

# TrueAlert ES Design Guide



Building Safety

 **Simplex**

## Get to Know SIMPLEX TrueAlert ES

SIMPLEX TrueAlert ES addressable notification is one of the most significant recent developments in the fire protection industry. Every aspect of notification, from design and installation to maintenance, testing and expansion, has been thoroughly redesigned to deliver better protection, maximum ease of use and lower operating costs. TrueAlert ES appliances promise to revolutionize notification, helping save lives, time and money with ground breaking benefits for engineers, installing contractors, building owners and facility managers.

This system design guide will introduce you to TrueAlert ES technology and show you how to use its advanced capabilities to create more efficient, cost effective and upgradeable fire alarm system designs.

### ***What is TrueAlert ES?***

SIMPLEX TrueAlert ES is a new family of intelligent, addressable notification appliances that delivers:

- Individual device identification and addressability
- Unparalleled system design and installation flexibility
- Lower costs through more efficient use of wire and power
- Revolutionary appliance testing capabilities

TrueAlert ES addressable technology allows each appliance to be individually identified and supervised by the fire alarm control panel, ensuring device disconnections or failures are quickly detected and reported. Addressability also allows key properties like the device candela rating and tone pattern to be set right from the fire alarm panel.

With TrueAlert ES we have also changed the way we power and wire the notification appliances. The result is that you can go further and connect more appliances to your circuits – all while using smaller gauge, unshielded wire. Because the devices are addressable, you control zones and alarm responses through software, not wiring. So, your wire runs are more efficient, and easier to install and modify.



## ***Freedom of Design***

Conventional, non-addressible notification appliances have very limited options and must be wired according to strict rules. In addition, the operation of the system is determined by how the wiring was implemented, so expanding or making changes to the system can be time consuming and costly. In contrast, it's far easier for engineers to design systems using TrueAlert ES addressable devices. Highly flexible and forgiving wiring architecture means fewer rules to follow and less chance of design roadblocks.

TrueAlert ES appliances use unshielded wire and support T-Tap installation. Superior use of power allows more appliances to be connected per circuit and circuits can support longer wire runs. In many cases TrueAlert ES devices can be installed using smaller gauge wiring. Less wiring, thinner cables, T-tap architecture, and fewer power supplies mean that installation time and costs can be significantly reduced.

The incredible flexibility of the wiring architecture also allows for easier modification and expansion. So as the needs of your facility change and grow, TrueAlert ES can quickly grow right along with you.

## ***Faster, More Efficient Installation***

In real-life applications, systems using TrueAlert ES appliances can be seen to cut installation costs by up to 50% when compared to conventional notification systems. How? TrueAlert ES Appliances operate at higher voltage, lower current draws, and across a much wider range of voltage. This approach can increase allowable wiring distances by up to 300% and enable more appliances to be connected per circuit. Fewer, more efficiently used circuits means fewer power supplies, notification appliance circuits (NACs), control cabinet AC power feeds and batteries are needed. In fact, in some cases power supply usage can be reduced by up to 50%. Combining, decreased wire gauge requirements, increased wiring efficiency and reduction in power supplies, batteries, and control equipment can lower the cost of system ownership.

The physical design of the TrueAlert ES appliances also helps promote easier, error-free installation. Many of the appliances have separate back plates making wiring fast and easy.

The SIMPLEX TrueStart II Installation Tool reduces the time needed to verify installation of wiring and appliances, and also speeds up troubleshooting.

## **TrueAlert ES:**

- **Most flexible wiring architecture in the industry**
- **Easier design with less rules and restrictions**
- **Software configurable candela settings for faster, more accurate installation and easier system updates**
- **Fewer power supplies, batteries and dedicated AC lines; no end of line resistors**
- **Lower system installation and ownership costs**
- **There is a multi-tone device with programmable and field settings for chime, bell, slow whoop, high/low, 520Hz square wave and siren to meet any application**

**The horn, bell and chime settings can be controlled as either Temporal Code 3 or Temporal Code 4 for CO Applications.**

## ***Appliances that Test Themselves***

With conventional systems, a manual test must be performed to determine the operational readiness of a notification appliance. Addressable technology gives TrueAlert ES notification appliances the intelligence to report their location and status to a SIMPLEX 4100ES, 4010ES or 4007ES fire alarm control panel. The appliances are electronically supervised 24 hours a day, 7 days a week by the panel and warn you with specific alerts when repair or maintenance is needed. This can give facility managers and system operators the confidence of knowing their notification appliances are operational and ready to perform in an emergency.

