

## Annex 1

UnderSafe web page [www.undersafe.eu](http://www.undersafe.eu)

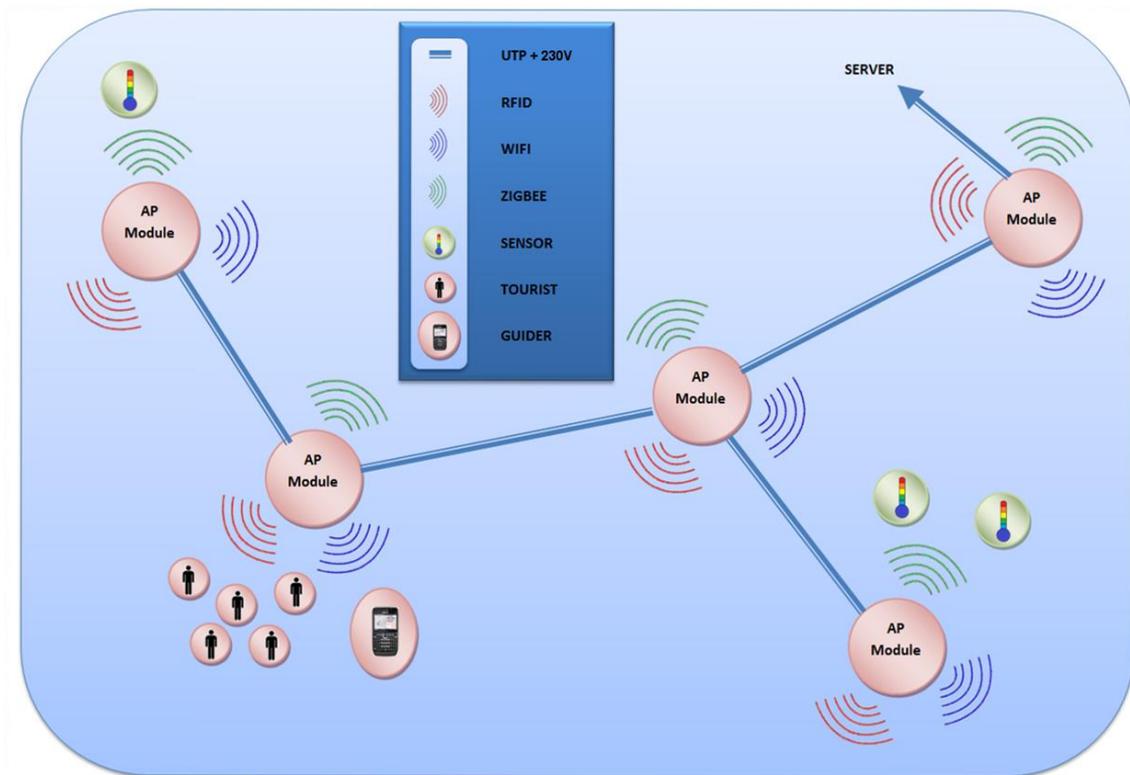
### Undersafe videos:

<http://www.youtube.com/watch?v=2tkAPiSD1eM>

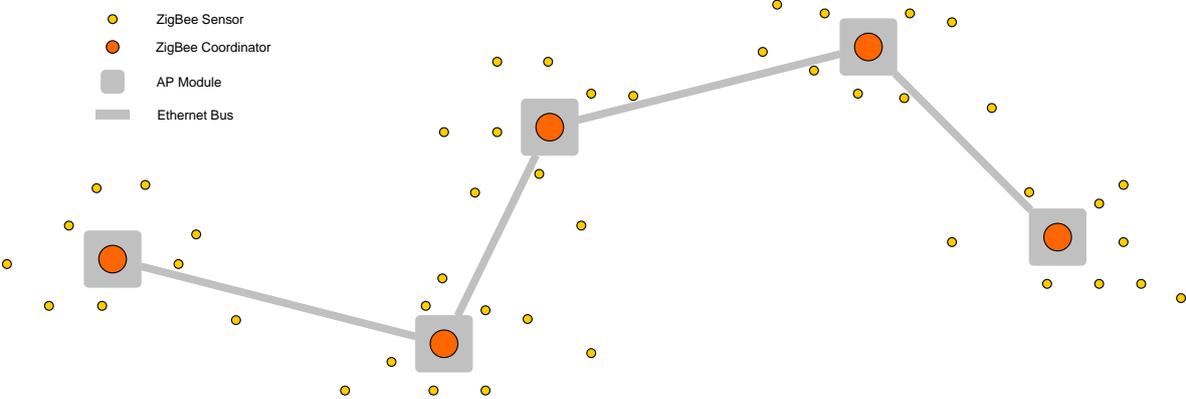
<http://www.youtube.com/watch?v=DEjJ-RZ8pSI>

### Figures and tables.

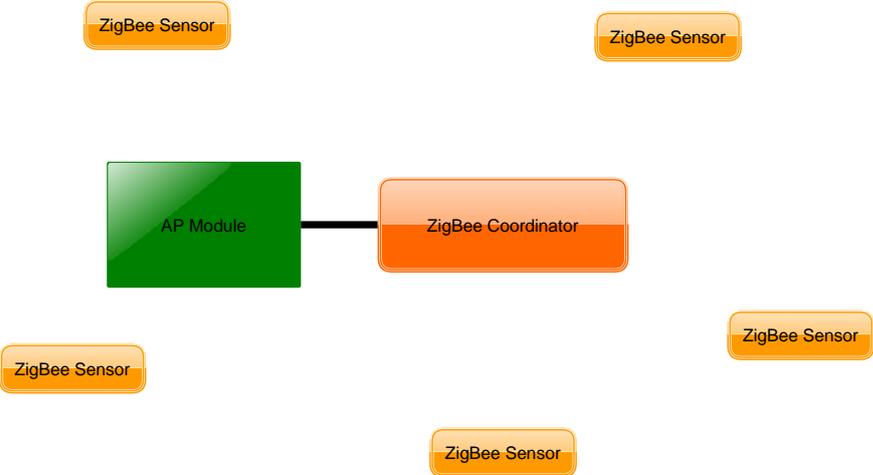
Figure 1 The system topology



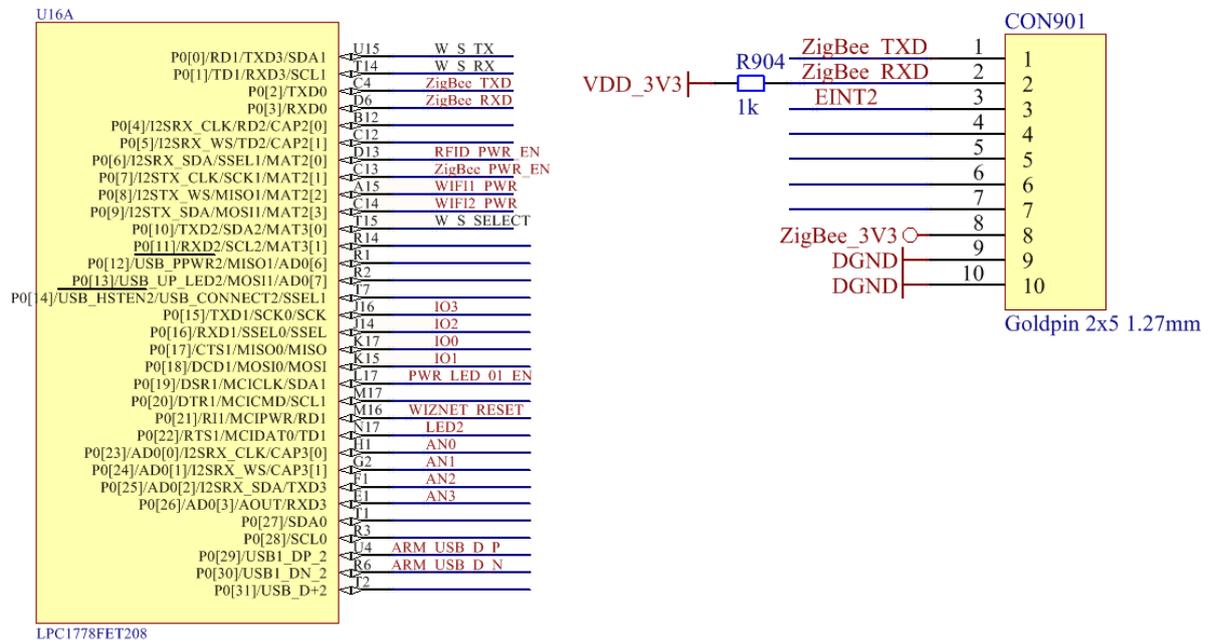
**Figure 2: Overall place of ZigBee sensor system in the project**



**Figure 3: Block diagram of the sensor system**



**Figure 4: ZigBee part on the AP Module board**



**Fig. 5: Location system principle**

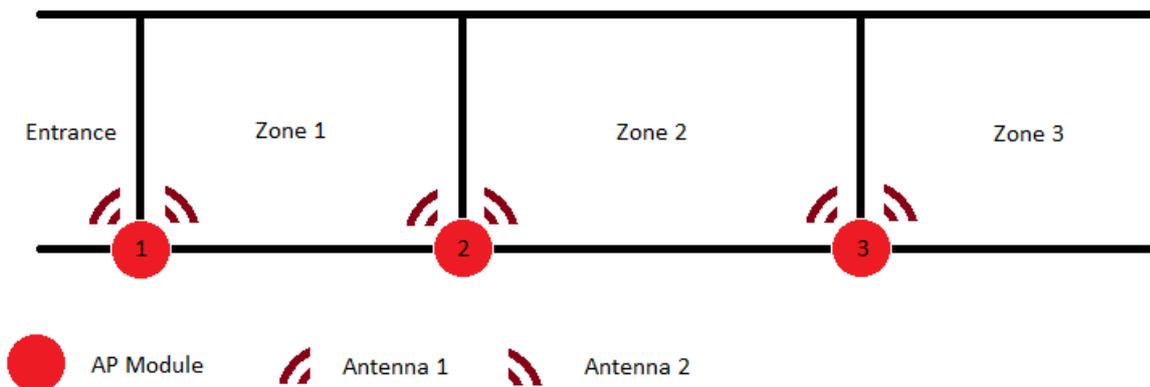
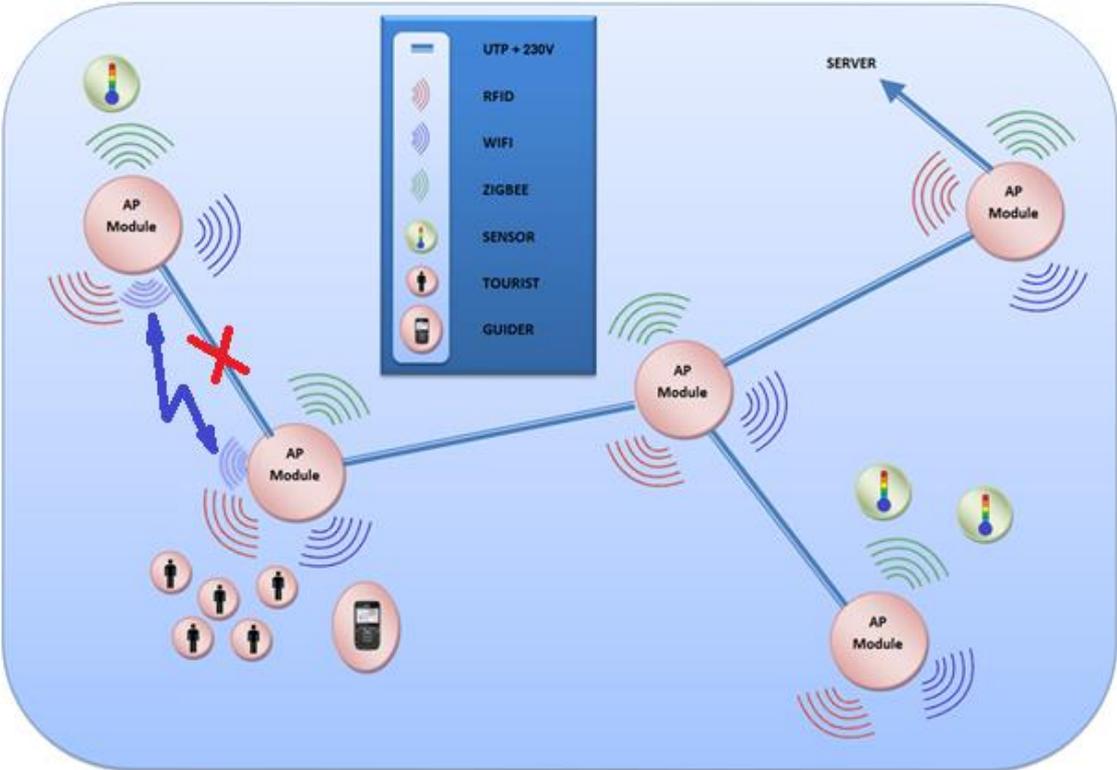


Fig. 6: Calculation of the number of persons within a zone.



Figure 7 - emergency WiFi connection



**Figure 8 - sensor scheme**

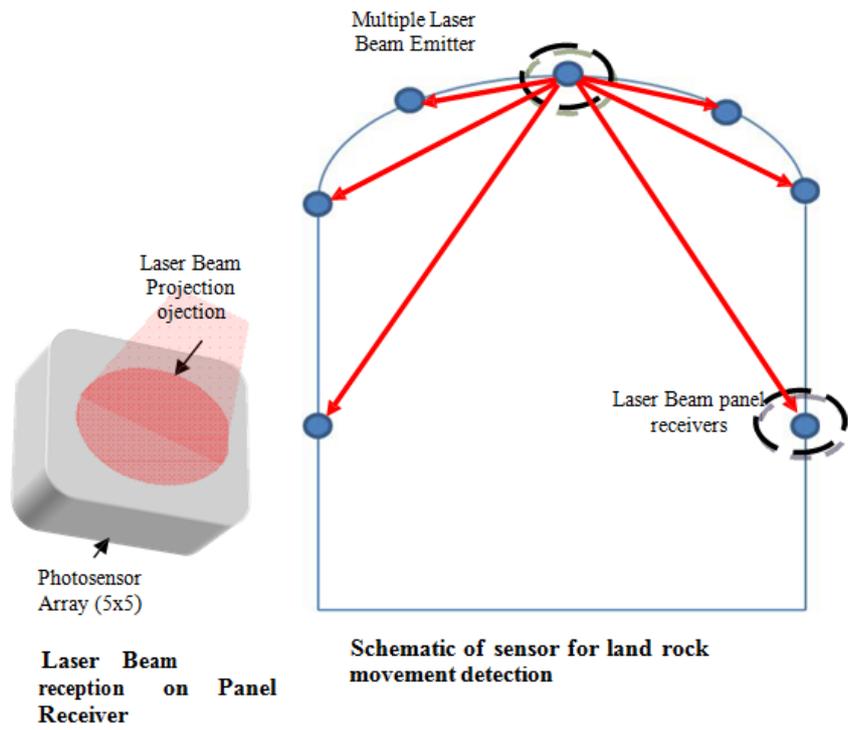
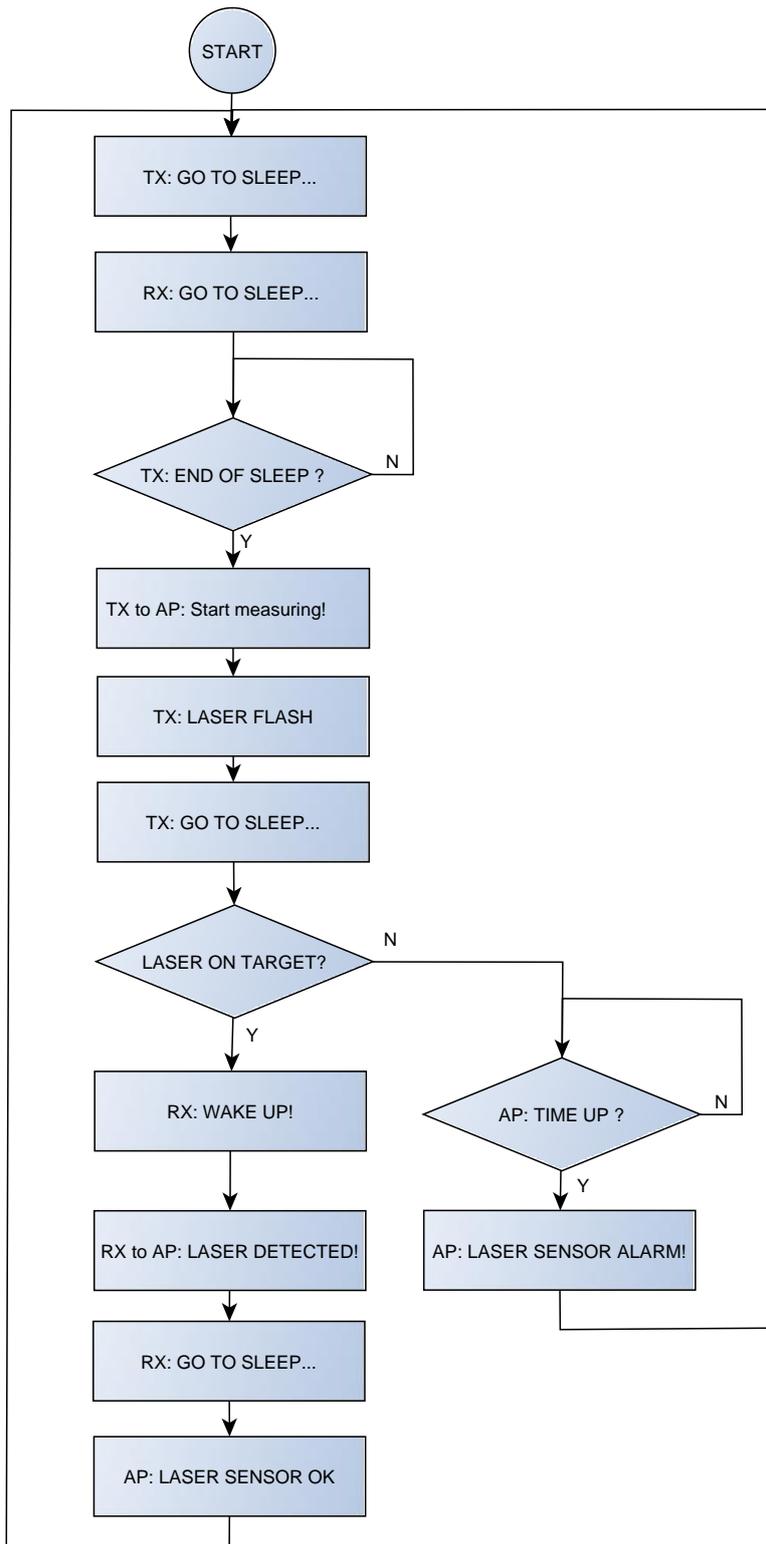
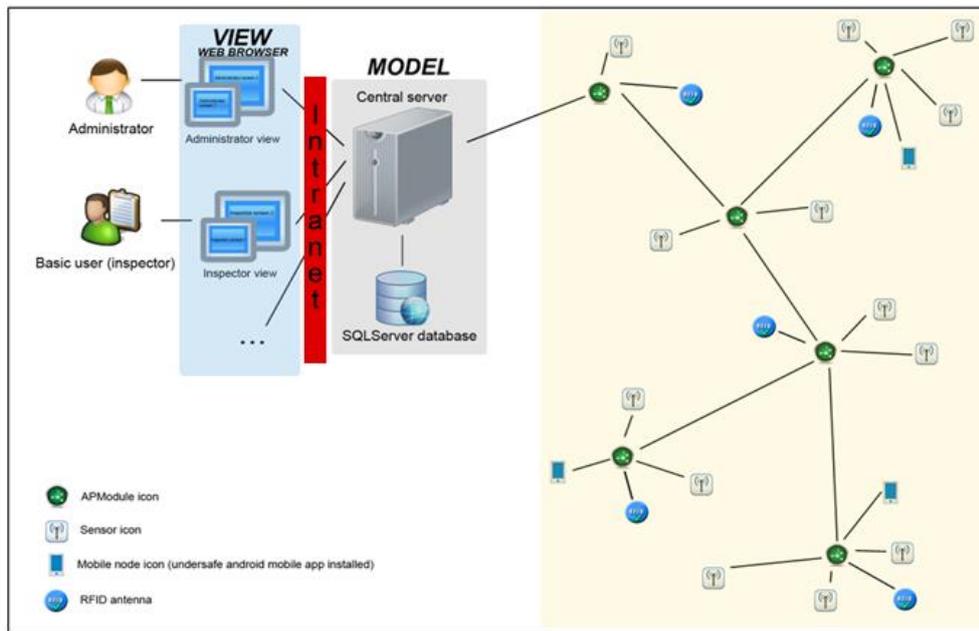


