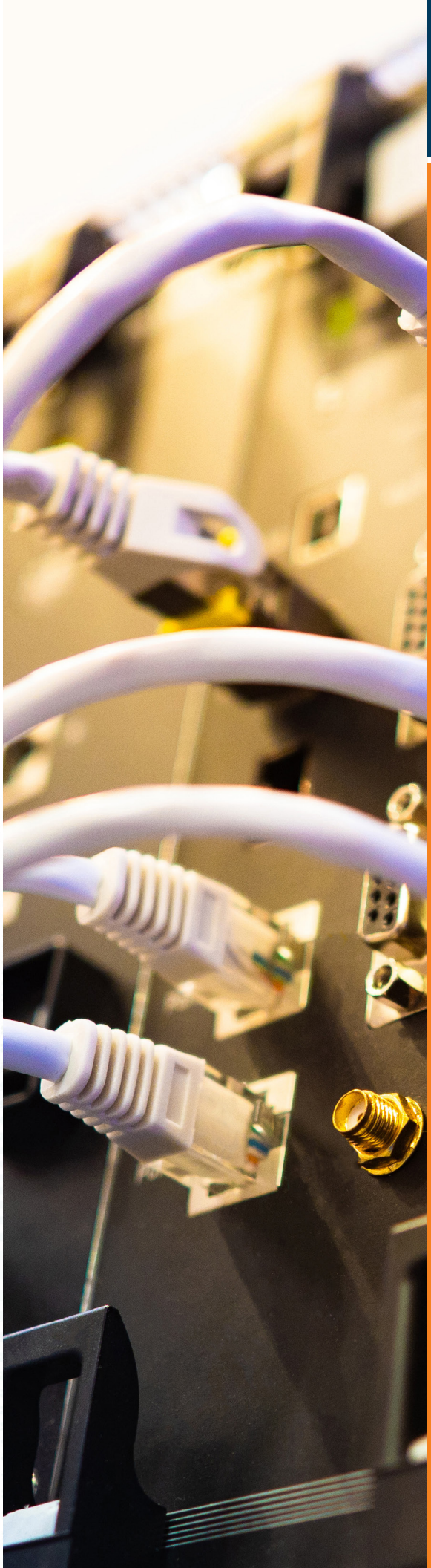
Ooma AirDial Fire Safety Regulatory Compliance

When replacing legacy phone lines, building owners may have questions about regulations related to fire panels. This whitepaper describes the relevant sections of the National Fire Protection Agency (NFPA) guidelines that apply to Ooma AirDial®.



Introduction

Historically, fire alarm control panels (FACP) sent signals to a monitoring station through the Public Switched Telephone Network (PSTN). These PSTN phone lines, also known as Plain Old Telephone Service (POTS) lines, were not part of the fire alarm system but were “shared communications” lines. The “shared” part means that in addition to supporting fire alarms, these lines could also be used for phone calls, faxing, or other uses.

As POTS lines started being eliminated, fire alarm service companies began replacing the shared PSTN lines with different technologies. These technologies differ in how they are installed and how they are regulated.

Categories of Fire Alarm Communications

Several new categories of phone line replacement solutions are specific to fire panels. In other words, they are not "shared" communication services. These solutions require installation by fire alarm service professionals. They usually require changes to the monitoring station receiver, the fire alarm panel, or both. Because of the complex installation and integration with the fire system, these solutions also require inspection by the local fire marshal, officially known as the Authority Having Jurisdiction (AHJ).

1. **Cellular Communicator –** These devices are wired directly to the FACP. The communicator is considered part of the fire alarm system (i.e., not a shared communications path). The communicator receives DC power from the panel. It communicates digital signals directly from the FACP to the Central Monitoring Station over a packet network such as cellular 3G or LTE. Cellular communicators must be installed by the fire alarm service provider. They require changing the protocol used between the FACP and the monitoring station. These solutions must be inspected by the AHJ after installation.

   Ooma AirDial is NOT a Cellular Communicator.

2. **Dial Capture Devices –** These devices take analog output from the FACP and interpret the underlying digital protocol (e.g., Contact ID). They then send the digital alarm signal over IP to a receiver at the monitoring station. These devices must be customized to understand and interpret the signaling protocol in use between the FACP and the monitoring station.

