

White Paper

New Generation Networks for
alarm communications



Table of contents

- Broadband IP Networks 5
- Broadband Installation considerations..... 5
 - Check the following elements with the Manufacturer / Alarm Transmission Services Provider (ATSP) . 5
 - General considerations..... 5
- Mobile networks..... 6
- Alternatives Mobile Services 6
- Mobile Installation Considerations..... 6
 - The following elements must to be confirmed with the manufacturer 6
- Mobile equipment Installation considerations 7
- Considerations for end-users 7
- Broadband IP..... 7
- Mobile services 7
- Conclusion..... 8

Foreword

Standard Public Switched Telephone Network (PSTN) services are progressively being replaced by high speed networks across Europe with a Voice over IP backbone. Telecom operators, regulators and government agencies have developed a plan in each European country to organize the migrations.

The years 2025 to 2030 appear to be the predicted time frame to complete the migration toward New Generation Networks (NGN). Examples:

United Kingdom	2018 - 2025 (Transition to IP)
France Germany	2017 - 2026 (End of analogue lines 2030)
	2017 - 2025 (End of ISDN in 2019)

For transmissions of alarms there are many combinations of alternate single and dual path solutions and products available on the market that are not based on analogue PSTN.

Changes revision table			
Date	Rev #	Paragraph / Page	Change
04/06/19			Final version

DISCLAIMER

Fast changes are occurring in the field of telecommunications in Europe; thus, this document is based on the information currently available.

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Broadband IP Networks

Broadband IP based signalling is an accepted solution and many companies have been providing these signaling services for a long time, in some cases over 10 years.

Therefore, there are several IP signalling Alarm Transmission Systems Providers (ATSP) who have mature products & services deployed in Europe. Over 100 000 Broadband based alarm systems are currently connected within Europe.

The Alarm Transmission Systems (ATS) should be specified and installed with products meeting the requirements of the EN 50136 series of standards and labelled with certification marks.

Subtitle

Euralarm does not support any country specific deviation nor additional requirement to European Standards. However, today additional “in-country” requirements may still remain – such as in the Netherlands or others countries - that operating companies should consider.

Changing from PSTN to an alternate telecommunications network will require Alarm Services Companies to adopt different operational techniques and considerations.

These operating companies should not try to compare or mimic the installation and operational methods of PSTN when these new technologies are adopted.

Alternative solutions / procedures need to be adapted to fulfil functionalities present in analogue PSTN installations.

Broadband Installation considerations

Check the following elements with the Manufacturer / Alarm Transmission Services Provider (ATSP)

- Does the Supervised Premises Transceiver (SPT) support both Dynamic Host Configuration Protocol (DHCP) and Fixed IP (Internet Protocol) addressing schemes?
- There should be no network inbound requirements for remote connectivity, specific firewall configurations should be set at minimum.
- Encryption, substitution and anti-playback techniques should be supported.

General considerations

- The network begins at the interface with the SPT and ends at the Receiving Center Transceiver (RCT)
- Power supply: There is no power delivered over fiber lines.
- The router is identified as a component within the Telecommunications Network and therefore battery backup of the router is not compulsory.
In an operational environment, battery backup and additional protection of the router is both costly and impractical. However suitable measures should be in place to protect the router from intentional tamper, for example being under the supervision of the security system.
- An independent power source is not provided with a fiber circuit; therefore, a power outage will disable the line. If a single path system is deployed, consideration must be given to the possibility of a power outage and the associated risk to the protected asset.



- A medium to high risk may result in the deployment of a Dual Path system with one Alarm Transmission Path (ATP), (or both) being a mobile technology solution. Battery backup should compliment this ATS from either the existing alarm system or an independent power supply.
- If remote connectivity and risk analysis require a short reporting time and protection from power failure (i.e. single path system), then a dual path with battery backed SPT should be specified.'
- If the fixed landline options and restrictions are not acceptable due to risk analysis, then an alternate solution such as single or dual path mobile may be considered.

Mobile networks

Networks are changing due to end-user and business demands for fast and reliable data services.

The services based on mobile data 2G and 3G have entered a sunset period.

