WIRELESS ALARM SYSTEMS: AN OVERVIEW

Nowadays, many of the fire alarm manufacturers provide their own line of wireless devices in one form or another. This trend is explained by the fact that radio-frequency technologies are becoming both cheaper and more sophisticated, making wireless alarm systems a reliable and cost-effective replacement for wired counterparts.

In this variety, the Streletz-PRO system, designed by Argus Spectrum International, stands out as the most advanced, secure, and feature-packed solution. This overview is aimed at comparing Streletz-PRO to six other systems from international manufacturers and demonstrating why it is the perfect choice when it comes to wireless fire protection.
### Max number of detectors per network

The capacity of Streletz-PRO allows you to build one big wireless system that will cover your whole building. Other solutions will require to install several translators each controlling its own separate network.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Model</th>
<th>Max Detectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argus Spectrum</td>
<td>Streletz-PRO</td>
<td>1920</td>
</tr>
<tr>
<td>Honeywell Life</td>
<td>Agile</td>
<td>32</td>
</tr>
<tr>
<td>Argus Security</td>
<td>Sagittarius</td>
<td>240</td>
</tr>
<tr>
<td>Apollo</td>
<td>XPander</td>
<td>31</td>
</tr>
<tr>
<td>Siemens</td>
<td>Swing</td>
<td>30</td>
</tr>
<tr>
<td>EMS</td>
<td>Firecell</td>
<td>504</td>
</tr>
<tr>
<td>Electro Detectors</td>
<td>Zerio</td>
<td>240</td>
</tr>
</tbody>
</table>

### Communication range

Streletz-PRO has a substantial communication range that allows you to use fewer resources and equipment to fulfill complicated projects, such as buildings with thick walls or multiple floors.

- Streletz-PRO: 1200 m
- Siemens: 1000 m
- Notifier: 400 m
- Argus Security: 150 m

### Max number of repeaters/expanders

Expanders and similar devices act as communication nodes in a wireless network. The more nodes the network has, the bigger the area it's able to cover. A big number of expanders in Streletz-PRO allows the system to cover even the largest buildings.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Max Repeaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argus Spectrum</td>
<td>127</td>
</tr>
<tr>
<td>Honeywell Life</td>
<td>32</td>
</tr>
<tr>
<td>Argus Security</td>
<td>7</td>
</tr>
<tr>
<td>Apollo</td>
<td>0</td>
</tr>
<tr>
<td>Siemens</td>
<td>30</td>
</tr>
<tr>
<td>EMS</td>
<td>31</td>
</tr>
<tr>
<td>Electro Detectors</td>
<td>7</td>
</tr>
</tbody>
</table>

1. Each device is a repeater
2. Standalone expanders
3. Each device is a repeater
4. Standalone expanders
5. Standalone expanders
## Expected battery life*

<table>
<thead>
<tr>
<th>Battery Type</th>
<th>Life Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR123A + CR2032 lithium batteries</td>
<td>10 years</td>
</tr>
<tr>
<td>4 × CR123A lithium batteries</td>
<td>5 years¹</td>
</tr>
<tr>
<td>2 × CR123A lithium batteries</td>
<td>8 years⁵</td>
</tr>
<tr>
<td>6 × AA alkaline batteries</td>
<td>5 years⁸</td>
</tr>
<tr>
<td>Battery pack 5 × AA lithium cells</td>
<td>3 years¹⁰</td>
</tr>
<tr>
<td>6 × AA alkaline batteries</td>
<td>5 years¹²</td>
</tr>
<tr>
<td>Battery pack 2 × AA lithium thynol cells</td>
<td>5 years¹⁶</td>
</tr>
</tbody>
</table>

*The long battery life of Streletz-PRO devices reduces the expenses required for system maintenance and makes it a very cost-effective fire protection solution.

## Battery type*

Streletz-PRO only uses 2 batteries per detector, which also has a positive effect on the maintenance costs. The system utilizes generic mass production batteries, which are freely available in any hardware store.

- **CR123A + CR2032 lithium batteries**
- **4 × CR123A lithium batteries**
- **2 × CR123A lithium batteries**
- **6 × AA alkaline batteries**
- **Battery pack 5 × AA lithium cells**
- **6 × AA alkaline batteries**
- **Battery pack 2 × AA lithium thynol cells**

## Operating temperature*

<table>
<thead>
<tr>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30...55 °C</td>
</tr>
<tr>
<td>-30...60 °C¹</td>
</tr>
<tr>
<td>-10...55 °C⁵</td>
</tr>
<tr>
<td>-10...50 °C⁹</td>
</tr>
<tr>
<td>-10...50 °C¹⁰</td>
</tr>
<tr>
<td>-10...55 °C¹¹</td>
</tr>
<tr>
<td>-0...60 °C¹⁶</td>
</tr>
</tbody>
</table>

*Radio transmitters can sometimes limit the acceptable temperature range of the device, especially below 0 degrees Celsius. Argus Spectrum engineers were able to overcome this drawback and create devices that can work in extremely cold conditions.