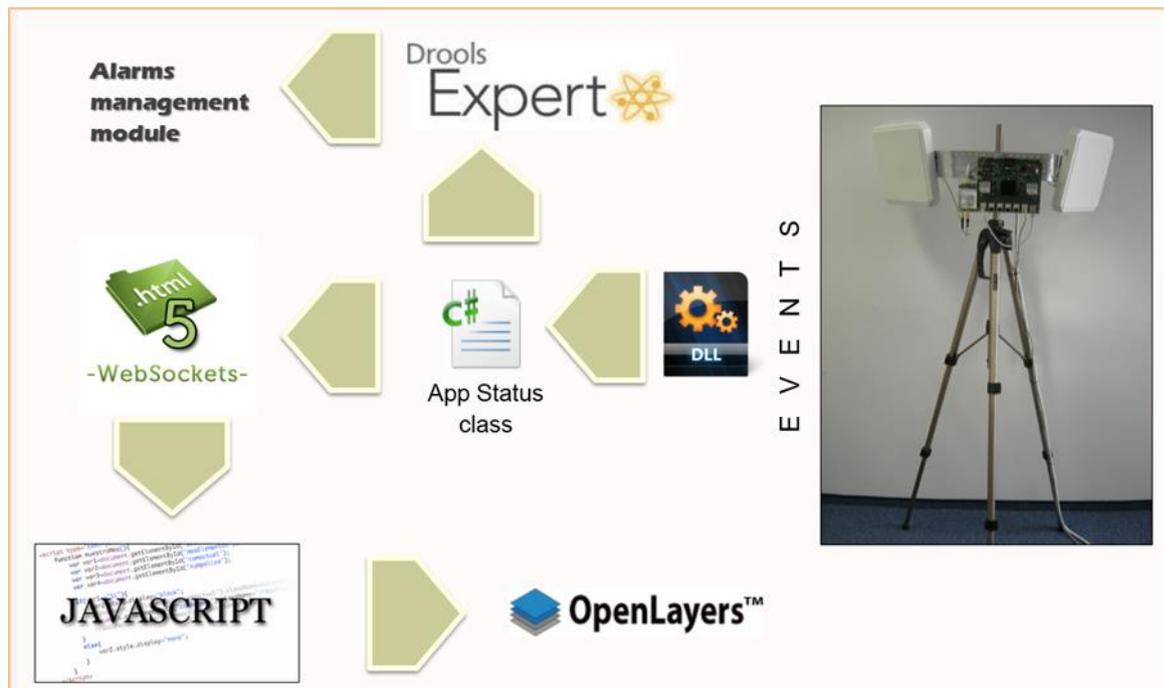
Figure 9 - flow chart



**Fig. 10: Final architecture of the UnderSafe system.**



**Fig. 11: Processing path of the AP modules data.**



**Table 1**

Variable	Name	Comments
<b>Temperature.</b>	TEMP	Current temperature.
<b>Relative humidity.</b>	RHUM	Current relative humidity.
<b>Water level.</b>	WATR	Control of the water level in lakes and rivers.
<b>Light sensor.</b>	LIGH	Current light level.
<b>Noise level.</b>	NOIS	Current noise level.
<b>CO2 level.</b>	CO2	Current CO <sub>2</sub> level.
<b>CO level.</b>	CO	Current CO level.
<b>SH2 level.</b>	SH2	Current SH <sub>2</sub> level.
<b>CH4 detected.</b>	CH4	Presence of CH <sub>4</sub> detected.
<b>Smoke detected.</b>	SMKE	Presence of smoke detected.
<b>Rock falling detected.</b>	ROCK	Detection of a fallen rock.
<b>Landslide detected.</b>	LDSO	Detection of a landslide.

**Table 2**

Keyword	Initial	Value	Usage
<b>NAME</b>	N	Provides the name for the rule generated from that row. The default is constructed from the text following the RuleTable tag and the row number.	At most one column.
<b>DESCRIPTION</b>	I	A text, resulting in a comment within the generated rule.	At most one column.
<b>CONDITION</b>	C	Code snippet and interpolated values for constructing a constraint within a pattern in a condition.	At least one per rule table.
<b>ACTION</b>	A	Code snippet and interpolated values for constructing an action for the consequence of the rule.	At least one per rule table.
<b>METADATA</b>	@	Code snippet and interpolated values for constructing a metadata entry for the rule.	Optional, any number of columns.

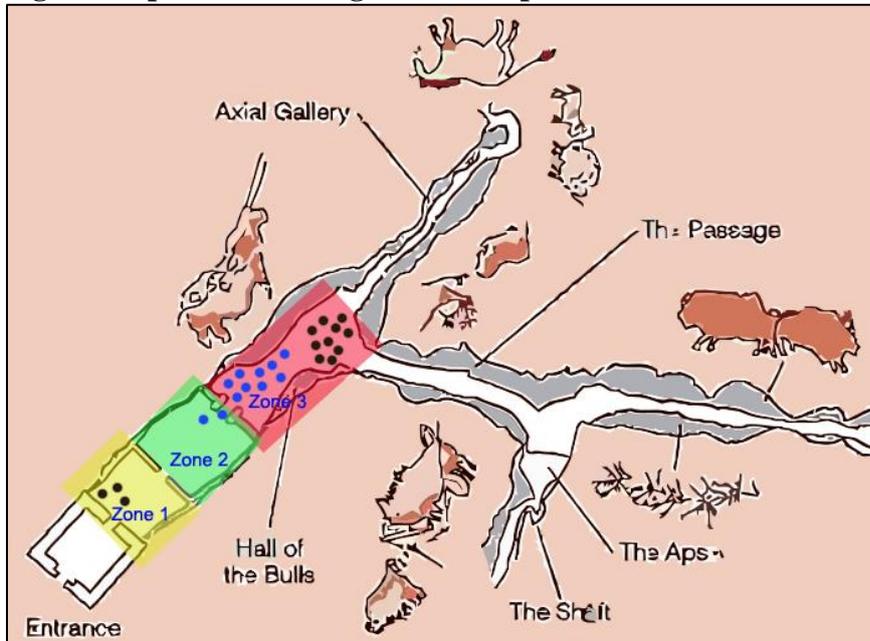
**Table 3**

Name	Type	Parameters	Usage
<b>Code</b>	CONDITION	String	Code of the zone affected by this rule.
<b>Minimum temperature</b>	CONDITION	Number	Activated when temperature is below the given parameter.
<b>Maximum temperature</b>	CONDITION	Number	Activated when temperature is above

			the given parameter.
<b>Minimum relative humidity</b>	CONDITION	Number	Activated when relative humidity is below the given parameter.
<b>Maximum relative humidity</b>	CONDITION	Number	Activated when relative humidity is above the given parameter.
<b>Minimum water level</b>	CONDITION	Number	Activated when relative humidity is below the given parameter.
<b>Maximum water level</b>	CONDITION	Number	Activated when water level is above the given parameter.
<b>Rock falling detected</b>	CONDITION	Boolean	If selected, condition is activated when rock falling is detected.
<b>Landslide detected</b>	CONDITION	Boolean	If selected, condition is activated when landslide is detected.
<b>Minimum light</b>	CONDITION	Number	Activated when light level is below the given parameter.
<b>Smoke detected</b>	CONDITION	Boolean	If selected, condition is activated when smoke is detected.
<b>Maximum noise</b>	CONDITION	Number	Activated when noise level is above the given parameter.
<b>Maximum CO<sub>2</sub></b>	CONDITION	Number	Activated when CO <sub>2</sub> level is above the given parameter.
<b>Maximum CO</b>	CONDITION	Number	Activated when CO level is above the given parameter.
<b>Maximum SH<sub>2</sub></b>	CONDITION	Number	Activated when SH <sub>2</sub> level is above the given parameter.
<b>Minimum O<sub>2</sub></b>	CONDITION	Number	Activated when O <sub>2</sub> level is below the given parameter.
<b>CH<sub>4</sub> detected</b>	CONDITION	Boolean	If selected, condition is activated when CH <sub>4</sub> gas is detected.
<b>THEN CLAUSE (Type, Code,</b>	ACTION	{ Any Database alarm type such as Warning or Danger }, <Any DataBase alarm code such as	The result of the rule activation.

Description)		MIN_TEMP or MAX_TEMP>, <Additional text describing or clarifying this rule activation. It will be shown in the when all conditions got activated.>	
--------------	--	--	--

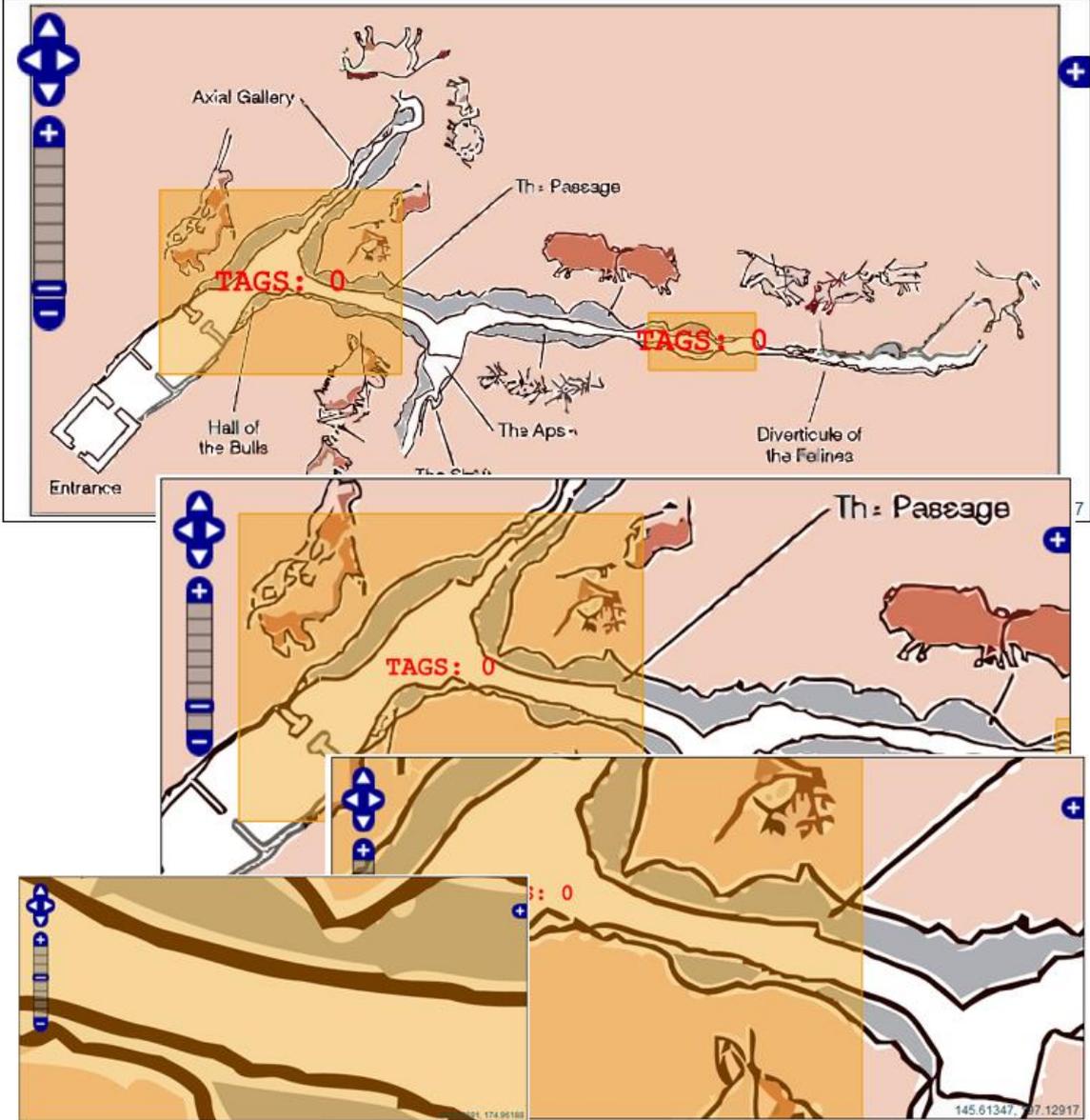
**Fig. 12: Separation from guider example situation.**



**Fig. 13: OpenLayers and UnderSafe technology, working together.**



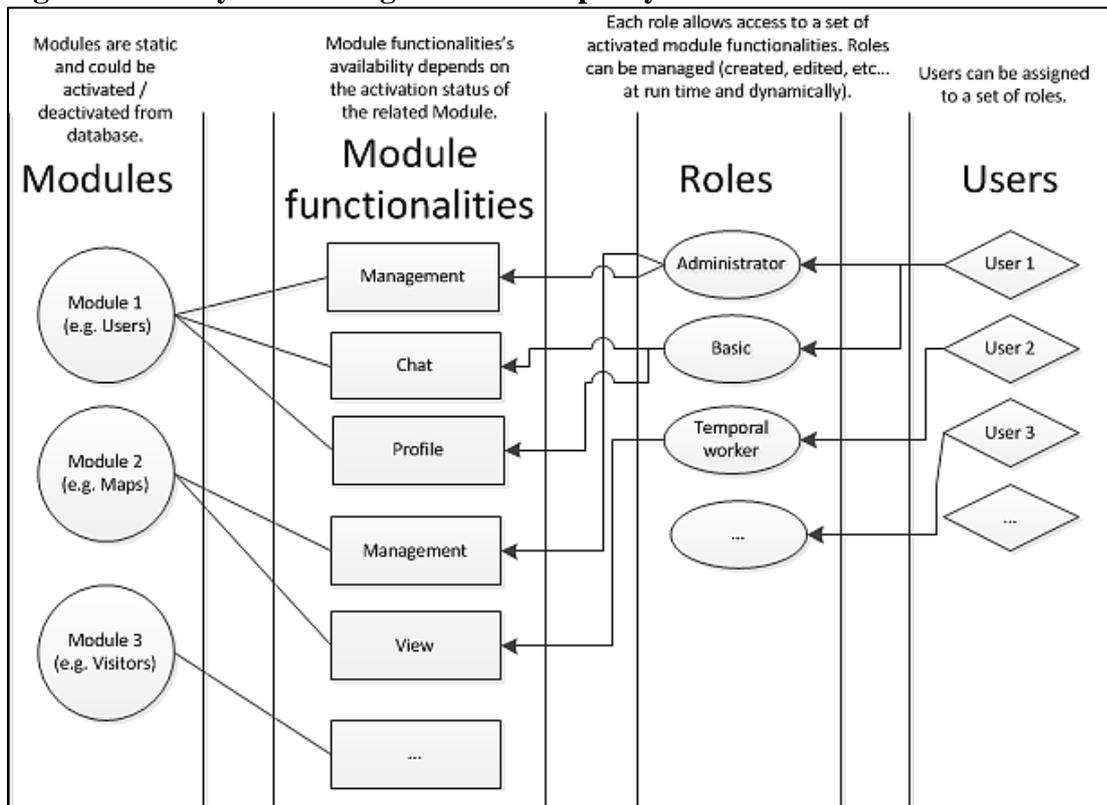
Fig. 14: SVG format and OpenLayers allow an interactive and powerful result where pixels cannot be noticed even with the maximum zoom level.