TrueAlert ES appliances are equipped with built-in light and sound sensors that enable the fire alarm control panel to detect the operation of the strobe and sounder and confirm whether the devices functioned properly. This capability allows the appliances to be tested remotely and without requiring a technician to visit each appliance. Testing is simple and quick, and can be done any time, day or night, without disrupting building occupants or operations. Testing may be manually initiated with the press of a button at the control panel or on a TrueSite Workstation graphical command center. Testing is programmable and can be scheduled to take place automatically. Devices can be tested individually, in groups or all of the appliances on the system can be tested simultaneously. This powerful, first of its kind testing capability saves your clients time, manpower and helps avoid compliance headaches. Device information and test history is stored electronically within the panel and can be retrieved for reports so when code compliance officials need to see documentation it's available at your fingertips.



## Rewriting the Rules

### Means and Methods

At the heart of the TrueAlert ES system is a new addressable power supply that supports both the TrueAlert ES and existing TrueAlert addressable notification appliances.

The supply provides three onboard IDNAC Signaling Line Circuit (SLC) channels. Each IDNAC provides a constant voltage circuit for addressable notification appliances with three amps of available power. The power supply supports Class A or B Operation with 29 VDC Regulated Output.

### 29 Volt Approach

Allows six volts of drop; Twice that of conventional systems. Increased voltage and voltage drop range means:

- Lower current draw
- Fewer power supplies
- Increased wiring distances
- Smaller wire gauges
- Battery requirements are not affected

AHJs and others can have concerns with operation and testing when the panel is operating on batteries such as during a mains power outage. TrueAlert ES addresses this concern by providing terminals voltage at 29 even when running on batteries. No additional design slack needs to be added to account for variations while operating on batteries. If the appliances work when the panel is operating on AC, they will work when the panel is operating on battery.

With the IDNAC circuit you are allowed a drop of 6 V which is much more than the 2.5 V drop allowed by non-TrueAlert ES conventional circuits and allows for greater wiring distances.

For example, at maximum load, assuming all appliances were at the end of the wiring run the TrueAlert ES IDNAC would allow you to go out 354 ft.(108 m) where the conventional circuit would be limited to 206 ft.(63 m).

### T-Tapping

The classification of the circuit performance and survivability has changed over the years with the most recent definition in NFPA 72 Chapter 12 – Circuits and Pathways. With standard Initiating Device Circuits (IDC) or Notification Appliance Circuits (NAC) you are required by NFPA 72 to maintain supervision in case of a fault that would inhibit that circuit's ability to function. Often these Conventional or Non-Addressable circuits require the installation of an End of Line (EOL) device either in the field or at the panel. The majority of these circuits only supervise the wiring to and from the devices and not the devices themselves.

### IDNAC CHANNEL OVERVIEW

- TrueAlert ES and Multi-Candela TrueAlert Addressable Appliances operate on and can be mixed on the IDNAC channel
- New 4100ES 4010ES and 4007ES EPS+ power supplies provide constant output of 29 volts in alarm
- IDNAC Repeater provides a full 3 amps, expanding distances and capacities
- Each IDNAC channel supports 6 volts of drop
- Appliances operate with dramatically reduced current draws
- IDNAC Channel supports the advanced capabilities of addressable notification
- 127 addresses supported per IDNAC
- T-Taping is allowed on both Class A and B Circuits

