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| **Interface Control Document**  Systems Engineering**-Company E** |
| **COP** |
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| System requirement specification | |
| Project: | $System Engineering**– Company E** |
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# Introduction

This document describes the analysis process on the case work with the Common Operations Picture (COP) case from Systematic. Company E is the main contractor and this document will explain one of the critical interfaces involved.

# Interface design

This paragraph describes the interface characteristics of one block within the COP domain.

It is recommended to read the System Requirement Specification before reading this document.

points-out the chosen block, where this interface control document will focus, and leave other interfaces as unexplored interfaces.



Figure 1 - SysML block diagram

## Interface identification and diagrams

This paragraph contains a identification of the limited system, which has been chosen to be described during this case work.

Figure 2, shows the chosen system interfaces.



Figure 2 - System interfaces

1. CCRT (Cross compatible radio - terminals): The interface between the different branches involved.
2. CCRC (Cross compatible radio - control): The interface to the headquarter, which provides and maintain the infrastructure and technology of this solution.

*Table 1* shows the overall setup of the interfaces.

|  |  |  |  |
| --- | --- | --- | --- |
| **Channel name** | **Source** | **Sink** | **Channel frequency** |
| CCRT | Bi-directional | | 380 - 921 MHz |
| CCRC | Bi-directional | | 380 - 921 MHz |

Table 1 - Interface overview

## CCRT and CCRC Interface

These two interfaces are treated as identical in this document since they, from a interface architects point-of-view, could be described the same way.

CCRT and CCRC will use the SINE solution , which is based TETRA technology, which is a wireless standard. TETRA is designed for use by government agencies, emergency services, police forces, fire departments, ambulance, rail transportation staff, and transport services.

TETRA is an ETSI standard [4] and works in a very similar way to GSM. The main differences are longer range and more bandwidth allocated for data.

### Type of interface

This interface complies with the TETRA communication standard [2]. It is a data transceiver interface, which will send or receive non-buffered data packages from the respective unit.

### Interface data elements and setup

The TETRA system is a Frequency Division Duplex (FDD) system. TETRA also uses FDMA/TDMA like GSM.

Modulation setup [3]:

* Digital modulation scheme: π/4 DQPSK (differential quadrature phase shift keying)
* Baud rate: 18000 sym/s
* Symbol maps: 2 bits/sym

Speech signals are the essential part of TETRA technology.

Speech channel [3]:

* Sampled at: 8 kbit/s
* Compressed with: ACELP (Adaptive Code Excited Linear Prediction).
* Data rate before channel coding: 4,567 kbit/s.
* Data rate after channel coding: 7,2 kbit/s.

A single slot consists of 255 usable symbols, the remaining time is used up with synchronisation sequences and turning on/off

### Address bus

NA

### Data bus

NA

### Memory Map

NA - Not a memory mapped interface

### Control registers

Read the TETRA ETSI standard [4]

### Status registers

Read the TETRA ETSI standard [4]

### Data registers

Read the TETRA ETSI standard [4]

### Hardware characteristics

Read the TETRA ETSI standard [4]

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