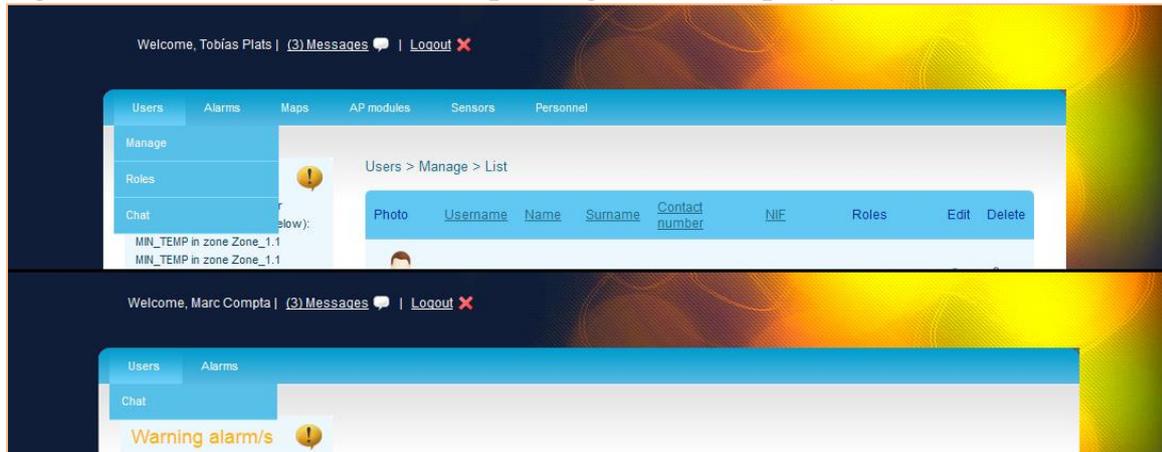
**Fig. 15: UnderSafe login screen.**



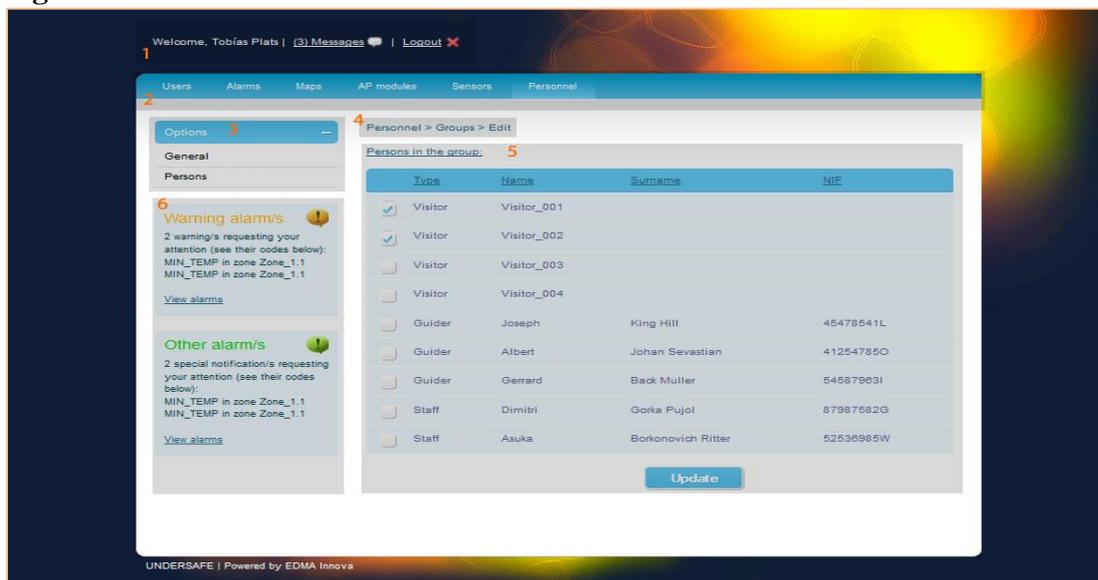
**Fig. 16: Four layers at charge of the roles policy.**



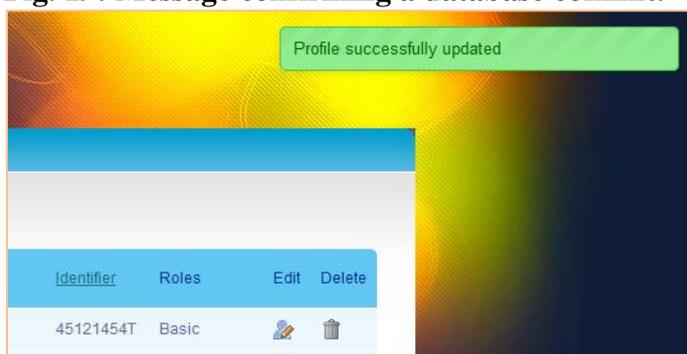
**Fig. 17: Available functionalities depending on the role policy.**



**Fig. 18: UnderSafe main interface schema.**



**Fig. 19: Message confirming a database commit.**



**Fig. 20: Profile screen.**

Users > Profile



Photo (upd):

Username:

Password:

Name:

Surname:

Contact number:

Identifier:

**Fig. 21: Users list view.**

Welcome, Tobias Plats | [3 Messages](#) | [Logout](#)

Users | Alarms | Maps | AP modules | Sensors | Personnel

Warning alarm/s   
2 warning/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1\_1  
MIN\_TEMP in zone Zone\_1\_1  
[View alarms](#)

Other alarm/s   
2 special notification/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1\_1  
MIN\_TEMP in zone Zone\_1\_1  
[View alarms](#)

Users > Manage > List

Photo	Username	Name	Surname	Contact number	MF	Roles	Edit	Delete
	MCompta	Marc	Compta	654878754	45121454T	Basic		
	RMartínez	Ramón	Martínez	222515248	95888451L	Administrator		
	TPlats	Tobías	Plats	441512145	48965213P	Administrator		
	KCoruño	Kike	Coruño	446989852	85469652U	Administrator		
	PPope	Pedro	Pope	123123456	4987562K	Administrator		

UNDERSAFE | Powered by EDMA Innova

Fig. 22: Users edit view.

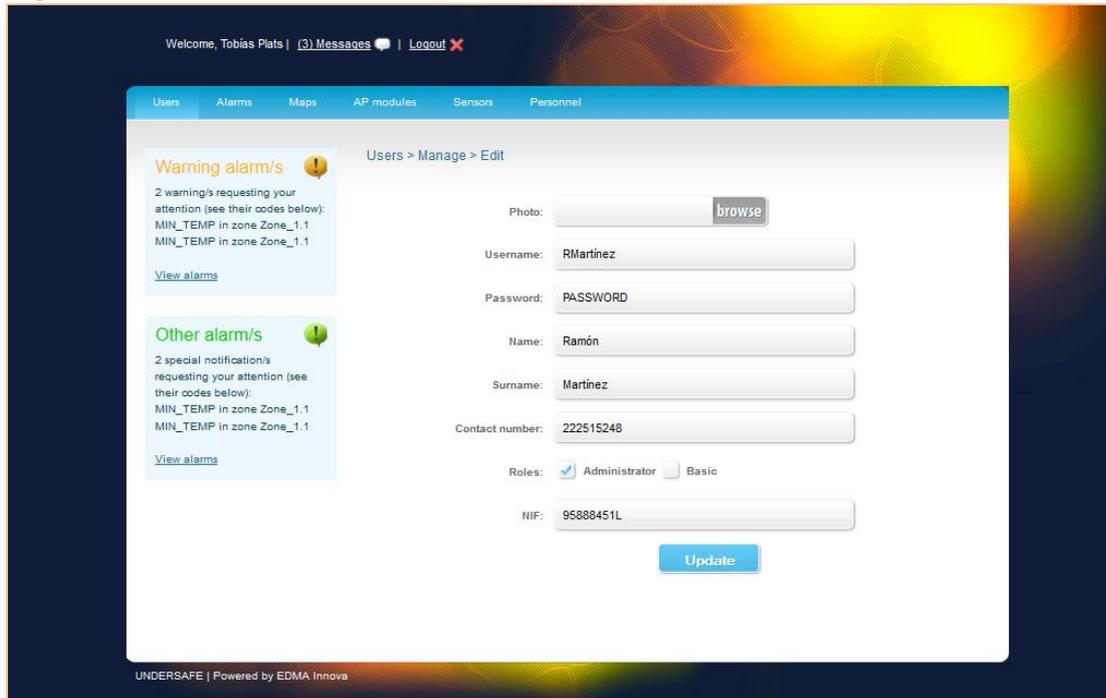
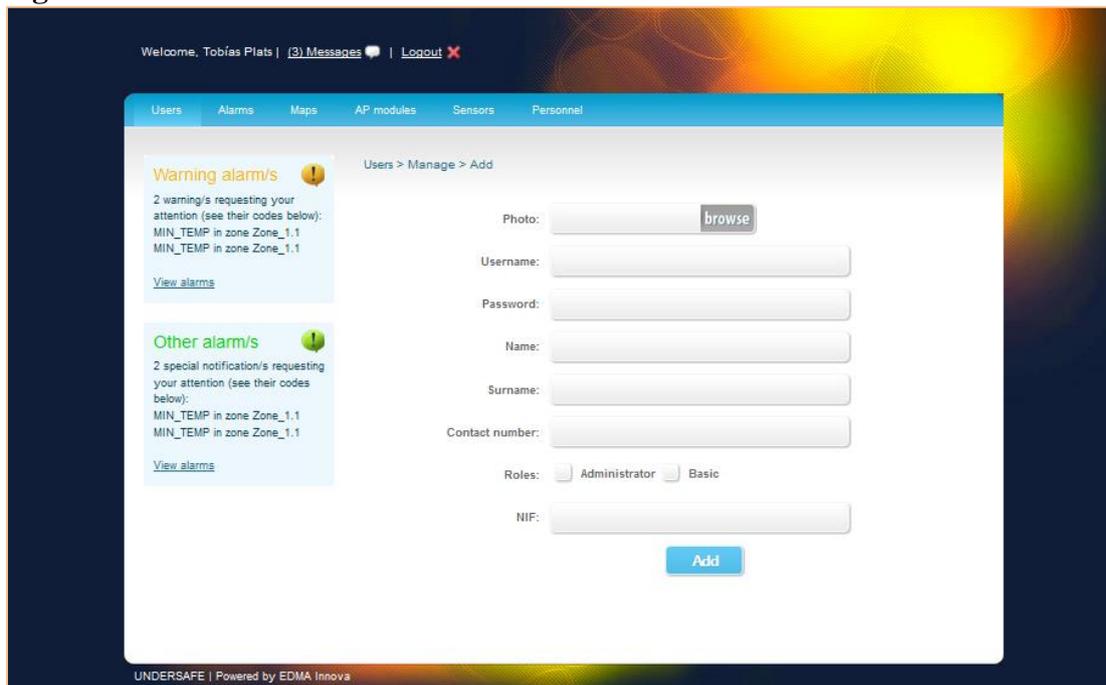


Fig. 23: Users add view.



**Fig. 24: Roles list view (up) and Roles edit view (bottom)**

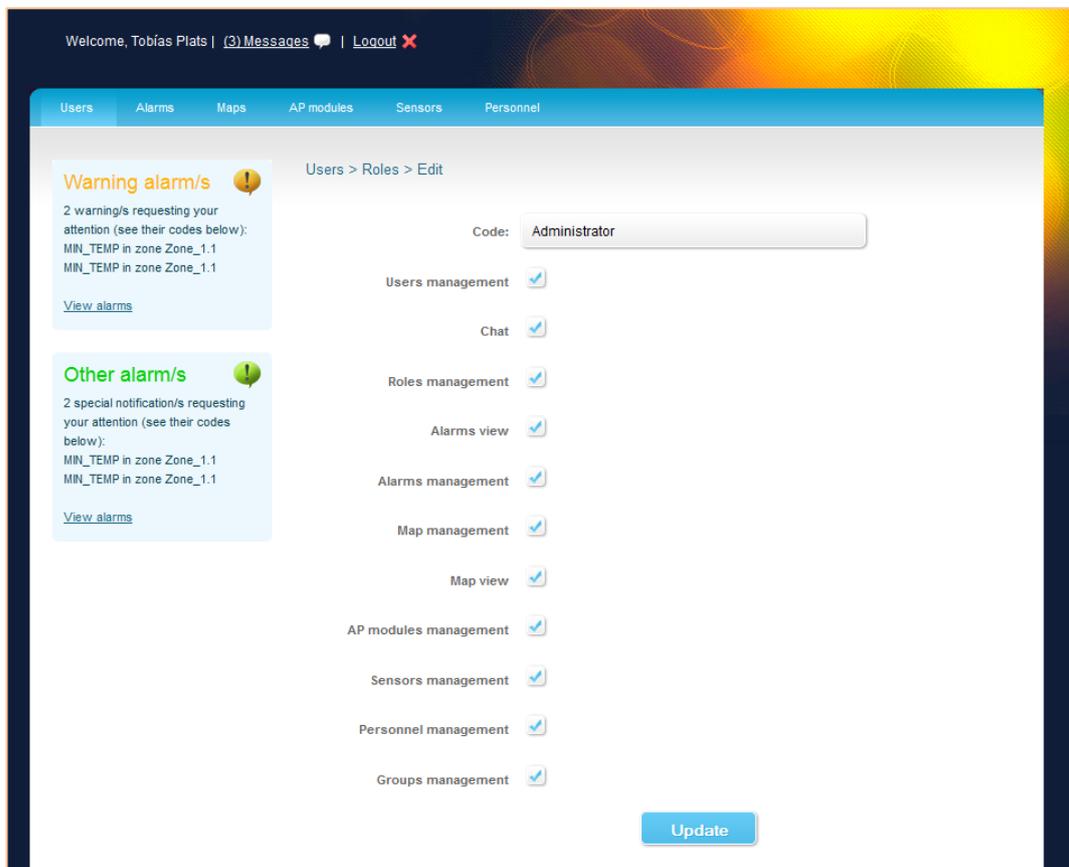
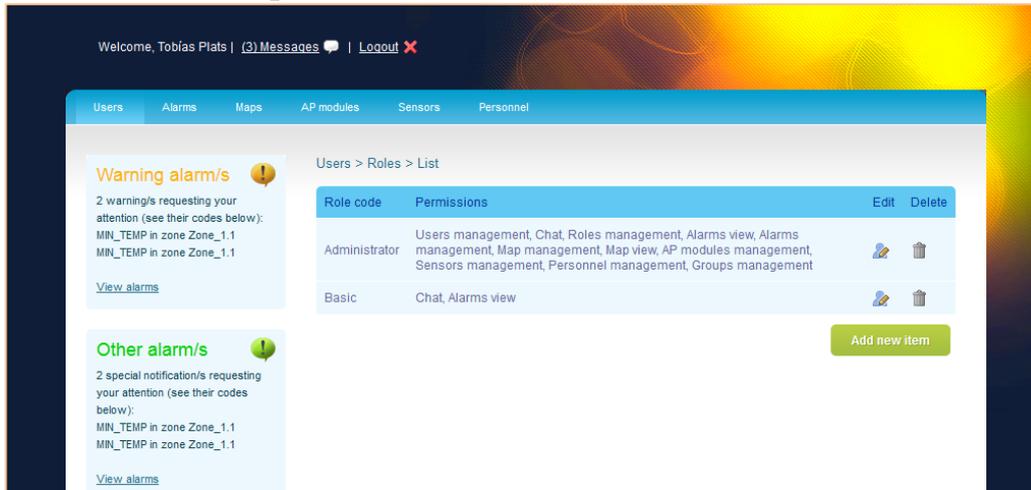


Fig. 25: Live chat.

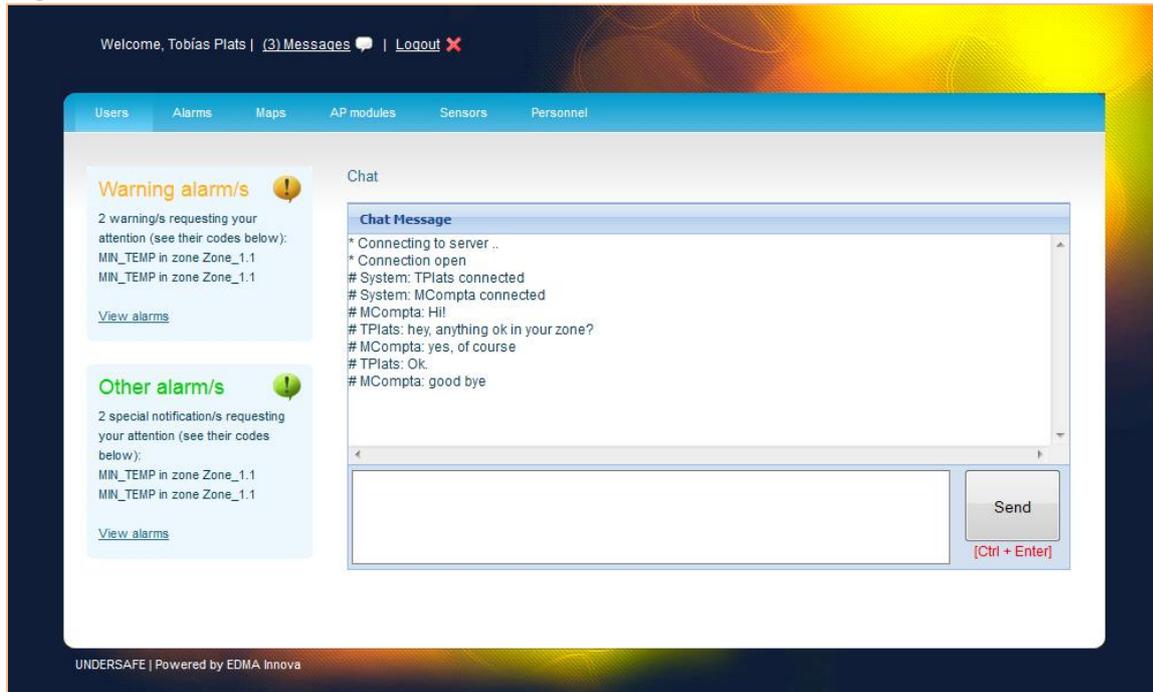
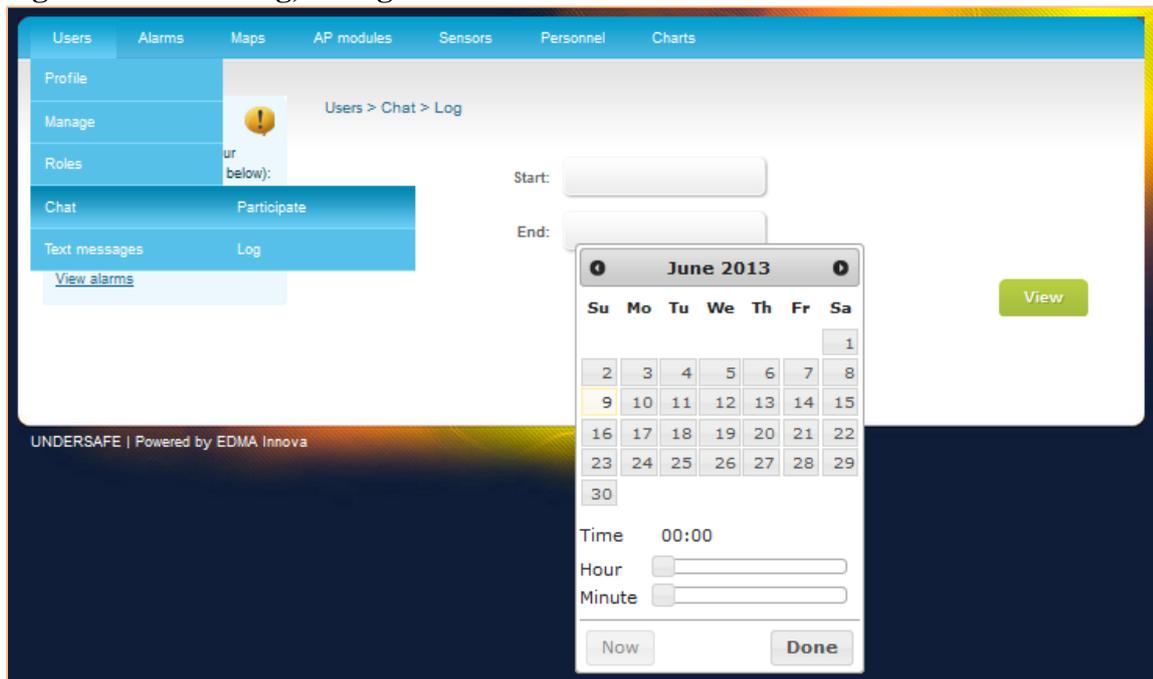
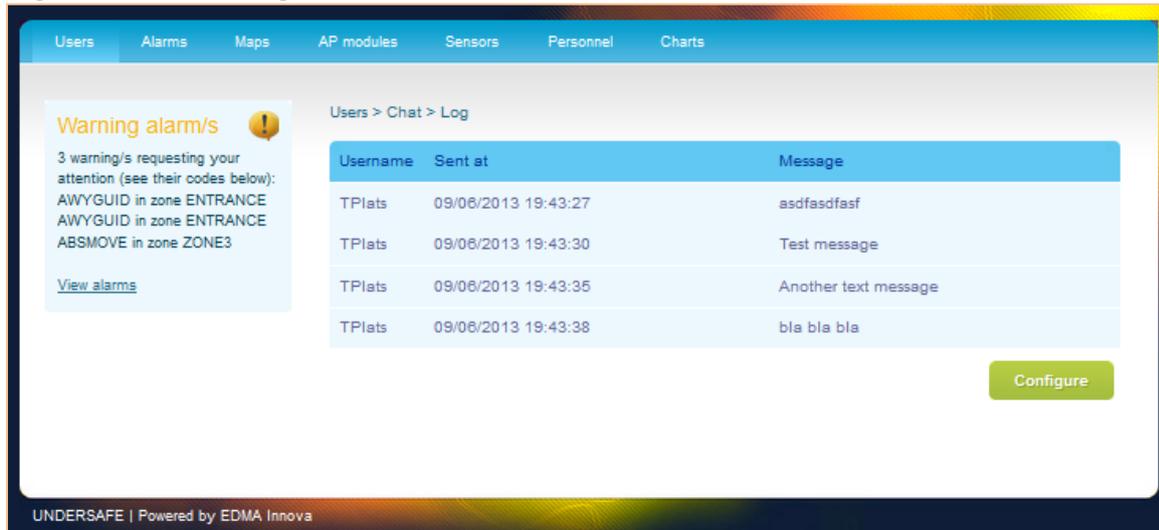


