By introducing mesh technology into fire safety and combining it with its unique **ASA***technology*, Siemens once again proves its innovation power and technology leadership.

Maximum protection with easy-to-plan technology

Offer your customers the best fire detection and highest flexibility: With SWING, Siemens combines the highly reliable mesh technology with its own unique **ASA***technology* for the first time.

Reliability at its best

Radio fire detection is the ideal solution for rooms or buildings of historical value, with aesthetic or architectural restrictions or for temporary installations. Thanks to wireless technology, devices can be quickly and freely positioned and repositioned. This facilitates planning, allows for cost-efficient installation and offers a high level of freedom and flexibility should room usage or building structure change in the future.

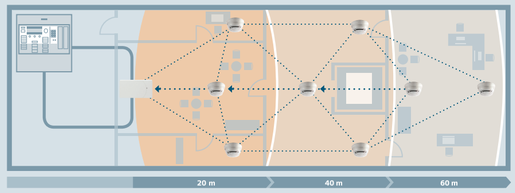
SWING is the first radio fire detection system on the market that uses the innovative mesh technology instead of the conventional star topology, increasing radio connection security. Mesh technology is well-known and already proven in the IT world. Simple planning rules make a significant contribution. A meshed network also excludes the risk of an open or short circuit. And because all wireless devices communicate with their neighbors, at least two redundant paths are always available to transmit information.

Furthermore, thanks to the unique **ASA***technology*™ from Siemens, the SWING detector can be optimally adapted to the current environmental condition by simply choosing the application-specific ASA parameter set. This makes the detector the optimal solution for any application – and also ensures highest life safety.

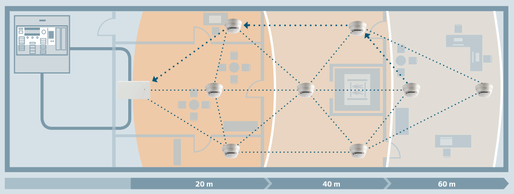
High level of safety, easy planning

The whole system is easy to plan due to:
- Streamlined portfolio – consisting of a gateway, one detector that fits all requirements and a manual call point.
- Node functionality of all wireless devices – each detector and manual call point works as a node, which means that shorter and stronger radio links and a larger overall radio range can be planned.
- Simple planning rules for net size, max. transmission distance and network density – no on-site measurement needed.

Planning a SWING network – example “glass elevator”

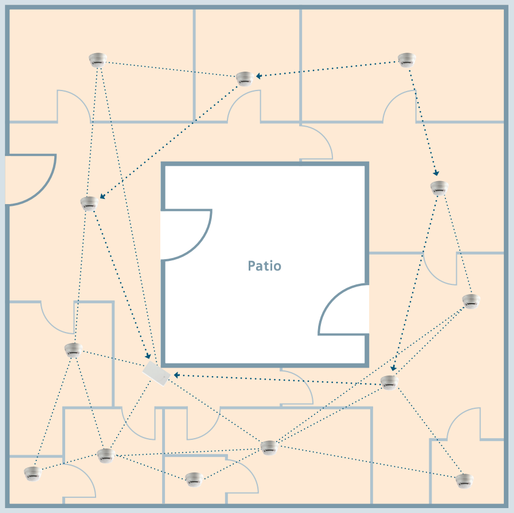


This application example shows an office floor with an elevator. Between all network nodes is a wall. That is why the maximum transmission distance between two nodes is no more than 20 m. When the elevator is located on a different floor, the wireless devices can communicate through the elevator shaft.



The elevator is located on our office floor. Now, the network nodes cannot communicate through the elevator shaft because of the metal in the elevator. The nodes thus automatically redirect information via another neighboring device and around the elevator shaft to the gateway.

Planning a SWING network – example “patio”



This building has a patio in the middle. The wireless communication might be hindered by the patio because there are two walls to cross. By placing the gateway in the optimal position, it is possible to get around the patio by using only one gateway. Each node has at least two redundant paths to transmit information to the gateway – and even the farthest detector reaches the gateway within 3 hops.

SIEMENS

SWING

Planning Tool

“We are the trusted technology partner for energy-efficient, safe and secure buildings and infrastructure.”

Answers for infrastructure.

