Smart Central
User Manual

Version 17.0

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1. Smart Central

For information about the Product environment, precautions, warnings and intended use see USR ENG Digistat Care (for the Digistat Suite EU) or USR ENG Digistat Suite NA (for Digistat Suite NA). The knowledge and understanding of the appropriate document are mandatory for a correct and safe use of the Smart Central module, described in this document.

1.1 Module selection

To select the Smart Central module:

- Click the corresponding icon on the lateral bar (Fig 1)

Fig 1

The Smart Central screen, shown in Fig 2, opens.

In some configurations, the Smart Central module is the only one available and is automatically selected after user log in.

1.2 Smart Central functionality

The Smart Central screen displays a schematic representation overview of the situation of each patient in the ward (Fig 2).

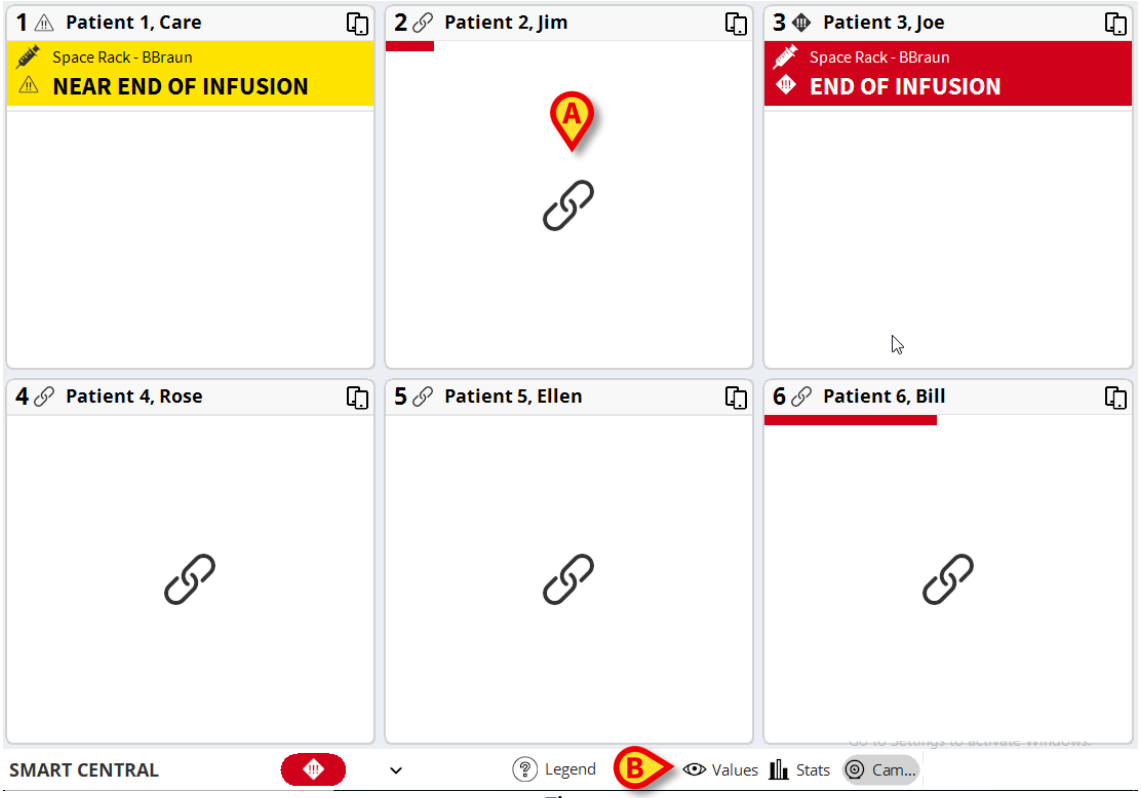


Fig 2

The screen is divided into rectangular areas, named Bed Cards (Fig 2 **A**). Every area refers to a bed and displays information on the devices connected to the patient admitted to that bed. By default, only the data referring to alarmed beds is displayed (Fig 4), and only data relating to alarms is displayed. A bed is alarmed if at least one of the devices connected to the bed is alarmed. If multiple alarms occur at the same time on the same bed, the alarm with the highest priority is notified.

It is possible to display all the available data (both referring to the non-alarmed beds and referring to the non-alarmed devices on the alarmed beds) by clicking the "VALUES" button on the command bar (Fig 2 **B**).

To display all the available data:

- Click the **Values** button on the command bar (Fig 2 **B**)

The button will be selected. The available information will be displayed as in Fig 3.

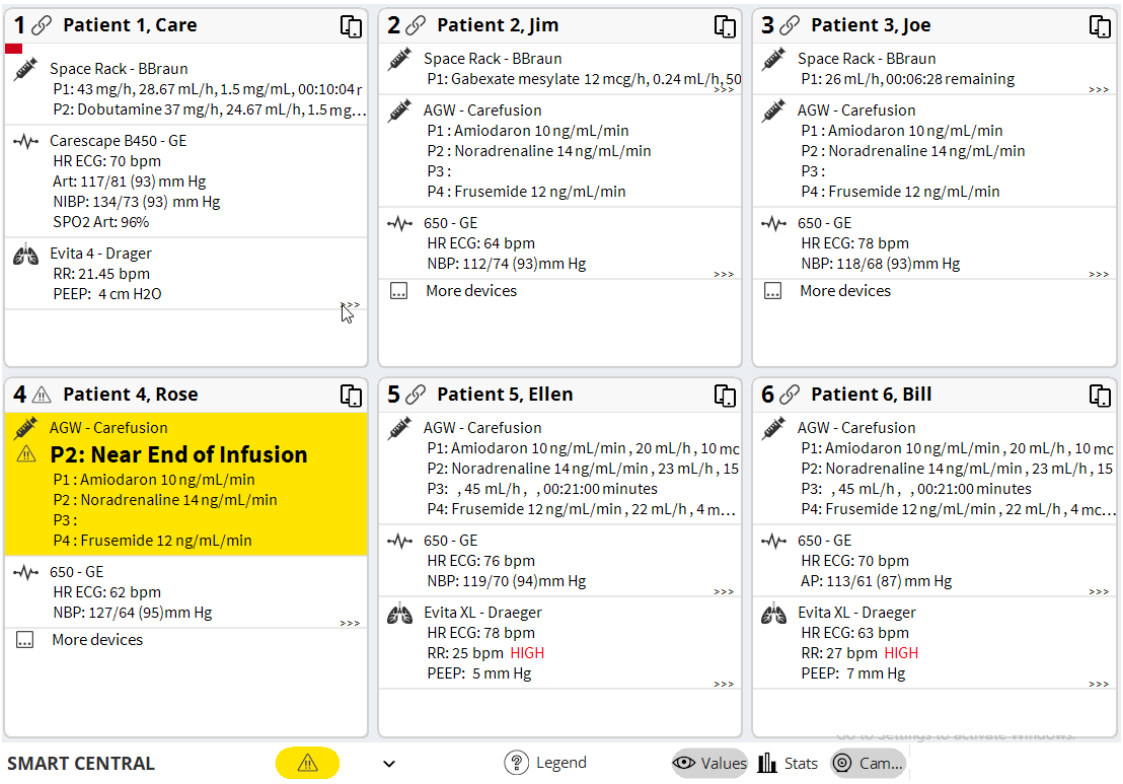


Fig 3

1.3 Bed Cards

Each Bed Card displays some of the data provided by the devices connected to the patient (Fig 4). The kind of data displayed depends on the design and configuration of the device.

If the Bed Card is partly light blue, as in Fig 4, it means that there is at least one low priority alarm, and no medium and/or high priority alarms, coming from the connected devices.

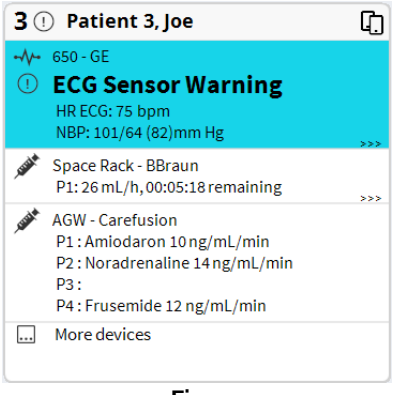


Fig 4

If the Bed Card is partly yellow, as in Fig 5, it means that there is at least one medium priority alarm, and no high priority alarms, coming from the connected devices.

