

# RESCUE

.....where GPS is unavailable

## Localization, Tracking and Mapping in areas without GPS

RESCUE is a system for location and tracking of pedestrians based on the processing of raw inertial data. It has been developed for environments where the GPS signal is unreliable or absent (inside buildings, underground areas, GPS-denied environments).

### Campidoglio's Square – Rome – Italy



### SUPPORTED CONFIGURATION

#### Real-time Configuration (for Localization and Tracking)

The Real-time configuration has been developed to allow real-time acquisition, localization, display and tracking of several operators, each wearing a RESCUE system.

Position data are dispatched to a Controlling Center remote from the mission area. In this configuration a Wi-Fi (or GSM or UMTS) connection or a dedicated Radio-Modem (not provided as a part of the system) must be available.

#### Off-Line Mode (for Mapping)

The Off-line configuration has been foreseen for mapping in areas when GPS signal is unreliable or absent (building interiors, underground areas, tunnels).

Position data are acquired and recorded on the Computing Unit and they can be downloaded, displayed and integrated at the Controlling Center at the end of the mission.

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## Easy, light and flexible

Due to the small size and weight RESCUE is smoothly wearable and it can be used both in real-time mode and in off-line mode according to the Customer needs.

The system includes an **Inertial Sensing Unit** to be fixed inside or outside a shoe heel, providing raw data to a **Computing Unit** for processing and a **MMI SW** used to acquire, integrate and display the path walked by the operator wearing RESCUE.

### SOLUTIONS

- Wi-Fi solutions
- Radio-Modem solutions
- Off-Line configuration

### APPLICATIONS

- Real-time localization and tracking of operators in dangerous areas
- Mapping of inside buildings and/or underground areas
- Pedestrian Position Monitoring

### SERVICES

- Integration Support
- Customized solutions
- Optional devices selection and realization on Customer request

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#### DUNE s.r.l.

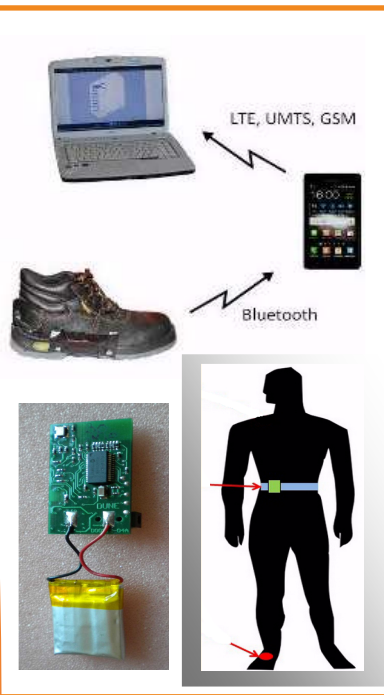
Via Britannia, 54  
00183 Rome - Italy  
Tel. +39-06-77203350  
Fax +39-06- 97605807  
[info@dune-sistemi.com](mailto:info@dune-sistemi.com)  
[www.dune-sistemi.com](http://www.dune-sistemi.com)

## RESCUE Components

**Sensing Unit:** it is the inertial unit measuring angular velocity and acceleration (raw data). It can be placed outside or inside a shoe heel.

**Computing Unit:** it is a SAMSUNG Galaxy S2 Smart Phone equipped with a SW application allowing raw data acquisition from Sensing Unit, processing and dispatching (Real-Time Mode) or recording (Off-Line Mode).

**Controlling Center MMI:** it is a SW application used to acquire, display and integrate processed position data either in Real-Time or Off-Line Mode. It can be installed on any PC/notebook/laptop located remotely from the operation area.



### SPECIFICATIONS

HW Components		Dimensions	Weight	Electrical	Notes
Sensing Unit	Inertial sensor	50 x 30 x 25 mm	20 g	3.7 V	
	Charger device	16 x 60 x 10 mm	10 g	5 V	USB input
Computing Unit	Main Unit				SAMSUNG Galaxy S2

SW Components	Running device	O.S.	Physical Media	Constraints
Computing Unit SW	SAMSUNG Galaxy S2	Android ICS 3.0.4	Pre-installed on Computing Unit	
Controlling Center MMI	PC/notebook/laptop	Windows XP/7	Installation CD	Public IP address must be available

Optional Components	Real-Time Configuration with Radio-Modem Unit
Radio-Modem (TX and RX Units)	The Radio Modem device is not provided as a part of the system. It should be selected according to the characteristics of the areas where the RESCUE system has to be used.
Radio-Modem (Power Supply Unit)	The selection depends on the selected Radio-Modem device
Serial-to-Bluetooth device	A serial-to-Bluetooth interface is needed if the Radio Modem device has just a serial I/O
Serial-to-USB cable and drivers	Cable interface serial to USB I/O is needed if the Radio Modem device has just a serial I/O. Any commercial cable can be used

### SERVICES

#### Customization

HW solutions to integrate additional sensors (meters for cardiac pulse, pressure, temperature).

Magnetic charge for Sensing Unit when placed on a shoe heel.

SW solutions to display inertial position data upon existing maps and to integrate them with GPS signal (when available).



#### Integration

Support on selection and integration a suitable Radio-Modem device according to Customer needs (if Radio-Modem configuration is adopted).

#### Optional devices (Radio-Modem configuration)

HW solutions to integrate a Power Supply Unit and a serial-to-Bluetooth device according to the Radio-Modem selected by the Customer.



RESCUE COMPONENTS

Sensing Unit

Computing Unit

Controlling Center SW

OPTIONAL COMPONENTS

Radio-Modem

Serial-to-Bluetooth interface

Serial-to-USB cable