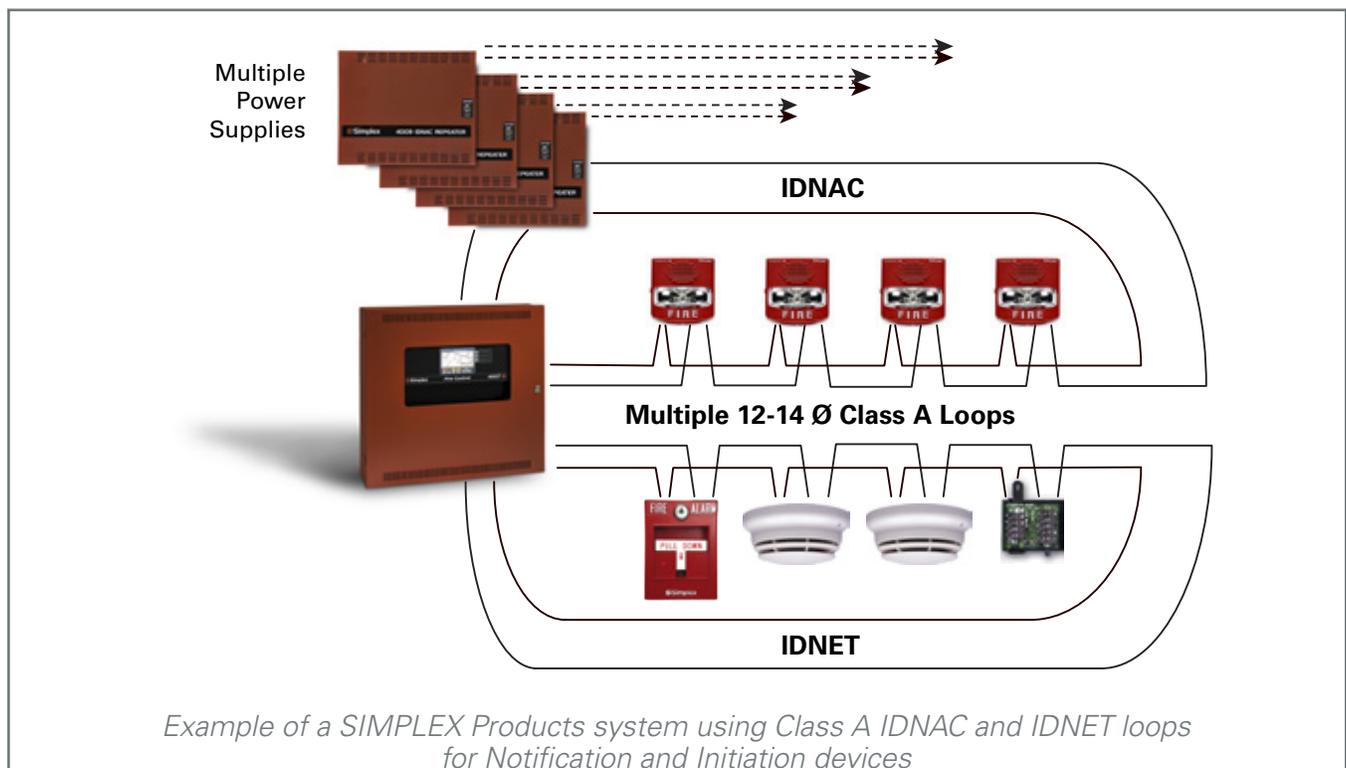
This method of supervision is extremely limited and based on technology that is decades old. Why limit yourself to supervising the circuit wiring when you can also supervise each individual TrueAlert ES device? Addressable communications make the entire system more robust than typical conventional in-and-out wiring schemes where a wire break would result in a loss of communications with all devices beyond the break.

