.e.

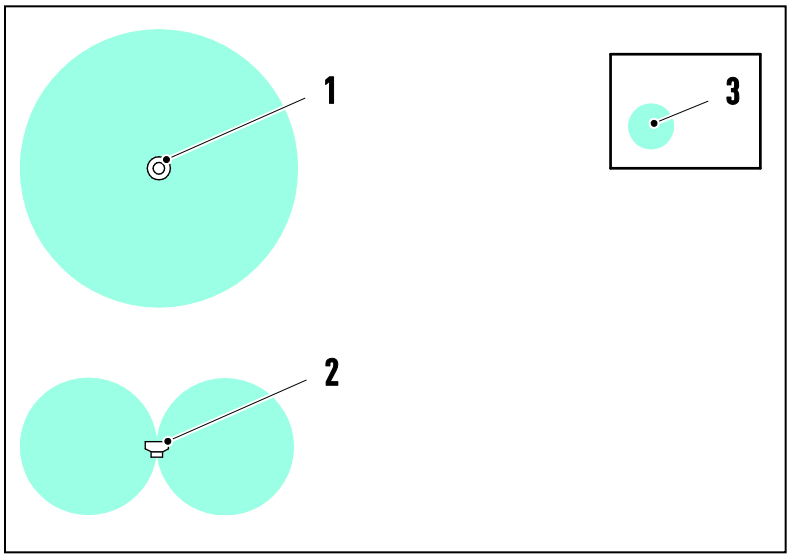
3.2.3. FIRE ALARM

When a Wireless detector is in fire alarm state it will directly send this information to the Base station. The Base station will directly send the fire alarm information to the c.i.e. “Fire alarm” will be activated and displayed in the c.i.e. and a signal will be sent to the Wireless detector (via the Base station) to turn on the detector LED and the built-in sounder. The Wireless detector sounder can be programmed for high, medium, and low priority. The sound of the three priorities must differ. Example:

- High priority: Steady (continuously); 3 kHz
- Medium priority: 1 Hz (0.5 s ON / 0.5 s OFF); Sweep from 2.8 to 3.2 kHz
- Low priority: 1 Hz (0.5 s ON / 0.5 s OFF); 3 kHz

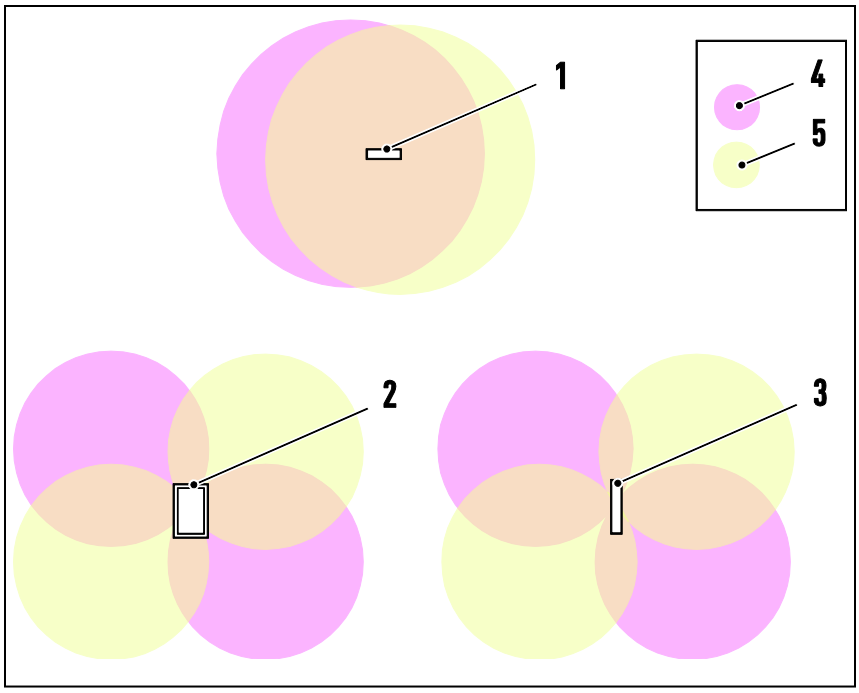
3.2.4. DIRECTIONAL CARACTERISTICS

WIRELESS FOTOELECTRIC SMOKE DETECTOR 4611



1) Wireless detector top view
2) Wireless detector side view
3) Directional pattern

ADDRESSABLE BASE STATION 4620



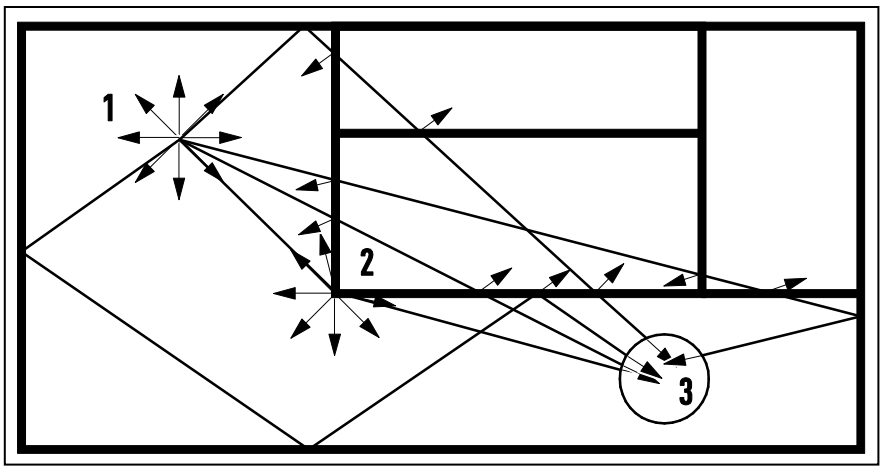
1) Base station top view
2) Base station front view
3) Base station side view
4) Directional pattern antenna 1
5) Directional pattern antenna 2

3.2.5. TRANSMISSION RANGE

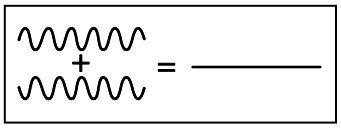
According to EN54-25, the transmission signal has to be OK in both directions, including an additional 30 dB "security margin". This is automatically checked during the registration procedure for the wireless detector.

The transmission distance is up to 170 meters in open air if the EN54-25 requirements shall be fulfilled.
The transmission distance is up to 250 meters, if the EN54-25 requirements do not have to be fulfilled. No additional 30 dB “security margin” is then needed.
NOTE! Open air between the wireless detectors and the Base station is required for the maximum transmission distance.
Radio signals are affected by both reflection and attenuation.

REFLECTION
Walls and objects between or close to the wireless detectors and the Base station, as well as the type of material, will affect the radio signal. Reflection of radio waves caused by walls or objects in the building can result in an increase or a reduction of the signal.



1) Transmitter
2) Spherical reflections
3) Receiver



The resulting signal is impossible to calculate. Tests on site are required.
The worst result is no signal at all.

During the registration procedure, the detector LED will indicate if the signal is OK or not.
See section 4.8 REGISTER A WIRELESS DETECTOR.

ATTENUATION

If the following items are between or close to the wireless units, the transmission distance **will** be affected:

- Metal or material including metal, for example reinforced concrete or glass wool with aluminum foil.
- Wireless station for TV, radio.
- Home electric products or office automation high frequency equipment, such as microwave oven or PC, closer than 2 meters.
- Mobile phone or other wireless systems.
- Human body.

The following table shows the approximate attenuation for different materials:

Thick wet brick walls, reinforced concrete ceiling / floor	30-40 dB
Steel reinforced concrete wall	30 dB
Light concrete wall / ceiling	20 dB
Indoor walls (sand/limestone, brick, wood, plaster etc.)	10-15 dB
Light indoor walls, dividers, etc.	1-5 dB

The exact attenuation for different materials is not possible to calculate in advance, because it is depending not only on the material itself but also the thickness of it.

The attenuation of the wireless signal in open air is approximately 16 dB when you double the distance.

Example:

5 m	40 dB
10 m	56 dB
20 m	72 dB
30 m	80 dB
40 m	88 (90) dB

As indicated above, the maximum attenuation must be less than 90 dB.

MORE EXAMPLES:
The following two examples are showing the approximate attenuation for different distances and materials:

Example 1: The distance between the Base station and a wireless detector is 20 m (72 dB) and an indoor wall (10 dB) gives an approximate attenuation of 82 dB, which is < 90 dB = OK.

