



Secure Means of Communication Status Report

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HSE and Functional Requirements

Functional requirements (EDMS 2588546):

1. An **alert system** must be present **every 200 m** in the CERN accelerators tunnels
2. It must be suitable for operating in the wide range of environmental conditions that are present on CERN premises (underground, radioactive areas, etc) + **technical galleries**, surface hotels, cold room, PMRs, kinder garden...
3. The system shall trigger a **level 3 alarm** (according to IS37).
4. It must have the capability to deliver **reliable two-way communications**.
5. It must be **able to operate in the event of a power failure for a given duration** compatible with the premises' emergency concept.
6. It shall provide an **unambiguous geo-location**.

Alert Systems - HSE requirements:

- In response to EN-AA questions ([EDMS 2894058](#), May 2023), response from HSE [EDMS 3021609](#) (March 2024) - SRF on **circuit integrity of Emergency Call Systems in Technical Galleries**

EDMS 3021609 - Details

Question 1: Does the "Emergency Call System" for the Technical Galleries must ensure voice communication with the fire brigade in the event of a power failure and for how long at least?

- **Answer:** The functionality of the emergency call system, **including voice communication with the fire brigade**, shall be guaranteed in case of power failure. This is important, for instance, if someone working in the technical galleries needs assistance soon after an incident that caused a power failure (e.g., short circuit). **The minimum duration shall be 60 minutes.**

Question 2: What are the characteristics that the cable trays for the system must meet, and in particular what is the fire resistance time required for these trays?

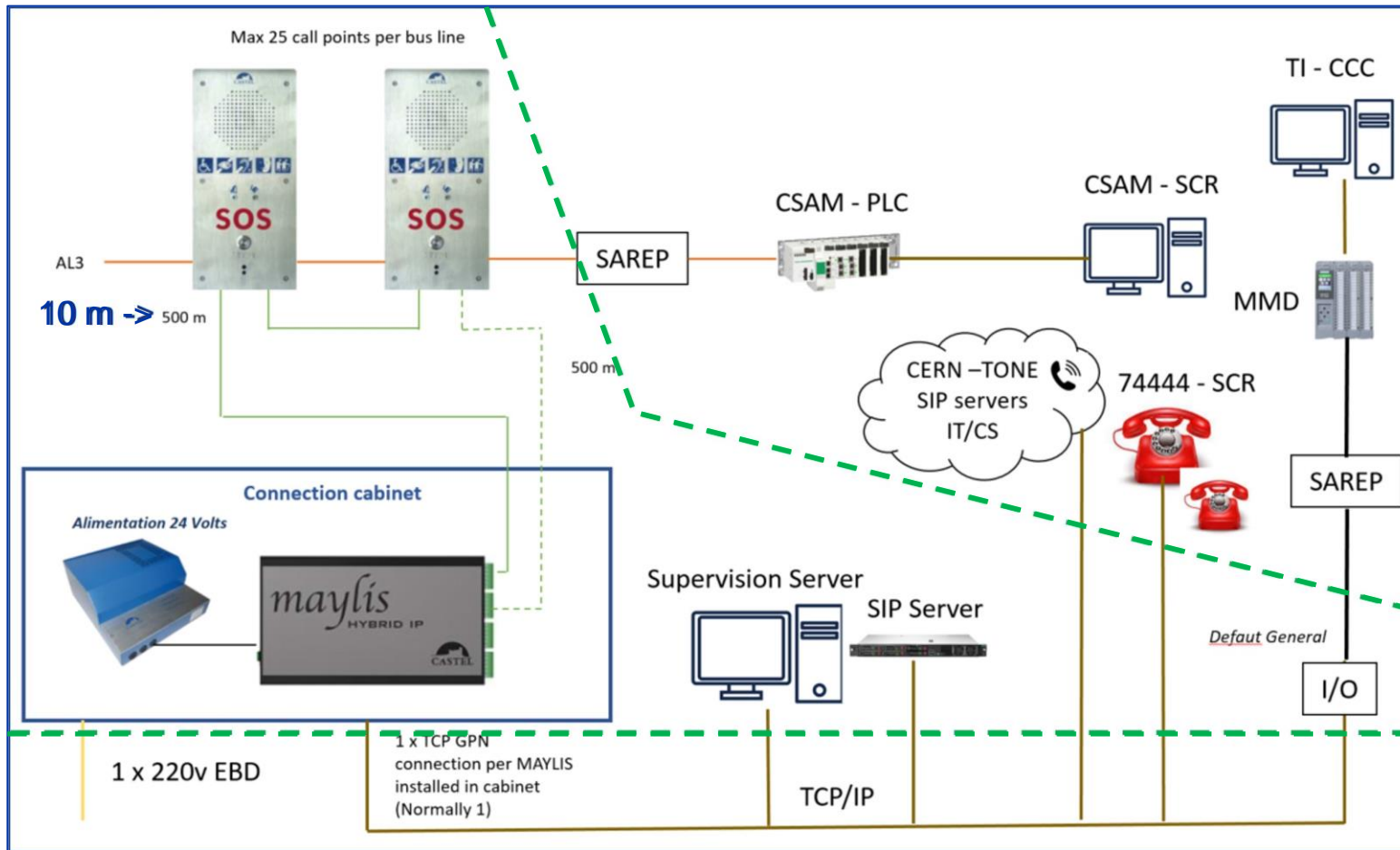
Question 3: Must the cables for voice communication and AL3 alarm transmission be fire-resistant and for how long at least?

