

**SEANET**

MARINEPLANET

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# Telecom Network Management System ZONITH Alarm Control System

Solution Description  
Version 1.0

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## Content

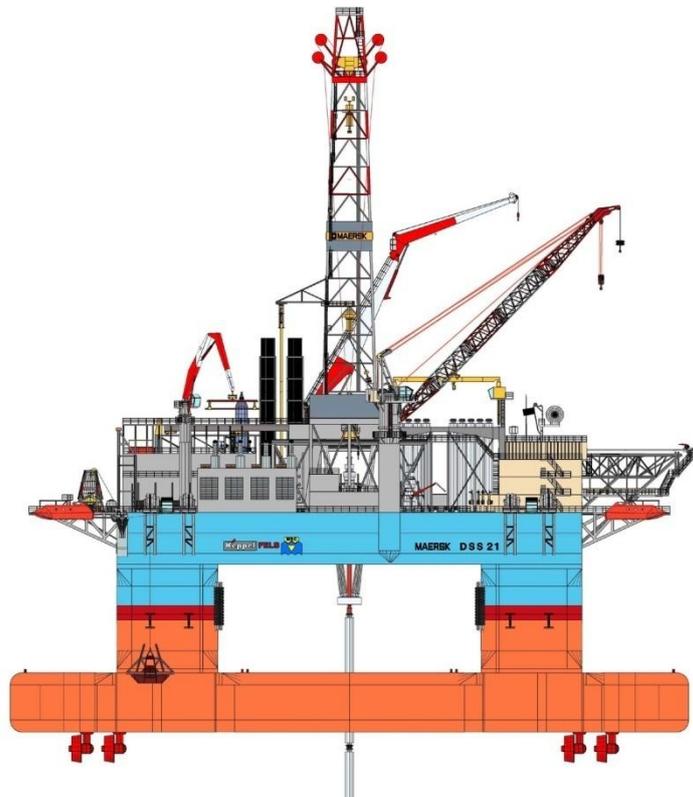
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## 1. Introduction

Any advanced technical installation needs monitoring of alarms and fast fault resolution to avoid downtime, danger to employees or damage of machinery. Off-shore installations need in particular to ensure fast and accurate fault resolution as the resources are limited and the environmental conditions are harsh.

This catalogue contain description of the different solutions offered for off-shore oil, gas and wind farm installations, ships and harbour terminals. All the solutions are tightly connected to the usage of digital radio technology on board and utilises the advanced and secure features offered by the digital radio technology. Combining radio communication, alarm handling and staff safety into one device is a very cost-effective way to increase the work efficiency and safety onboard. All solutions in this catalogue require a digital radio infrastructure to be in place on the facility.

The most beneficial used digital radio solution used is the TETRA radio system. TETRA radios can replace any analogue UHF/VHF radio, pager system, DECT phone or whatever radio communication system used onboard and at the same time provide the staff with a toolbox that make their work easier.



## 2. Alarm Control System

The Alarm Control System is a software solution that functions as a bridge between various alarm sources and the TETRA handheld radios or Alarm Displays. All alarms are piped into Alarm Control System, logged, inspected and dispatched to the on-call staff most appropriate to deal with the problem in question or to be shown on displays. The sophisticated watch schedule will automatically find the most suitable person to resolve the problem.

Not all alarms are equally important, and alarms might have varying degrees of importance depending on a system they came from or where they were raised. The concept of Action Filters guarantees that just critical alarms, like fire alarms, are handled without any delay, whereas alarms with lower priority can be delayed until e.g. the next workday.

The staff can use the interactive acknowledge function and ensure the system knows that they have taken action to solve the problem. If an alarm is not acknowledged within a certain period of time, it will be escalated to the next person in line. This process continues until there is a certainty that the alarm is dealt with. If for instance one terminal has an uncharged battery, the system will send an alarm notification to a backup person.

### 2.1. Functionality Overview

The Alarm Control System software should be installed on a suitable Windows server. The overall configuration of the system is shown in Figure 1.