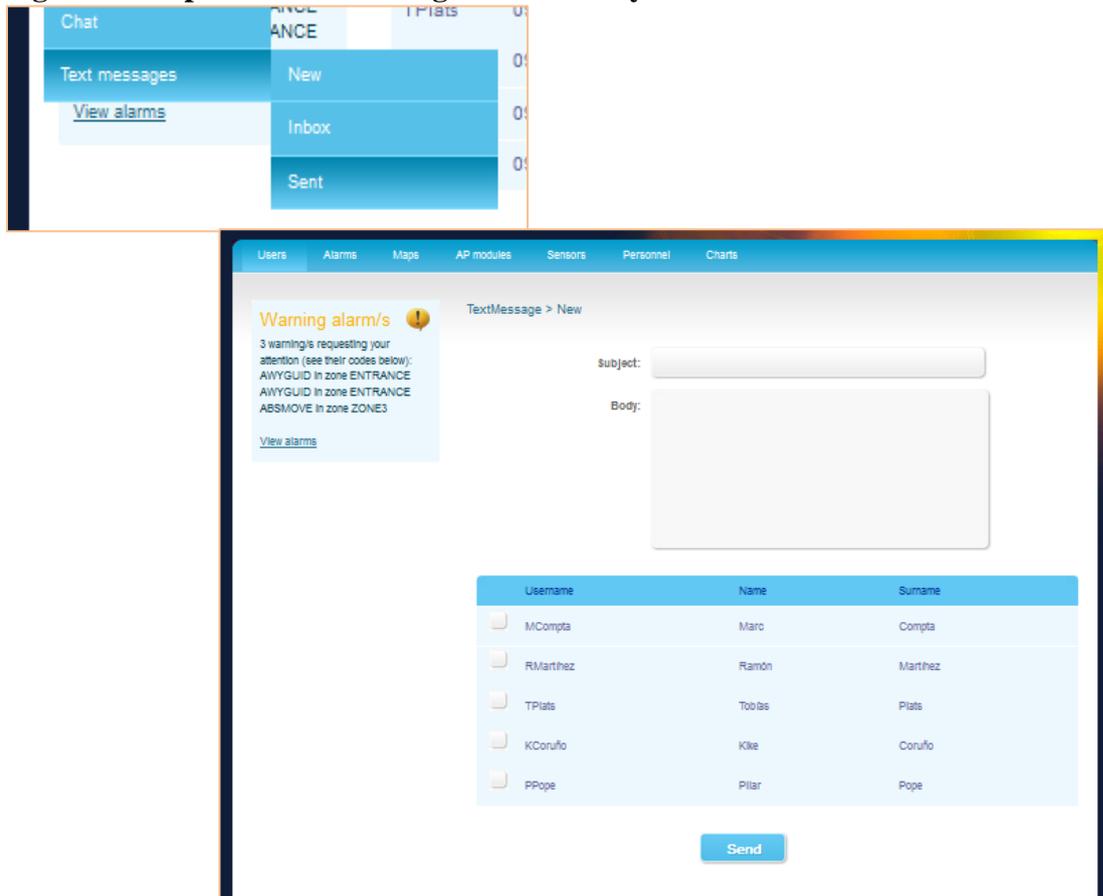
Fig. 26: Live chat log, configuration screen.



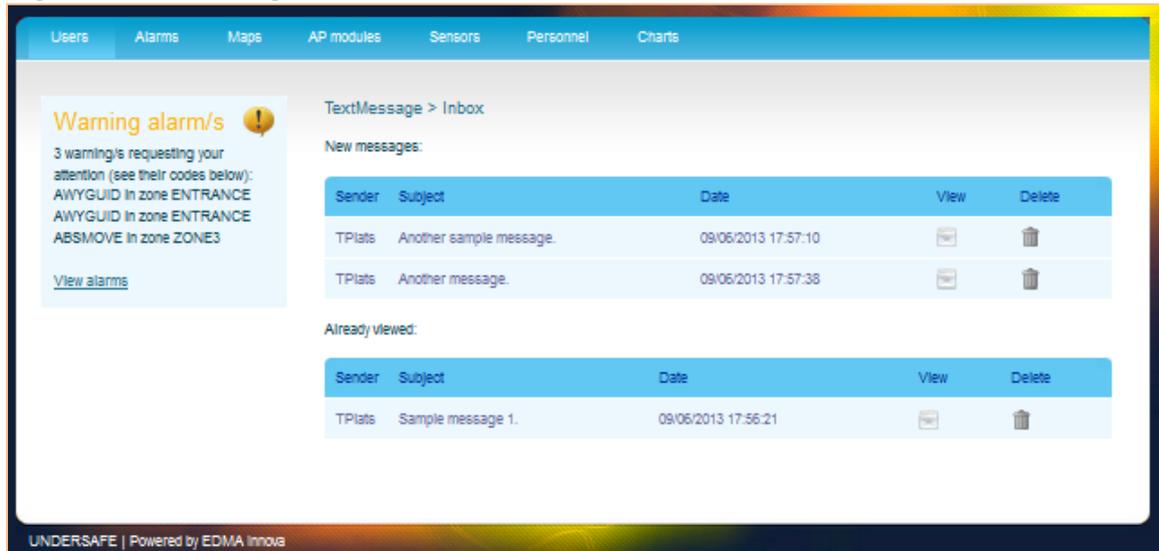
**Fig. 27: Live chat log, view screen.**



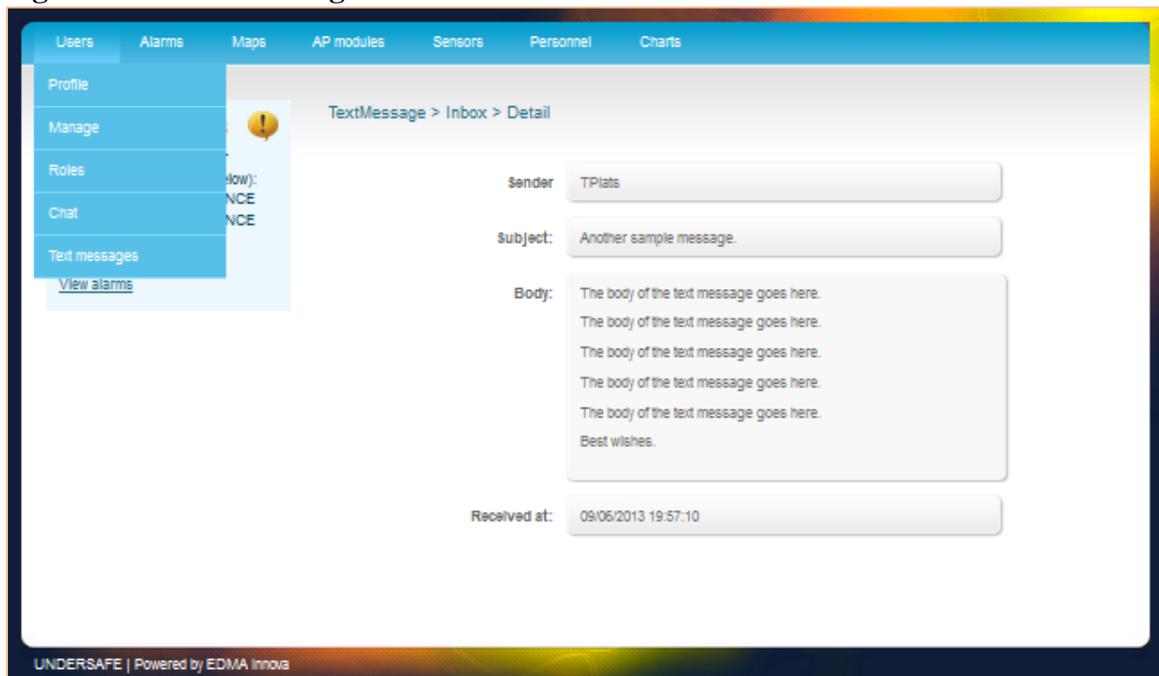
**Fig. 28: New private text message functionality.**



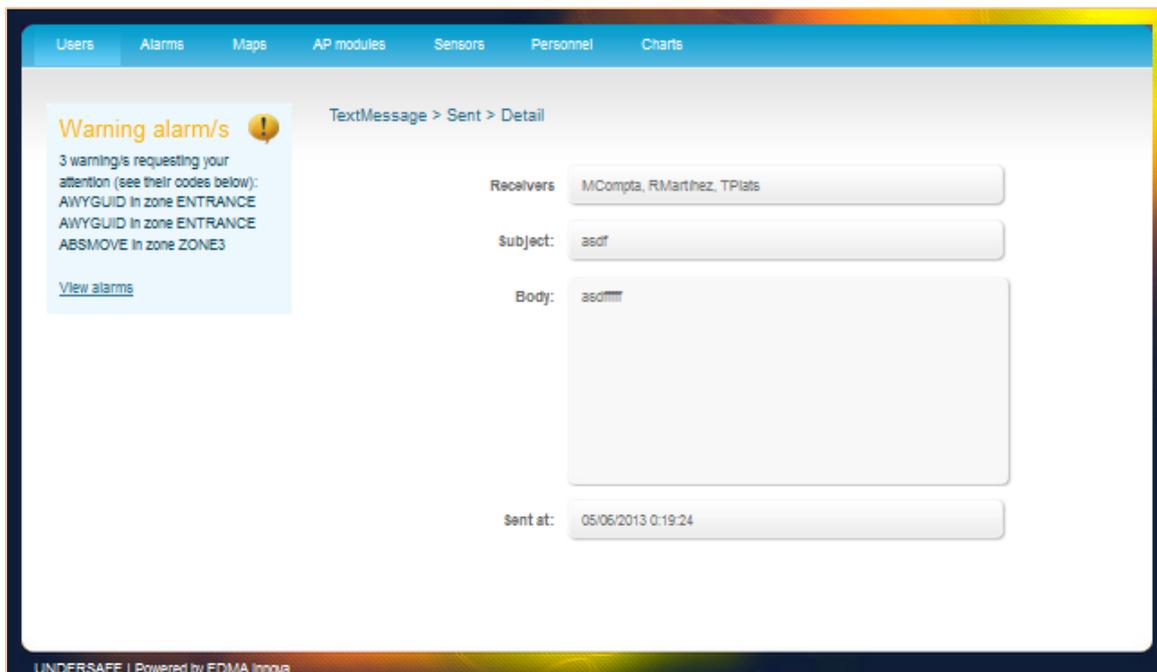
**Fig. 29: Text messages inbox.**



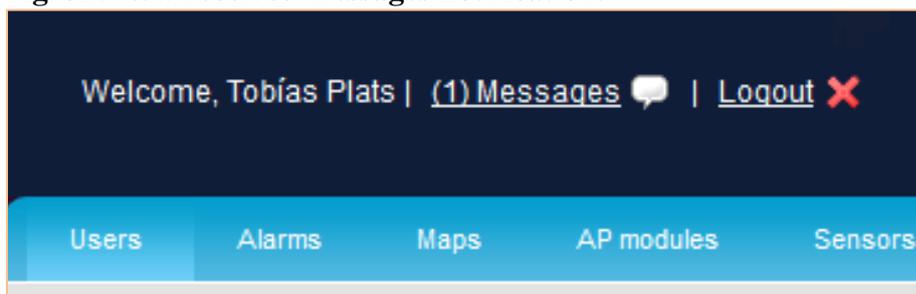
**Fig. 30: Received message detail.**



**Fig. 31: Sent message detail.**



**Fig. 32: New received messages notification.**



**Fig. 33: Alarms log configuration screen to retrieve alarms based on a time interval.**

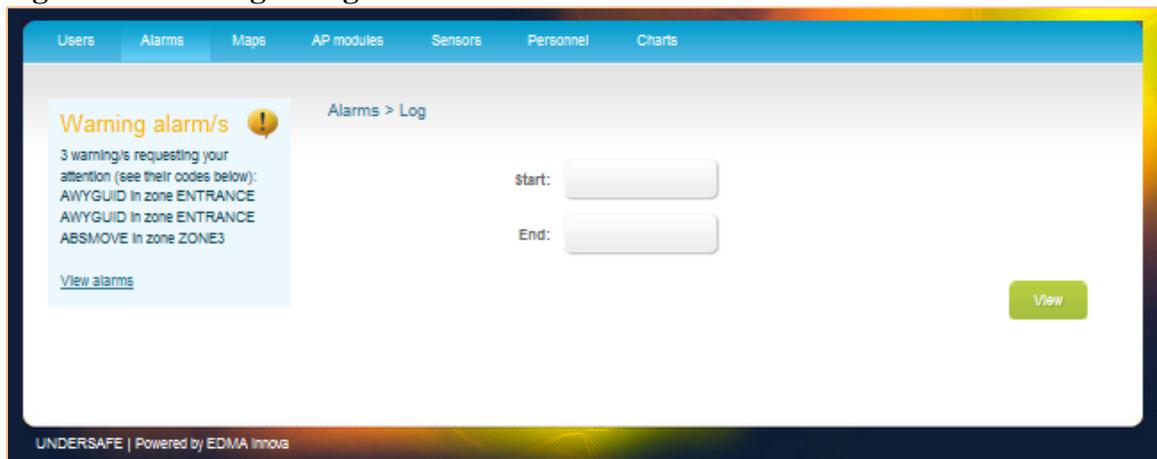


Fig. 34: Alarms list view.

Welcome, Tobias Plats | (3) Messages | Logout

Users Alarms Maps AP modules Sensors Personnel

**Warning alarm/s** ⚠️  
2 warning/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1.1  
MIN\_TEMP in zone Zone\_1.1  
[View alarms](#)

**Other alarm/s** 📢  
2 special notification/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1.1  
MIN\_TEMP in zone Zone\_1.1  
[View alarms](#)

Alarms > Manage > List

Type	Code	Status	Location	Raised at	Solved at	Other information	Edit	Delete
⚠️	MIN_TEMP: Minimum temperature reached	Raised	Zone_1.1	16/02/2013 10:07:24	16/02/2013 11:24:45	Description_1	✎	🗑️
⚠️	MIN_TEMP: Minimum temperature reached	Solved	Zone_1.1	16/02/2013 10:07:24	16/02/2013 11:24:45	Description_2	✎	🗑️
⚠️	MIN_TEMP: Minimum temperature reached	Raised	Zone_1.1	16/02/2013 10:07:24	16/02/2013 11:24:45	Description_3	✎	🗑️
⚠️	MIN_TEMP: Minimum temperature reached	Solved	Zone_1.1	16/02/2013 10:07:24	16/02/2013 11:24:45	Description_4	✎	🗑️

[Add new alarm](#)

UNDERSAFE | Powered by EDMA Innova

Fig. 35: Alarms edit view.