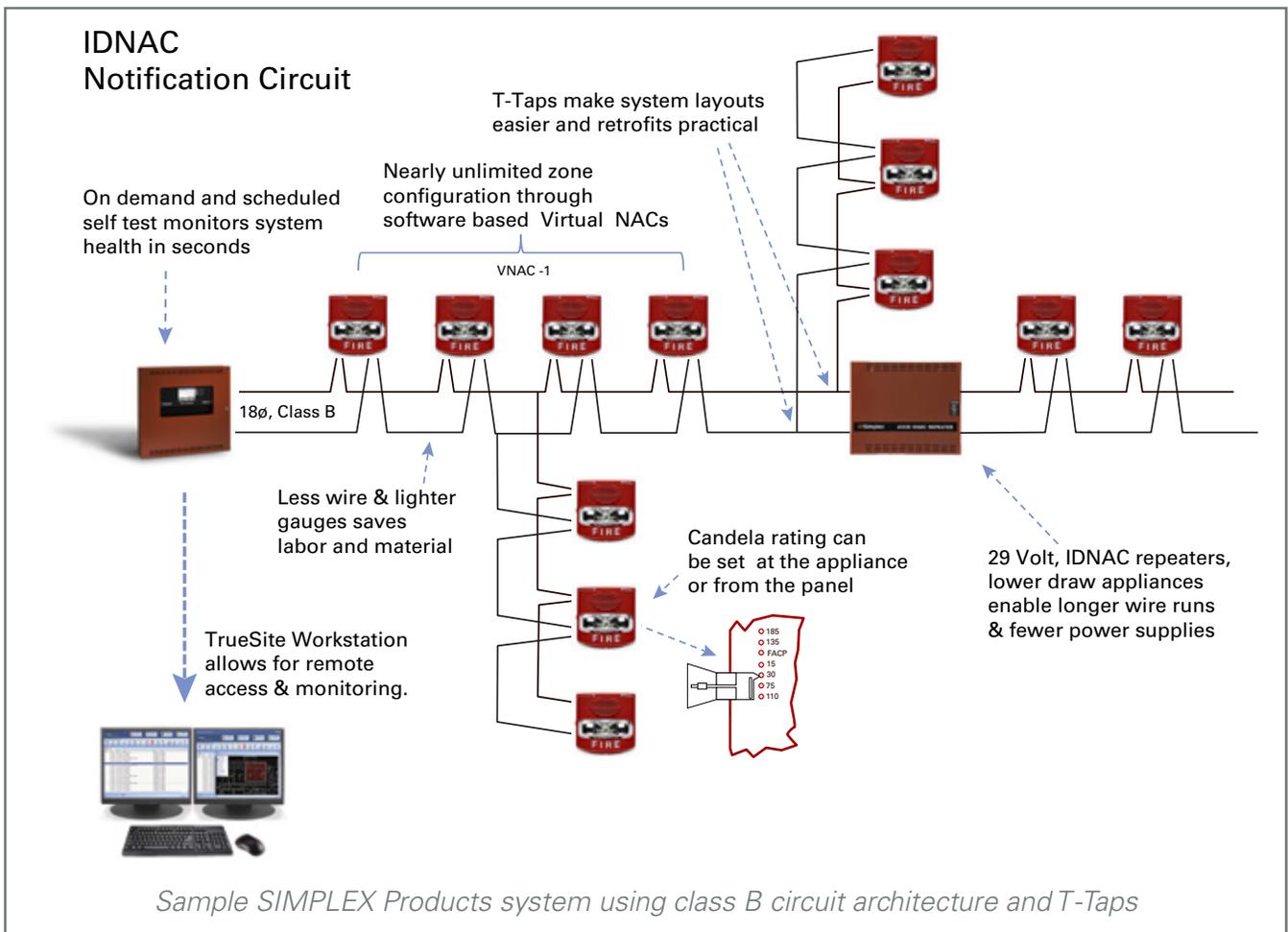
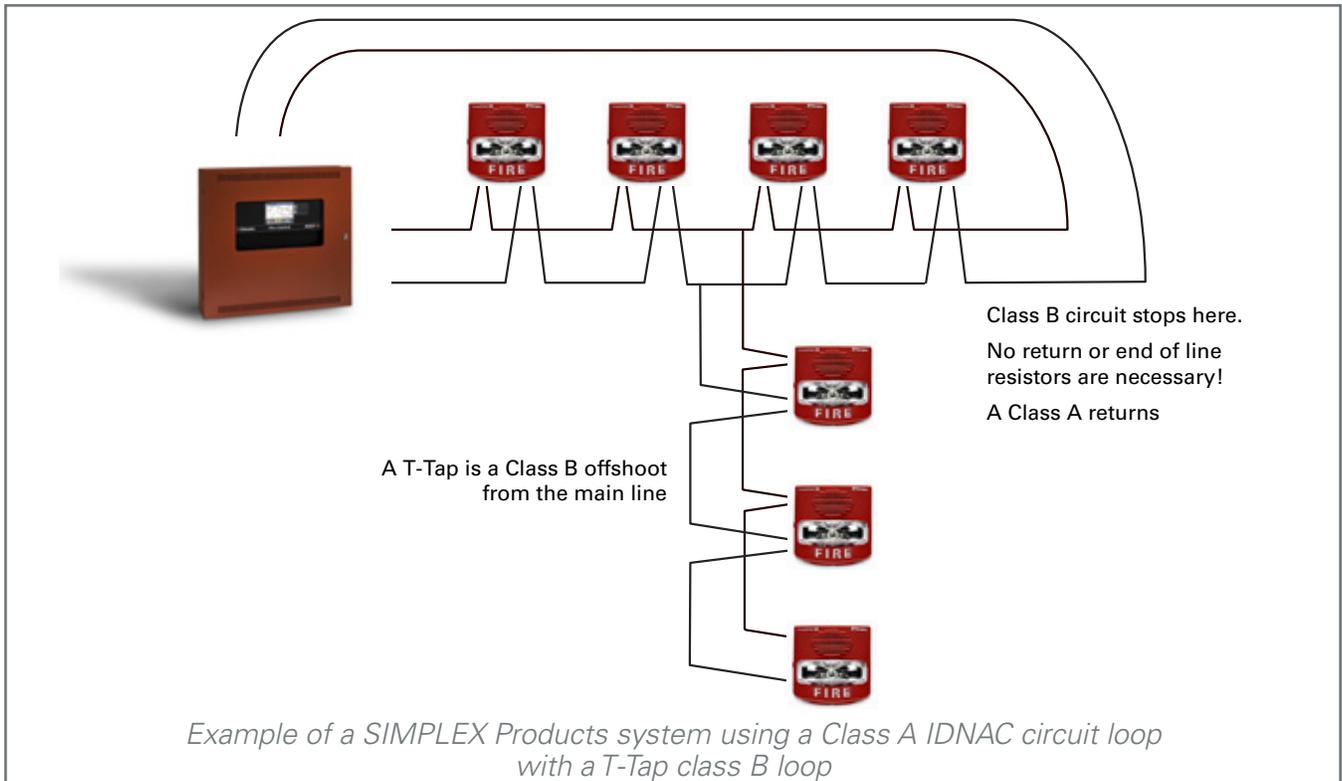
A fire alarm “T-Tap” is merely a parallel tap into the loop. The reason T-Tap wiring is allowed is because communications are being supervised to the device level. T-Tapping the different legs of the SLC provide multiple communications paths of the field devices and control equipment. Not only is this a leap forward in terms of system functionality and reliability but it presents a host of new benefits to the installer, including allowing the freedom to use multiple circuit topologies and removing the requirement of the end of line (EOL) device.