   The signaling can be sent over standard wired broadband or cellular wireless. These solutions require changes at the monitoring station to accept the new digital signaling.

   Ooma AirDial is NOT a dial capture device.

Categories of Fire Alarm Communications (continued)

3. **POTS Replacement Service –** These services are shared communications services, like original PSTN lines. They may also be used for faxing, phone calls, and more. They do not touch the fire alarm system. Rather, they are installed in the telco room or demarcation point, also known as the minimum point of entry (MPOE) or "demarc". Like original POTS lines, POTS replacement services receive analog audio input from the FACP. They deliver the same analog audio as output to the receiver at the monitoring station. The system is a simple replacement of the original PSTN or POTS line. It does not require any changes to the FACP panel nor to the alarm monitoring station.

   Because these are shared communications lines that mimic old PSTN or POTS lines, the applicable requirements of the NFPA are a little different from those for cellular communicators or dial capture devices.

AirDial Features Related to NFPA 72 Guidelines

- Fully managed end-to-end MFVN solution for pathway reliability
- Standby power > 8 hours, can be extended to > 24 hours with optional accessory
- No reconfiguration of fire and security panel required
- Line seizure compliance
- Central Office compliance

Compliance Considerations

Ooma AirDial is built as a shared communications device with compliance to section 26.6 of the 2022 edition of the NFPA 72 guidelines related to "Communications Methods for Supervising Station Alarm Systems".

Pathway Reliability

The NFPA 72 code requires communications paths for fire alarm signals to use a Managed Facilities-based Voice Network (MFVN), a physical network owned and operated by a voice service provider that delivers traditional telephone service via a loop start analog telephone interface.

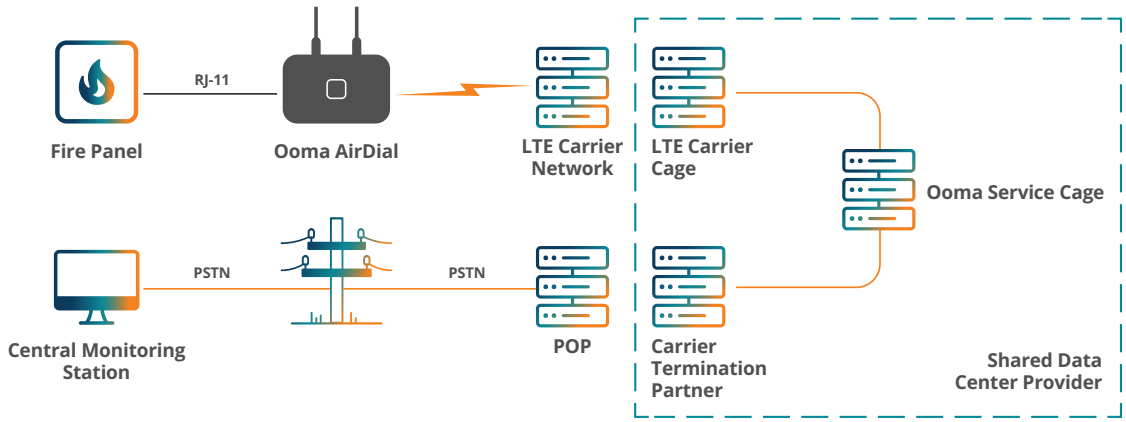
MFVNs are interconnected with the PSTN and provide dial tone to end users. Historically, this was provided by equipment at Bell company central offices; however, today's MFVNs can include a combination of access network (last mile network of copper, coaxial cable, or fiber optics), customer premises equipment (CPE), network switches and routers, network management systems, voice call servers, and gateways to the larger PSTN.

Section 3.3.161 of NFPA 72 now describes a MFVN as "a physical facilities-based network capable of transmitting real-time signals with formats unchanged that is managed, operated, and maintained by the service provider to ensure service quality and reliability from the subscriber location to the interconnection point with other MFVN peer networks or the supervising station."

AirDial routes all communications over network paths that are proactively managed and maintained by MFVN-compliant providers. Outbound AirDial traffic is first routed over an MFVN-compliant LTE cellular data connection. AirDial has partnered closely with cellular providers to create a direct ethernet connection to the Ooma MFVN network in a shared data center. From Ooma's data center, traffic is passed to an MFVN-compliant gateway provider, again with a direct hardwired connection in a shared data center. Our gateway partner then terminates the call to the PSTN.