Welcome, Tobias Plats | (3) Messages | Logout

Users Alarms Maps AP modules Sensors Personnel

**Warning alarm/s** ⚠️  
2 warning/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1.1  
MIN\_TEMP in zone Zone\_1.1  
[View alarms](#)

**Other alarm/s** 📢  
2 special notification/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1.1  
MIN\_TEMP in zone Zone\_1.1  
[View alarms](#)

Alarm > Manage > Edit

Code:

Status:

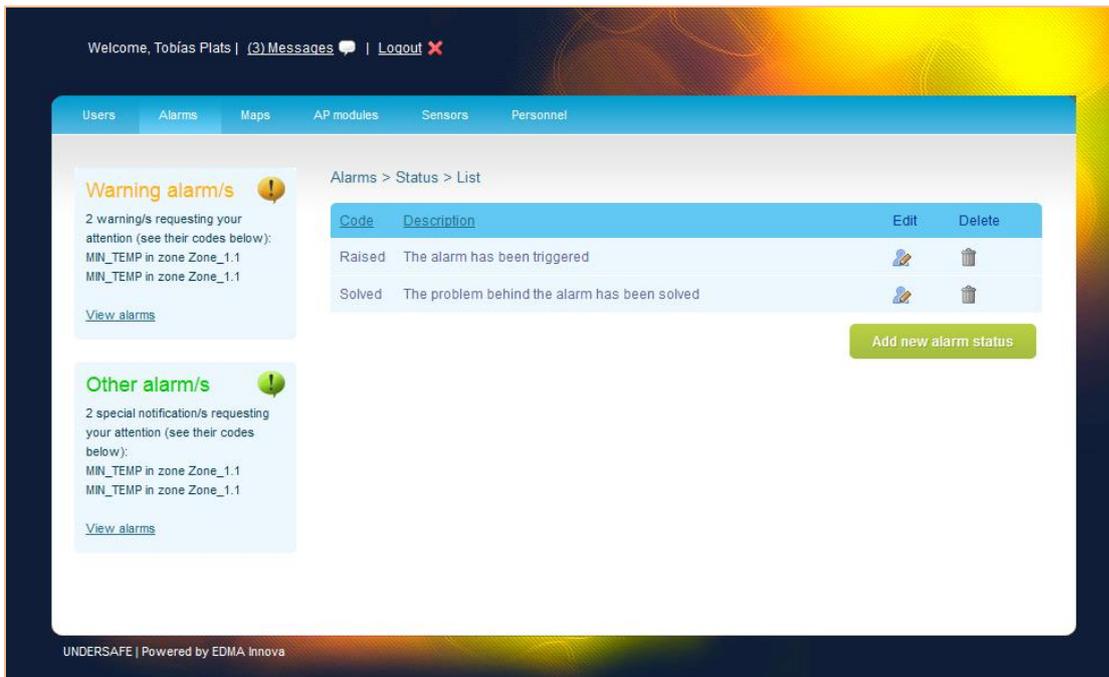
Type:

Location:

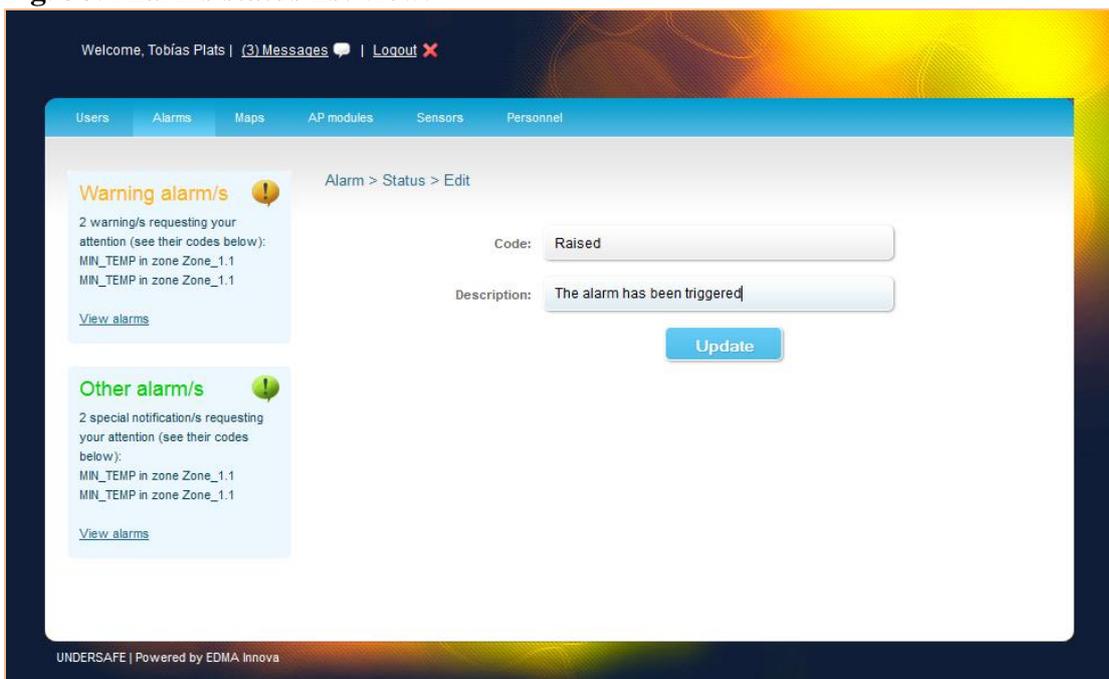
Description:

[Update](#)

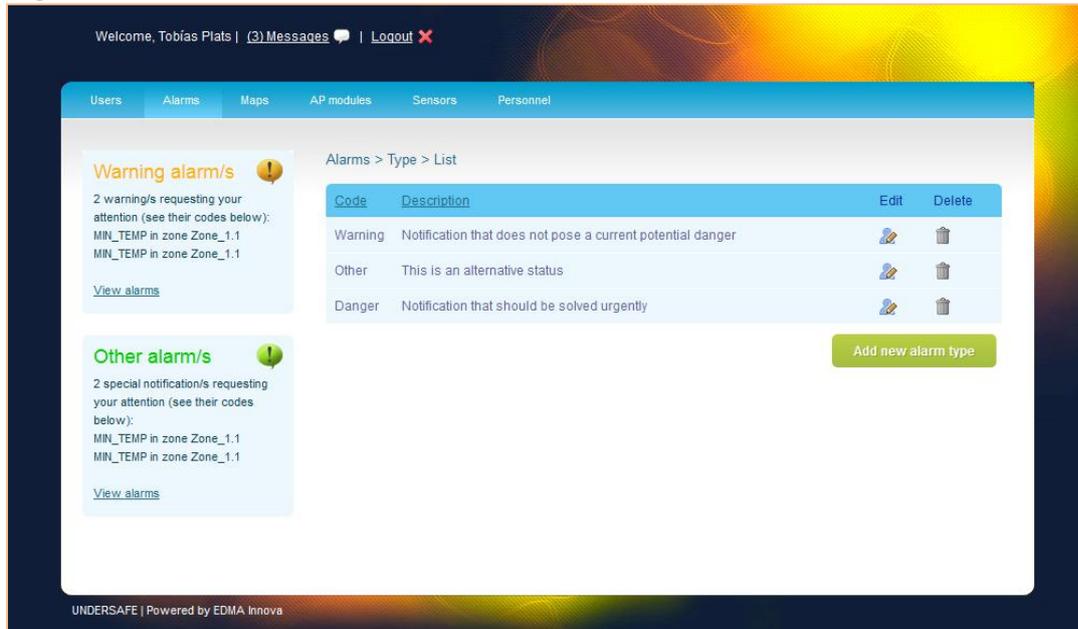
UNDERSAFE | Powered by EDMA Innova



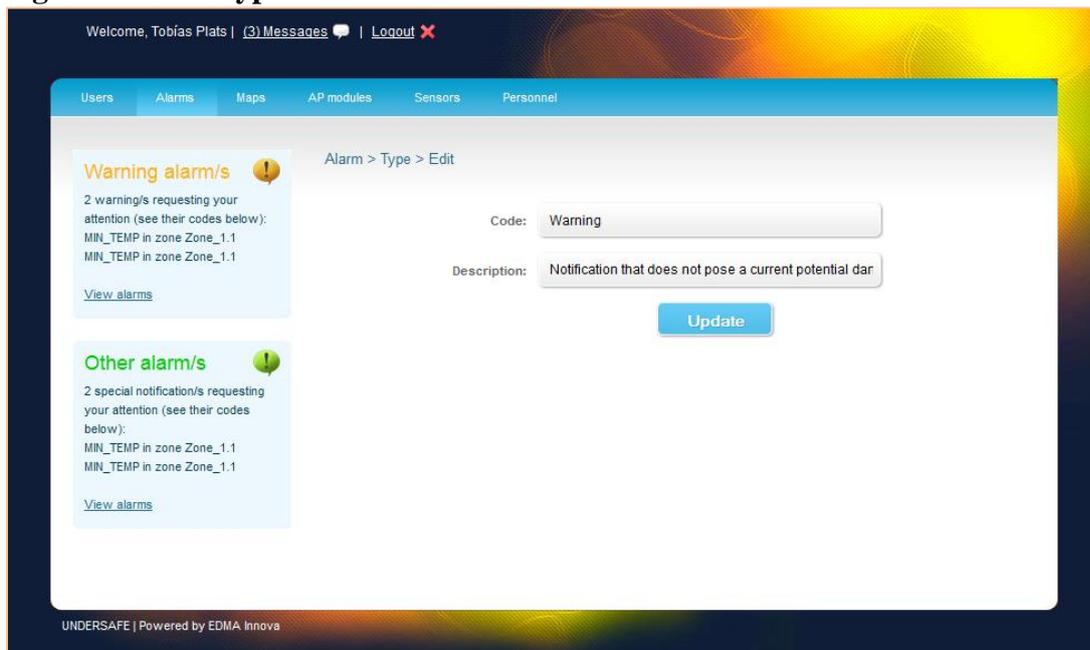
**Fig. 36: Alarms status list view.**



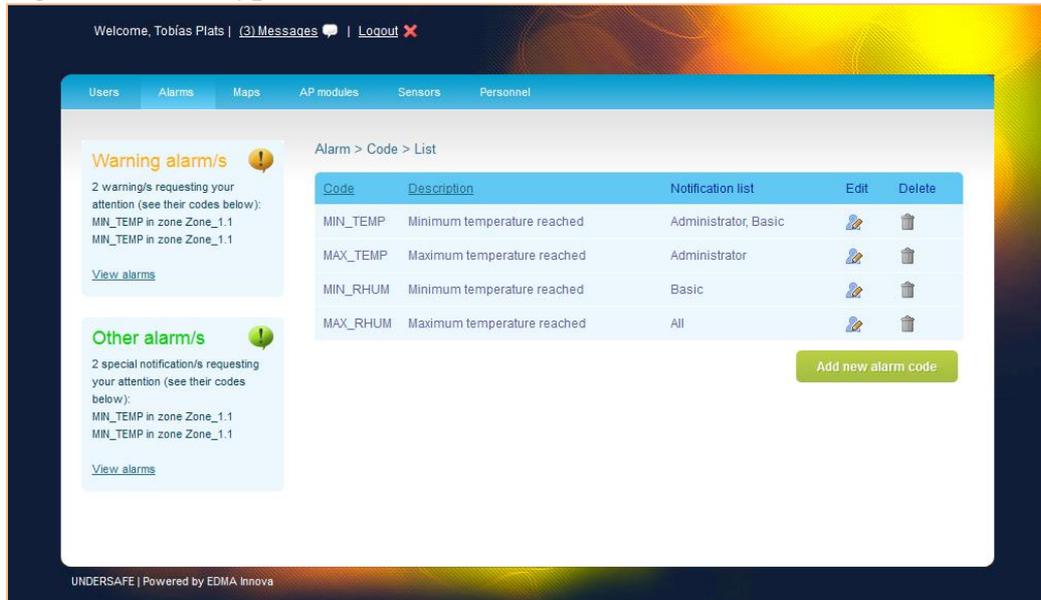
**Fig. 37: Alarms statuses edit view.**



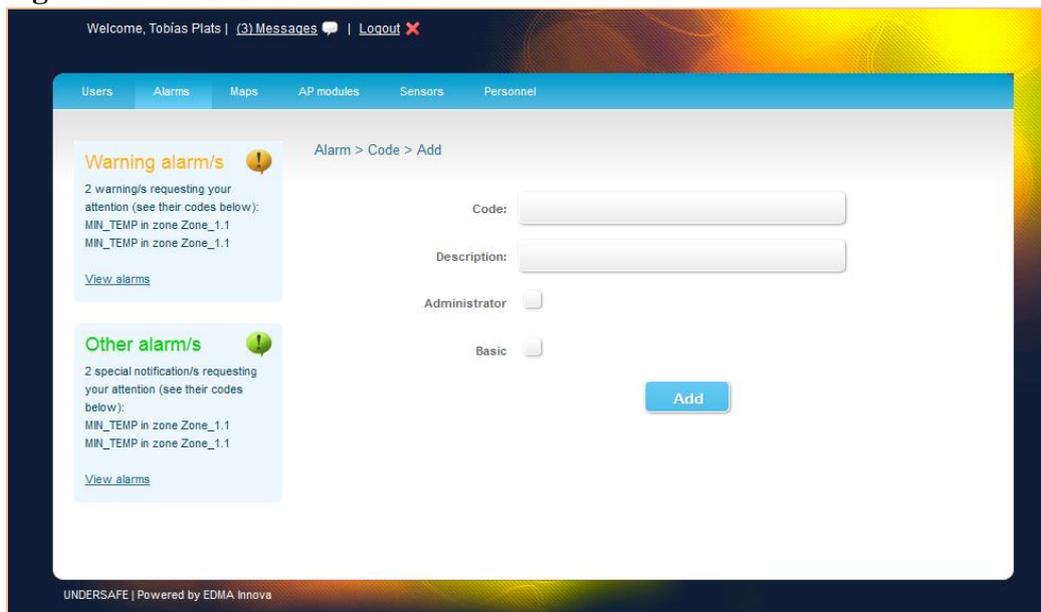
**Fig. 38: Alarms types list view.**



**Fig. 39: Alarms types edit view.**

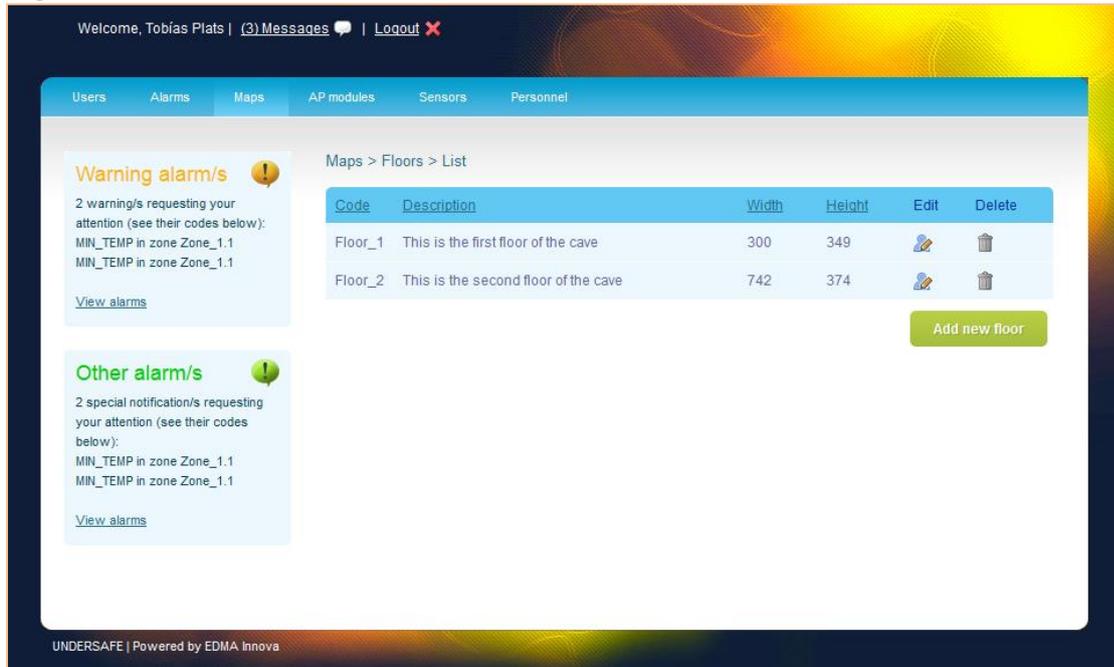


**Fig. 40: Alarms codes list view.**

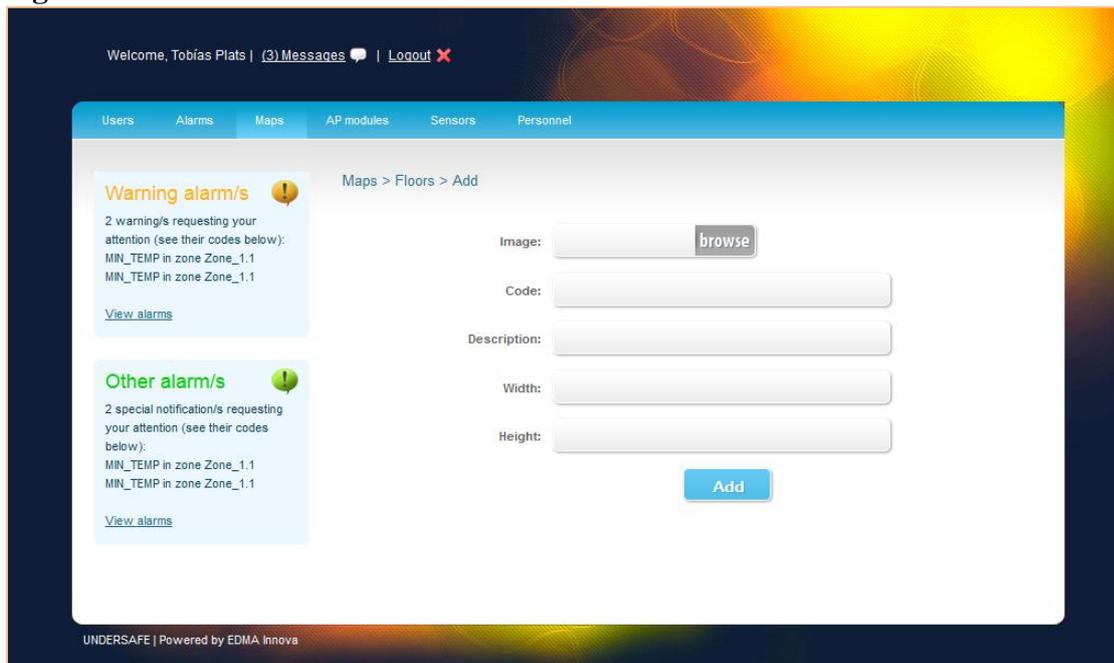


**Fig. 41: Alarms codes add view.**

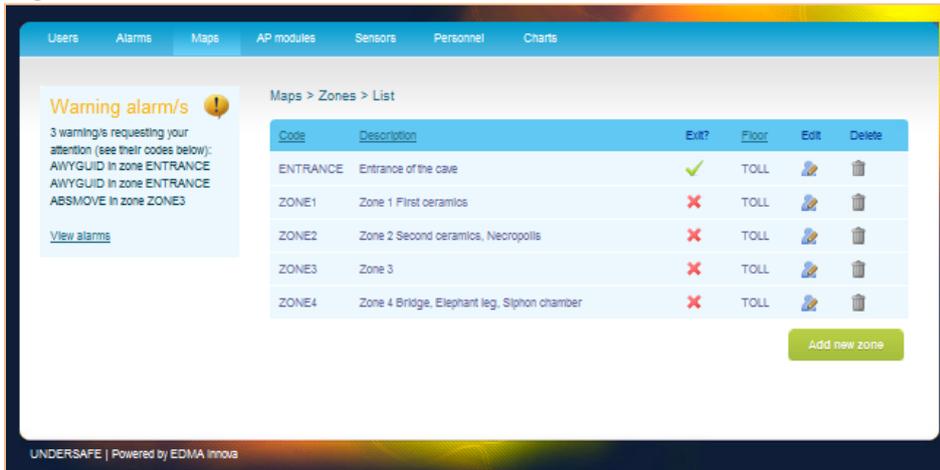
**Fig. 42: Floors list view.**



**Fig. 43: Floors add view.**



**Fig. 44: Zones list view.**



**Fig. 45: Zones add view.**

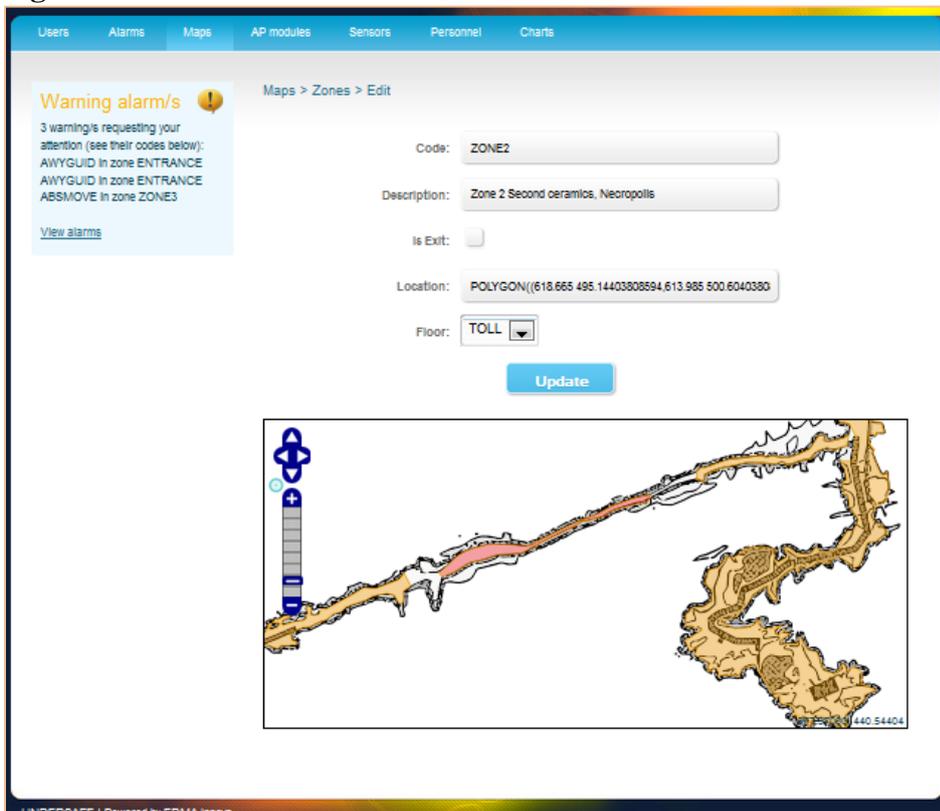


Fig. 46: Map view (I).