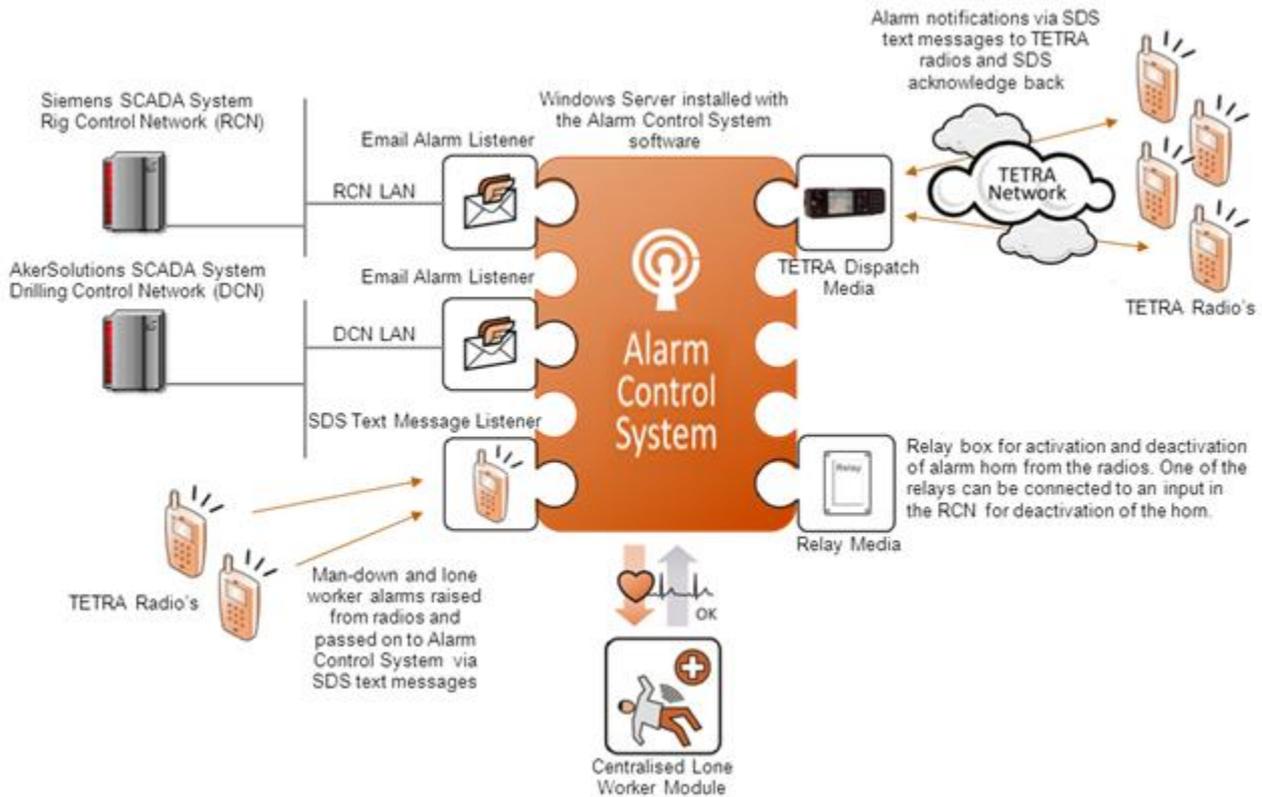


Figure 1 – Overview of the configuration of the Alarm Control System

## 2.2. Text Messaging

A standard feature of the Alarm Control System is the text message sending screen. From this screen it is possible to send text messages to individual TETRA radios as well as to groups. If other medias like GSM or DECT is deployed text messages can be send to these units too. Access rights are needed to use the screen. The screen is shown in Figure 1.

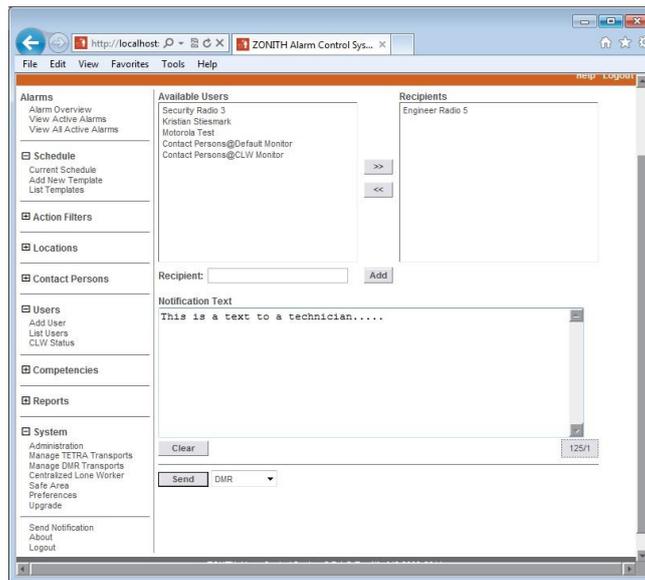


Figure 1 - Alarm Control System standard text message sending screen

## 2.3. Alarm Monitoring

The following section describes the different standardized ways for the Alarm Control System to monitor alarm sources. In general the Alarm Control System uses software modules called “Listeners” to monitor alarms from various systems.