- **Answer to 2 and 3:** The **fire resistance** class of AL3 cable systems (the assembly of trays, supports, accessories, cables, etc.) shall be **at least 60 minutes**. **Cabling installations do not need to be fire resistant if:**
 - The circuit of the emergency call system is built in a loop, and functionality is maintained in case of failure at any location
 - Or all the following conditions are fulfilled:
 - The circuit is contained in a single fire compartment.
 - The galleries have two alternative exits, and no dead ends longer than 10 m.
 - The emergency call system has a fail-safe mode (i.e., triggers a level-3-alarm when a cable is cut, and CFRS can localise where the failure occurred).

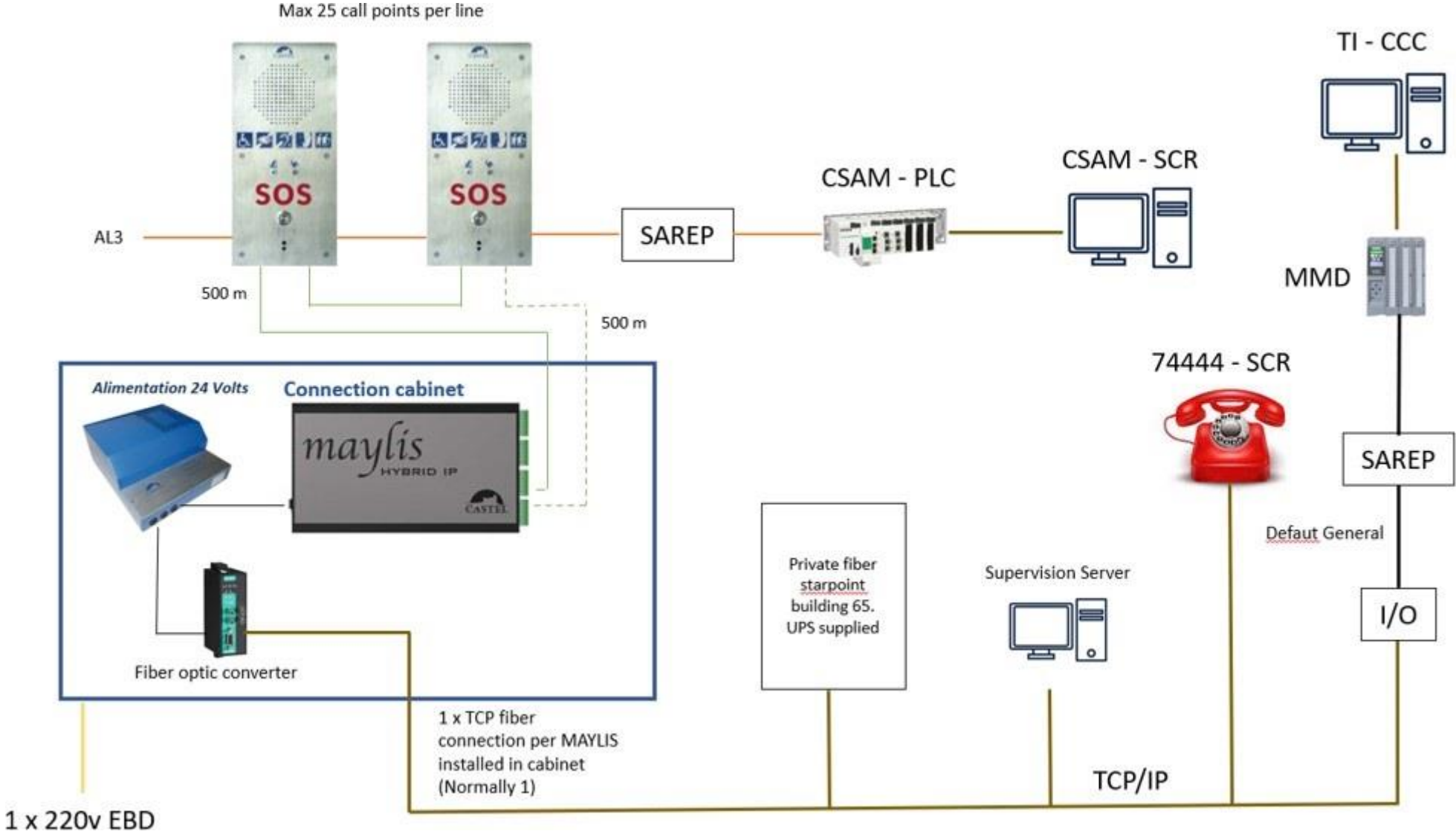
Note: If voice transmission cable is present and is independent from AL3 cable, the above-mentioned fire resistance is not required for such cable as fire-degraded functionality of global system is covered by AL3 part.