In some countries 2G services have already disappeared. It is expected that all 2G services will be phased out by 2030, and 3G may go sooner as well.

Alarm Services Companies and Manufacturers should be deploying equipment manufactured with mobile radio modules that can operate as a minimum on both 3G & 2G, 4G & 2G or on 4G, 3G and 2G.

The SIM card alone does not determine which networks can be used by the supporting transmission device.



The mobile radio module determines which networks are supported. For example, a 4G SIM card fitted to a device fitted with a 2G GSM module will not operate or connect onto a 4G network.

Alternatives Mobile Services

Narrow band services are a possible alternative (SigFox, LTE...), however the availability is affected by local usage (contention with 4G & Voice) and has much less network capacity.

Whilst it is adopted for remote metering services and other non critical situations, its use in a critical alarm data application such as Fire & Security is not recommended.

Mobile Installation Considerations

The following elements must be confirmed with the manufacturer

- Check with the manufacturer that the communication module supports 4G or 3G with a fall back to 2G,
- Check that the module is not a narrow band device,
- Does the SIM card have an in-country roaming capability and there is no network steering applied (i.e. the SIM will continually try and re-connect with its "home" network in preference to the available alternate network)

The SIM card should be provided by the ATSP and not the end-user or alarm service installer, it should be a "contract SIM card" (as opposed to "Pay as you go"). SIM cards supplied by the Alarm Transmission System provider ensure there is clear ownership of the SIM contract. This provides effective billing that can also accommodate any moves/changes to the ownership of the system through transfer of the contract.

Economies of scale and control of data throughput are also managed by the ATSP. Therefore installers/end users are not at risk from locations where data rates exceed the maximum of the contract and therefore provide a fixed cost over the term of the contract (usually annual on a monthly invoice).

- In mobile only installations, it is advisable for the SIM card to have a fixed IP address capability on a private network so that the SPT can be contacted on-demand. i.e. for diagnostic / remote maintenance connectivity with the connected alarm or fire systems.

Mobile equipment Installation considerations

- Do not install these systems underground and ensure that the best possible mobile reception can be obtained (Always look for a strong mobile reception or alternatively use a remote antenna located in an area that receives a strong mobile signal).
- Ensure the service technician has appropriate alternate antennas to provide the best possible reception.
- Use mobile coverage maps and web applications to survey the site.

Considerations for end-users

Alarm Services Companies should amend the service contracts highlighting the end-user's responsibilities in organizing the maintenance of the Alarm Transmission System.

These considerations are similar to those already in place for PSTN or mobile based services.

Broadband IP

- The end-user should not disconnect the Ethernet cable at any time
- The end-user should not turn down the power to the router for more than 3 minutes without informing the Alarm Services Company
- The end-user should inform the Alarm Services Company of any changes in the network provision
- The end-user should inform the Alarm Services Company of the changes to the local network that may affect the ATS i.e. Firewall changes, IP address allocation...



Mobile services

- A stable mobile service delivery is required for an affective mobile ATS/ATP,
- Mobile coverage may be affected by a number of factors like location, environment, weather conditions...Location of the mobile device and the antenna is critical. The device should not be located underground.
- A cost may be associated with accommodating the location of a new device or moving an existing device that is not in a suitable location to obtain reliable communication. This may only be apparent after the installation is completed.
- The equipment is supplied with a manufacturer supplied antenna for use in the majority of installations. Where an alternate antenna is required to obtain reliable service, additional cost may be incurred. This may only be apparent after the installation is completed.

Conclusion

The landscape of Alarm Signalling is changing.

The migration to an IP backbone and high-speed broadband to homes and businesses will not be a national or regional change, but a random change as end-users adopt these new high-speed services. It is highly likely (and already proven) that some PSTN based signalling equipment will either work intermittently, or not at all when connected to a fiber circuit.

The mobile networks are equally in a transition period, and it is advisable to ensure that the equipment deployed is selected based on its sustainability.

Installers should be considering installing Single and Dual Path Alarm Transmissions systems that support Broadband or Mobile networks; or a combination of both by default.

They should be aware of the alternate operational requirements and the responsibilities of the end-user that differ from those associated with PSTN based installations.



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