



1. Introduction

We are reliable partners for the rapid development and distribution of services and products in the field of Thermo Technology. We bring German engineering to life with our reliable and efficient products. The electronic control unit, AF200 with fire alarm display, is firedelect's own innovative solution. Making its world debut at Busworld 2015, this newly developed system was nominated for an "Innovation Award", launching firedelect as a pioneering think-tank, bringing experience and efficient solutions to Technology Management in the field of Thermo Technology.

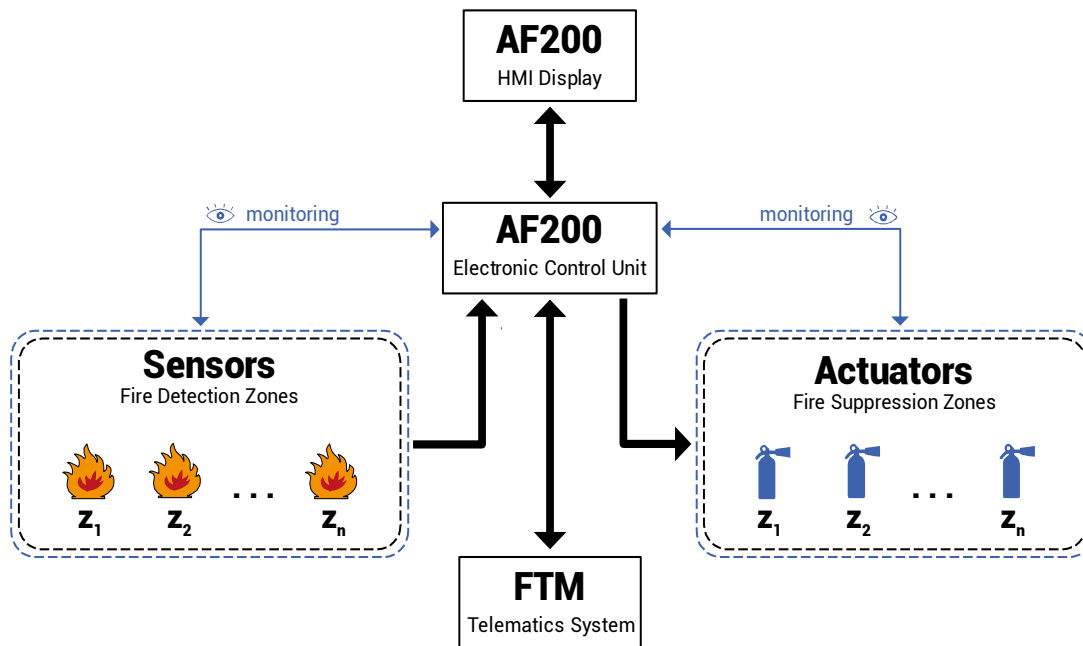


Figure 1: Modular System Design

Our control unit and regulatory electronics are part of a modular system, designed for fire detection and suppression in vehicles. Each component can be selected and each system tailored specifically to suit individual needs. The firedelect telematics module (FTM 100) allows an automatic notification of the operation headquarters and/or emergency services in case of an alarm in the vehicle, **reducing the response time to a minimum.**