### 2.3.1. SNMP Alarm Monitoring

The Alarm Control System can receive SNMP traps from any source provided the MIB is available. There are support for SNMPv3.0 alarms.

### 2.3.2. Monitoring of alarms from potential free contacts

To monitor the alarms originating from potential free contacts an I/O alarm listener (software) and an I/O unit (hardware). Four alarm contacts can be added to this unit. Zonith will setup the system to monitor the following alarm signals when the contact closes.

The I/O unit has it's own power supply and is also able to deliver 12 VCD to the potential free contacts. The I/O unit communicates with the Alarm control System via a RS232 serial connection. The RS232 cable will be supplied by Zonith.

The I/O unit will be placed in the same cabinet as the Alarm Control System PC.

### 2.3.3. LAN based I/O Alarm Monitoring

To monitor the alarms originating from the Manned Machinery Alarm Space (MMAS) systems, two interfaces (called Alarm Listeners) have been provided.

The configuration is shown in Figure 2.

The MOXA I/O LAN Alarm Listener connects via the ships LAN to a number of small MOXA units. Each unit contain 12 digital input signals (24 VDC voltage level). One MOXA Unit will be placed in the same cabinet as the TETRA base station and the Alarm Control System server and interface to the Manned Machinery Alarm Space (MMAS) systems. The two other MOXA units can be placed anywhere in the ship and interface to other discrete dry contact signals. The configuration of the alarm text and tag number associated with each input signal is easily setup in the Alarm Control System via a web-browser. The only requirement for the location of the MOXA units is availability of a LAN connection and power.

The solution also provides a Windows Command Line client which is capable of sending alarm information as IP packages via the TCP/IP network. Several Command Line Clients can be used to pass alarms on to the Alarm Control System.

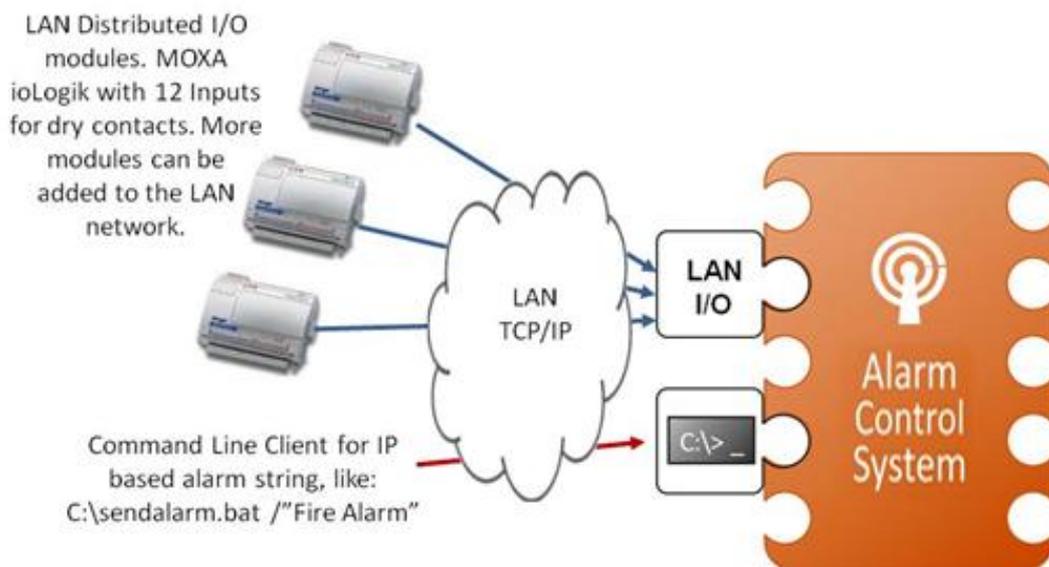


Figure 2 – MOXA I/O LAN Alarm Listeners

#### 2.3.4. Monitoring of alarms from RS232 based sources, like NMEA-0183

To monitor alarms from the systems with a serial output, like a Kongsberg VMS system, the serial ASCII alarm listener will be delivered. This listener detects the ASCII string originating from the system and transmitted via a serial RS422 connection.

The data protocol supports sub-set of the maritime NMEA-0183 standard.

To convert the RS422 signals into RS232 signals a converter unit can be supplied.

#### 2.3.5. Monitoring of Alarms Originating from Emails

To monitor the alarms originating from emails the standard generic Email Alarm Listener software package is proposed. The Email Listener receives and interprets messages from an e-mail server. An alarm or task is raised when an e-mail contains a predefined string of text.