*The provided numbers are applicable to optical smoke detectors (chosen as an example as it’s the most common device in a fire alarm system). Specifications can differ across the product range, e.g. sounders may use a different type of power supply.*
### Mesh network

In Streletz-PRO devices are not tied to a specific expander, and can dynamically find pathways to the central translator. This substantially enhances the design and installation process since there's no need to manually configure the network topology. It also means that in case of an expander fault, you don't lose connection with a portion of the network, and wireless detectors will find a backup communication route.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Yes²</th>
<th>No⁶</th>
<th>No⁸</th>
<th>Yes¹⁰</th>
<th>No¹¹,¹³</th>
<th>No¹⁷</th>
</tr>
</thead>
</table>

### Functionality

The product range of Streletz-PRO is not only limited to fire alarm devices. It is possible to create a multipurpose wireless network that will cover a wide range of security and safety issues.

- Fire alarm
- Burglar alarm
- Panic alarm
- Automatic fire suppression
- Personal notification
- Positioning system
- Temperature and water leak monitoring

<table>
<thead>
<tr>
<th></th>
<th>Fire alarm¹</th>
<th>Fire alarm⁷</th>
<th>Fire alarm⁸</th>
<th>Fire alarm¹⁰</th>
<th>Fire alarm¹⁴</th>
<th>Fire alarm¹⁷</th>
</tr>
</thead>
</table>

### Intrinsically safe devices

Intrinsically safe devices are used in various types of industrial facilities that work with flammable or explosive materials, liquids, and gases. A line of intrinsically safe equipment allows Streletz-PRO to have a boundless range of use cases.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No¹</th>
<th>Ex</th>
<th>Yes⁷</th>
<th>No⁸</th>
<th>No¹⁰</th>
<th>No¹⁴</th>
<th>No¹⁷</th>
</tr>
</thead>
</table>
**COMMUNICATION PROPERTIES**

Wireless communication isn’t only characterized by general properties such as range and capacity. It’s also important to know how fast information is transferred across devices, how the system protects itself from interference, what type of mechanisms are implemented to enhance connection reliability, and other possible limitations the system might have.

- **Fast alarm activation**
  Communication in wireless alarm systems doesn’t always happen instantly. Alarm signals from detectors are usually delivered immediately, while other commands may have a lower priority, which can cause sounders and other alarm devices to have a certain delay before activation. Argus Spectrum engineers were able to optimize communication protocol so that the delay between the alarm signal from the detector and the sounder activation does not exceed 3 seconds.

- **Backup communication channels**
  When Streletz-PRO detects interference on the main frequency channel, it will automatically switch to a different one and continue operating normally. In fact, there are 6 frequency channels available in the 868 MHz range that can be utilized by Streletz-PRO. This makes the system resistant to natural and technological sources of electromagnetic interference.

- **Effective radiated power adjustment**
  A simple but clever principle: when the connection is strong, devices lower the effective radiated power in order to save battery when the device is starting to lose connection, it boosts up the transmission power.

- **Dense expander network**
  Expanders in Streletz-PRO automatically arrange in a network, so signals can travel through multiple expanders before they reach the central controller. One expander can serve as a communication node for 31 others, which allows the network to get very dense and robust.

- **A lot of devices within one range**
  Some systems may struggle when a big number of wireless devices are located in an area, where each of the devices is in the communication range of all the others. That is not the case with Streletz-PRO: up to 2000 devices can work in one area and not interfere with each other.

---

**OCCUPATIONAL SAFETY**

The connected worker devices market is a very promising and rapidly expanding prospect in the occupational safety industry. Different industries, such as oil and gas, logistics, construction, manufacturing, mining are investing heavily in new technologies that could help provide the highest level of safety for employees as well as monitor and coordinate the work process. Currently, the connected worker devices market is estimated to be worth $400 million and is expected to grow at a 13% annual rate, eventually reaching $4 billion in 2040.

Argus Spectrum International provides a reliable and versatile technological solution to safety and productivity in the workplace. The Streletz-PRO system can be equipped with personal wearable devices that cover a wide range of use case scenarios. These devices work in the same wireless network as the fire detectors and even use the same software.