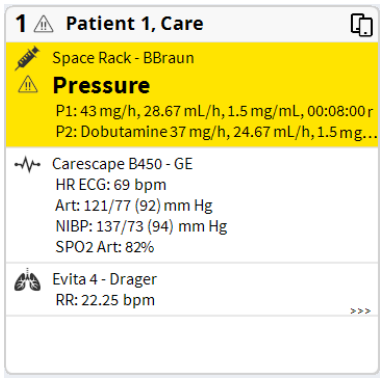


Fig 5

If the Bed Card is partly red, as in Fig 6, it means that at least one of the connected devices is in high priority alarm state.

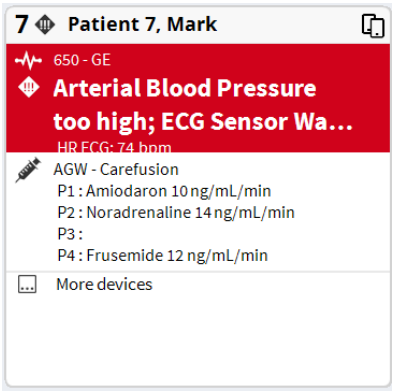


Fig 6

The connected beds from which no alarms are received appear as in Fig 7. No device data is displayed as this might distract the reading of possible alarms occurring on the other beds.

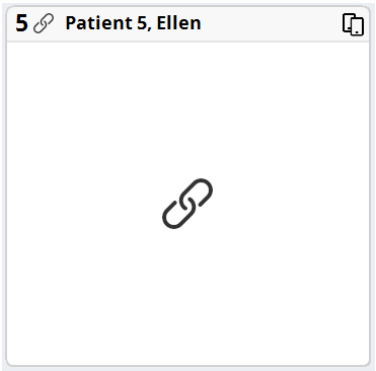


Fig 7

To display device data on these devices "pump" click the **Values** button on the command bar (Fig 2 **B**). The Bed Card will appear as in Fig 8.

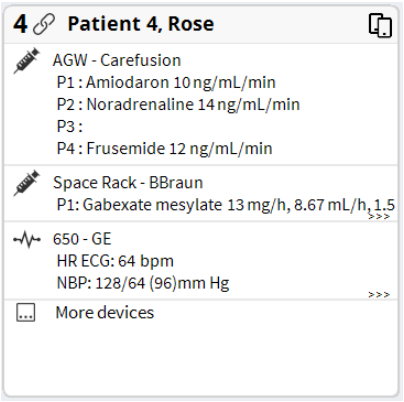


Fig 8

Disconnected beds are displayed as in Fig 9 a, and Fig 9 b (if "Values" button is clicked).

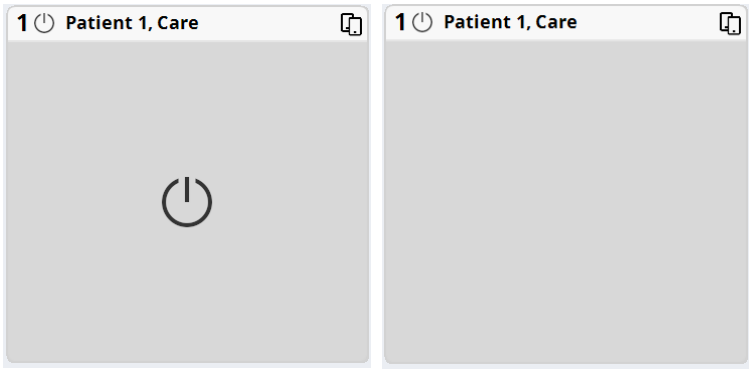


Fig 9 a/b

1.3.1 Bed Card description

This section provides a detailed description of the way information is displayed on every Bed Card. On top of the Bed Card the bed number and the patient name are displayed (Fig 10). The icon means that the bed is connected to Smart Central and that Smart Central is currently receiving device data from the bed. If one of the devices connected to the bed is notifying a low priority alarm the icon is displayed instead.

If one of the devices connected to the bed is notifying a medium priority alarm the icon is displayed instead. If one of the devices connected to the bed is notifying a high priority alarm the icon is displayed instead.

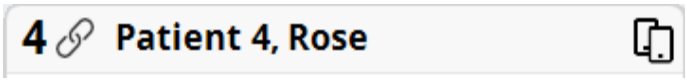


Fig 10

The information in the Bed Card is divided by "Device type". Each device type is characterized by a specific icon (Fig 11 **A**).

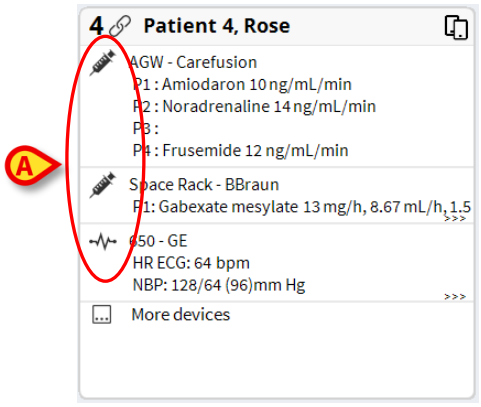


Fig 11

A legend is available showing which device type a specific icon refers to.

To display the legend:

- Click the **Legend** button on the command bar. See paragraph 1.4.1 for a detailed description

Data coming from the same kind of devices are grouped together. In Fig 12, for instance, three groups are indicated: infusion pumps, patient monitor and pulmonary ventilator.

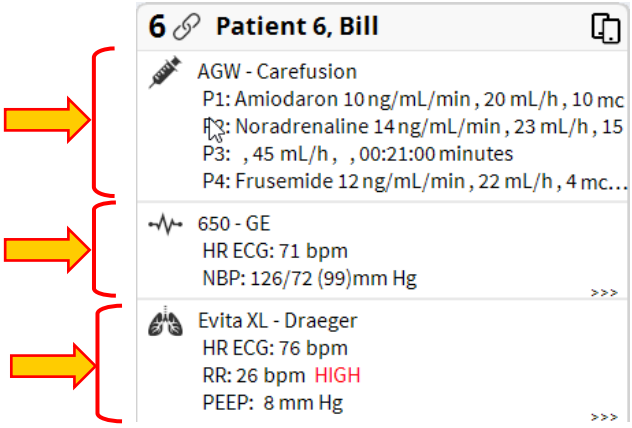


Fig 12

It is possible that not all the data coming from the devices is displayed in the box. If there is hidden data the >>> symbol is displayed at the end of every group (see Fig 13 **A**).

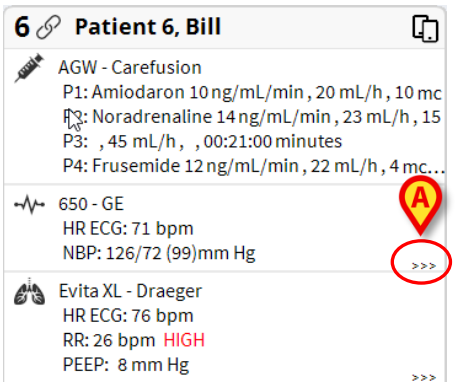


Fig 13

Hidden data can be displayed by clicking the Bed Card, which is enlarged to display all the available information (Fig 14).

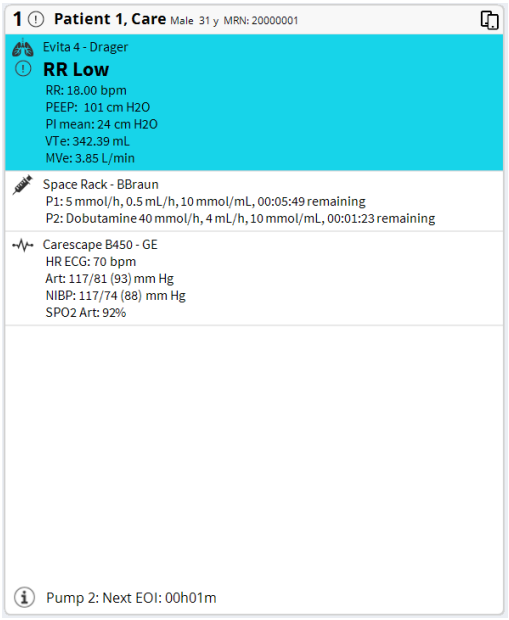


Fig 14

Additional information about the connected devices and the list of the possible disconnected devices are displayed at the bottom of the Bed Card (Fig 15 **A**). Disconnected devices are indicated by the icon. Additional information is indicated by the icon.