Technical Verification of the Technology

- The **technology was tested and validate in a test platform** (in collaboration with IT-CS, 2Q2023):
 - *Call points connected in a communication bus (RS485) to CERN TCP/IP infrastructure and interface with CERN telephony via SIP*

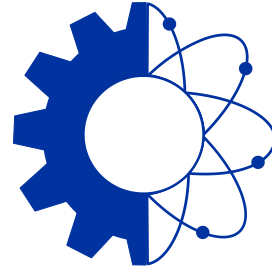
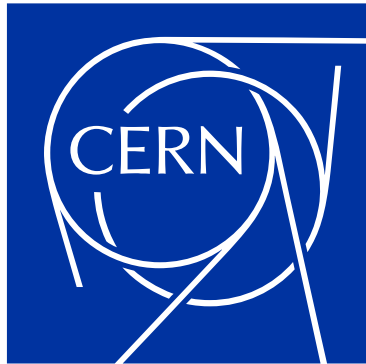


Network Architecture



Status Report

- **March 2024:** The SRF is released, and it clarifies the requirements and specifications needed for Emergency Call Systems
- **March 2024:** Technical meeting with IT-CS and HSE to evaluate impact of integrating new requirements as recommended by HSE
- **Evaluation of technical implementation and cost estimate to ensure requirements (on hold) :**
 - Secured power supply of all equipment is needed
 - Replacing of general-purpose TCP/IP network initially considered by a dedicated secured optical fibre network
 - **Whole network layout and estimated quantity of call points to be carefully reviewed:**
 - Central secured Optical Fibre Starpoint in building 65?
 - Optimisation of call points lines for the new Optical Fibre network architecture
 - **Request to TG-Cons project: A specific layout to positions of Emergency Call Points to review network architecture is needed.**
- **Tender process for the purchase and supply of Emergency Call System equipment on hold until technical solution and total scope fully defined:**
 - Discussions in progress with NA Cons since November 2023 to integrate all non-radioactive technical galleries attached to their project on the scope of the Technical Galleries Emergency Call System Project
- **System operation & maintenance responsibility listed but not defined nor approved**



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