This feature isn’t limited to new installations. Adding to a system after the initial installation becomes a great deal easier since it is relatively simple to find an existing field device and T-Tap into the circuit to add more equipment. Bear in mind that the circuit’s capacity and associated voltage drop calculations still need to be completed to verify the code compliance and reliability of the system. Designers may also include a “spare capacity” margin of 10-25% in their calculations.

### Addressable Programming

With TrueAlert ES you can put 127 addresses, on each IDNAC circuit and, because it’s addressable, the system can be easily modified and is highly configurable. For example, a university may have a residence hall with rooms off the corridor with each requiring a smoke detector and horn or horn strobe. The hall itself has three notification appliances that are controlled by the panel. Ideally you would like to be able to control the activation of each notification device based on the activation of the smoke detector it is paired with. Using conventional wiring methods you would have to pull additional wiring to achieve single station smoke detector operation. This equates to additional labor and materials. With True Alert ES addressable notification this same functionality can be programmed using V-NACs (Virtual Notification Appliance Circuits) at the Panel. This is but one example of how SIMPLEX Fire Alarm system programming flexibility can help save you money.





## V-NAC FAST FACTS

- AV circuit type
- You can put any AV, VO or AO devices in that VNAC
- All appliances will be tagged with the VNAC number
- VO circuit type
- You can put any AV or VO devices in that VNAC
- If you put an AV, only the visual appliance will be tagged with the VNAC number
- AO circuit type
- Follow the same logic. You can put any AO or AV in that V-NAC
- In that case, if you put an AV, only the Audible appliance gets tagged with the V-NAC number
- You can have 56 V-NAC's per SLC