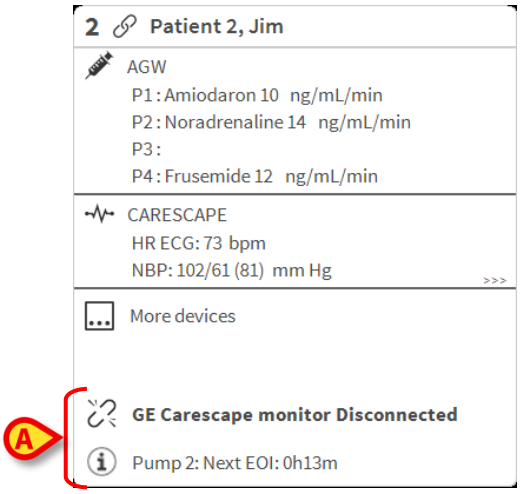


Fig 15

It is possible, by configuration, to associate messages to the displayed values. For instance it is possible to define a range of values that are "normal" and configure the system to inform the user if the collected values are outside this range. See for instance Fig 16 **A,** in which the values are defined as "Low".

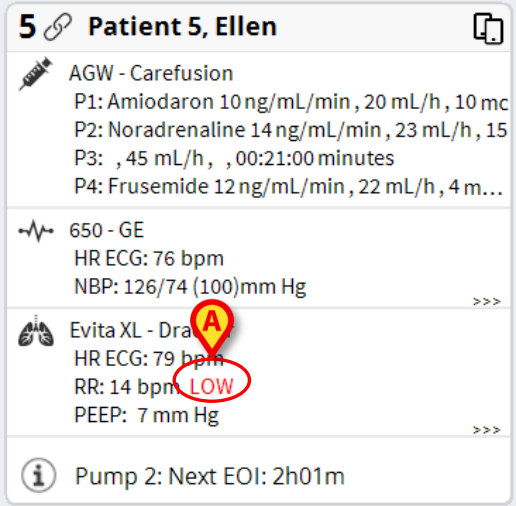


Fig 16

A visual feature on the upper bar on each Bed Card keeps temporarily track of the last alarm notification provided after the Bed Card has changed to a different priority alarm (or no alarm). This makes it possible to be aware of alarms occurring and rapidly passing (Fig 17).

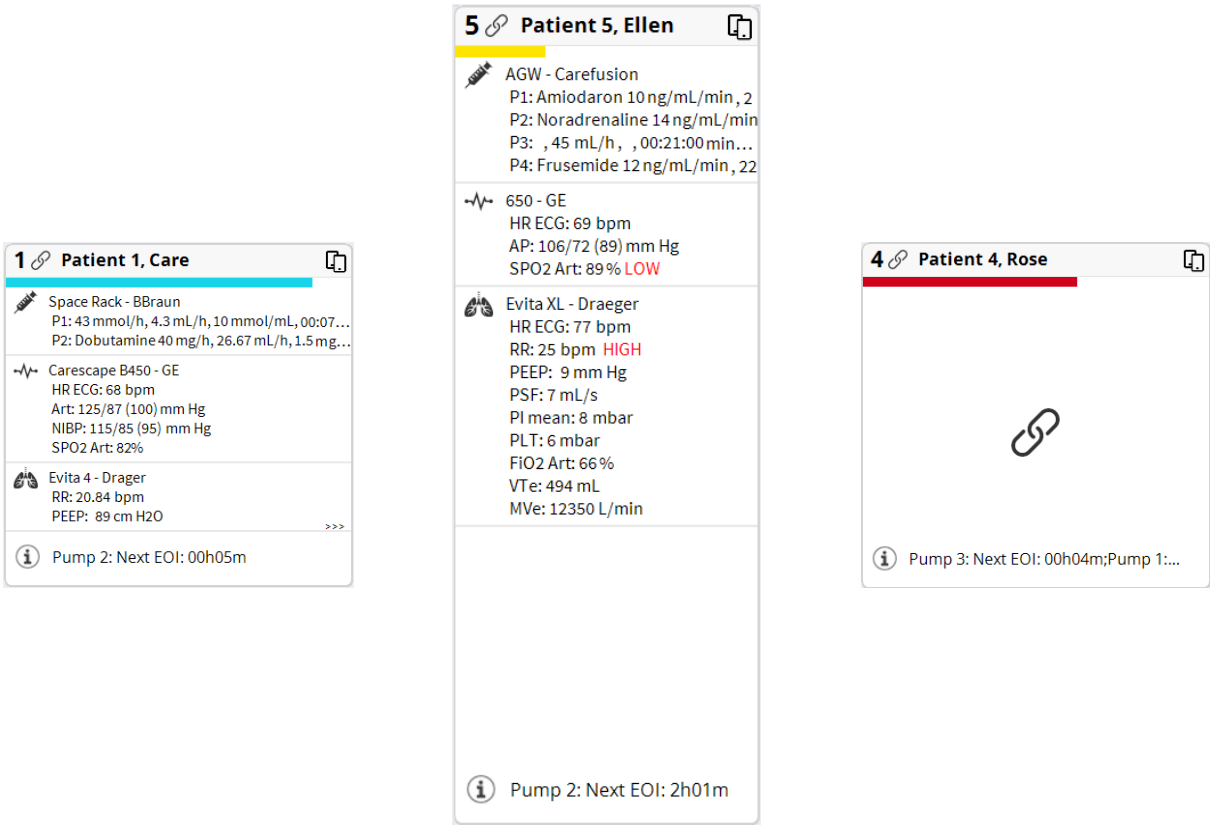


Fig 17

1.4 The Smart Central command bar

The buttons on the command bar of the Smart Central make it possible to perform different actions.

Fig 18

The arrow buttons (Fig 18 **A**) make it possible to scroll up and down the screen when it is not possible to display all the configured Bed Cards at the same time.
When one (at least) of the non-displayed Bed Cards is notifying an alarm, the corresponding button takes the color corresponding to the alarm priority level (blue = low; yellow = medium; red = high).
In case of multiple alarms, the arrow color corresponds to the highest priority notified (e.g.).
An icon can be displayed in the box between the arrow buttons (Fig 19). It indicates that there is an alarm on one of the Bed Cards currently displayed.

Fig 19

The **Legend** button displays a window with the meaning of all the different icons that can be found while using the software (See paragraph 1.4.1).

The **Values** button displays all the available data (both referring to the non-alarmed beds and referring to the non-alarmed devices on the alarmed beds).

The **ICU** button contains an acronym indicating the ward currently displayed. If the system is configured to cover more than one ward, the button can be clicked to open a menu displaying all the configured wards.

1.4.1 Legend

The **Legend** button opens a window explaining the meaning of all the different icons that can be found while using the software.

To display the "Legend":

- Click the **Legend** button

The following window is displayed (Fig 20).