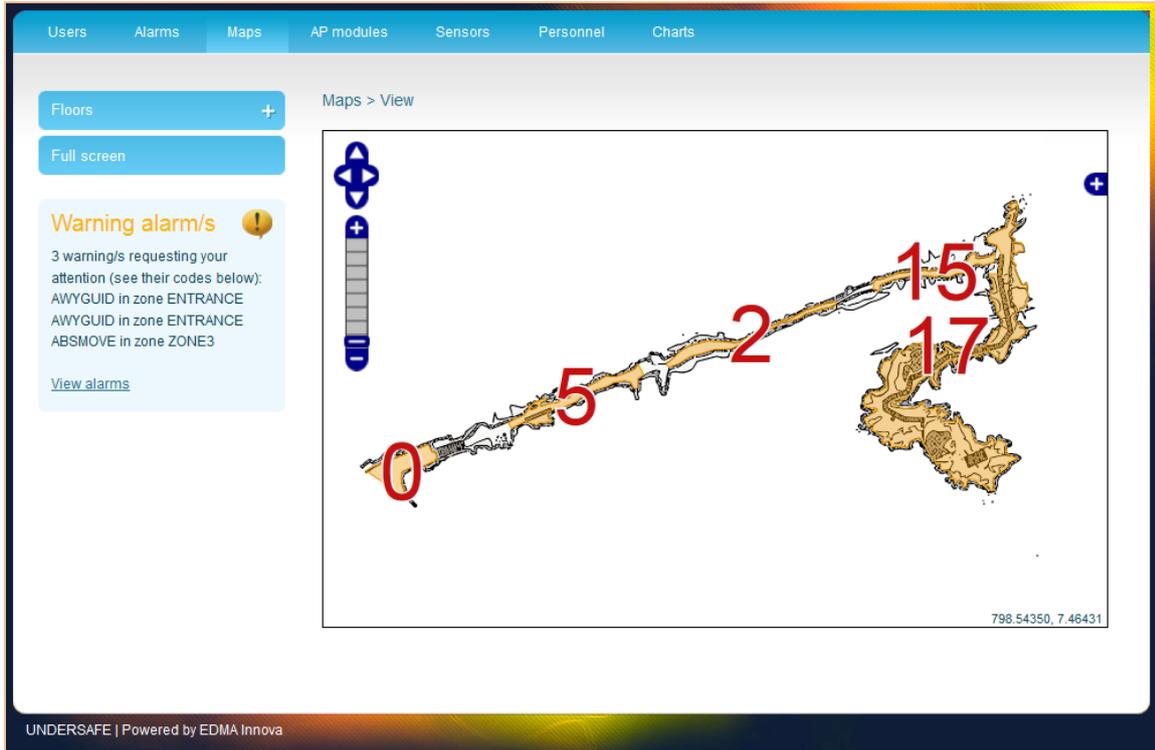
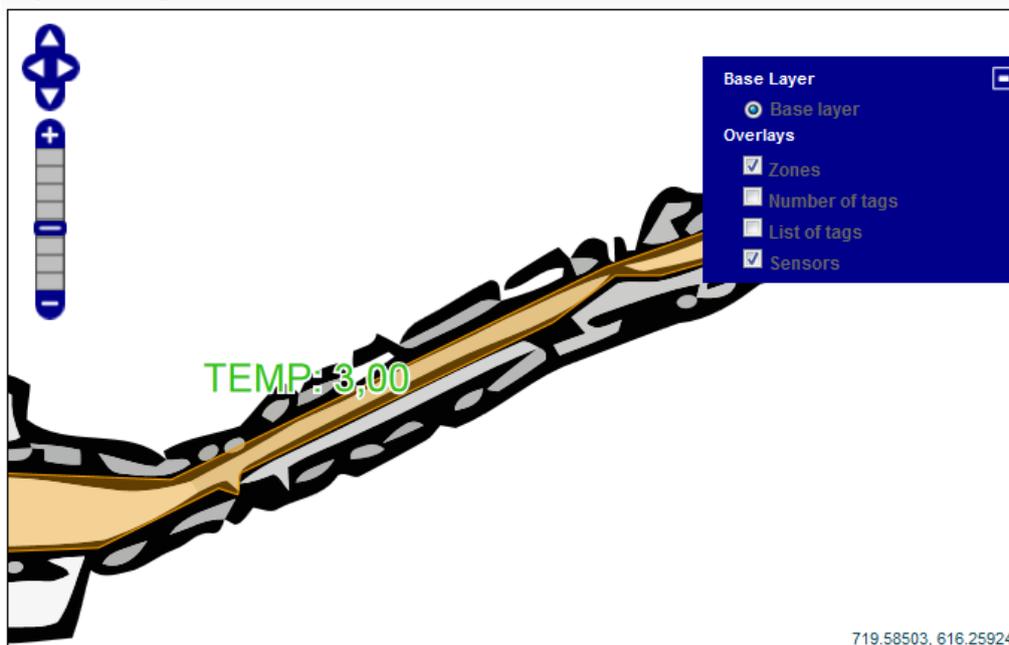


Fig. 47: Map view (II).



**Fig. 48: Map view, full screen.**



**Fig. 49: AP Modules list view.**

Users Alarms Maps **AP modules** Sensors Personnel Charts

**Warning alarm/s** 

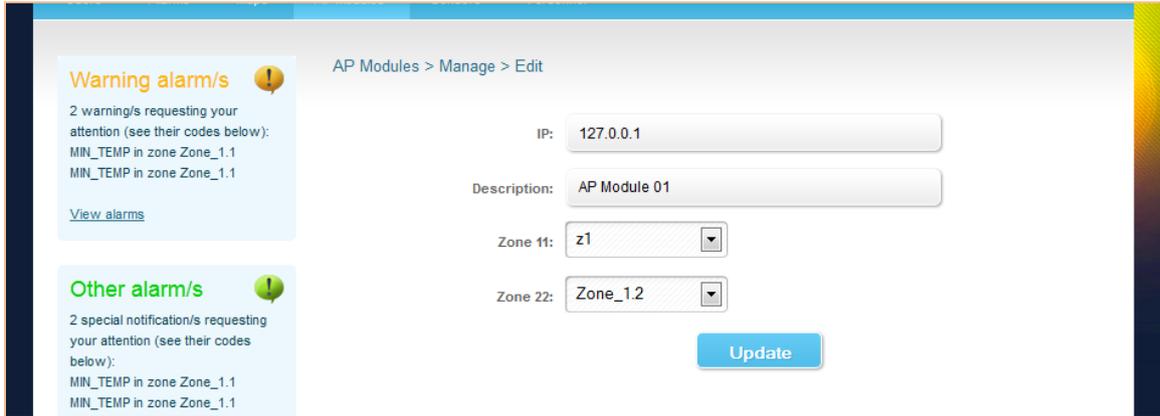
42 warning/s requesting your attention (see their codes below):  
AWYGUID in zone ENTRANCE  
AWYGUID in zone ENTRANCE  
ABSMOVE in zone ZONE3  
ABSMOVE in zone ZONE1  
ABSMOVE in zone ZONE2  
ABSMOVE in zone ZONE2

AP Modules > Manage > List

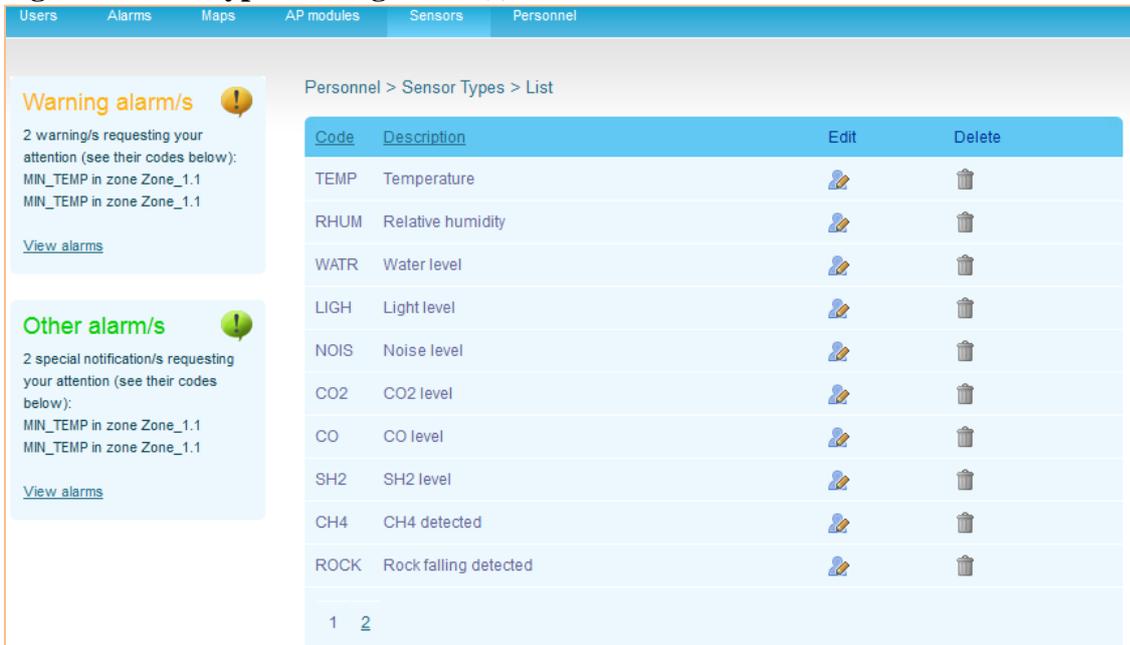
IP	Description	Active	Zone 11	Zone 22	Power	Edit	Delete
127.0.0.1	AP MODULE 1	✗	ZONE1	ENTRANCE	Grid		
127.0.0.2	AP MODULE 2	✗	ZONE2	ZONE1	Grid		
127.0.0.3	AP MODULE 3	✗	ZONE3	ZONE2	Grid		
127.0.0.4	AP MODULE 4	✗	ZONE4	ZONE3	Grid		

[Add new AP Module](#)

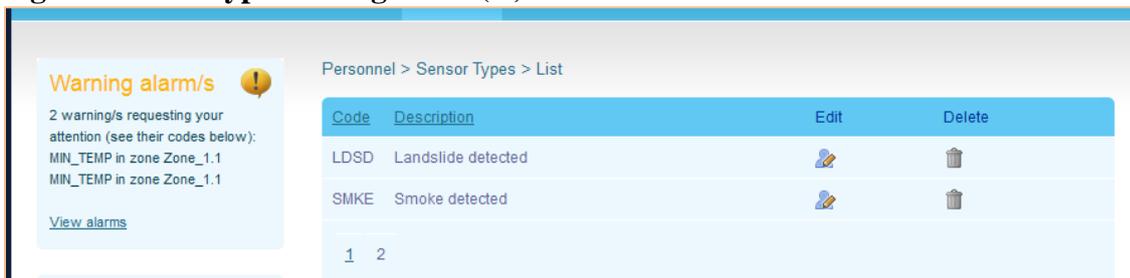
**Fig. 50: AP Modules edit view.**



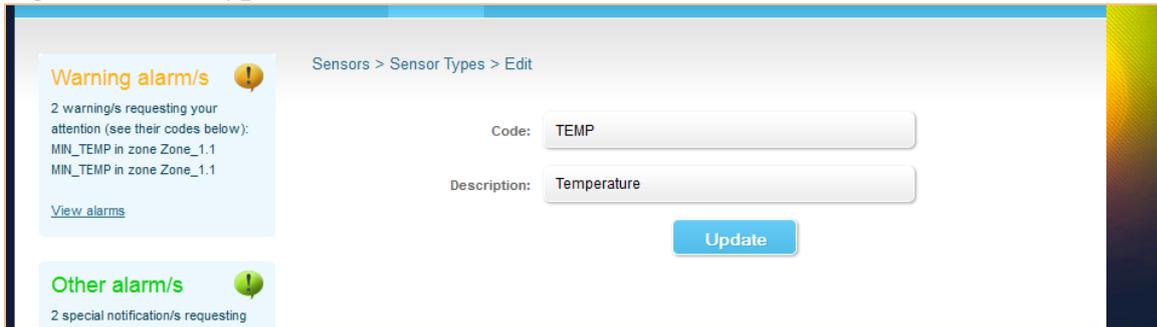
**Fig. 51: Sensor types management (I).**