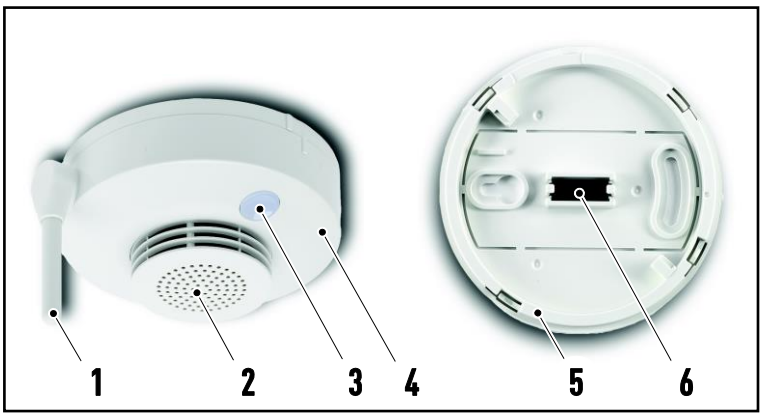
Example 2: The distance between the Base station and a wireless detector is 10 m (56 dB) and a reinforced concrete ceiling (40 dB) gives an approximate attenuation of 96 dB, which is more than 90 dB = **not** OK.

NOTE! The examples above are **theoretical and rough calculations** that have to be verified in the actual installation on site. Also note that movements and activities inside the building can affect the wireless signal. The result could vary during the different hours of the day.
Because of the large attenuation by reinforced concrete in ceiling / floor, it is recommended to have minimum one Base station per level / floor.

NOTE! A Wireless sniffer is highly recommended to be used, to check the background noise as well as the signals between a Base station and its Wireless detectors. See chapter 6 WIRELESS SNIFFER 4613.

4. WIRELESS PHOTOELECTRIC SMOKE DETECTOR 4611

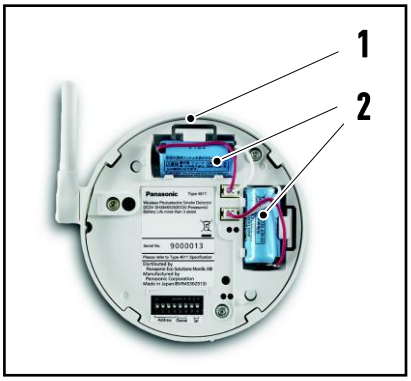
4.1. BASIC INFORMATION



1) Adjustable antenna
2) Sounder
3) Detector LED and signal check button
4) Detector
5) Detector base
6) Tamper switch magnet

- 4611 consists of a detector (4), which is plugged in a supplied base (5). It must be mounted in the ceiling.
- The detector has an external adjustable antenna (1). The detector shall be mounted with the antenna in the direction towards the Base station.
- The built-in sounder (2) has three priority levels. The sounder is programmed as an output via EBLWin.
- The signal check button (3) has an LED for fire alarm indication. For more information on the detector led and signal check button, see 4.10 MANUAL SIGNAL CHECK.
- On the detector base (5) there is a tamper switch (6) for detector removal signal. Removal of the detector (4) will give a fault message in the c.i.e.

BATTERIES, TYPE NUMBER 4612



1) Wireless detector inside
2) Batteries

The Wireless detector is powered by two pieces of supplied 3 V Lithium batteries. A battery voltage less than 2.8 V will generate a fault in the c.i.e. The detector will turn off the wireless signal when the battery voltage is less than 2.3 V, since the function cannot be guaranteed at such a low voltage. A "no reply" fault will then be generated in the c.i.e. Available as spare part.

4.2. IR LED

The smoke detection chamber consists of an IR LED and a photodiode. Reflection of the infrared light is used to detect smoke. The smoke enters the detection chamber through an insect filter and an optical labyrinth. This construction improves the smoke inflow and also causes steam to condense on the outer surfaces, to prevent false alarms. The condition of the IR LED is checked every 30 minutes. If the IR LED condition is not OK, a fault will be generated in the c.i.e. after three fault readings. That is after 3 x 30 (=90) minutes.

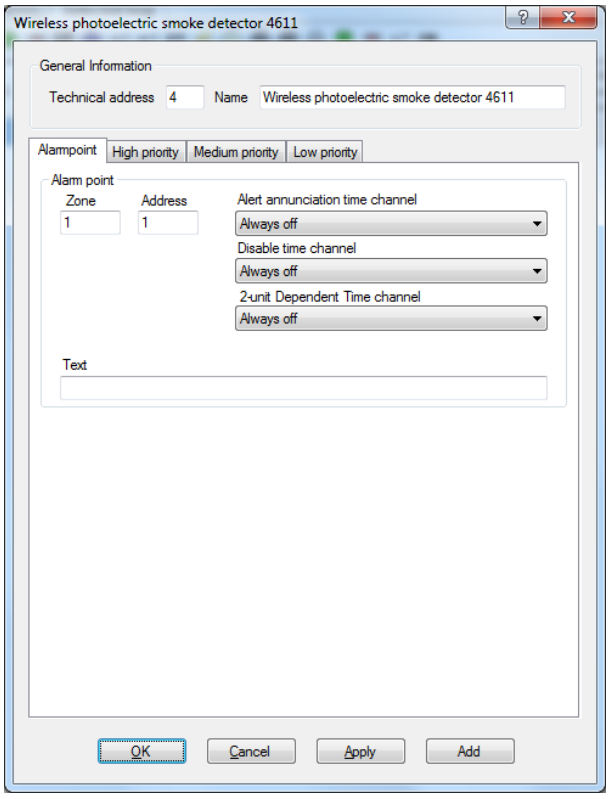
4.3. FIRE ALARM

The detector performs a fire alarm check every 5.1 second, which changes to 1 second when the value is over the fire alarm threshold level, which is 3.5 % obscuration per meter. In order to reduce false alarms, three values/readings over the alarm threshold level are required before a fire alarm message will be sent to the c.i.e. The c.i.e. will send a message to turn on the indication LED on the Wireless detector. The c.i.e. will also send a message to turn on the built-in sounder if a control expression is programmed for High, Medium and/or Low priority.

4.4. SENSITIVITY COMPENSATION DUE TO CONTAMINATION

Every hour the detector's average smoke density value is checked. If the value is > 2.0 %/m during 18 hours, 2.0 %/m will automatically be subtracted from the smoke density value before checking if it's over the fire alarm threshold level (3.5 %/m) or not.

4.5. SET THE COM LOOP ADDRESS - EBLWin PROGRAMMING

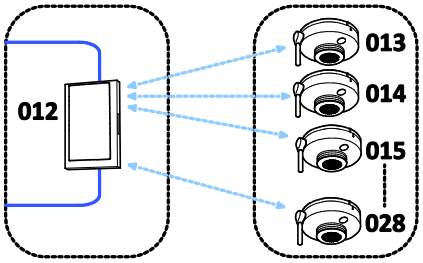


EBLWin dialog box “Wireless photoelectric smoke detector 4611.

Each Wireless Detector takes one COM loop address, which will be the Base Station's COM loop address +1, +2, up to +16.

Each Wireless Detector also has to be programmed via the PC program EBLWin regarding presentation number (Zone-Address), alarm text, and so on. Control expressions for the sounder (high, medium and/or low priority) have to be programmed.

Example: The Base station's com loop address is 012.

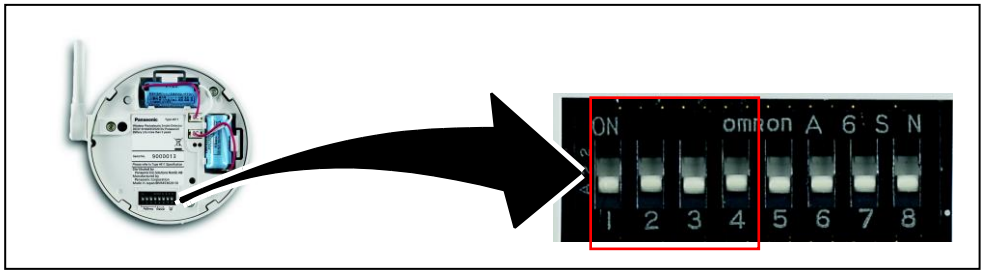


Wireless detector number	Wireless detector COM loop address
0	Base station's COM loop address +1 (012+1=013)
1	Base station's COM loop address +2 (012+2=014)
…and so on…	
15	Base station's COM loop address +16 (012+1=028)

4.6. SET THE DETECTOR ADDRESS

NOTE! Due to static electricity, it is not recommended to use any conductive tool, for example a metal screw driver, to set the DIL-switches.