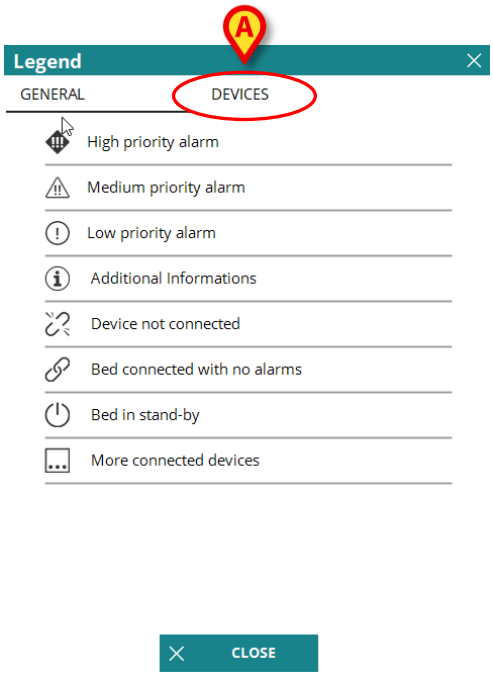


Fig 20

The window lists the "General" icons that can appear in different contexts. Another list of icons, those indicating the connected devices, can be displayed by clicking the "DEVICES" button indicated in Fig 20 **A**. To see the "Devices":

- Click the **Devices** button indicated in Fig 20 **A**

The "Devices" legend is this way displayed (Fig 21)

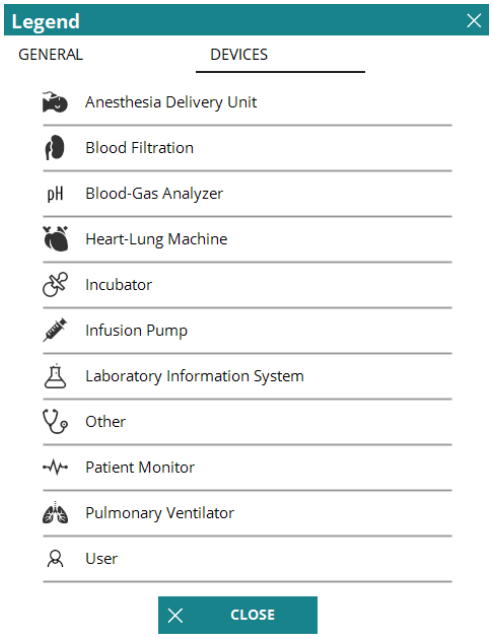


Fig 21

On this window all the possible icons are listed. Alongside the icon the device name is specified, with the corresponding abbreviation / acronym (e.g. INF refers to infusion pumps, MON to patient monitors and so on).

1.5 Events list

It is possible to display a detailed list of all the events occurred for a patient.

To display the events list:

- Click the Bed Card referring to the bed to be displayed (Fig 22)

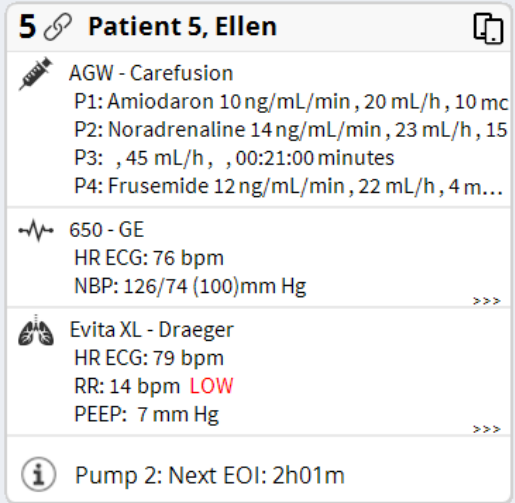


Fig 22

The events list will be displayed on the right (Fig 23).

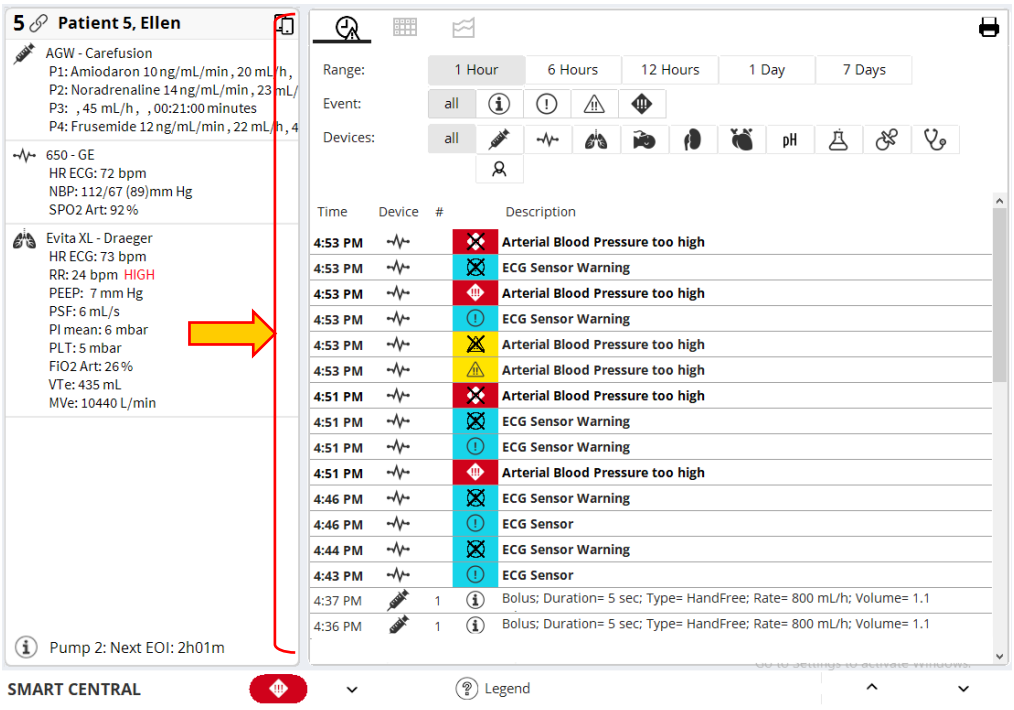


Fig 23

The vertical bar indicated in Fig 23 delimiting the area on the right, can be dragged left/right to resize the area.

The default proportions of the two areas (bed card and events list in Fig 23) are configurable.

The number and type of the tab labels possibly displayed on top of the area on the right (Fig 24) depend on configuration. Refer to the system administrators if the labels are not correctly or partially displayed.

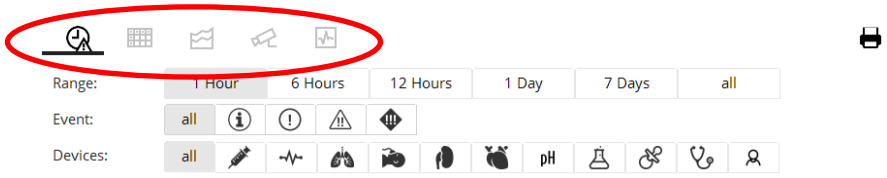


Fig 24

1.5.1 Events list description

The table shown in Fig 25 contains the list of all the events occurred on all the devices connected to the selected patient during their stay.