**Fig. 52: Sensor types management (II).**



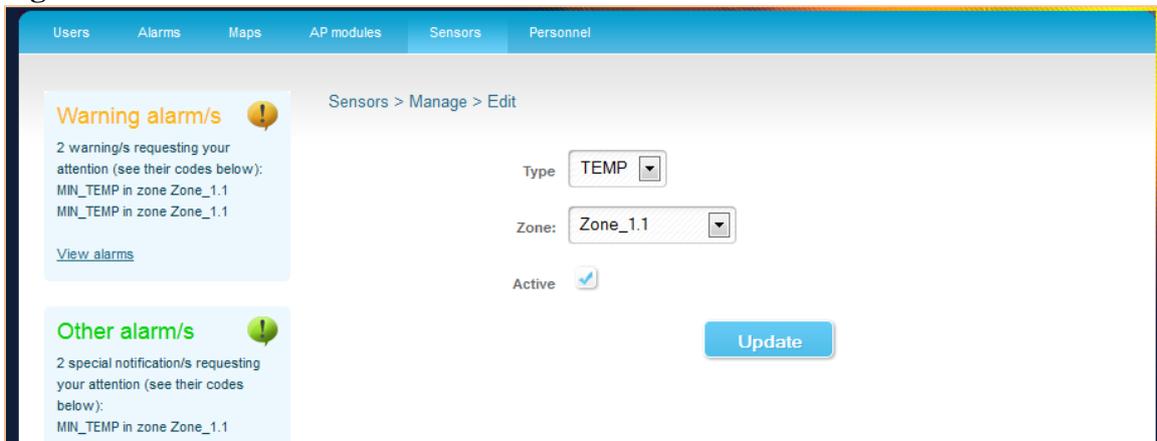
**Fig. 53: Sensor types edit view.**



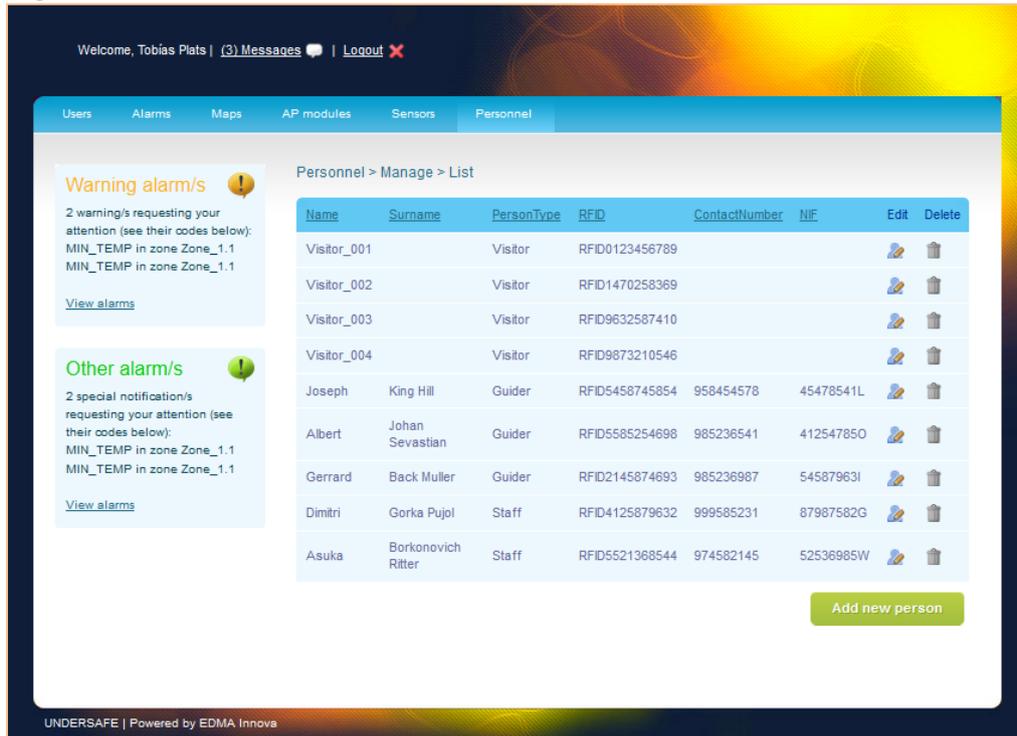
**Fig. 54: Sensor list view.**



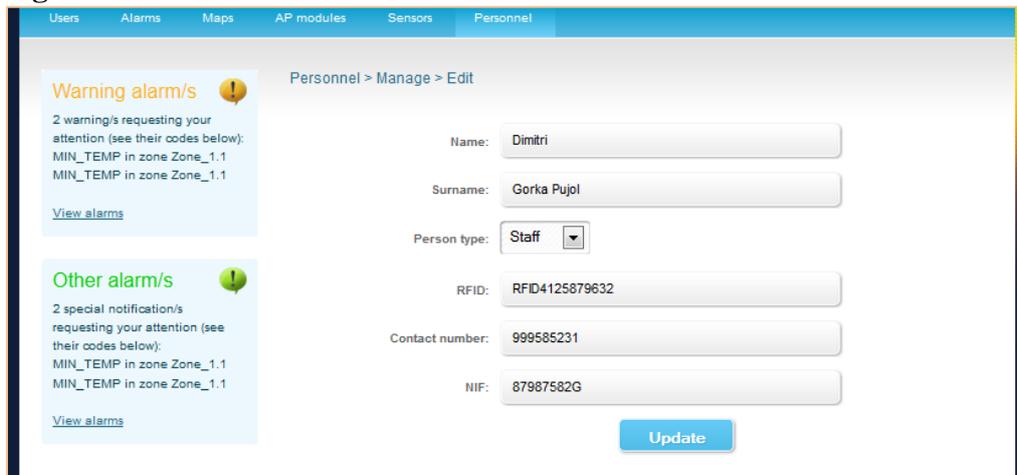
**Fig. 55: Sensor edit view.**



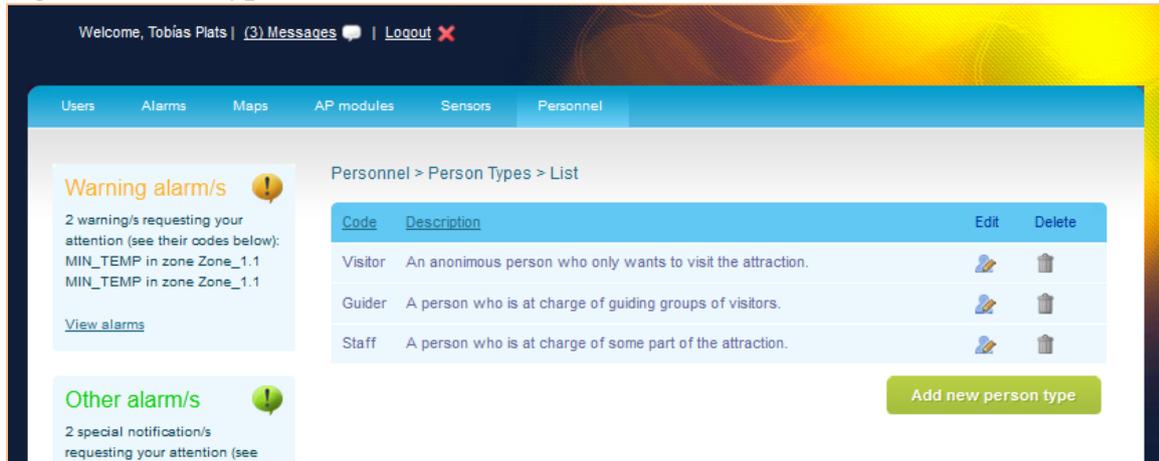
**Fig. 56: Personnel list view.**



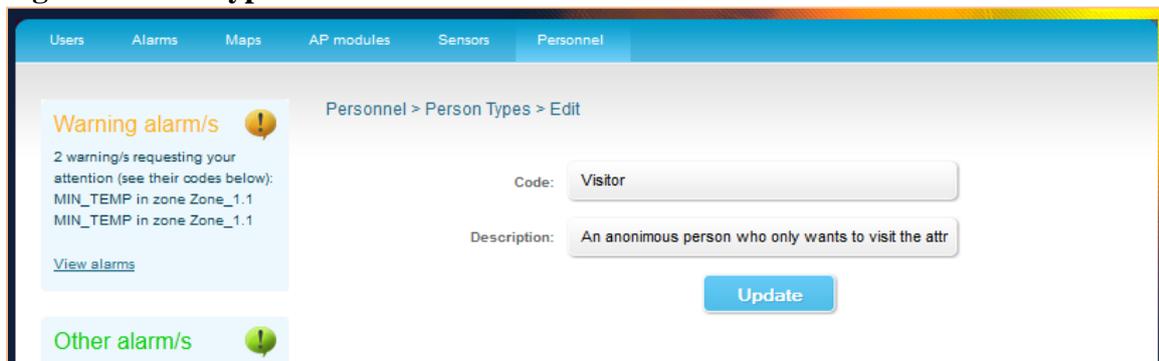
**Fig. 57: Personnel edit view.**



**Fig. 58: Person types list view.**



**Fig. 59: Person types edit view.**



**Fig. 60: Groups list view.**

Warning alarm/s

2 warning/s requesting your attention (see their codes below):  
 MIN\_TEMP in zone Zone\_1.1  
 MIN\_TEMP in zone Zone\_1.1

[View alarms](#)

Other alarm/s

2 special notification/s requesting your attention (see their codes below):  
 MIN\_TEMP in zone Zone\_1.1  
 MIN\_TEMP in zone Zone\_1.1

[View alarms](#)

Personnel > Groups > List

Code	Start date	End date	Comments	Edit	Delete
GRP_OLD_01	07/01/2013 9:11:22	11/01/2013 18:33:44	Formed mostly by elderly people		
GRP_KID_01	09/01/2013 9:55:02	09/01/2013 18:11:23	Formed mostly by kids		

Persons in the group:

[Add new item](#)

---

Personnel > Groups > List

Code	Start date	End date	Comments	Edit	Delete
GRP_OLD_01	07/01/2013 9:11:22	11/01/2013 18:33:44	Formed mostly by elderly people		
GRP_KID_01	09/01/2013 9:55:02	09/01/2013 18:11:23	Formed mostly by kids		

Persons in the group:

Type	Name	Surname	NIF
Visitor	Visitor_001		
Visitor	Visitor_002		
Visitor	Visitor_003		
Visitor	Visitor_004		
Guider	Joseph	King Hill	45478541L
Guider	Albert	Johan Sevastian	412547850
Guider	Gerrard	Back Muller	54587963I

[Add new item](#)

UNDERSAFE | Powered by EDMA Innova

**Fig. 61: Groups add view.**

Manage  
Personnel > Groups > Add

Code:

Comments:

Start:

End:

**Fig. 62: Groups edit view (I).**

Personnel > Groups > Edit

Code:

Comments:

Start:

End:

**August 2012**

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Time 00:00

Hour

Minute

**Fig. 63: Groups edit view (II).**

Users Alarms Maps AP modules Sensors Personnel

Personnel > Groups > Edit

Options

General

Persons

Warning alarm/s 

2 warning/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1.1  
MIN\_TEMP in zone Zone\_1.1

[View alarms](#)

Other alarm/s 

2 special notification/s requesting your attention (see their codes below):  
MIN\_TEMP in zone Zone\_1.1  
MIN\_TEMP in zone Zone\_1.1

[View alarms](#)

Persons in the group:

Type	Name	Surname	NIF
<input checked="" type="checkbox"/>	Visitor	Visitor_001	
<input checked="" type="checkbox"/>	Visitor	Visitor_002	
<input checked="" type="checkbox"/>	Visitor	Visitor_003	
<input checked="" type="checkbox"/>	Visitor	Visitor_004	
<input checked="" type="checkbox"/>	Guider	Joseph	King Hill 45478541L
<input checked="" type="checkbox"/>	Guider	Albert	Johan Sevastian 412547850
<input checked="" type="checkbox"/>	Guider	Gerrard	Back Muller 54587963I
<input type="checkbox"/>	Staff	Dimitri	Gorka Pujol 87987582G
<input type="checkbox"/>	Staff	Asuka	Borkonovich Ritter 52536985W

[Update](#)

**Fig. 64: Charts, configuration screen (I).**

Users Alarms Maps AP modules Sensors Personnel Charts

Charts > Generate

No alarms/s

The facilities's global status is completely under control.  
Presence of abnormal parameters is not advised.

Filter by:  Zone  Source

First level filter: ENTRANCE

Second level filter: TEMP (id=1)

Start:

End:

[Add](#)

[Generate](#)

UNDERSAFE | Powered by EDMA Innova

**Fig. 65: Charts, configuration screen (II).**

**No alarms/s**  
The facilities's global status is completely under control. Presence of abnormal parameters is not advised.

Charts > Generate

Filter by:  Zone  Source

First level filter: ZONE3

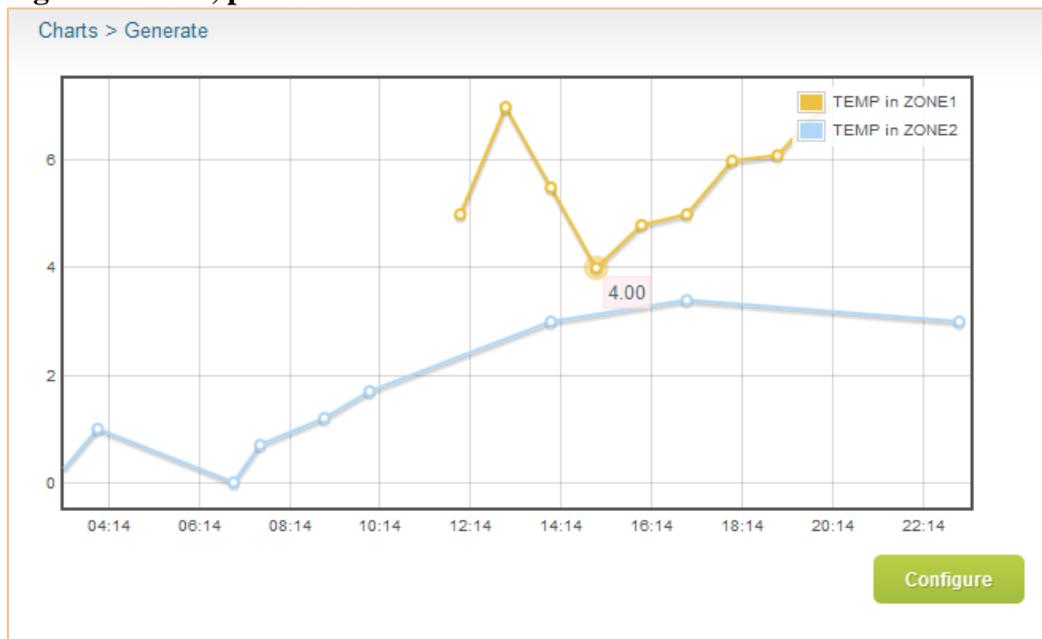
Second level filter: TEMP (id=4)

Start:

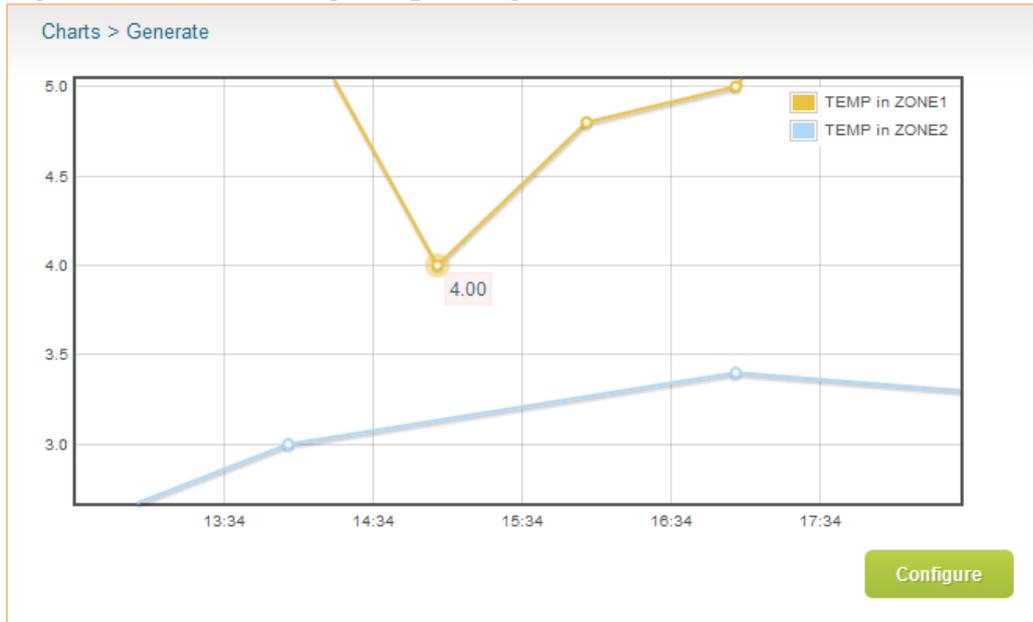
End:

Filter by	First level filter	Second level filter	Start	End	Delete
Zone	ZONE1	TEMP (id=2)			<input type="button" value="Delete"/>
Zone	ZONE2	TEMP (id=3)			<input type="button" value="Delete"/>
Zone	ZONE3	TEMP (id=4)			<input type="button" value="Delete"/>

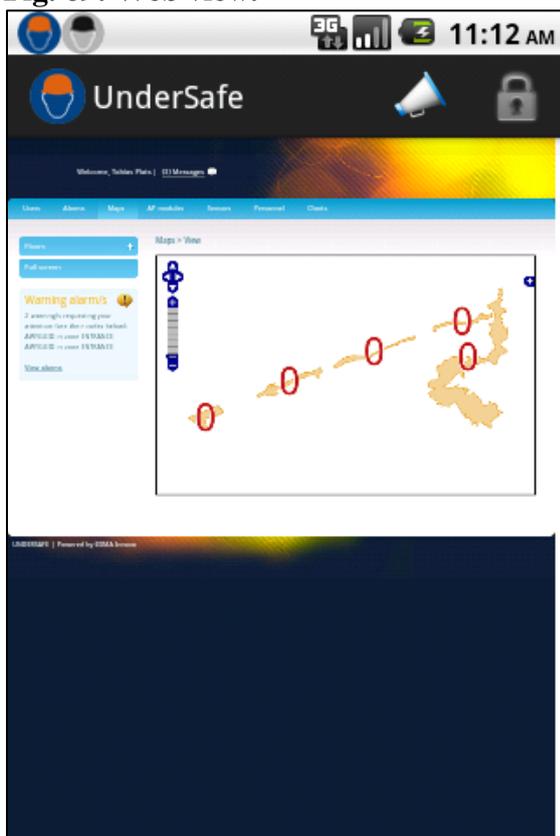
**Fig. 66: Charts, plot screen.**



**Fig. 67: Charts, zooming and panning.**



**Fig. 69: Web view.**



**Fig.70: How GCM works.**

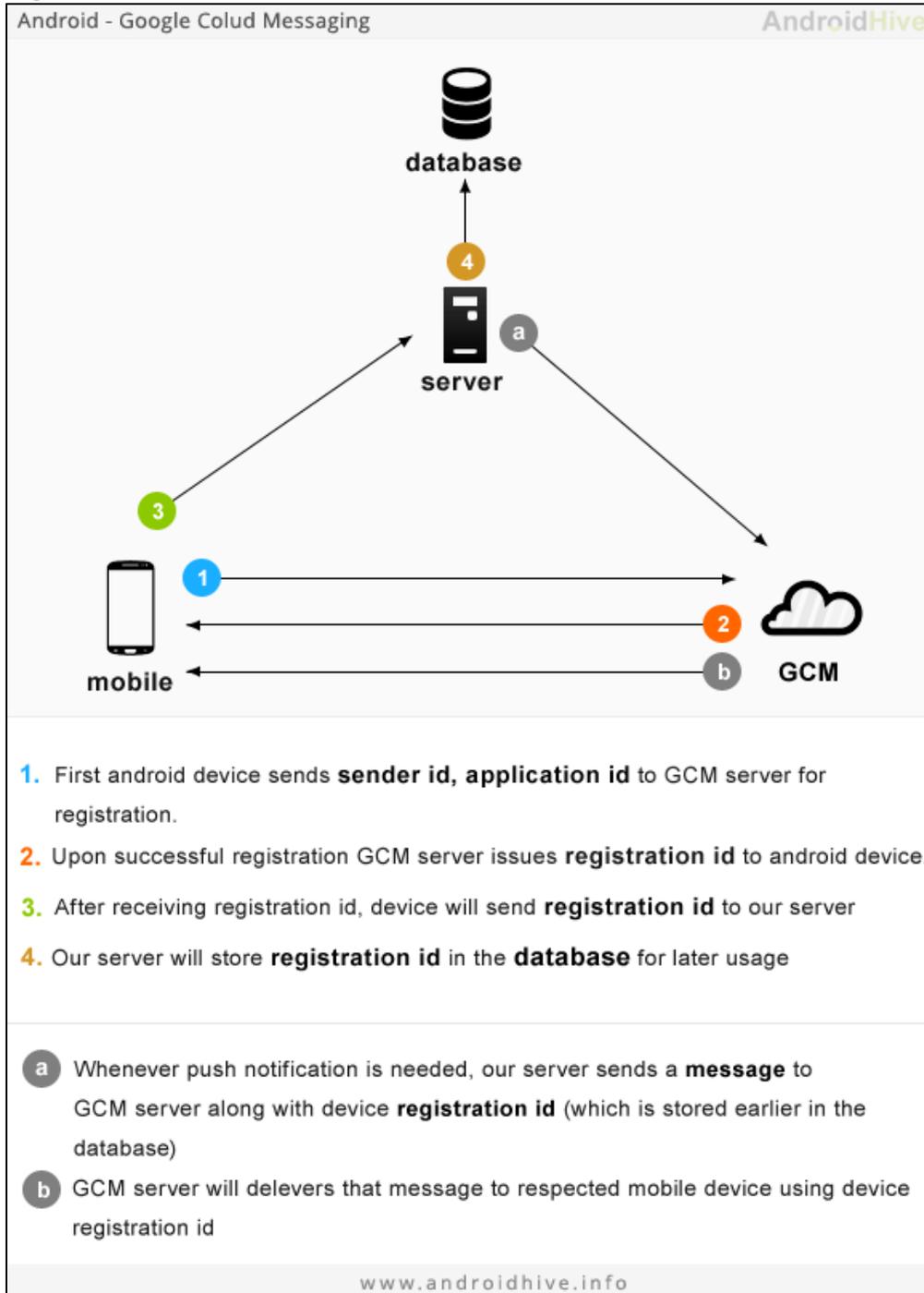


Fig. 71: Alarms on mobile device.