Each Base station can support up to 16 wireless detectors.
The Detector addresses (0-15) have to be set for each wireless detector respectively.
Depending on the Base station's COM loop address and the Detector address, each wireless detector will get a specific COM loop address, used for programming. See section 4.5 SET THE COM LOOP ADDRESS - EBLWin PROGRAMMING.



0 = OFF 1 = ON

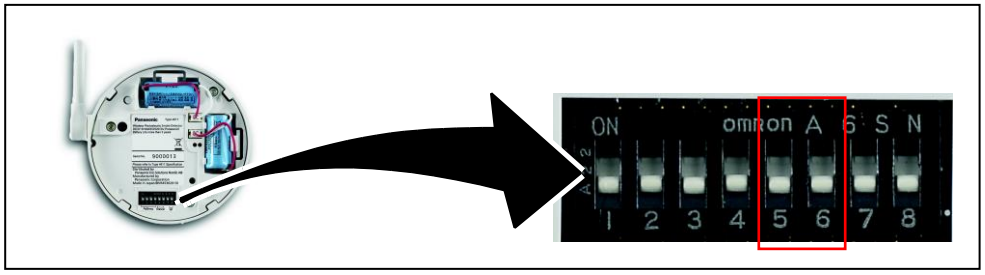
Address	Switch 1	Switch 2	Switch 3	Switch 4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

NOTE! After change of address a power reset is required. Disconnect and re-connect both batteries.

4.7. SET THE TRANSMISSION CHANNEL

NOTE! Due to static electricity, it is not recommended to use any conductive tool, for example a metal screw driver, to set the DIL-switches.

See section 3.1.1 TRANSMISSION CHANNEL (0-3) for more information.



0 = OFF 1 = ON

Transmission channel	Switch 5	Switch 6
0	0	0
1	0	1
2	1	0
3	1	1

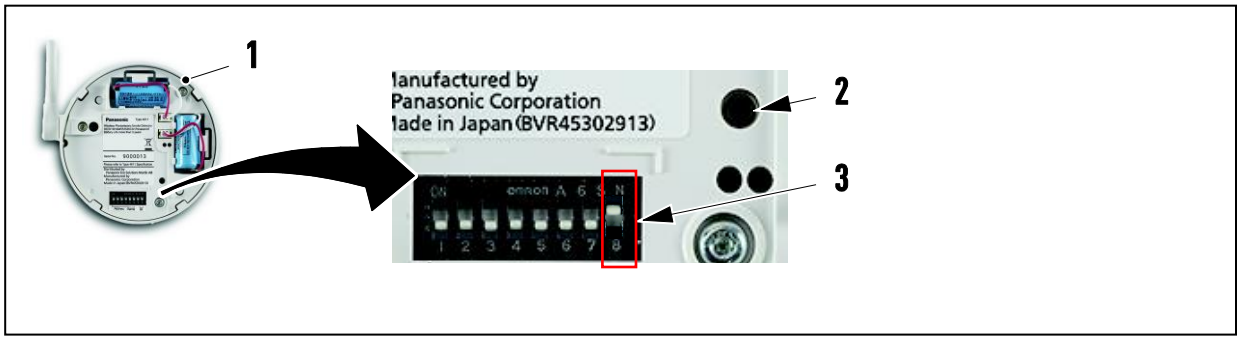
NOTE! After change of transmission channel a power reset is required. Disconnect and re-connect both batteries.

4.8. REGISTER A WIRELESS DETECTOR

NOTE! Due to static electricity, it is not recommended to use any conductive tool, for example a metal screw driver, to set the DIL-switches.

NOTE! It is recommended to do the registration procedure as close as possible to the final mounting position of the wireless detectors respectively.

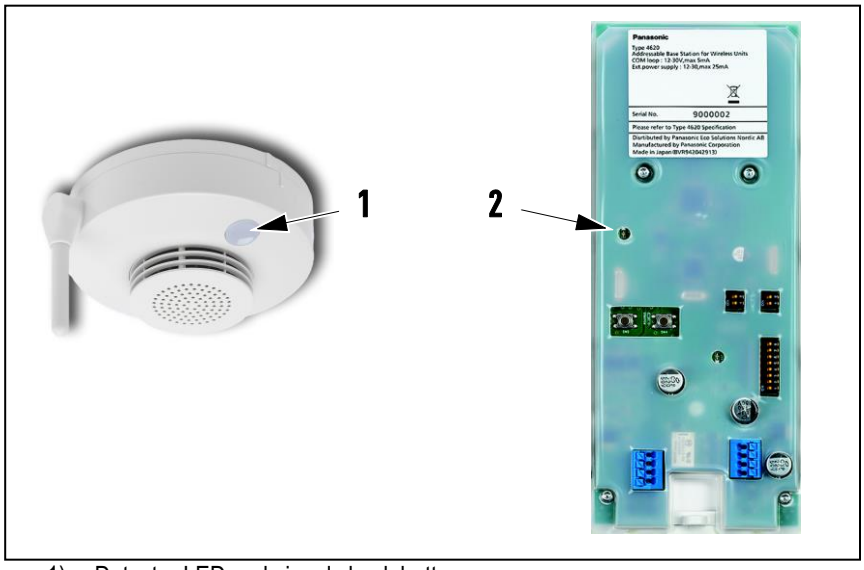
See section 3.1.1 TRANSMISSION CHANNEL (0-3) for more information.



1) Wireless detector – open
2) Registration button
3) DIL switch 8. **ON** = Register

a) Set the Base station to "Register" according to section 5.6 SET TO REGISTER MODE.
b) Set the DIL switch 8 (3) to **ON**.
c) Mount and connect two pieces of battery 4612. See illustration above.
d) Press the Registration button (2).
e) Verify the registration according to section 4.8.1 CHECK REGISTRATION.
f) End the "Register mode" in the c.i.e. for the correct Base station. See section 5.6 SET TO REGISTER MODE for the Base station.

4.8.1. CHECK REGISTRATION



1) Detector LED and signal check button
2) Blue LED

If the Registration is OK:

- The Blue LED (2) on the Base station is flashing 3 times.
- The Detector LED (1) is flashing 3 times and the detector sounder beeps one time.
- If the registration is OK, plug the wireless detector in its base.

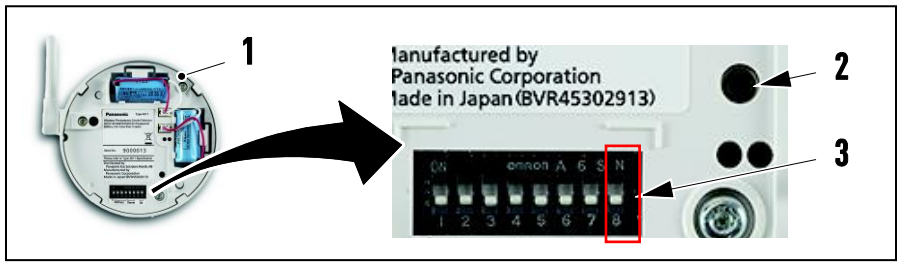
If the Registration is not OK:

- The Blue LED (2) on the Base station is not flashing.
- The Detector LED (1) is not flashing and there is no sound.
- The Wireless detector and/or Base station have to be moved to another position and/or replace the batteries, before a new registration procedure can be started.
- If the position of the Base station is changed, all detectors are affected. The registration procedure has to be repeated for all detectors.

4.9. SET TO UNREGISTER MODE

One registered wireless detector can be individually deregistered.
All wireless detectors registered in one Base station can be collectively cancelled in that Base station.
See section 3.1.1 TRANSMISSION CHANNEL (0-3) for more information.

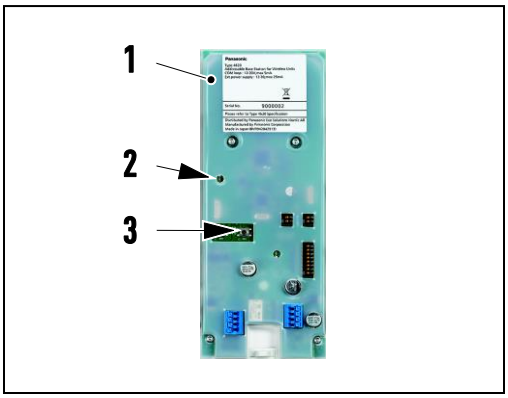
4.9.1. UNREGISTER ONE WIRELESS DETECTOR



1) Wireless detector – open
2) Registration button
3) DIL switch 8. **OFF** = Unregister

a) Set the Base station to "Unregister" according to section 5.7 SET TO UNREGISTER MODE.
b) Set the Detector DIL switch 8 (3) to position **OFF**.
c) Press the Registration button.
d) Verify the deregistration according to section 4.8.1 CHECK REGISTRATION.
e) End the "Unregister mode" in the c.i.e. for the correct Base station. See section 5.7 SET TO UNREGISTER MODE for the Base station.