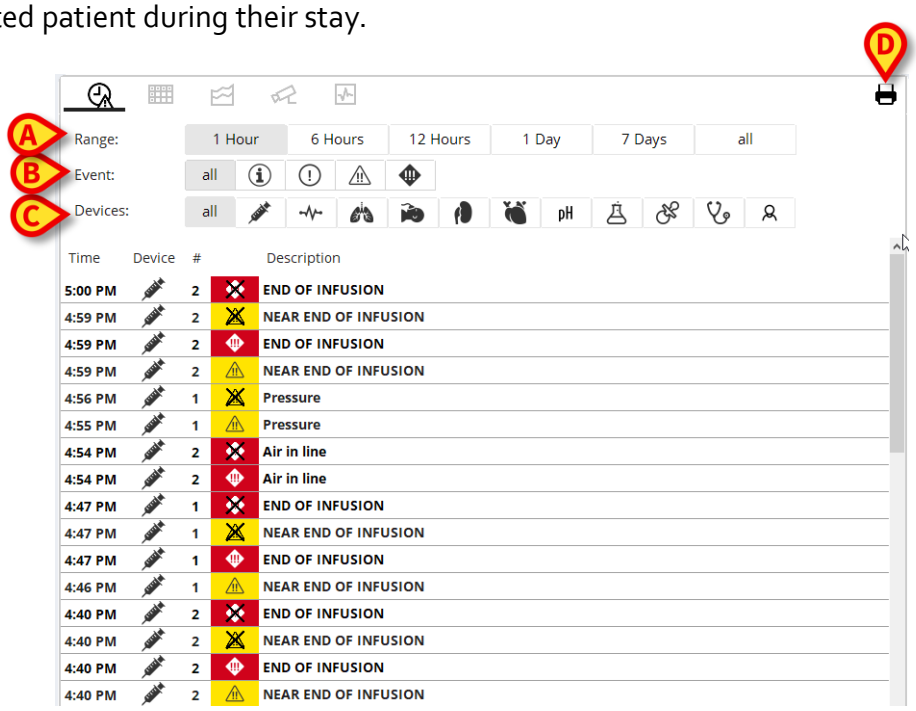


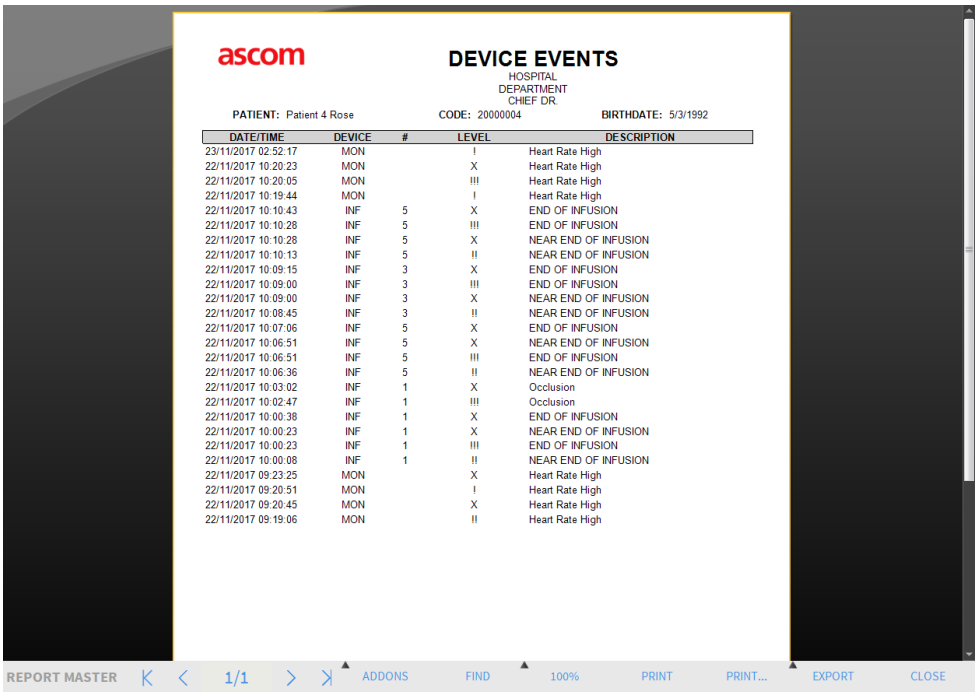
Fig 25

The time period to which the events list refers can be selected using the "**Range**" filters (Fig 25 **A**).

The "**Event**" buttons indicated in Fig 25 **B** are also filters making it possible to display only certain types of events. The **All** button, selected by default, displays all the events occurred in the selected time period. The button only displays the "Information" events; the buttons only display the low and medium priority alarms; the button only displays the high priority alarms. Multiple selections is possible to display two kinds of events at the same time (i.e. only low and medium priority alarms).

The "**Device**" buttons indicated in (Fig 25 **C**) are also filters making it possible to display only the events referring to a specific device. The **All** button, selected by default, displays all the events occurred in the selected time period; the button only displays the events referring to the infusion pumps; the button only displays the events referring to patient monitors and so on... The full list of icons with their explanation can be found in the "**Legend**" window (see paragraph 1.4.1). Multiple selection is possible to display the events referring to two or more devices at the same time.

The **Print** button indicated in Fig 25 **D** makes it possible to print the list of events displayed (Fig 26).



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DEVICE EVENTS

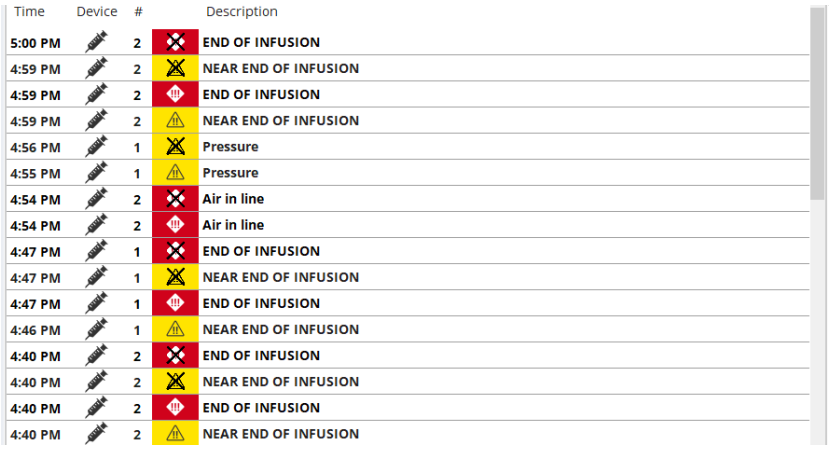
HOSPITAL
DEPARTMENT
CHIEF DR.

PATIENT: Patient 4 Rose **CODE:** 20000004 **BIRTHDATE:** 5/3/1992

DATE/TIME	DEVICE	#	LEVEL	DESCRIPTION
23/11/2017 02:52:17	MON		I	Heart Rate High
22/11/2017 10:20:23	MON		X	Heart Rate High
22/11/2017 10:20:05	MON		III	Heart Rate High
22/11/2017 10:19:44	MON		I	Heart Rate High
22/11/2017 10:10:43	INF	5	X	END OF INFUSION
22/11/2017 10:10:28	INF	5	III	END OF INFUSION
22/11/2017 10:10:28	INF	5	X	NEAR END OF INFUSION
22/11/2017 10:10:13	INF	5	II	NEAR END OF INFUSION
22/11/2017 10:09:15	INF	3	X	END OF INFUSION
22/11/2017 10:09:00	INF	3	III	END OF INFUSION
22/11/2017 10:09:00	INF	3	X	NEAR END OF INFUSION
22/11/2017 10:08:45	INF	3	II	NEAR END OF INFUSION
22/11/2017 10:07:06	INF	5	X	END OF INFUSION
22/11/2017 10:06:51	INF	5	X	NEAR END OF INFUSION
22/11/2017 10:06:51	INF	5	III	END OF INFUSION
22/11/2017 10:06:36	INF	5	II	NEAR END OF INFUSION
22/11/2017 10:03:02	INF	1	X	Occlusion
22/11/2017 10:02:47	INF	1	III	Occlusion
22/11/2017 10:00:38	INF	1	X	END OF INFUSION
22/11/2017 10:00:23	INF	1	X	NEAR END OF INFUSION
22/11/2017 10:00:23	INF	1	III	END OF INFUSION
22/11/2017 10:00:08	INF	1	II	NEAR END OF INFUSION
22/11/2017 09:23:25	MON		X	Heart Rate High
22/11/2017 09:20:51	MON		I	Heart Rate High
22/11/2017 09:20:45	MON		X	Heart Rate High
22/11/2017 09:19:06	MON		II	Heart Rate High

Fig 26

The events table is displayed below (Fig 27).



Time	Device	#		Description
5:00 PM		2		END OF INFUSION
4:59 PM		2		NEAR END OF INFUSION
4:59 PM		2		END OF INFUSION
4:59 PM		2		NEAR END OF INFUSION
4:56 PM		1		Pressure
4:55 PM		1		Pressure
4:54 PM		2		Air in line
4:54 PM		2		Air in line
4:47 PM		1		END OF INFUSION
4:47 PM		1		NEAR END OF INFUSION
4:47 PM		1		END OF INFUSION
4:46 PM		1		NEAR END OF INFUSION
4:40 PM		2		END OF INFUSION
4:40 PM		2		NEAR END OF INFUSION
4:40 PM		2		END OF INFUSION
4:40 PM		2		NEAR END OF INFUSION

Fig 27

The events table provides the following information:

- Event time (indicated as hh:mm);
- Type of device in which the event occurred;

- Number (in case of infusion pumps it indicates the pump number);
- Alarm priority level;
- Event description;
- The black cross on the alarm symbol indicates the end of the corresponding alarm.

Events snapshot

➢ Double-Click the icon (if present - Fig 28) to display the snapshot of the waveform related to the corresponding event.

Fig 28

1.5.2 User Events

A Smart Central feature makes it possible for users to manually enter "user" events.

To enable this feature it is necessary:

1. to set to "true" the EventEditorEnabled system option;
2. the required permissions level for the logged user.

See the Web Configurator User Manual for more information (*CFG ENG Web Configurator*).