This set of direct connections is designed so that AirDial communications will not traverse the public internet. This is a critical feature of the AirDial architecture that is different from many VoIP solutions. In many competing solutions, traffic is handed off to the public internet for one or more legs of the path.

In addition, Ooma AirDial has flexible support for combinations of communication pathways through a mix of LTE and wired broadband connections where specified or tolerated as pathway options by the Authority Having Jurisdiction (AHJ).



Standby Power

Section 26.6.3.13.1.1 of NFPA 72 requires that "Secondary power capacity for shared equipment shall be permitted to have a capacity of 8 hours where acceptable to the authority having jurisdiction and where a risk analysis is performed to ensure acceptable availability is provided." AirDial includes an integrated backup battery that will supply more than 8 hours of both standby and active usage of the device, typically closer to 12 hours. Additionally, AirDial customers can monitor real-time battery status through the Remote Device Management (RDM) portal, including charge level and whether the battery is in use or not. Users can also arrange for AirDial to send alerts, via email or SMS text message, for events related to the battery. These events include when the AirDial device changes from AC to battery power and when the battery charge level drops below 10%.

AirDial can support secondary power of >24 hours at the protected premises with an additional accessory.

AirDial fulfills UL 2054 requirements for portable primary (non-rechargeable) and secondary (rechargeable) batteries for use as power sources in products. These requirements are intended to reduce the risk of fire or explosion when batteries are used in a product.

AirDial also conforms to UL-62368-1 which is applicable to the safety of electrical and electronic equipment with a rated voltage not exceeding 600 volts.

Loop Start Interface

Section 26.6.4 of NFPA 72 requires that communications equipment connected to the Digital Alarm Communicator Transmitter (DACT) must provide a loop start interface. AirDial provides a standard loop start interface via its four FXS ports, each with an RJ-11 jack. AirDial does not provide a ground start interface.

Line Seizure

Section 26.6.4.1.3 of NFPA 72 requires that DACTs must be able to seize the line and disconnect any outgoing or incoming telephone call and prevent use of the line for outgoing calls until signal transmission is completed.

Each AirDial FXS port and its associated RJ-11 connector operates as an independent POTS line replacement. AirDial does not allow multiple virtual lines to be assigned to any single FXS port. AirDial does not operate as a "party line".

It is recommended that each AirDial port be connected to only one piece of equipment. If AirDial is replacing a POTS line serving multiple pieces of equipment, the other equipment should be reassigned to use additional FXS ports on AirDial, or on additional AirDial hardware as necessary.

If a single AirDial line must be used to support multiple devices, the line seizure equipment, such as an RJ31X device, must be inspected and approved by the AHJ. AirDial is intended to behave just as a legacy POTS line would behave in this situation, with the same on-hook and off-hook behavior.

Central Office Requirements

MFVN requirements in Section A.3.3.161 of NFPA 72 provide that central office facilities maintain 24 hours of standby power supply capacity. The equivalent of "central office" for AirDial are the data centers through which traffic is routed and terminated.

All data centers in the AirDial MFVN network include more than 24 hours standby power capacity.

Section A.3.3.161 also requires that network equipment be safeguarded to prevent unauthorized access to the equipment and its connections.

All AirDial data centers include extensive security measures to allow only authorized access to equipment. AirDial data centers maintain disaster recovery plans to address both individual customer outages and widespread events such as tornados, ice storms or other occurrences of a catastrophic nature, which include specific network power restoration procedures equivalent to those of traditional landline telephone services.

Conclusion

Ooma AirDial is built with the applicable fire safety regulations in mind, including MFVN, standby power, loop start support, line seizure support, and end-to-end pathway reliability. Ooma AirDial is not a cellular communicator and not a dial capture device. AirDial is installed in the telco room or “demarc”, where the original POTS lines enter the building. AirDial replicates original PSTN phone lines and does not require changes to the fire panel nor to the receiver at the monitoring station.

Ooma and its distributors continue to work with regulatory authorities to assess the status of compliance of the AirDial solution with fire life safety regulations.