4.9.2. UNREGISTER ALL WIRELESS DETECTORS



1) Addressable Base station – open
2) Blue LED
3) Clear button

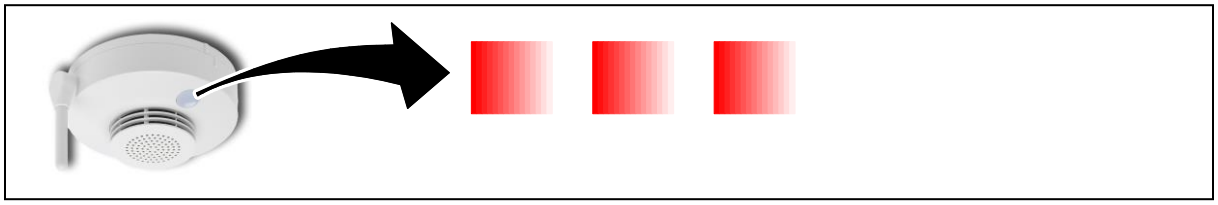
a) Set the Base station to "Unregister" according to section 5.7 SET TO UNREGISTER MODE.
b) Press the Clear button (3) on the Base station for 5 seconds.
c) If the deregistration is OK - The Blue LED (2) on the Base station is flashing 3 times.
d) The blue LED (2) turns off and the base station restarts. When communication between the c.i.e. and the base station has been established again, the c.i.e. will set the base station to unregister mode.
e) End the "Unregister" mode in the c.i.e. for the correct Base station. See section 5.7 SET TO UNREGISTER MODE for the Base station.

4.10. MANUAL SIGNAL CHECK

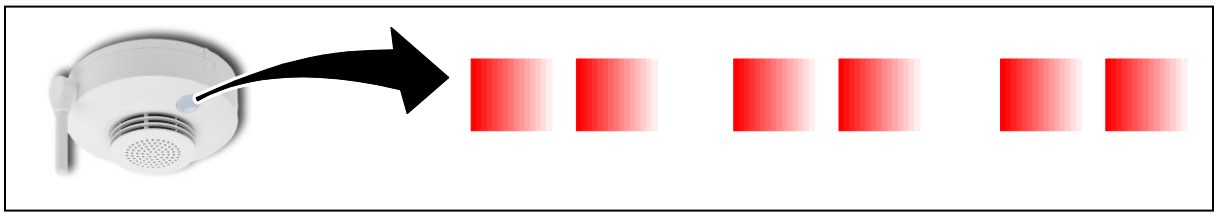
When the wireless system is working in "normal" mode, the communication between the Base station and a Wireless detector can be checked as follows:

a) Press the Signal check button on the Wireless detector. The detector LED is flashing for 5 seconds.
b) Check the detector LED after those 5 seconds:

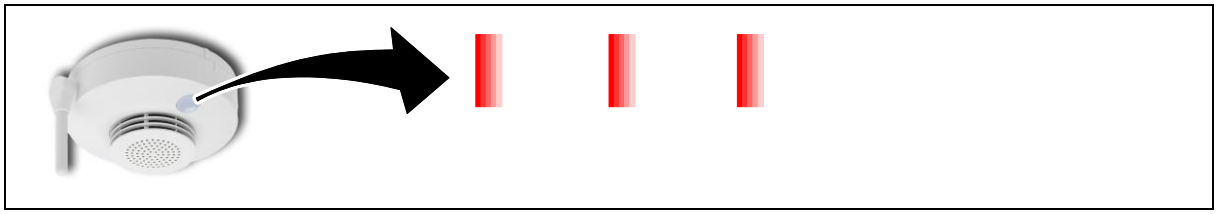
- If the LED is flashing 3 times (1s ON/0.5s OFF) it is indicating that the Wireless detector communicates with its Base station and the EN54-25 requirements are fulfilled.



- If the LED is flashing 2 times x 3 is indicating that the Wireless detector communicates with its Base station but the EN54-25 requirements are **not** fulfilled.



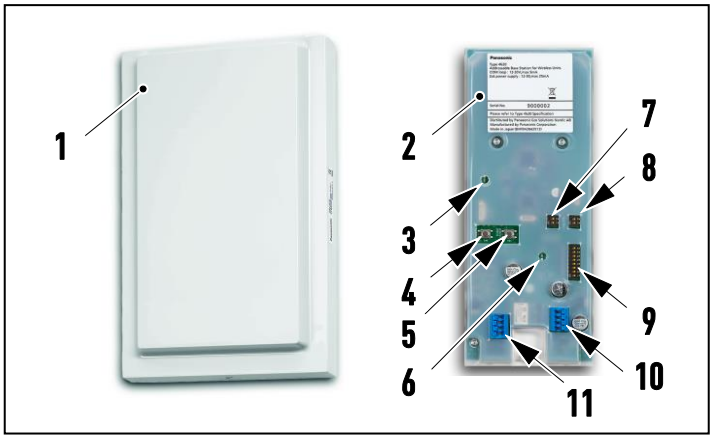
- If the LED is flashing 3 times (0.25s ON/1.25s OFF) it is indicating that the transmission signal is too low. The Wireless detector and/or the Base station have to be moved to another position.



- If the LED is not flashing (OFF) it is indicating that the wireless detector is not communicating.

5. ADDRESSABLE BASE STATION FOR WIRELESS UNITS 4620

5.1. BASIC INFORMATION



1) Cover
2) Base station – open
3) Blue LED
4) Setting button (Register)
5) Clear button (Unregister)
6) Red LED
7) Mode DIL
8) Channel DIL
9) Address DIL
10) Main power terminal
11) COM loop terminal

The Addressable Base station for wireless units consists of a printed circuit board mounted in a Cover (1). It has two fast connector terminals for the COM loop (11) (in / out) and Main power (10).
See chapter 8 TECHNICAL DATA.
Each Base station can support up to 16 Wireless photoelectric smoke detectors type 4611. Up to four Base stations can be connected to each COM loop.

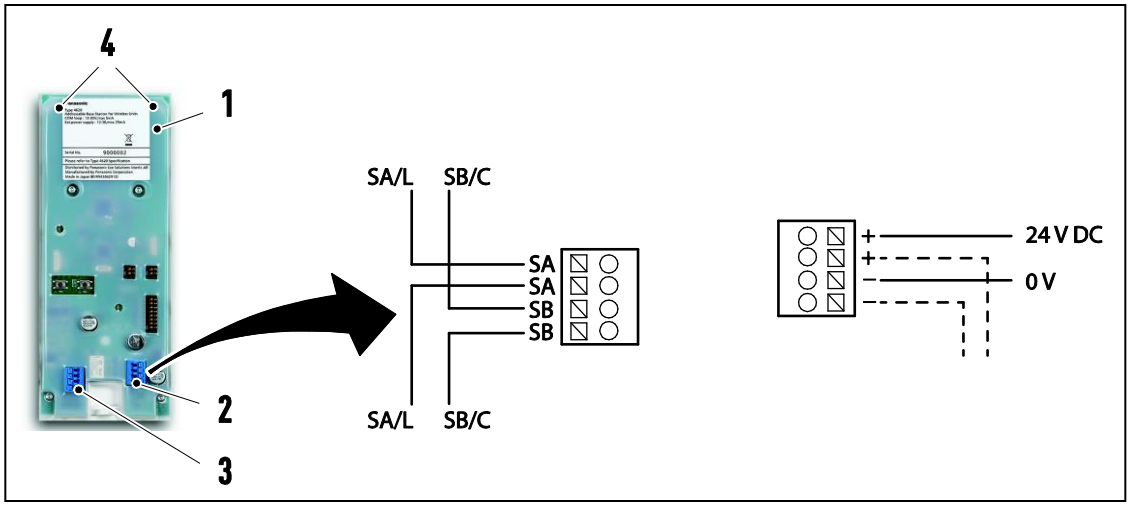
It is recommended to mount the Base station vertical, since the Base station's two built-in antennas then will be in the most favourable position. The Base station shall have a central place relative to the Wireless detectors. Take into account various materials in the walls.

SHORT CIRCUIT ISOLATOR
As an extra feature, the Base station has a built-in short circuit isolator that requires no separate COM loop address. Like any other short circuit isolator, it has to be given an individual sequence number in the COM loop A-direction when registered in EBLWin.

5.2. CONNECTIONS

The Base station has two fast connector terminals. The Main power terminal (2) and the COM loop terminal (3).
Use connector wire Ø 0.6 – 1.2 mm (approximately 0.28 – 1.13 mm²).
If wire Ø 0.6 mm is used, the release button may have to be pushed when the wire is pressed into the connector.