When the EventEditorEnabled system option is set to true and Digistat is restarted, a new action bar is displayed at the bottom of the events grid (Fig 29 **A**):

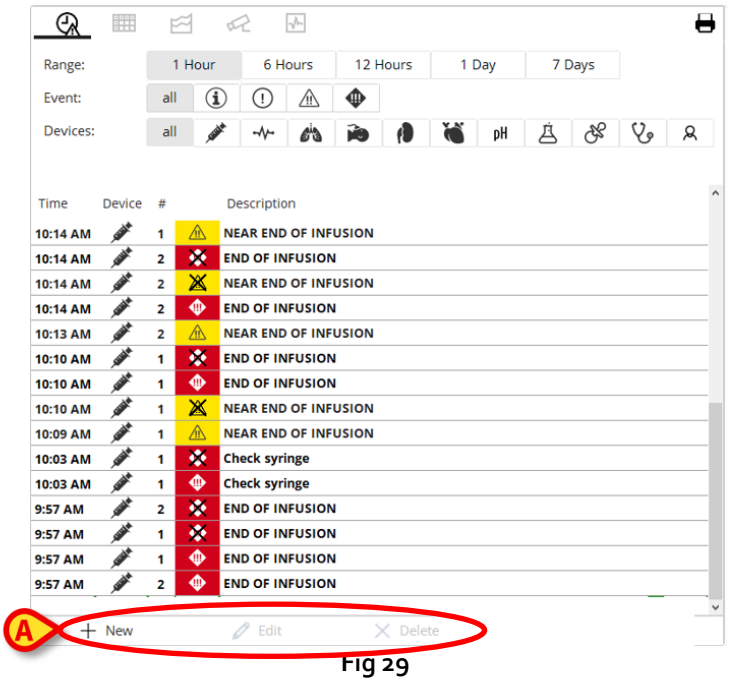


Fig 29

The new action bar allows to create, edit and delete "user" events.

A user event is then marked by a specific icon: .

1.5.2.1 Creating new user events

To create a new user event:

- Click the **New** button (Fig 29 **A**).

The following window is displayed (Fig 30):

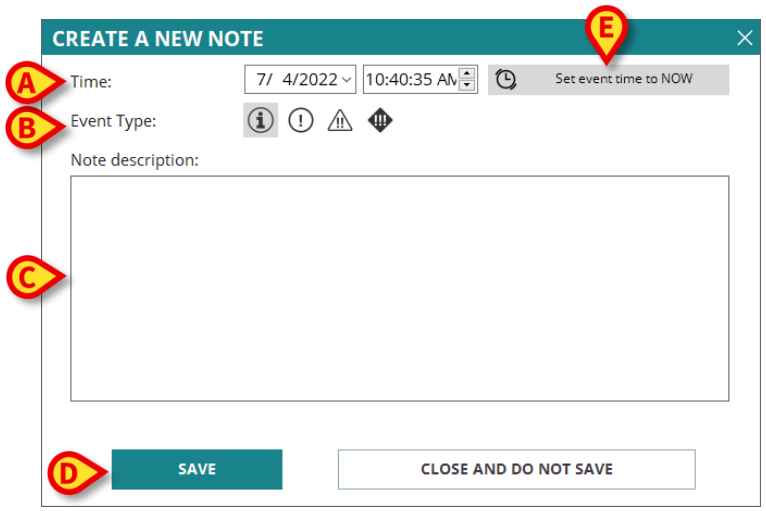


Fig 30

The following information can be specified on the window:

- Time: date and time of the event (Fig 30 **A**).
- Event Type: an event can have different priorities, from information to low/medium/high priority (Fig 30 **B**).
- Note Description: note text (Fig 30 **C**).

- Click **Save** to save the note or **Close and do not save** to quit without saving (Fig 30 **D**).

The **Set event time to NOW** button (Fig 30 **E**) can be used to set to current date and time as time of the event.

The user event is displayed in the events grid, marked by the icon (see Fig 29).

To select an existing event, in the events grid:

- click the row corresponding to the event to be selected.

The behavior of the action bar changes according to the type of event selected:

- If no row is selected it is only possible to create a new "user" event. The **Edit** and **Delete** buttons are disabled.
- If a row corresponding to a user event is selected, it is possible to edit or delete it. It is still possible to create a new user event.
- If a row corresponding to a device event is selected, it is only possible to create a new "user" event. In this case:

- Click **New** to display a "New Event" window (Fig 30) having the same date and time of the selected event. This feature allows to easily create user events having the same date and time of existing device events.

1.5.2.2 Editing user events

To edit a user event, on the events grid:

- Click the row corresponding to the user event
- Click **Edit** on the action bar.

The window shown in Fig 30 is displayed.

- Edit the event (Date/time, priority, description).
- Click **Save**.

1.5.2.3 Deleting user events

To delete a user event, on the events grid:

- Click the row corresponding to the user event.
- Click **Delete** on the action bar.

User confirmation is required.

- Click **Yes** to delete the event.

The corresponding row disappears from the events grid.

1.6 Dashboard configuration

If the Smart Central is configured as a "Dashboard" Smart Central, some additional functionalities are available. These are the "Vital Signs" and "Charts" functionalities, described below (Fig 31 **A**).
Both functionalities are accessible from the "Notification area".

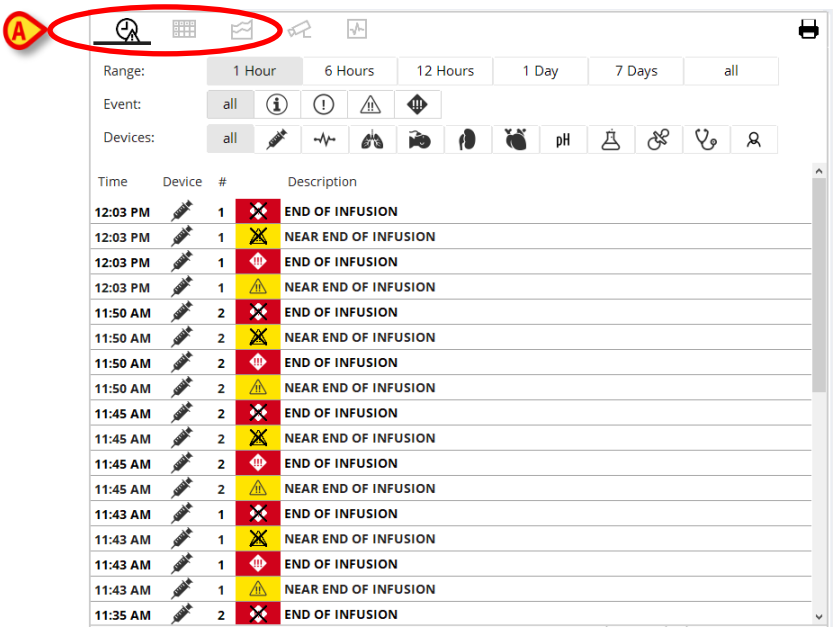


Fig 31

1.6.1 Vital Signs

To activate the "Vital Signs" functionality:

- Click the Vital Signs grid button (Fig 32 **A**).

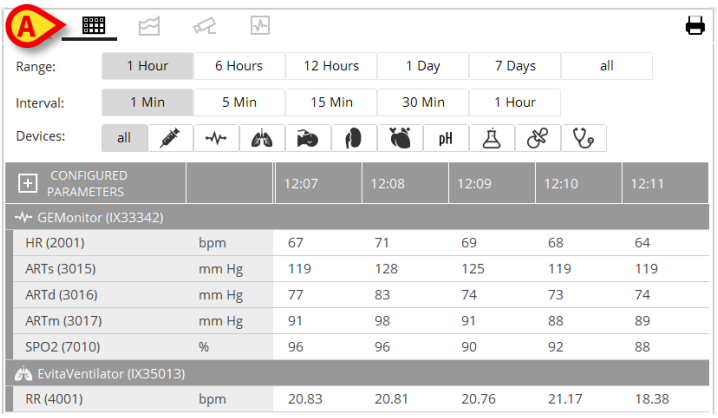


Fig 32

"Vital signs" makes it possible to display in a table some selected parameters (Fig 33), defined by configuration. In the table displayed they are grouped by acquisition device.