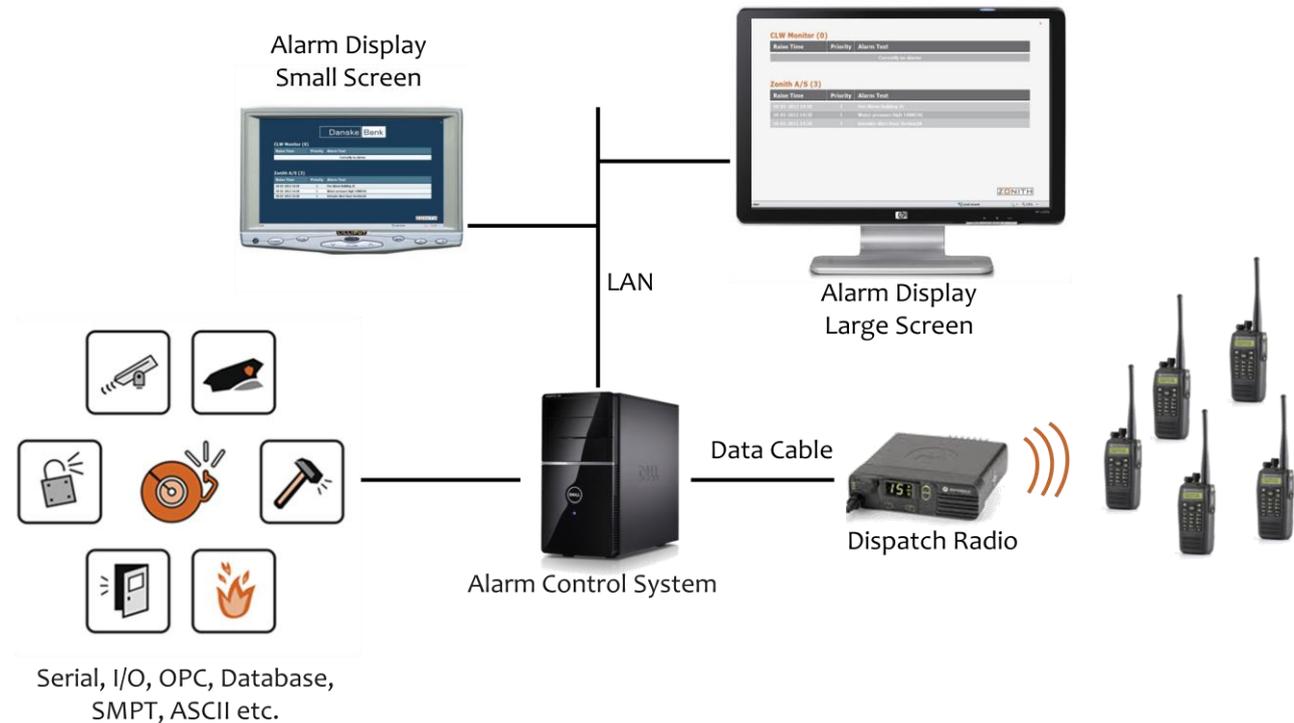
The Email Alarm Listener is delivered with a graphical user interface for setting up the alarm information correctly. Alarm Dispatch Media

## 2.4. Dispatch Medias

The Alarm Control System can dispatch the alarms to a large number of different medias, like digital handheld radios or small or large displays.

### 2.4.1. Alarm Display Media

The Alarm Displays is basically a software client running on a Windows PC. The Alarm Display software can freely be configured to show alarms on any size of screen, in any colour combination and in any alarm prioritisation the user need. The only requirement for the Alarm Display is that there should be a LAN connection between the Alarm Control System and the Windows PC running the Alarm Display Client. Many Alarm Displays can run at the same time and showing different alarm information, i.e. telecom alarms on one Alarm Display and production alarms on another Alarm Display.



### **2.4.2. TETRA Dispatch Media**

The TETRA Dispatch Media can send SDS text messages to the TETRA radios in the network. The SDS text messages contain the alarm information originating from the telecom or SCADA systems. The TETRA Dispatch Media also receives SDS alarm acknowledges from the TETRA radios.

It is required that a TETRA Mobile radio is connected to the PC via serial RS232.

### **2.4.3. Relay Output Media**

This Relay Media enables the activation of relay outputs as a result of an alarm. It is used for. It can activate lights and sirens to warn on-site personnel of danger. The relays in the Relay Media can be deactivated by a TETRA radio user by acknowledging alarms. The Relay Media consist of software and a hardware unit containing 4 relays.