- Main power: 24 V DC (in / out) respectively. Maximum 40 mA is required.
- COM loop: COM loop current consumption is max. 6 mA.



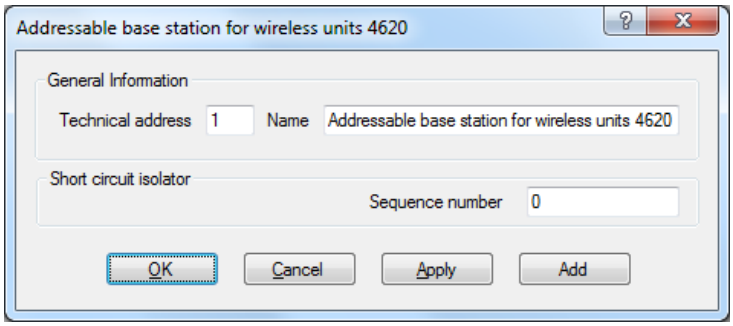
1) Base station – open
2) Main power terminal
3) COM loop terminal
4) Built in antennas

NOTE! It is recommended to have the cable inlets close to the Main power terminal (2) and the COM loop terminal (3), since the antennas (4) are located on the upper part of the Base station. The antennas must not be hidden by cables.

5.3. SET THE COM LOOP ADDRESS - EBLWin PROGRAMMING

The Base station has to have a COM loop address, 1-255. The Base station is programmed via the PC program EBLWin.
Up to four Base stations can be connected to each COM loop in an EBL c.i.e.

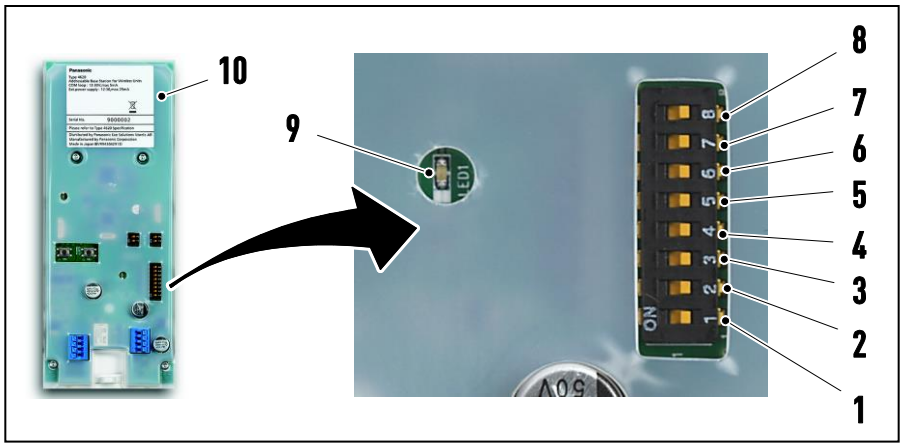
NOTE! If the Base station shall supply 16 Wireless Detectors, the highest possible COM loop address for the Base station is 255-16=239.



EBLWin dialog box for Addressable base station 4620

THE ADDRESS DIL-SWITCH ON THE BASE STATION

NOTE! Due to static electricity, it is not recommended to use any conductive tool, for example a metal screw driver, to set the DIL-switches.



1) Address 128
2) Address 64
3) Address 32
4) Address 16
5) Address 8
6) Address 4
7) Address 2
8) Address 1
9) Red LED
10) Base station - open

- All switches (1-8) OFF = 0 NOTE! 0 is not a valid COM loop address.
- Switch "8" ON = 1 (COM loop address 001.)
- Switch "8" OFF and Switch "7" ON = 0+2 = 2 (COM loop address 002.)
- Switch "8" ON and Switch "7" ON = 1+2 = 3 (COM loop address 003.)

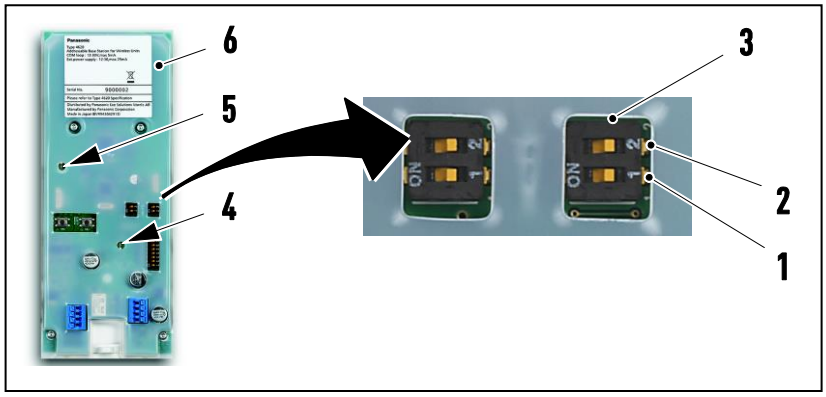
…and so on…

Example: Switches "8", "7", "6", "5", "4", "3", "2" and "1" ON = 1+2+4+8+16+32+64+128 = Address 255. After the address setting the Base station will do an automatic restart, indicated by the Red LED (9) flashing 1 time.

5.4. SET THE TRANSMISSION CHANNEL

NOTE! Due to static electricity, it is not recommended to use any conductive tool, for example a metal screw driver, to set the DIL-switches.

See section 3.1.1 TRANSMISSION CHANNEL (0-3) for more information.



1) Channel switch 1
2) Cannel switch 2
3) Channel DIL
4) Red LED
5) Blue LED
6) Base station - open

0 = OFF 1 = ON

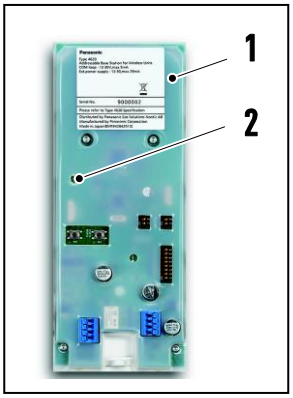
Transmission channel	Switch 1	Switch 2
0	0	0
1	0	1
2	1	0
3	1	1

NOTE! After changing transmission channel the Blue LED (5) will blink 3 times and then the Base station will do a restart. The restart is indicated by the Red LED (4) blinking 1 time.

NOTE! After changing transmission channel, all data about any registered detector will be erased. All the wireless detectors have to be registered on the new transmission channel.

5.5. SET TO INSTALL MODE

Normally the Base station communicates with its wireless detectors every 2 minutes.
In “Install mode” the communication will be every 5 seconds. This mode can be used while collecting data for the sniffer and the log, so that the data will be collected faster than normally.



1) Base station
2) Blue LED

a) Set the Base station (1) to “Install mode” from the c.i.e. menu H5/A8.
b) The change of mode is confirmed by the Blue LED (2), which is lit with a fixed light.

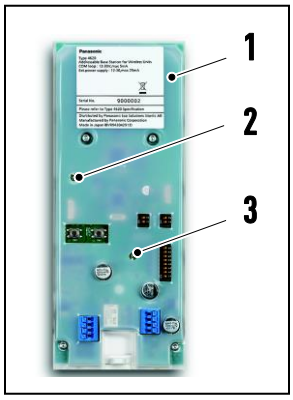
END THE “INSTALL MODE”

c) After operation, end the “Install mode” in the c.i.e. for the correct Base station:
   - In EBL512 G3; go to menu H5/A8
   - In EBL128; go to menu H5/A9

NOTE! If the Base station is set in “Install mode” from the c.i.e. it remains in this mode until ended from the c.i.e. or automatically after 10 hours.

NOTE! In “Install mode” the Wireless detectors will not work normally. The fire alarm cannot be activated and the manual signal check function will not work.

5.6. SET TO REGISTER MODE



1) Base station
2) Blue LED
3) Red LED

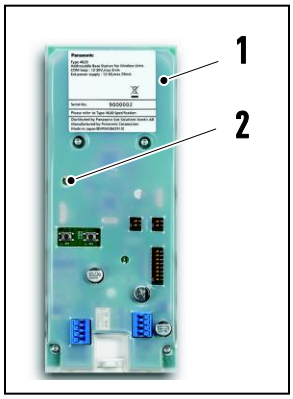
a) Set the Base station (1) to “Register mode” from the c.i.e. menu H5/A8.
b) The change of mode is confirmed by the Blue LED (2), which is lit with a fixed light.