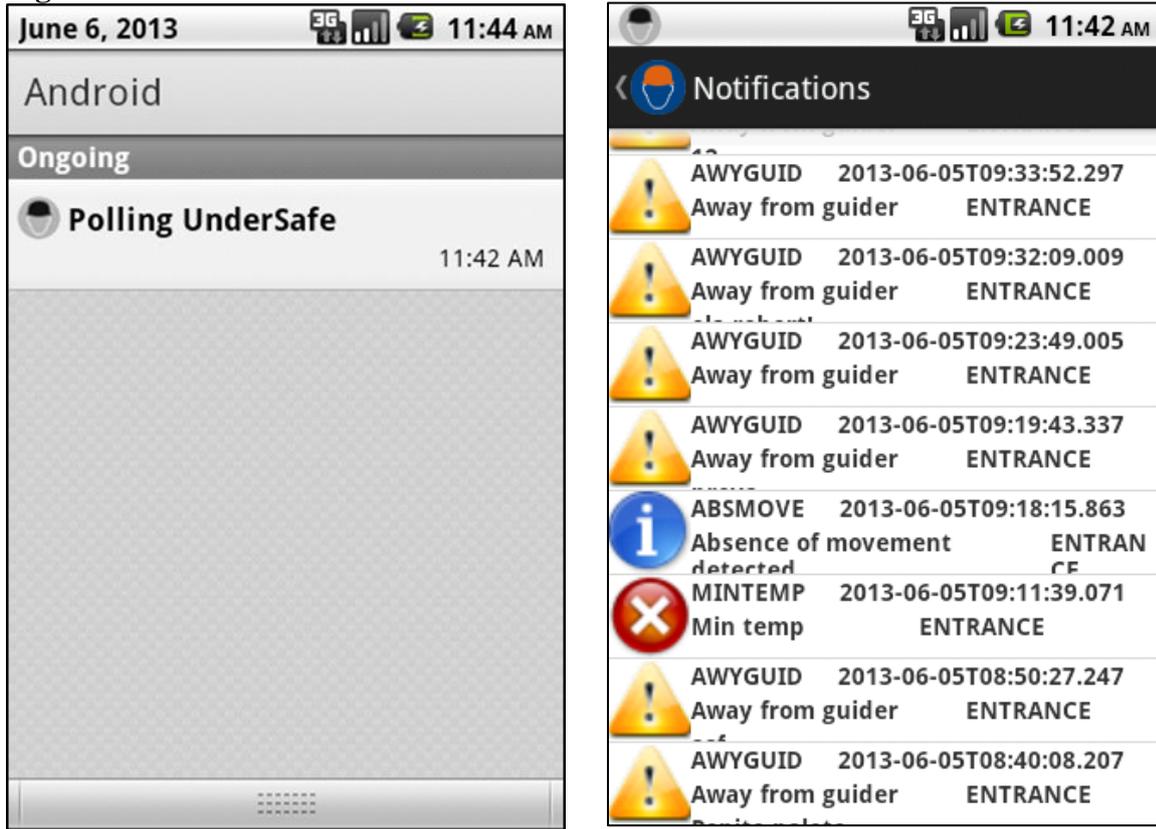


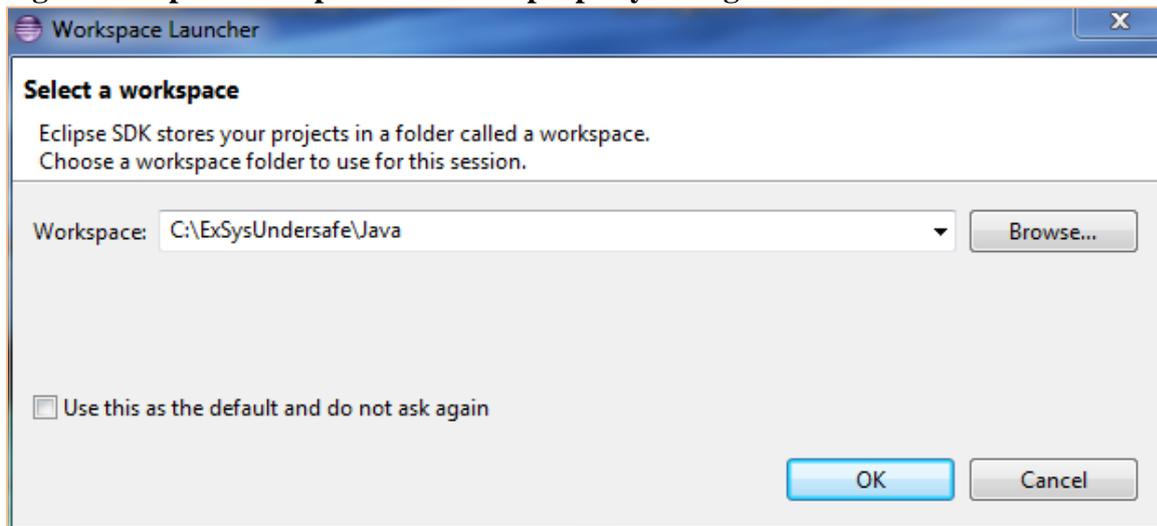
Fig. 72: Microsoft SQL Management Studio initial login window.



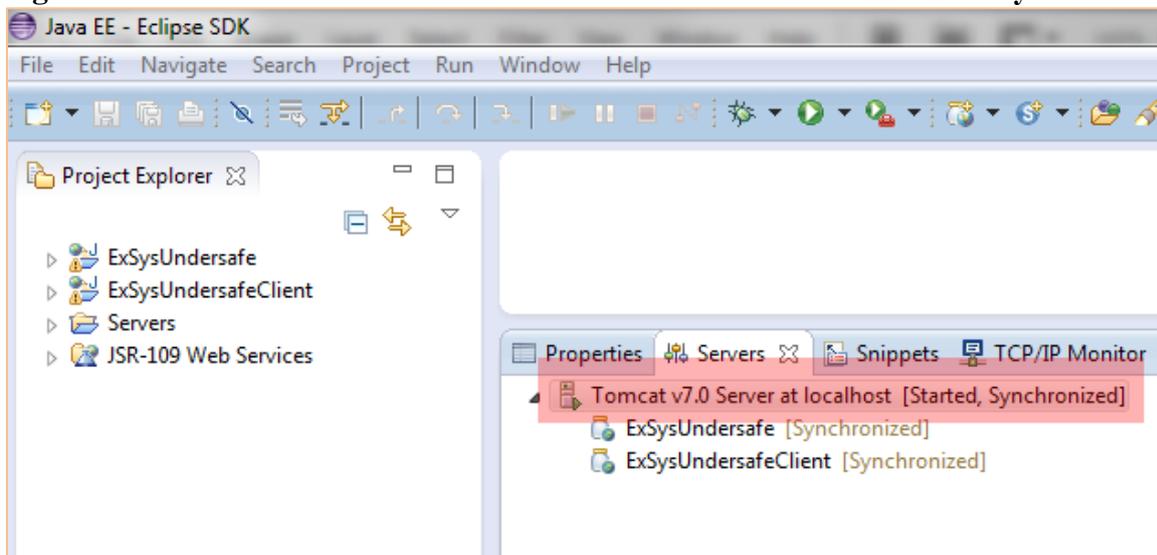
**Fig. 73: Microsoft SQL Management Studio initial login screen, with the recently created user.**



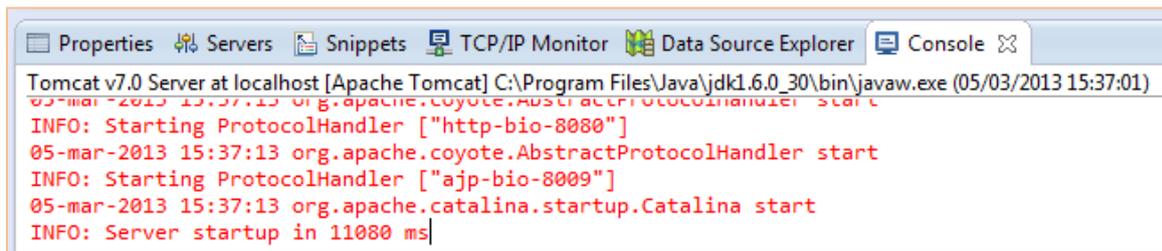
**Fig. 74: Eclipse Workspace Launcher properly configured.**



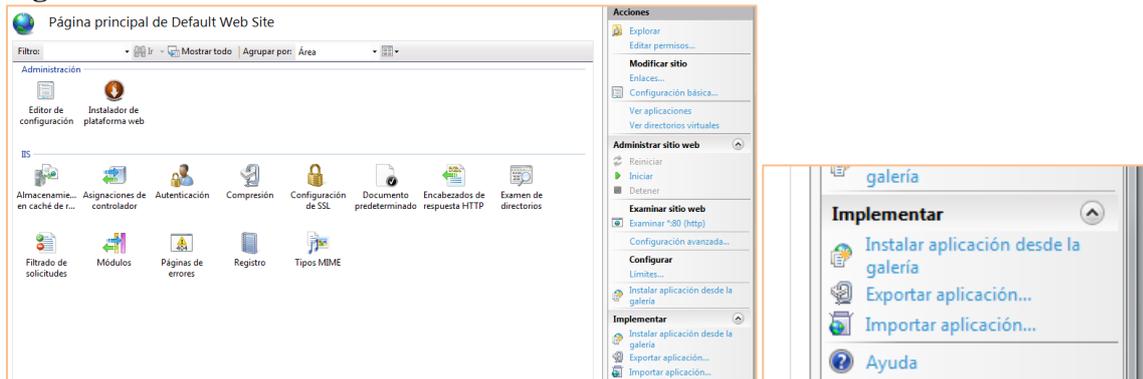
**Fig. 75: Servers tab with "Tomcat v7.0 Server at localhost" started and synchronized**



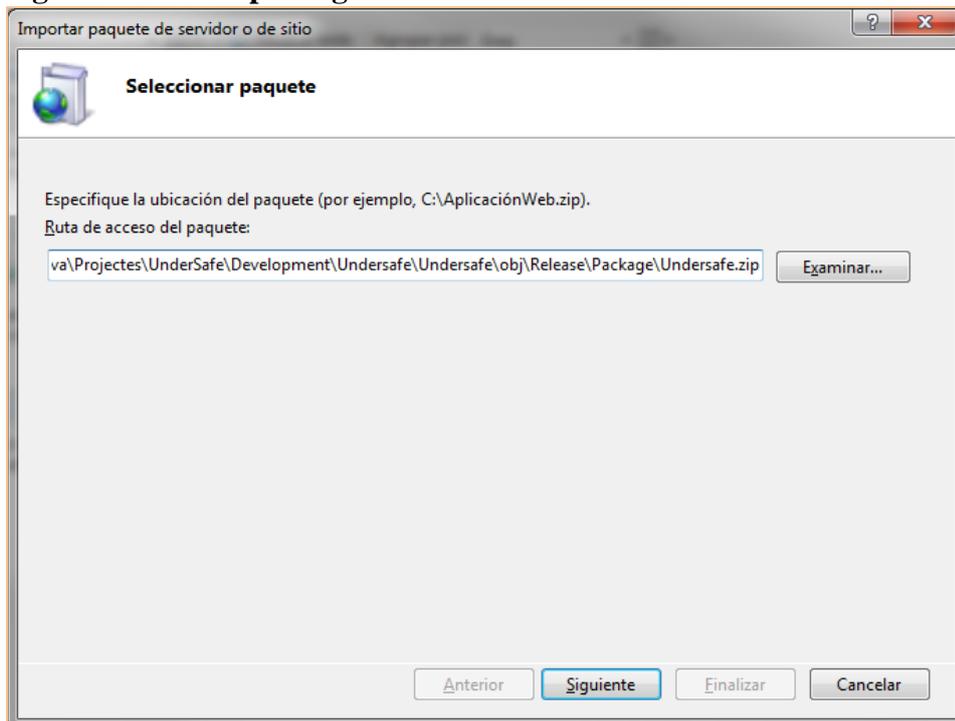
**Fig. 76: ExSysUnderSafe has been properly deployed.**



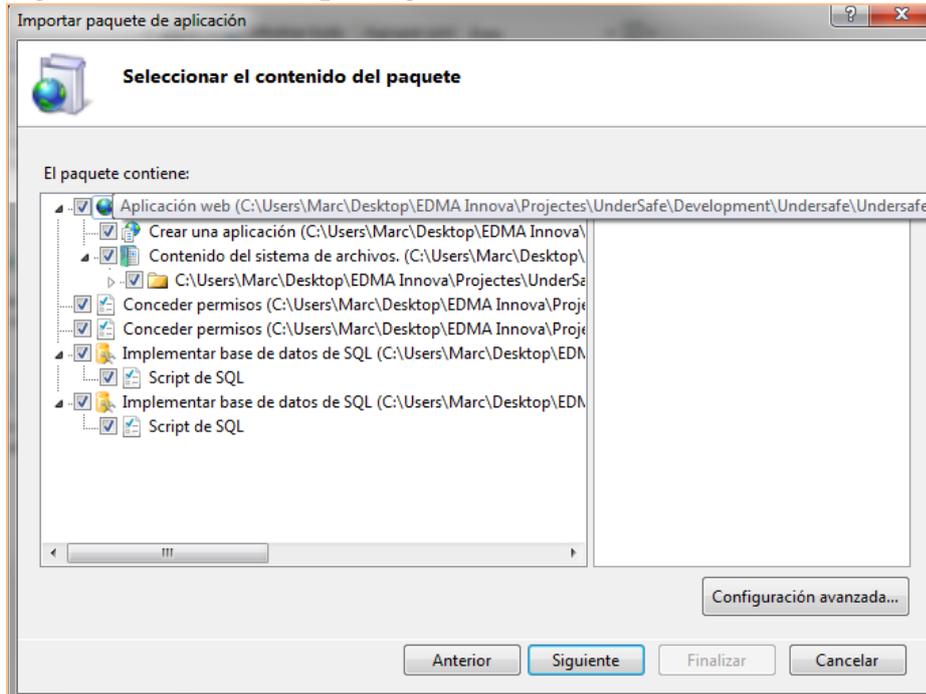
**Fig. 77: IIS main menu window.**



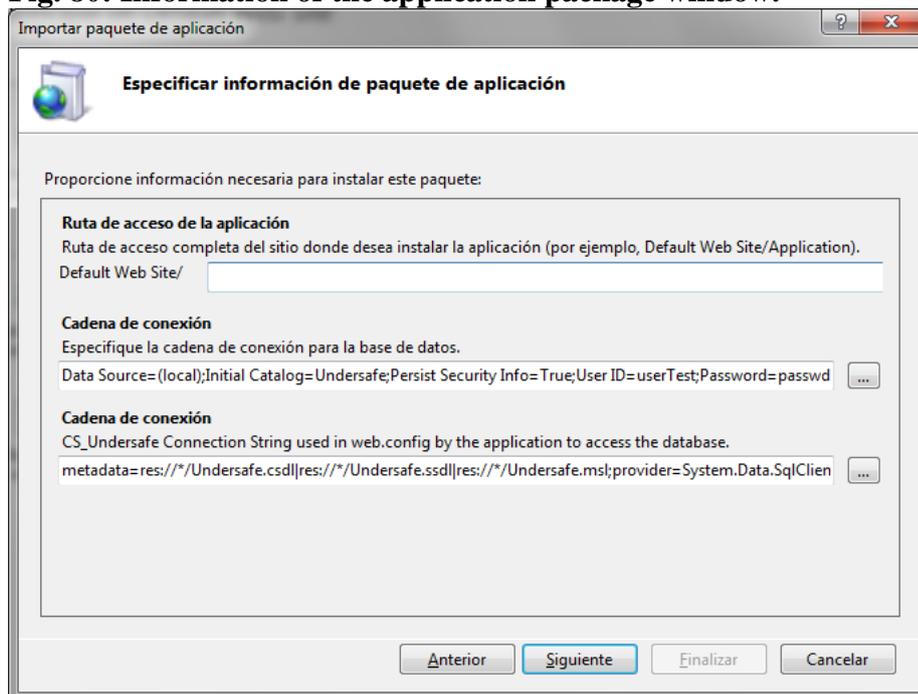
**Fig. 78: IIS select package window.**



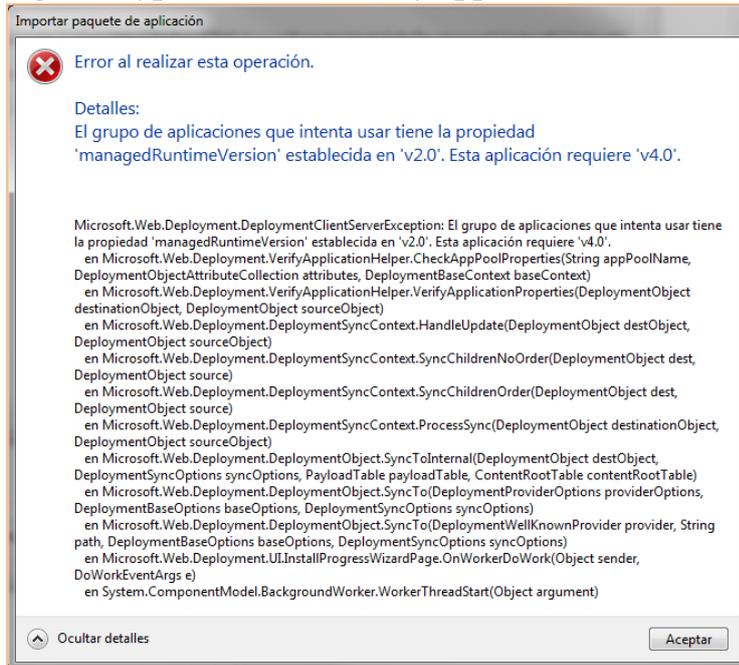
**Fig. 79: Content of the package selection window.**



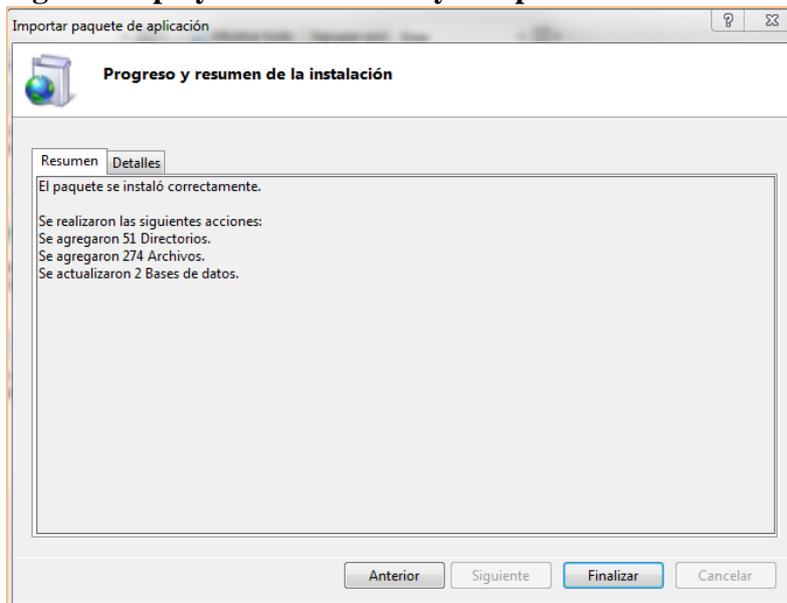
**Fig. 80: Information of the application package window.**



**Fig. 81: Typical error that may appear...**



**Fig. 82: Deployment successfully completed.**



**Fig. 83: UnderSafe login screen.**