2. Overview Example Wiring

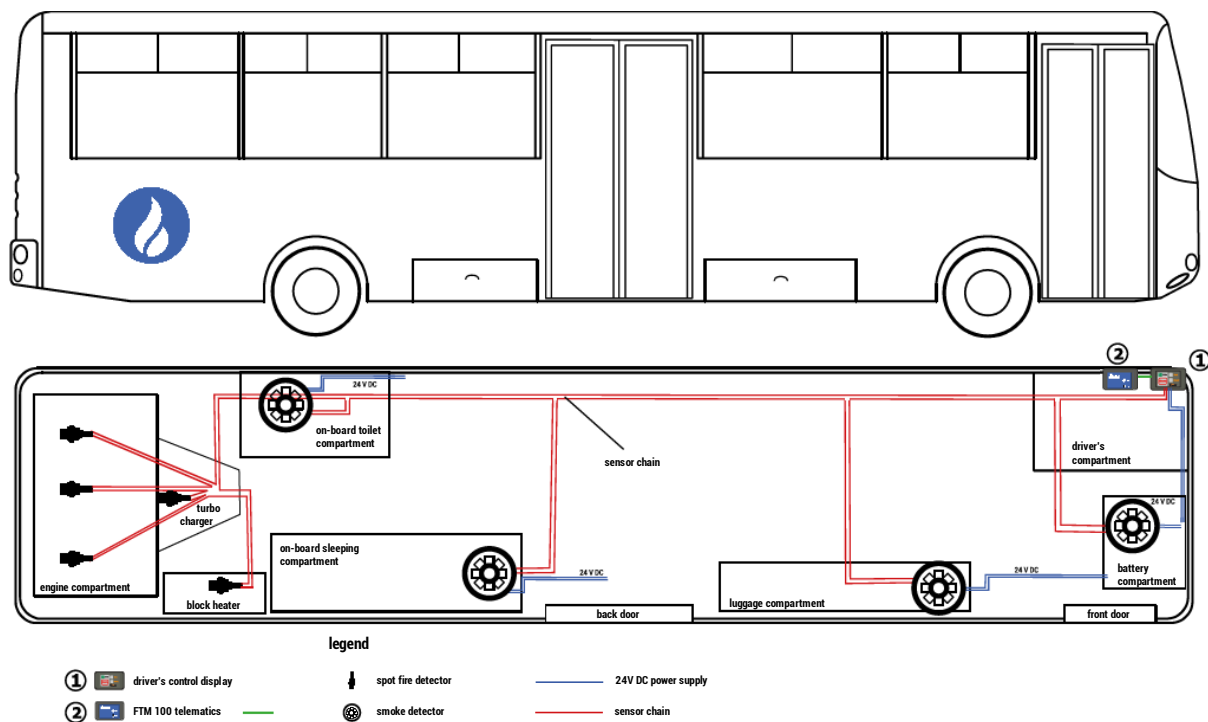


Figure 2: System Wiring Principle

3. FTM 100

The FTM 100 is connected to the Fire Control Unit (e.g. AF200) and continuously monitors the GPS location and GSM network strength, allowing for a quick reaction time in case of an alarm. The system is compatible with all cell phone frequency bands and can quickly obtain the location of the vehicle using different Global Navigation Satellite Systems (e.g. GPS and GLONASS).

If a fire is detected, the Fire Control Unit (e.g. AF200) sends an alarm signal to the FTM, where the position is determined and a message with the alarm type, time, and location is sent to the predefined emergency number(s) using the short messaging service (SMS). For easy location, a Google maps hyper-link, which can immediately display the location, can be incorporated into the alarm message. Optionally, the alarm can also be sent through the TCP/IP network of the cell phone provider, providing additional information about the alarm situation.

Additional information, i.e. engine type (diesel, gas, electric), can be included, allowing emergency services to respond accordingly. If the immediate location cannot be determined, i.e. no GPS/GNSS location is available, the last known timestamp and location will be sent. The system verifies that it is able to receive a cellular signal and will continue to reconnect and resend the message, if necessary.