END THE “REGISTER MODE”

c) When the detectors are registered, end the “Register mode” in the c.i.e. for the correct Base station:
    - In EBL512 G3; go to menu H5/A8
    - In EBL128; go to menu H5/A9
d) This is confirmed by the Blue LED (2), which is turned off.
e) The Red LED (3) flashes 1 time, indicating the restart of the Base station.
f) The Base station will now be synchronized with all its wireless detectors. This can take up to 5 minutes.
g) When the synchronization is ready, correct if there are any faults in the c.i.e.

NOTE! If the Base station is set in Register mode from the c.i.e. it remains in this mode until ended from the c.i.e. or automatically after 10 hours.

5.7. SET TO UNREGISTER MODE



1) Base station
2) Blue LED

a) Set the Base station (1) to “Unregister” from the c.i.e. menu H5/A8.
b) The change of mode is confirmed by the Blue LED (2), which is lit with a fixed light.

END THE “UNREGISTER MODE”

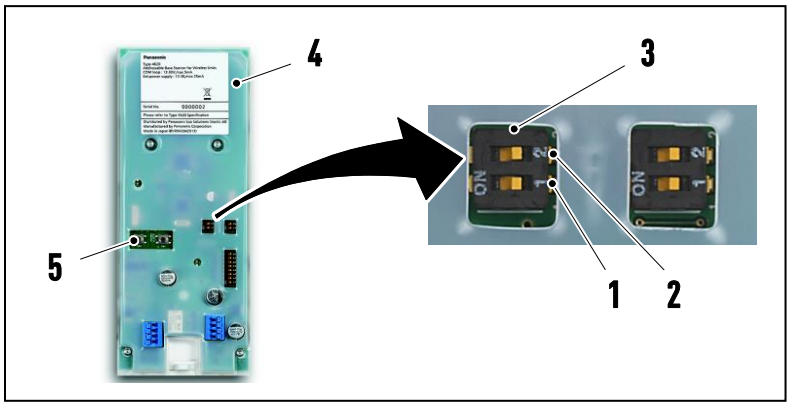
c) When the detectors are deregistered, end the “Unregister mode” in the c.i.e. for the correct Base station:
   - In EBL512 G3; go to menu H5/A8
   - In EBL128; go to menu H5/A9
d) This is confirmed by the Blue LED (2), which is turned off.
e) The Red LED (3) flashes 1 time, indicating the restart of the Base station.
f) The Base station will now be synchronized with all its wireless detectors. This can take up to 5 minutes.
g) When the synchronization is ready, correct if there are any faults in the c.i.e.

NOTE! If the Base station is set in Unregister mode from the c.i.e. it remains in this mode until ended from the c.i.e. or automatically after 10 hours.

5.8. MODE DIL

The function of the Mode DIL (3) can be used for registration of Wireless detectors. The Base station does not have to be connected to the c.i.e. Only 24 V connections for the Base station are required. Therefore, this function is ideal when the registration takes place off site.

NOTE! Due to static electricity, it is not recommended to use any conductive tool, for example a metal screw driver, to set the DIL-switches.

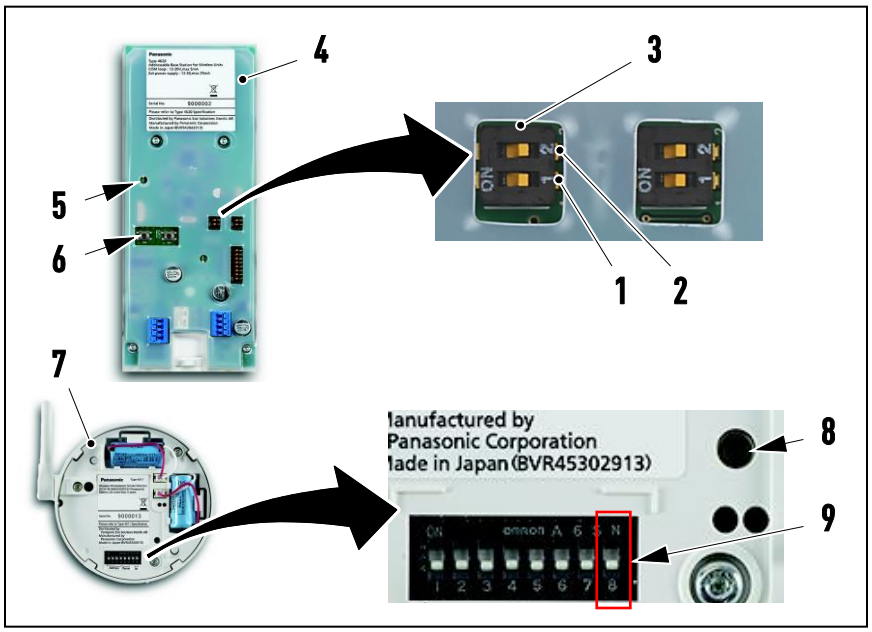


1) Mode switch 1
2) Mode switch 2
3) Mode DIL
4) Base station – open
5) Setting button

0 = OFF 1 = ON

MODE	Mode switch 1	Mode switch 2
Normal mode	0	0
Setting mode	0	1

5.8.1. REGISTER WITH MODE DIL



1) Mode switch 1
2) Mode switch 2
3) Mode DIL
4) Base station – open
5) Blue LED
6) Setting button
7) Wireless detector – open
8) Registration button
9) DIL switch 8

a) Connect 24 V to the base station according to section 5.2 CONNECTIONS.
b) Set the transmission cannel for the base station according to 5.4 SET THE TRANSMISSION CHANNEL.
c) Set the transmission cannel for the detectors according to 4.7 SET THE TRANSMISSION CHANNEL.
d) Set the detector address for the detectors according to 4.6 SET THE DETECTOR ADDRESS.
e) Set the Mode DIL (3) to Setting mode. See table in section 5.8 MODE DIL.
f) Set the DIL switch 8 (9) to **ON**.
g) Mount and connect one piece of battery 4612 into the detector.
h) Press and hold the Setting button (6) in the Base station. The blue LED (5) turns on.
i) Press the Registration button (8) on the detector.
j) Verify the registration according to section 4.8.1 CHECK REGISTRATION.
k) Release the Setting button (6). The blue LED (5) turns off.
l) Disconnect the battery from the detector.
m) When all detectors have been registered, disconnect 24 V from the Base station.

6. WIRELESS SNIFFER 4613

6.1. BASIC INFORMATION

As a help during planning, installation and commissioning, a Wireless sniffer can be used to check if the signals between a Base station and all its wireless units are Good, Acceptable or Bad. Also the background noise can be checked. It is highly recommended to do a check on site, prior to the final installation.

The sniffer is a USB device with an antenna. The device is plugged in a PC (laptop) and is used together with the EBLsniffer PC program. The PC program is used on site to check and present:

- The background noise.
- The signals between a Base station and its wireless detectors.

NOTE! Since the PC itself can affect the sniffer, it is highly recommended to use a USB extension cable between the PC and the sniffer when checking the background noise. The cable should be at least 2 meters. The cable is not included with the sniffer.

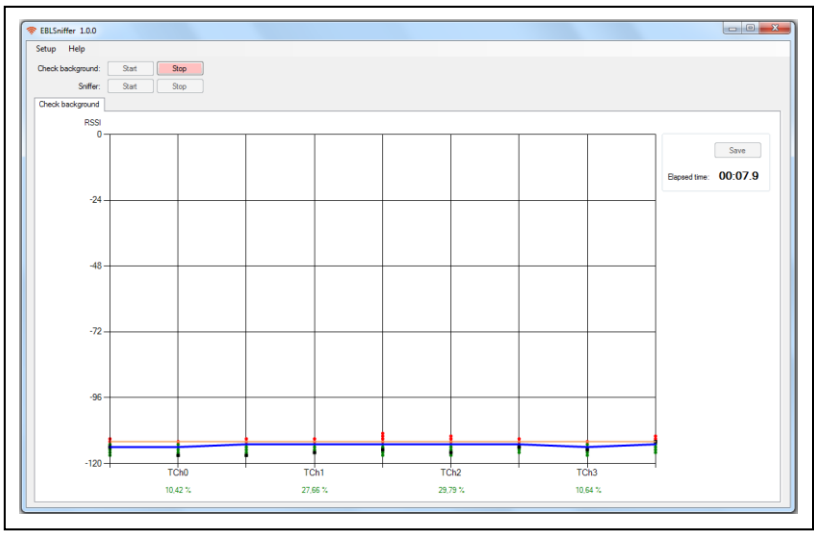
NOTE! The sniffer needs drivers. Download the drivers from our homepage and see MEW01308 for installation instructions.

NOTE! To use the program in the PC, an EBLWin key 5094 is required.