Our world is undergoing changes that force us to think in new ways: demographic change, urbanization, global warming and resource shortages. Maximum efficiency has top priority – and not only where energy is concerned. In addition, we need to increase comfort for the well-being of users. Also, our need for safety and security is constantly growing. For our customers, success is defined by how well they manage these challenges. Siemens has the answers.

www.siemens.com/swing

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Answers for infrastructure.

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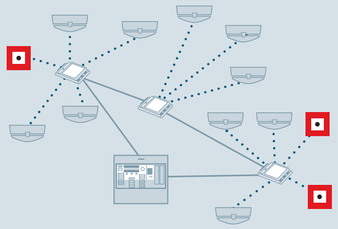
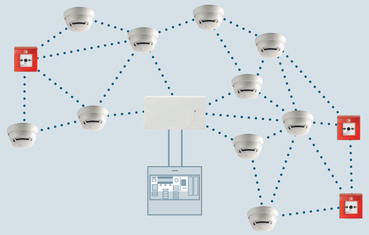
SWING Planning Tool – easy planning with intelligent technology

Mesh technology – as safe as cable

Yesterday: star technology



Today: mesh technology



SWING mesh technology – an enormous leap from traditional to innovative technology

The mesh technology allows for a safer connection than with the traditional radio solution and is as redundant as the ring main wiring (loop):
– Every SWING detector or manual call point acts as a network node.
– Every network node communicates with two or more network nodes.
– Information is transmitted from node to node until it reaches the gateway (up to 3 hops).
– Therefore, not every node has to have a direct connection to the SWING gateway.

Benefits

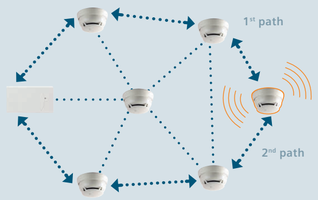
– Stronger and more reliable connection than with traditional 1:1 connection of wireless detector and gateway.
– Larger networks are possible:
  • Up to 90 m from the gateway to the farthest network node (detector) if there are no walls in between and with max. 3 hops.

Mesh technology basics

Basic information about SWING mesh technology:

– Node:
  • Wireless device, e.g. SWING detector or SWING manual call point
  • Each node has two frequency bands: 868 MHz SRD-band (23 channels), 433 MHz-band (20 channels)
– Hop:
  • Link between two wireless devices
  • Up to 3 hops allowed between farthest node and gateway
  • 2 hops = multi-hop

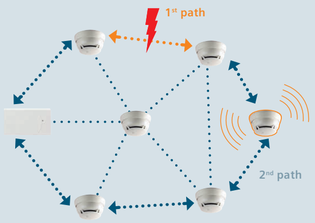
Multi-hop and 2-path communication



Safe as a loop – intelligent multi-hop communication with two paths

The mesh technology offers the same safe connection as a loop:
– Up to 3 hops between gateway and farthest detectors.
– Each network node communicates with its neighbors.
– Use of multi-hops allows large and reliable transmission distances throughout the whole system.
– At least two different paths (different hops and nodes) are always possible to transmit information from one node to the gateway.
– Wireless devices connect and configure themselves – continuous network adaptation during operation.

Mesh technology – safe from disruptions



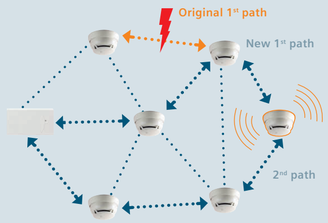
Network nodes check constantly whether two connections are available – independent of an alarm. They continuously look for an optimal connection. If one connection is lost, the network node will automatically look for a possibility to maintain the connection or find another path. Disruptions can be caused, for example, by other radio systems, e.g. garage door opener, remote controls or EMC through elevator drives.

Change of channel or frequency band

Frequency band 433 MHz									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
Frequency band 868 MHz									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23							

In case of a disturbance, a network node dynamically changes:
1. Channels within frequency band
2. Frequency band if change of channel is not successful
3. Channels within new frequency band

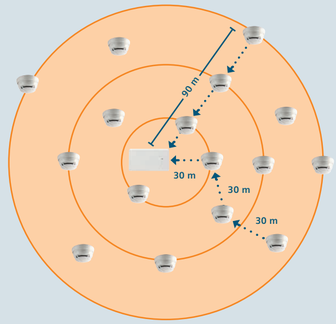
Intelligent routing



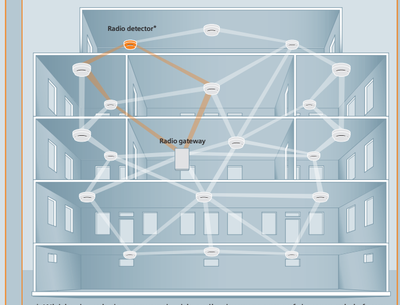
In case a change of channel and of frequency band is not successful, information will be rerouted on the other path. The panel will display the message "One path lost". This message will disappear as soon as the second redundant path is available again.