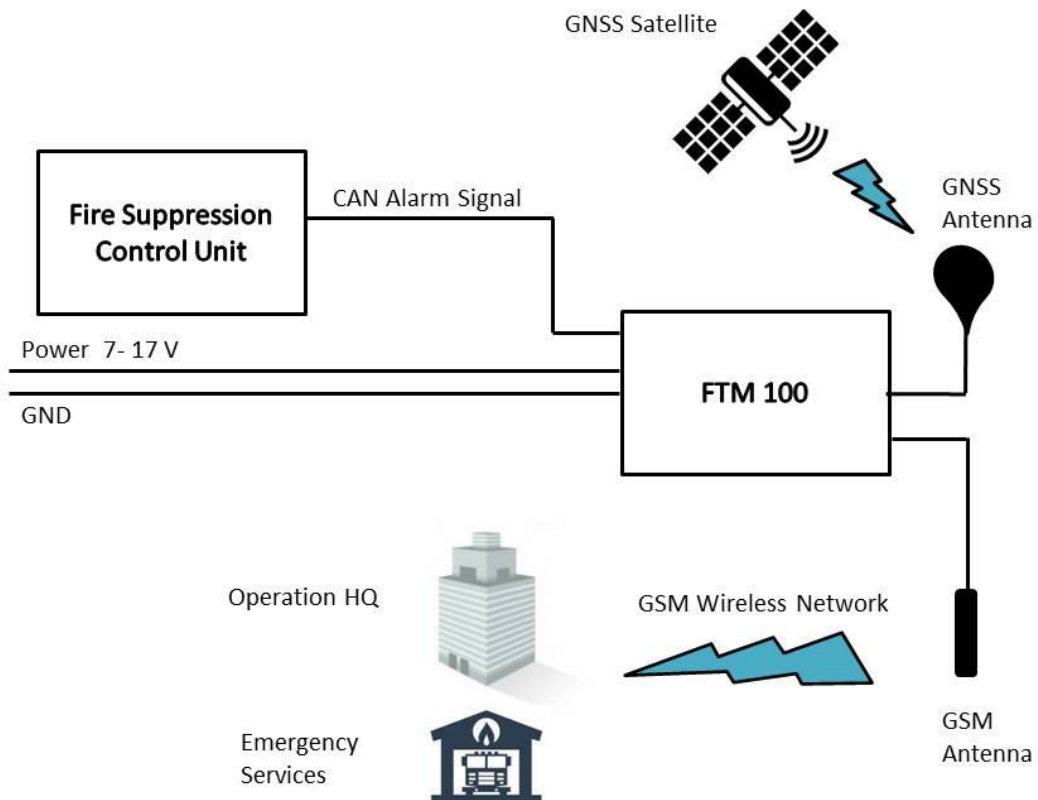


Figure 3: Telematics Diagram

4. Technical Data Overview

Since the current FTM 100 is in a prototype phase, the exact operational information is not yet available. The number of inputs and outputs (digital/analog) is not yet finalized and can be adjusted according to customer specifications.

Accompanying the CAN bus, additional channels of communication, e.g. I2C, I2S, UART, SPI, can be implemented, allowing for monitoring of operational systems, e.g.:

- engine temperatures
- fuel levels
- exhaust systems
- tire pressures
- automatic/manual alarms.

4.1 Technical information

- Operating Voltage Range: 7 - 17V DC
- Operational Temperature: -25 °C to 50 °C
- UMTS/CDMA cellular network compatibility
- Mini SIM Card holder
- TCP/IP possibility for continuous monitoring of location and system parameters.
- GPS/GNSS enabled for fast position determination
- ARM Processor with 512KB Flash Memory and 64KB RAM for customized functions
- Compliant with directive 1999/5/EC and 2011/65/EU
- EMC certified: EN 301 489-1, EN 301 489-7, EN 301 489-24
- Radio spectrum efficiency certified: EN 301 511, EN 301 908-1, EN 301 908-2

4.2 Connectors

The number and type of connectors is not yet finalized and can be partially customized to specific needs. The following connectors will exist in every version of the FTM:

- A power supply connector for the operational voltage
- SuperSeal housing type Tab to be connected to the vehicle power supply
- CAN Bus Connector
- Communication for the Alarm messages from the Fire suppression control unit (e.g. AF200)
- GSM Antenna
- External GSM Antenna for the mobile network, should not be within the dashboard
- GNSS Antenna:
External GNSS Antenna for position determination. For best performance the antenna should be mounted on the driver windshield



Figure 4: External GPS Antenna



Figure 5: External GSM Antenna

firedelect's highly experienced software engineers can address your specific needs and develop custom concepts and software solutions.

firedect Gmb

Leibnizstr. 4
72202 Nagold
Germany

T +49 7052 816 130 - 0
F +49 7052 816 130 - 9
E info@firedect.com
W www.firedect.com