6.2. CHECK THE BACKGROUND

The background noise is caused by other units than the Wireless detectors and Base stations. If the signal levels on the same frequencies that are used for the wireless units are too high, they can affect the wireless units.

a) Set up the EBLsniffer PC program, with an USB extension cable between the PC and the sniffer. See section 6.1 BASIC INFORMATION.
b) Click the **Setup/Open serial port**. Select any channel. It doesn't matter which master channel or sub channel that is open. Background check only uses one sniffer that scans the whole frequency band of interest.
c) Click the **Check background/Start** button. The Check background tab opens.
d) Click the **Check background/Stop** button. The check will be stopped.
e) Click the **Save** button. The diagram will be saved as a .jpg image.



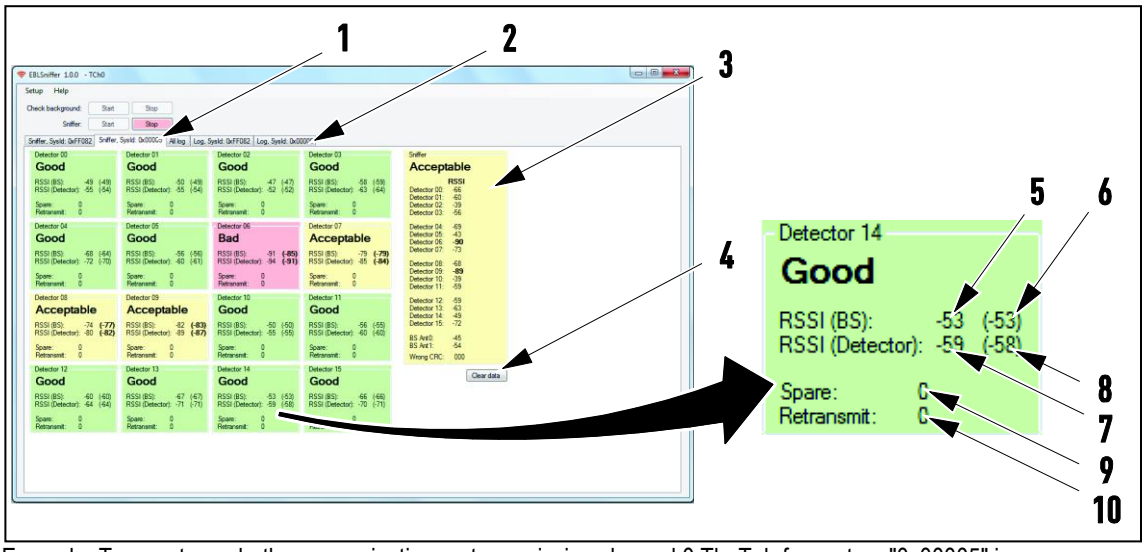
Example:
In this example the blue line is beneath the orange line. The background noise is acceptable. The % value shall be less than 50% and the lower the better.

Red dots: Radio signal levels that could be a potential danger for the detectors and Base station.
Green dots: Radio signal levels that are not a potential danger for the detectors and Base station.
Blue line: Shows the red and green dots' average value and shall be on or beneath the orange line.
(The blue line will never be shown beneath the -120 line.)

6.3. CHECK THE COMMUNICATION

Check the communication value of the Base station and the detectors after installation. The sniffer helps to optimize the position of the wireless units.

a) Set up the EBLsniffer PC program.
b) Set the Base station to “Install mode” according to section 5.5 SET TO INSTALL MODE.
c) Click the **Setup/Open serial port** and choose which transmission channel (TCh0-TCh3) you want to listen to. Designate a sniffer to the selected transmission channel. (Optional: If you want to listen to backup channels, designate a sniffer to each backup channel you want to listen to.)
d) Click the **Sniffer/Start** button. The sniffer and log tabs opens. Wait for communication.
e) Click the **Sniffer/Stop** button. The check will be stopped.
f) Click the **Save** button. The diagram will be saved as a .jpg image.



Example: Two systems, both communicating on transmission channel 0.TheTab for system "0x00005" is open.

1) Sniffer tab
2) Log tab
3) Sniffer square RSSI: The signal level in the sniffer for each wireless detector and the Base station.
4) Clear data: Clear all detector and sniffer data and resets average. Click when detector is moved to new position.
5) Latest value of RSSI (BS): The signal level in the Base station
6) Average value of RSSI (BS): The signal level in the Base station
7) Latest value of RSSI (Detector): The signal level in the wireless detector
8) Average value of RSSI (Detector): The signal level in the wireless detector
9) Spare: Number of messages sent in 'Spare' frame
10) Retransmit: Number of retransmitted messages

DETECTOR SQUARE - EXPLANATION OF THE COLOURS

Good: Both the average value for the Base station and the detector are over -75. EN54-25 is fulfilled.	**Acceptable**: At least one average value for the Base station and a detector is between -90 and -75. EN54-25 is not fulfilled.	**Bad**: At least one average value for the Base station and a detector are beneath -90. Positions of Detector and/or Base station have	All data is not received yet or the detector stopped answering (nothing received in 5

This means that if EN54-25 shall be fulfilled, all detector squares have to be green.

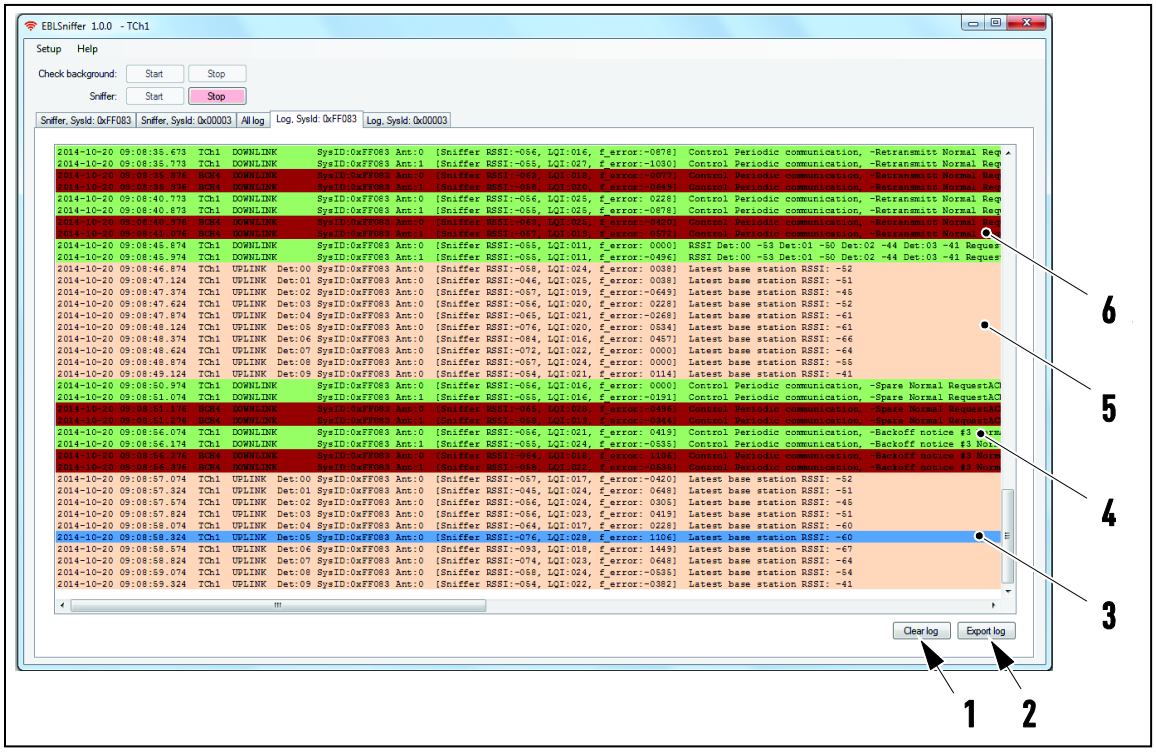
SNIFFER SQUARE - EXPLANATION OF THE COLOURS

Good: No RSSI value beneath -75	**Acceptable**: No RSSI value beneath -90.	**Bad**: One RSSI value beneath -90.	All data is not received yet or the detector stopped answering (nothing received in 5

These values show if the sniffer position, compared with the Wireless detectors and Base station positions, is good, acceptable or bad. If necessary, move the sniffer to an acceptable or good position.

LOG TAB

The "Log tab" for a system shows the communication between the Base station and the Wireless detectors. This log and the information shown are primarily intended for research and development purposes.