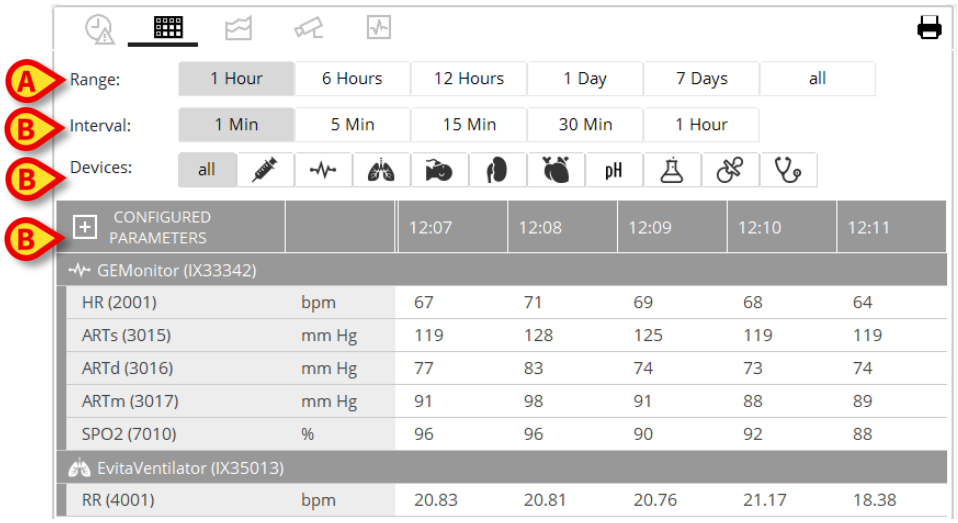


Fig 33

Use the "Range" filters (Fig 33 **A**) to display the chosen time span within which the parameters are acquired. For instance: if **1 hour** is selected the table displays the parameters acquired within the last hour; if **6 hours** is selected the table displays the parameters acquired within the last 6 hours, and so on.

Use the "Interval" filters (Fig 33 **B**) to define the values acquisition interval (i.e., depending on the interval selected, the values displayed in the table will be acquired each minute, every 5 minutes, every 15 minutes, and so on).

Use the "Devices" filters (Fig 33 **C**) to display only the values acquired by selected devices.

Click on "Configured Parameters" (Fig 33 **D**) to display all the acquired parameters (1 minute interval).

The "all" option displays all the acquired parameters (1 minute interval).

A task in the database deletes the previous data at a set time.

Click the print button to create a print report of the displayed parameters.

1.6.2 Charts

Click the **Charts** button to activate the "Charts" functionality (Fig 34 **A**).

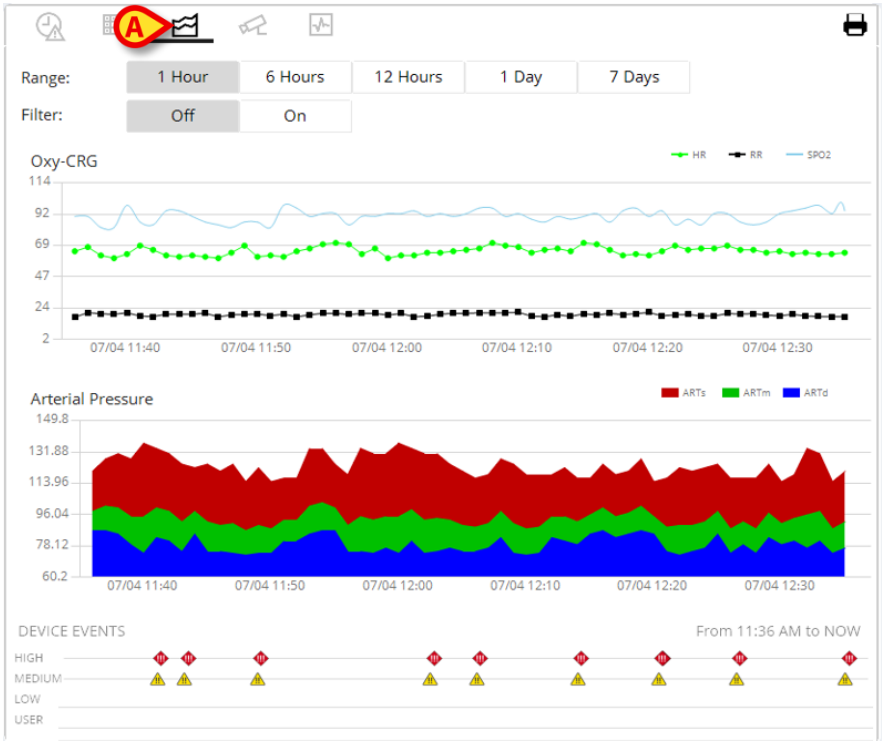


Fig 34

"Charts" makes it possible to display different charts drawn from the acquired parameters (Fig 35). The charts show the configured parameters as trends. The number of charts, their contents and names can be defined by configuration.

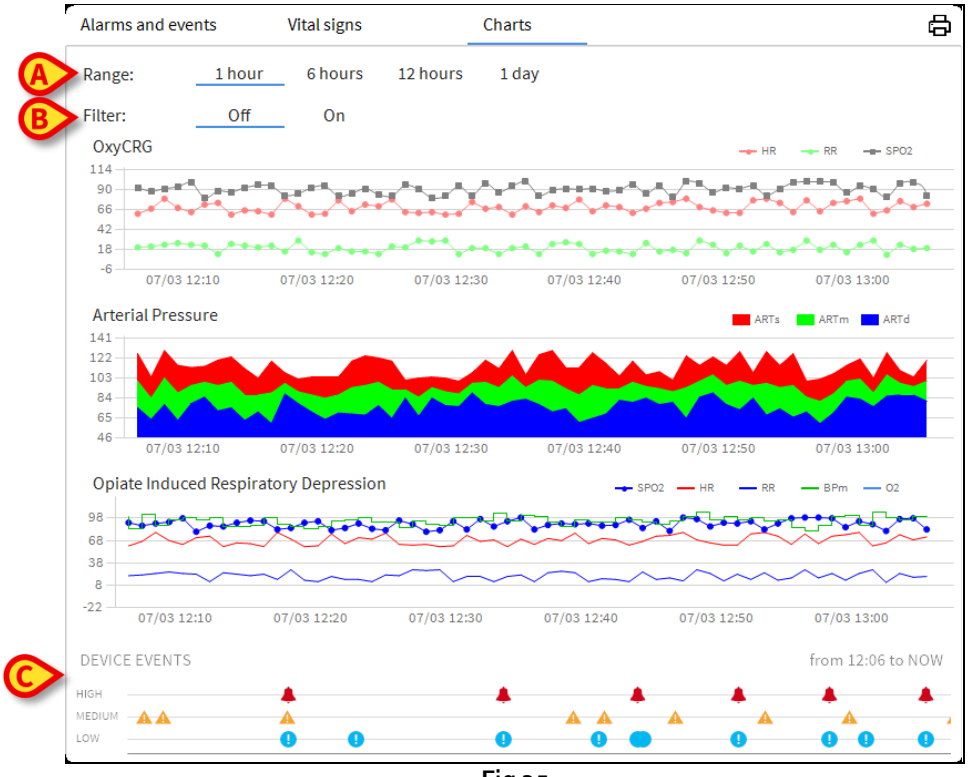


Fig 35

Use the "Range" filter (Fig 35 **A**) to define the time span in which the charts are drawn. For instance: if **1 hour** is selected the charts display the trends starting one hour in the past until present time; if **6 hours** is selected the charts display the drawn within the last 6 hours.

Use the "Filter" option (Fig 35 **B**) to activate an algorithm that approximates the charts values making it possible to better display and evaluate the trends. If this option is activated the acquired data are grouped five by five and each group of five is then ordered keeping only the middle value of them, discarding the other four. This procedure eliminates the lowest and highest values (i.e. artefacts) and provides a "normalised" chart.

The chart indicated at the bottom of the page (Fig 35 **C**) is always present and it displays on three different rows different device events. Each event is positioned according to its priority level (represented on the y axis) and time of occurrence (represented on the x axis).

Click any chart to display a vertical cursor making it possible to display the numerical values of all charts at a given time (Fig 36 **A**).

Fig 36

1.6.3 Alarms statistics

A printed report of the alarm statistic history can be generated by accessing the System Report menu.

To print an Alarm statistic report:

- Click the **Menu** button on "Control Bar"

The main menu opens:

- Click on **System Reports** and then
- Click Smart Central Dashboard

Select the data source (either Current Patient, All patients or a Location from a dropdown menu of preconfigured options) and select the Date Range either clicking on the provided ranges or entering the date time manually in the available fields.