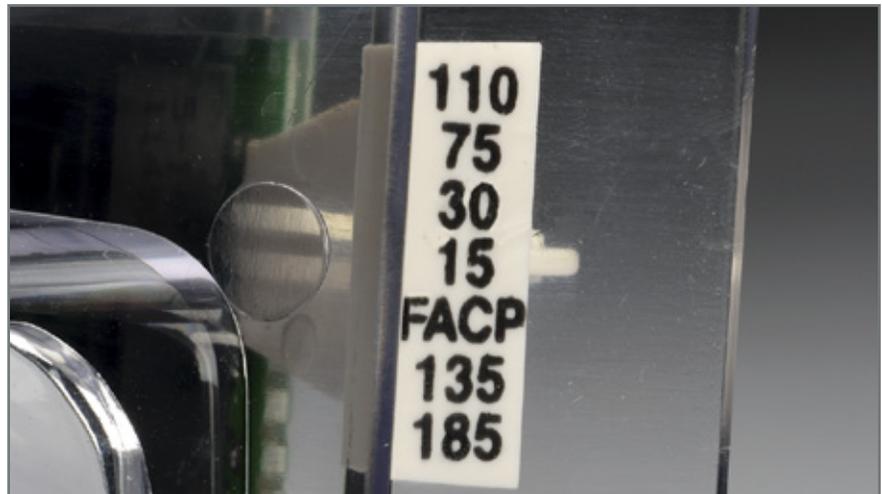
## Virtual NACs

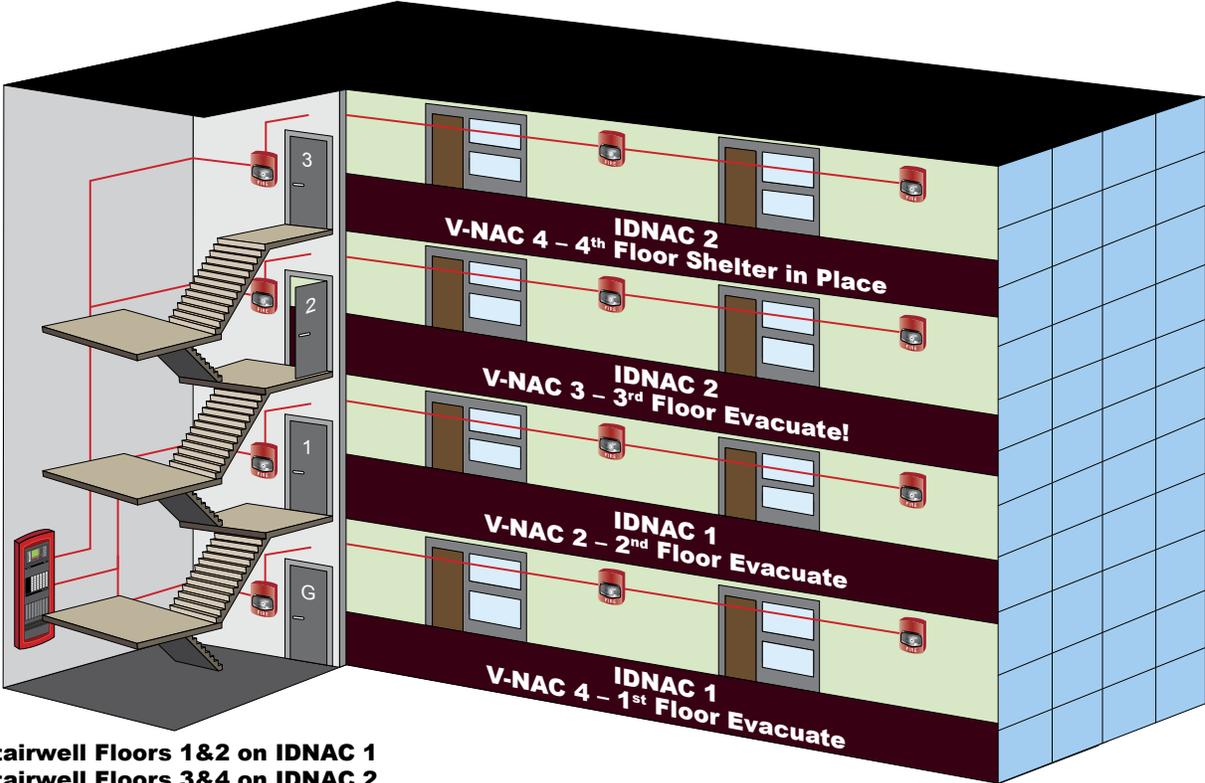
A NAC is an acronym for a notification appliance circuit. A Virtual NAC (V-NAC) emulates a physical circuit construct in programming. This allows greater flexibility and control of groups of appliances within the same SLC or across SLC's

Although you can have 56 VNACs per SLC they do have their limitations. The magic number is always three per appliances. The horn and the strobe being 2 different appliances sitting on the same device, you have 2 times a limit of three. Each time a device is added to a VNAC, the VNAC number is attached to the appliance based on the VNAC circuit type.

## Programmable Candela Outputs

Installers want to pull wire and make connections. Every additional step costs them money. With the introduction of multi-candela devices additional steps, programming via dip switches and other analog controls was added to their task list. TrueAlert ES notification appliances check that task box themselves. The default shipping setting on TrueAlert ES is "FACP" for Fire Alarm Control Panel control. This means the candela settings can be controlled through the panel programming handled by SIMPLEX Fire Products technicians and designers responsible for commissioning. The A&E community has to make candela setting decisions based on NFPA requirements. But what happens when construction changes impact the system design? When the configuration of the space changes you no longer have to replace the device or add new devices, you simply change the settings to meet the requirements. Now a change order can be addressed quickly and efficiently, and with minimal disruption.