1) Clear log: The log will be cleared.
2) Export log: The log will be exported to Excel. **NOTE!** Excel 2007or later is required.
3) Blue row: Shows the selected event.
4) Green row: (DOWNLINK) shows the communication from the Base station to one or several detectors.
5) Peach row: (UPLINK) shows the communication from the detectors to the Base station.
6) Brown row: (DOWNLINK or UPLINK) shows the communication on sub channels.

In case of needed support and analyses of the log, do as follows:

a) Choose the Log tab.
b) Click on Export log. The sniffer program will create an Excel document.
c) Save the Excel document: Choose File/Save as.

7. COMMISSIONING THE WIRELESS SYSTEM

This chapter describes the correct sequence to install, set and check your wireless system.
NOTE! Make sure to read the complete technical description before commissioning the system.

PREPARATIONS AND MOUNTING

a) Check the background noise with the Wireless sniffer according to section 6.2 CHECK THE BACKGROUND.
b) Mount the Base station on the wall. See section 3.2.5 TRANSMISSION RANGE.
c) Mount the bases for the wireless smoke detectors in the ceiling, with the antenna in the direction towards the Base station.

CONNECTIONS

d) Set the transmission channel for the Base station according to section 5.4 SET THE TRANSMISSION CHANNEL. Also read section 3.1.1 TRANSMISSION CHANNEL (0-3).
e) Connect the Base station to the COM loop and 24 V DC according to section 5.2 CONNECTIONS.

PROGRAMMING IN EBLWIN AND DOWNLOADING SSD

f) Do the programming in EBLWin. Set the COM loop address for the Base station according to section 5.3 SET THE COM LOOP ADDRESS - EBLWin PROGRAMMING and for the Wireless detectors according to 4.5 SET THE COM LOOP ADDRESS - EBLWin PROGRAMMING.
g) Download the Site Specific Data (SSD) to the Control unit.

REGISTER

h) Set the Base station to “Register mode” according to section 5.6 SET TO REGISTER MODE.
i) Set the transmission channel for each wireless detector according to section 4.7 SET THE TRANSMISSION CHANNEL.
j) Set the detector address for each wireless detector according to section 4.6 SET THE DETECTOR ADDRESS.
k) Connect both batteries into the wireless detectors.
l) Register all the Wireless detectors that shall be registered to the same Base station. Those detectors have the same transmission channel as the Base station. Register according to 4.8 REGISTER A WIRELESS DETECTOR.
m) Make sure to end the register mode for the Base station according to 5.6 SET TO REGISTER MODE, c) to g).

CHECK

n) Mount the detectors in their in their bases.
o) Make a manual signal check according to section 4.10 MANUAL SIGNAL CHECK.
p) Check the communication with the Wireless sniffer according to section 6.3 CHECK THE COMMUNICATION.

8. TECHNICAL DATA

NOTE! All current consumptions are valid by nominal voltage and by 25 °C.

8.1. TRANSMISSION DATA – VALID FOR 4611 and 4620

Transmission distance:	Up to 170 in open air. (EN54-25 fulfilled) Up to 250 in open air (EN54-25 **not** fulfilled)
Transmission / Modulation method	TDMA / FSK
Transmission power:	10mWerp
Frequency band:	868.6125MHz (Channel 0) 868.6375MHz (Channel 1) 868.6625MHz (Channel 2) 868.6875MHz (Channel 3) 869.3125MHz (Backup Channel 4) 869.3375MHz (Backup Channel 5) 869.3625MHz (Backup Channel 6) 869.3875MHz (Backup Channel 7)

8.2. WIRELESS PHOTOELECTRIC SMOKE DETECTOR - 4611

Detector battery: Min. / **Norm.** / Max.	 2.5 / **3** / 3.5 V DC Battery = 2 x 3 V Lithium battery, type 4612
Current consumption:	30 µA (Normal average)
Sensitivity:	3.5～4% /meter (Smoke density)
Sensitivity (obscuration; %/m) Detection cycle (sec.)	3.5 5.1 (but when over the fire alarm threshold level: 1.)
Sensitivity compensation (%/m) Compensation cycle (hour)	2.0 (when the average smoke density > 2.0) 18
Sounder:	More than 85 dB/meter
Address:	0～15 (DIL-switch)
System:	Up to 16 Wireless units (type 4611) per Base stations (type 4620)
Material: Cover and Base: Body and Button:	 ABS PC - Modified polycarbonate
Ambient temperature: Operating Storage	 -10 to +55 °C -15 to +60 °C (Without batteries)
Ambient humidity:	Maximum 95, % RH (Non condensing)
Ingress protection rating:	IP 50
Weight:	165 g (including batteries)
Size: ∅ x H Antenna length	 100 x 45 mm (antenna excluded) 55 mm
Colour:	White (10Y9/0.5, Munsell colour code).

8.3. ADDRESSABLE BASE STATION FOR WIRELESS UNITS - 4620

Voltage: Allowed Normal	External power supply COM loop 12-30 V DC 12-30 V DC 24 V DC 24 V DC
Current consumption at normal voltage:	External power supply COM loop Max. 40 mA 4.5 mA (max. 6)
Short circuit isolator	Built-in
Address:	1～255 (DIL-switch)
System:	Up to 16 Wireless units (type 4611) per Base stations (type 4620)
Material: Cover and Base:	 ABS
Ambient temperature: Operating Storage	 -10 to +55 °C -15 to +60 °C
Ambient humidity:	Maximum 95, % RH (Non condensing)
Ingress protection rating:	IP 50
Size: H x W x D	 240 x 150 x 31 mm
Weight:	345 g
Colour:	White (10Y9/0.5, Munsell colour code).

8.4. WIRELESS SNIFFER - 4613

Connection	USB device
Frequency band:	868 MHz
Material:	
Ambient temperature: Operating Storage	 -10 to +55 °C -15 to +60 °C
Ambient humidity:	Maximum 95, % RH (Non condensing)
Ingress protection rating:	IP 50
Size: H x W x D	 23 x 14 x 190 mm
Weight:	30 g
Colour:	Black

9. DECLARATION OF CONFORMITY

R&TTE 1999/5/EC - Radio and Telecommunications Terminal Equipment Directive.

NAME OF MANUFACTURER
Panasonic Corporation Eco Solutions Company Energy System Business Division System Components Business Unit (short PES SCBU).

TYPE OF EQUIPMENT
Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620.

cs Česky [Czech]	*PES SCBU* tímto prohlašuje, že tento Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede *PES SCBU* erklærer herved, at følgende udstyr Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt *PES SCBU*, dass sich das Gerät Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab *PES SCBU* seadme Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, *PES SCBU*, declares that this Wireless detector system; Wireless photoelectric smoke

	detector, type 4611 and Addressable Base station for wireless units, type 4620, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente *PES SCBU* declara que el Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *PES SCBU* ΔΗΛΩΝΕΙ ΟΤΙ Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
it Italiano [Italian]	Con la presente *PES SCBU* dichiara che questo Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
lv Latviski [Latvian]	Ar šo *PES SCBU* deklarē, ka Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
lt Lietuvių [Lithuanian]	Šiuo *PES SCBU* deklaruoja, kad šis Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl Nederlands	Hierbij verklaart *PES SCBU* dat het toestel Wireless

[Dutch]	detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt Malti [Maltese]	Hawnhekk, *PES SCBU*, jiddikjara li dan Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, *PES SCBU* nyilatkozom, hogy a Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
pl Polski [Polish]	Niniejszym *PES SCBU* oświadcza, że Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	*PES SCBU* declara que este Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko [Slovenian]	*PES SCBU* izjavlja, da je ta Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
sk Slovensky [Slovak]	*PES SCBU* týmto vyhlasuje, že Wireless detector system; Wireless photoelectric smoke detector, type

	4611 and Addressable Base station for wireless units, type 4620, spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
fi Suomi [Finnish]	*PES SCBU* vakuuttaa täten että Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
sv Svenska [Swedish]	Härmed intygar *PES SCBU* att detta Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Íslenska [Icelandic]	Hér með lýsir *PES SCBU* yfir því að Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
no Norsk [Norwegian]	*PES SCBU* erklærer herved at utstyret Wireless detector system; Wireless photoelectric smoke detector, type 4611 and Addressable Base station for wireless units, type 4620, er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

10.APPROVALS

Applicable directive	Applicable standards		Notified body
	Wireless Detector	Base Station	
CPD	EN54-25 （RF） EN54-7 （smoke detector）	EN54-25 （RF） EN54-17 （Isolator） EN54-18 （IF unit）	VdS (Certification)
R&TTE	EN300-220-2 （RF） EN301 489-01 (EMC) EN301-489-3 (EMC)		Telefication (Self declaration)
EMC	EN61000-6-3 (Emission) EN50130-4 (Immunity)		PES (Self declaration)