- **Wearable device**
  Ergonomic design
  No interference with the work process

- **Man down alert**
  Get alarm signals if the wearer has not moved for a certain time
  Detect when employees may require medical help

- **Positioning**
  See real-time location of every employee
  Indoor and outdoor positioning

- **Paging**
  Receive short text messages sent from the software
  Coordinate and optimize the workflow

- **Panic button**
  Manually send alarm signals
  Signals trigger sounders or other bracelets

- **Personal notification**
  Receive vibration signals and text notifications
  Ensure that every person is warned about the emergency
<table>
<thead>
<tr>
<th>Product Type</th>
<th>Argus Spectrum</th>
<th>Notifier by Honeywell</th>
<th>Argus Security</th>
<th>Apollo</th>
<th>Siemens</th>
<th>EMS</th>
<th>Electro-Detectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke detector</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Smoke detector with built-in sounder</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Smoke detector with built-in speaker</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Heat detector</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Heat detector with built-in sounder</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Combined sensor detector</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Call point</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Beam detector</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Flame detector</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Voice annunciator</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Sounder</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Detector base with sounder</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Input module</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Output module</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Output for AFES modules</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Wireless key fob</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Keypad</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>
**SUMMARY**

Streletz-PRO provides highly advanced technical specifications in terms of communication distance, overall capacity, and power consumption. In addition to that, it also has an exceptionally versatile product range, incorporating a wireless model for almost all types of detectors. This makes Streletz-PRO possibly the top choice out of all wireless systems in the fire alarm market.

<table>
<thead>
<tr>
<th>Communication range</th>
<th>System capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200</td>
<td>0</td>
</tr>
<tr>
<td>1000</td>
<td>250</td>
</tr>
<tr>
<td>800</td>
<td>500</td>
</tr>
<tr>
<td>600</td>
<td>750</td>
</tr>
<tr>
<td>400</td>
<td>1000</td>
</tr>
<tr>
<td>200</td>
<td>1250</td>
</tr>
<tr>
<td>0</td>
<td>1500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max number of expanders</th>
<th>Battery life</th>
</tr>
</thead>
<tbody>
<tr>
<td>128</td>
<td>0</td>
</tr>
<tr>
<td>96</td>
<td>1</td>
</tr>
<tr>
<td>64</td>
<td>2</td>
</tr>
<tr>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Argus Spectrum Int. Honeywell</th>
<th>Argus Security Apollo Siemens EMS Electro Detectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argus Spectrum Int. Honeywell</td>
<td>Argus Security Apollo Siemens EMS Electro Detectors</td>
</tr>
<tr>
<td>Argus Spectrum Int. Honeywell</td>
<td>Argus Security Apollo Siemens EMS Electro Detectors</td>
</tr>
<tr>
<td>Argus Spectrum Int. Honeywell</td>
<td>Argus Security Apollo Siemens EMS Electro Detectors</td>
</tr>
<tr>
<td>Argus Spectrum Int. Honeywell</td>
<td>Argus Security Apollo Siemens EMS Electro Detectors</td>
</tr>
</tbody>
</table>

**SOURCE**

Krivoshonok V. – «A review of wireless security systems on the Russian and the foreign market»

**REFERENCES:**

1. Agile Wireless Fire Detection 990-182_0919 (Data Sheet) [https://www.notifirefiresystems.co.uk/docs/notifirefiresystems/en/d/Angle_Wireless_Fire_Detection_990-182_0717.pdf]
2. Agile Wireless Fire Detection 102018 (Sales brochure) [https://www.notifirefiresystems.co.uk/docs/notifirefiresystems/en/b/Angle%20Wireless%20Fire%20Detection%202018.pdf]
3. ISE-4224-003 22051E-RF Smoke Sensor [https://www.systemsenseurope.com/English/download/Team/156-4224-003%2022051E-RF.pdf]
4. VW2WIOO Sales Datasheet [https://www.argusspectrum.it/products/detail/p19-wireless-translator-module-static]
15. Zer0Plus Sales Brochure [https://www.electrodetectors.co.uk/includes/Zero%20Plus%20Brochure%20V5.0.pdf]
16. EDA-R5000 Radio Smoke Detector Data Sheet [https://www.electrodetectors.co.uk/includes/DataSheets/EDA_R5000_dataSheet_V105.pdf]
17. Zer0 Plus Installation & operation manual [https://www.electrodetectors.co.uk/includes/Manuals/zpcontroltechnician_r105%20(4).pdf]

[^5]: Cengage Learning
[^4]: ISBN: 978-1-337-56841-1
[^3]: [PDF](https://www.argusspectrum.com)