**Stairwell Floors 1&2 on IDNAC 1**  
**Stairwell Floors 3&4 on IDNAC 2**  
**Entire Stairwell on V-NAC 5**

*Example of a SIMPLEX Products system using a V-NAC circuit loop*



## Wiring Guidelines

TrueAlert ES appliances can operate using a wide range of wire types and gauges. Here are some guidelines for you to use when laying out TrueAlert ES systems:

Unshielded twisted pair (UTP) wiring is recommended

A single IDNAC circuit may run on up to 1000 ft. (305 m) of non-twisted wiring if it is the only circuit in the conduit

You can run to a maximum of 4000 ft. (1.2 km) using 12 gauge wire on a class B circuit

You can run to a maximum of 2500 ft. (762 m) using 18 Gauge wire on a Class B circuit

There is a maximum of 10,000 ft.(3 km), accrued, of wire across the complete circuit to include T-Taps

### WIRING TYPES

The following list details the type of wiring that may be used for circuits that are mixed with IDNet+ in a conduit.

#### Any NEC 760 wire

DC NAC

TrueAlert Addressable  
(Another) IDNet+  
Channel

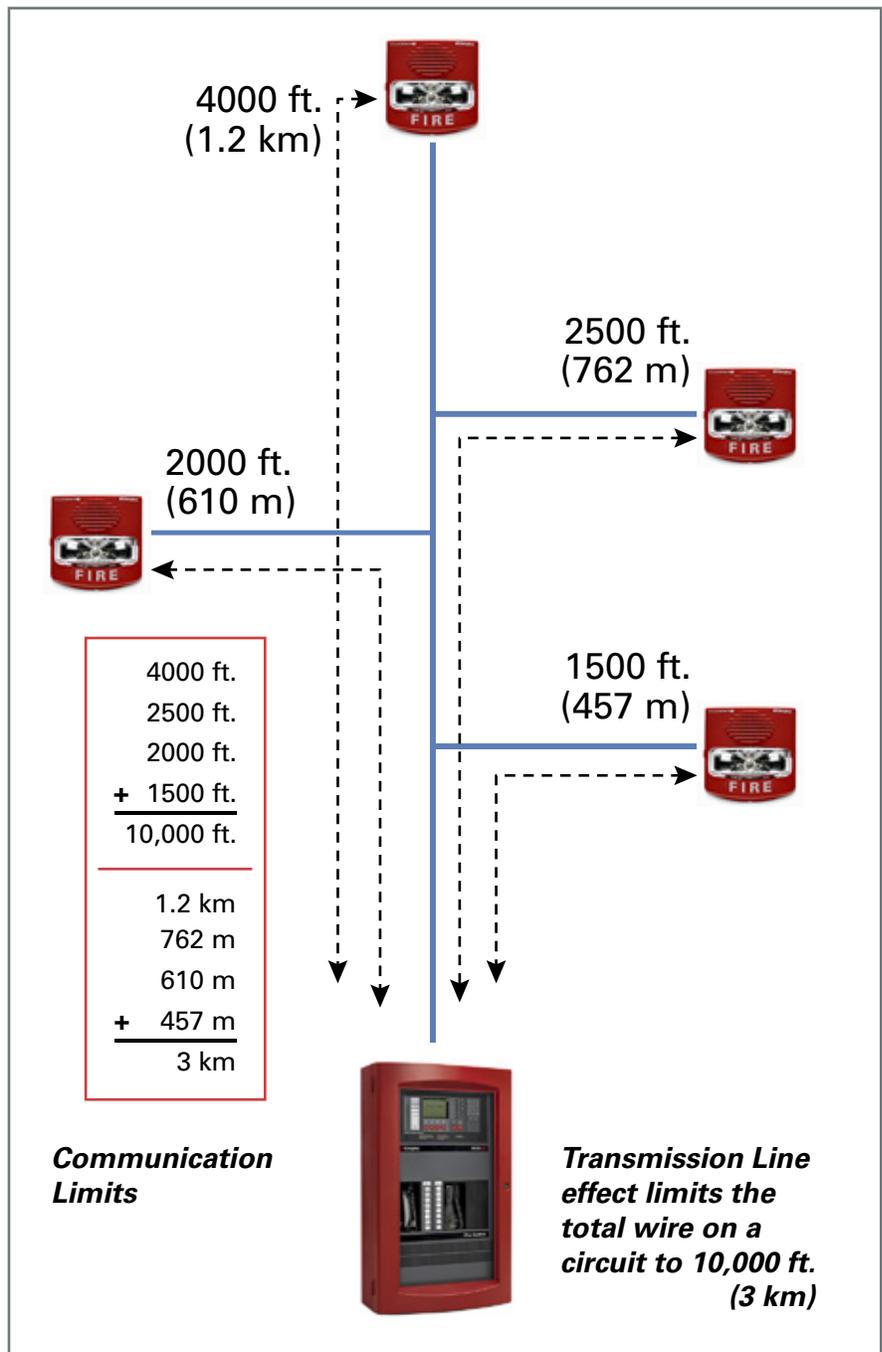
#### Unshielded Twisted Pair (UTP)