Mesh network planning – easy and reliable

Transmission distance on same floor



Transmission distance spanning up to 5 floors



* Within the wireless network, this radio detector can safely transmit information to the radio gateway via two independent paths with max. 3 hops.

Three simple planning steps

Following these project planning rules eliminates the need for on-site measurements and use of a tool:
– 1. Net size
  • Max. 30 network nodes per gateway
  • Max. 16 gateways per loop/stub
– 2. Max. transmission distance
  • Max. distance of 90 m between gateway and farthest detector (with 3 hops).
– 3. Network density
  • Max. transmission distance between two network nodes is 30 m, or 20 m respectively through one wall.
  • The more wireless devices a network has, the more paths are possible, which increases the reliability of the network connection.

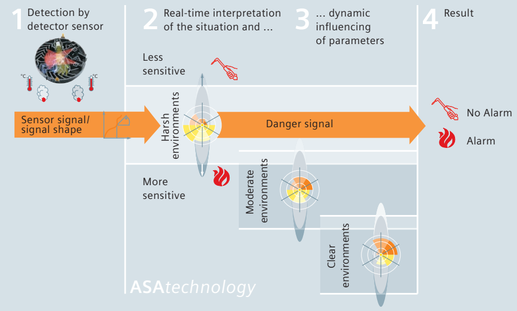
Transmission distance spanning 5 floors

– One gateway can cover up to 5 floors.
– To be in contact with the gateway, all wireless devices have to be within transmission distance.
– Transmission distance from the gateway across up to 5 floors:
  • Floor +2: 20 m radius
  • Floor +1: 40 m radius
  • Within floor: 60 m radius
  • Floor -1: 40 m radius
  • Floor -2: 20 m radius

Please note

– **The transmission distance of up to 30 m** between two network nodes applies for cases with a simple building structure and where there are no walls between the nodes, e.g. in a large hall. With 3 hops, this adds up to a total of 90 m between the gateway and the farthest detector.
– **The transmission distance of up to 20 m** between two network nodes applies for cases where there is a concrete wall or a ceiling between the nodes. With 3 hops, this adds up to a total of 60 m between the gateway and the farthest detector.
– In an area containing metal (e.g. an elevator shaft), glass (e.g. a patio) or reinforced concrete wall or ceiling, it may also be possible to plan a path around the obstacle (see example "patio").
– Optimally, the gateway is placed centrally, but away from large metal objects.
– For detector positioning, local regulations may apply.

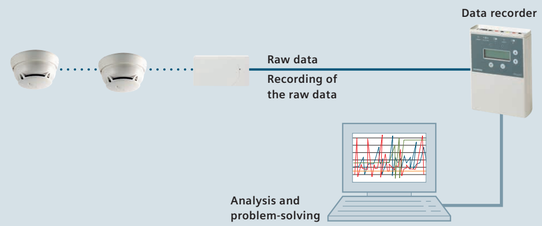
ASA*technology* – best protection without false alarms



(1) The signals recorded by the sensor are converted into mathematical components using algorithms and compared with preprogrammed values. With the selection of an ASA parameter set, the algorithms can be influenced – and the fire detector can be set to the expected local environmental influences and individual risks. The optimal parameter set is selected taking the individual risks and the existing environment into account.

(2) + (3) Interpretation of the situation in real time results in the selected ASA parameter set being dynamically adapted. This automatically shifts the optimum application range of the detector. Consequently, the detector reacts more sensitively in the event of a fire – and more forcefully in response to deceptive phenomena.

(4) The result is unique fire detection with unprecedented reliability against deception.



The parameter sets can be selected according to the application guideline. In very difficult applications, the data recorder from Siemens can be used to measure the specific challenge and select and document the appropriate **ASA***technology* parameter set.