Analog Audio Riser  
Digital Audio Riser  
4100U Speaker NAC  
(Other) Speaker NAC  
RUI

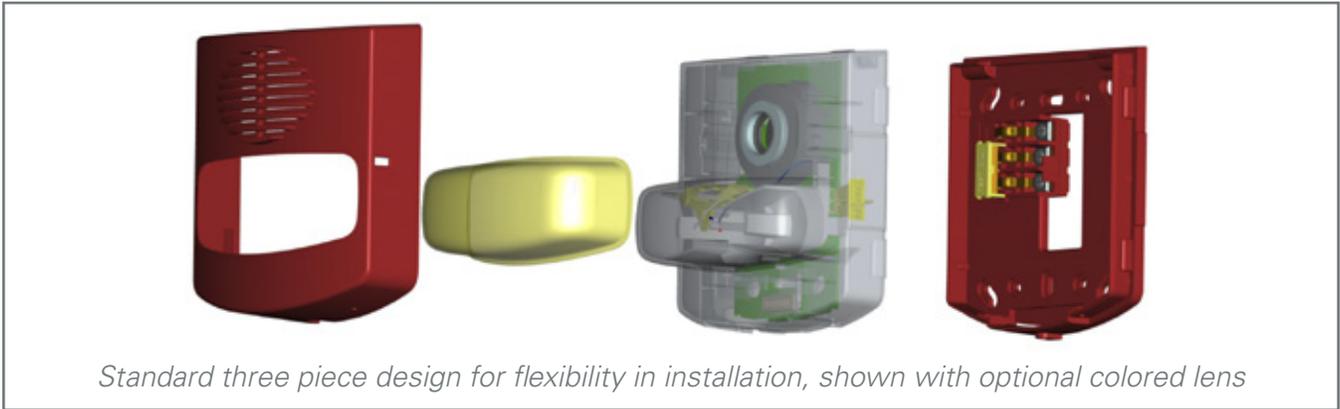
Network  
Communications

#### Shielded Twisted Pair (STP)

Remote Microphone  
Firefighter's Telephones



# TrueAlert ES Notification Appliance Family



## TrueAlert ES Notification Appliance Family



### ***49AO – Audible Only Series***

OPTIONS INCLUDE:

Colors - Red & White

Print - Fire, Alert, Simplex Logo Only, and Blank. In English, French, and bilingual English/French & English/Chinese.

Appliance only, Weather Proof and Built in America Versions are available



### ***49VO – Visual Only Series***

OPTIONS INCLUDE:

Colors - Red & White

Print - Fire, Alert, Simplex Logo Only, and Blank. In English, French, and bilingual English/French & English/Chinese.

Full PID's for Clear and Amber Lenses.

Optional Blue, Red, Green, and Amber Lens Kits (derating applies)

Appliance only, Weather Proof and Built in America Versions are available



### ***49AV – Audible - Visual Series***

**OPTIONS INCLUDE:**

**Colors - Red & White**

**Print - Fire, Alert, Simplex Logo Only, and Blank. In English, French, and bilingual English/French & English/Chinese.**

**Full PID's for Clear and Amber Lenses.**

**Optional Blue, Red, Green, and Amber Lens Kits (derating applies)**

**Appliance only, Weather Proof and Built in America Versions are available**



### ***49MT – 520 HZ enabled Multi Tone Audible and Audible-Visual Series***

**OPTIONS INCLUDE:**

**Colors - Red & White**

**Print - Fire, Alert, Simplex Logo Only, and Blank. In English, French, and bilingual English/French & English/Chinese.**

**Industry Leading tone-cadence combinations.**

**Optional Blue, Red, Green, and Amber Lens Kits (derating applies)**

**Appliance only, and Conventional Versions are available**



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