- Click the **Generate** button

A print preview of the selected Event statistics will open.

1.7 Notification area

A notification area is displayed on the right of the Smart Central screen, reporting various notifications sent by the connected devices (Fig 37 **A**).

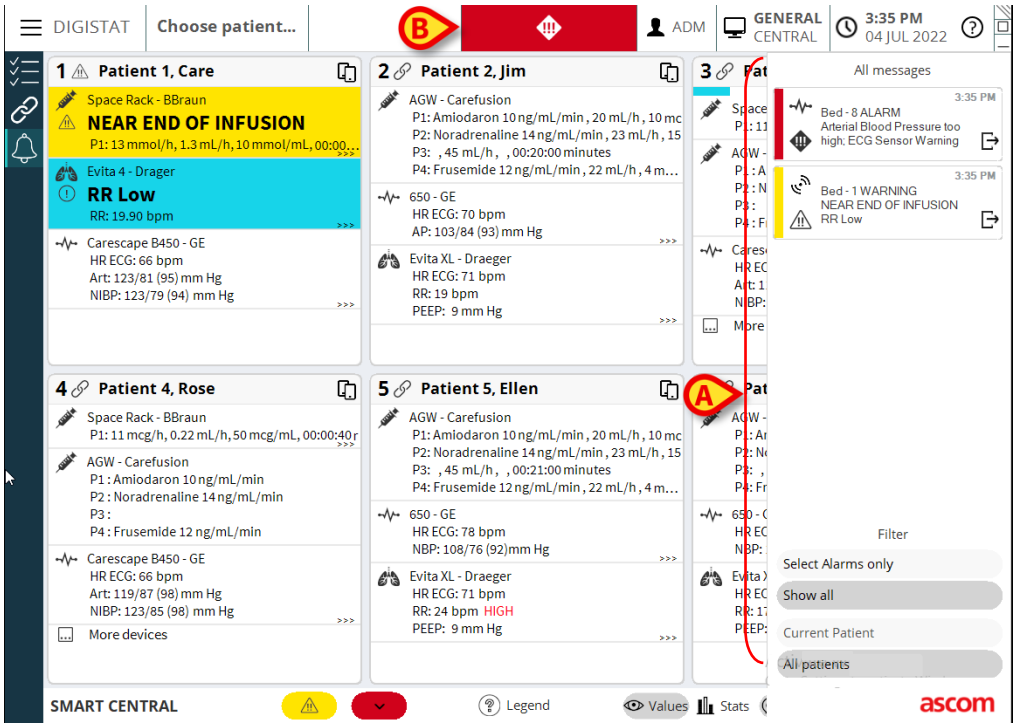
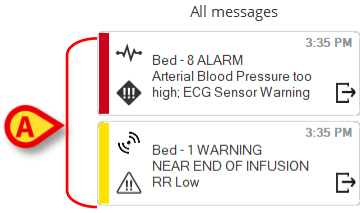


Fig 37

The notification area can be, by configuration:

- Always visible
- Automatically displayed when a new notification comes
- Only visible after user click on the Control Bar alarm button (Fig 37 **B**).

The different messages are displayed in chronological order, (most recent on top - Fig 38 **A**) and by criticality (High priority alarms on top, then medium priority, then low priority).



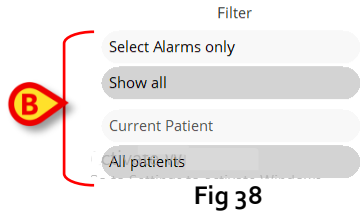


Fig 38

Each notification is characterized by the colour that corresponds to the priority level (red for high priority, yellow for medium priority, blue for low priority).

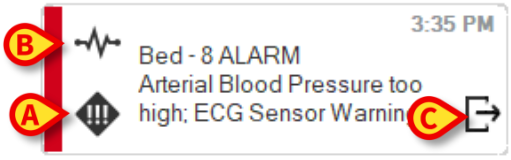


Fig 39

In the message box (Fig 39), the following information is displayed:

- Date-time of occurrence.
- The number of the bed from which the message comes.
- The actual message text.
- An icon characterizing the message type (Warning, Alarm, Info - Fig 39 **A**).
- An icon indicating the message category (Fig 39 **B**).
- A "Callback" button. Click the button to access the patient station on which the notification occurred (Fig 39 **C**).

At the bottom of the area, four different filters are available, making it possible to choose the type of message to be displayed (Fig 38 **B**). The available filters are:

- Only alarms.
- All messages.
- Messages relating only to the selected patient.
- Messages relating to all patients.

1.8 Alarms notification

By default, the Smart Central screen displays the device data referring to a bed only if there is an alarm notification coming from at least one of the devices connected to that bed.
In a condition of "No alarms" the Smart Central screen would appear as in Fig 40, where five connected "Beds" are displayed and where no devices on any of the beds is in alarm state.

Fig 40

Each time an alarm occurs on one of the devices, the data relating to the bed to which the device is connected is displayed. In Fig 41, for instance, bed 4 is notifying a high priority alarm. A short text specifying the kind of alarm occurring is displayed on the Bed Card.

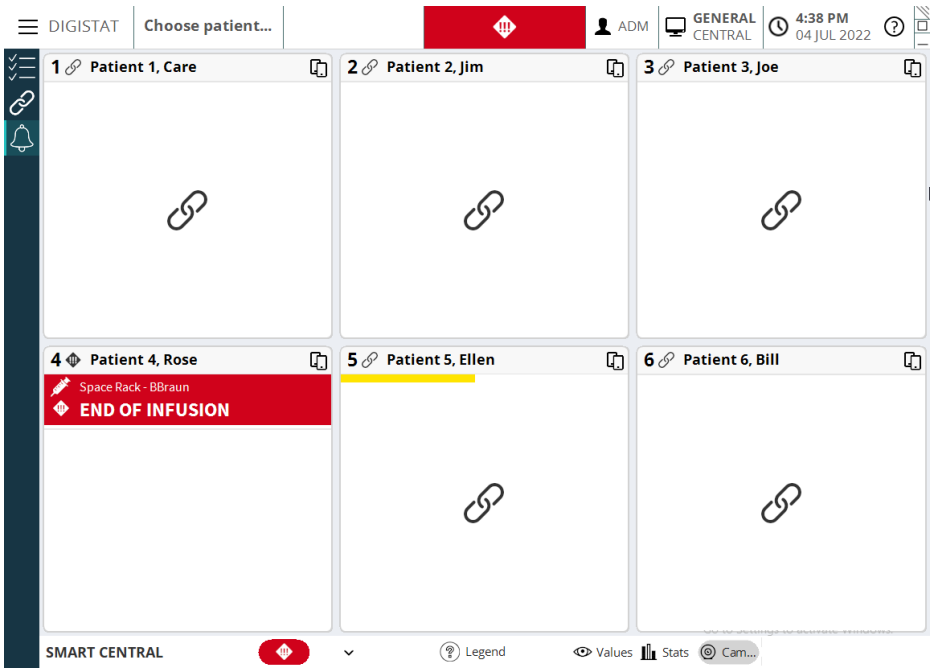


Fig 41

In addition, a sound notification is provided. Three different sounds exist, one for each alarm priority level. In case of multiple alarms, the sound corresponding to the one with highest priority is provided.

The occurrence of alarms is also notified on the command bar by the arrow-buttons indicated in Fig 42, Fig 43 and Fig 44.

Fig 42

Fig 43

Fig 44

These buttons make it possible to scroll up and down the screen when it is not possible to display all the configured Bed Cards at the same time.
When one (at least) of the non-displayed Bed Cards is notifying an alarm, the corresponding button takes the color corresponding to the alarm priority level (blue = low; yellow = medium; red = high). In case of multiple alarms the arro w color corresponds to the one with the highest priority.
An icon can be displayed within the box between the arrow buttons (Fig 45). It indicates that there is an alarm on one of the Bed Cards currently displayed.


Fig 45

A visual feature on the upper bar on each Bed Card keeps temporarily track of the last alarm notified after the Bed Card has changed to a different priority level alarm (or no alarm). This makes it possible to be aware of alarms occurring and rapidly passing.

When the state of a Bed Card changes to a lower level alarm (or no alarm), the color relating to the previous alarm (Fig 46) remains on the heading bar for a certain configurable time.

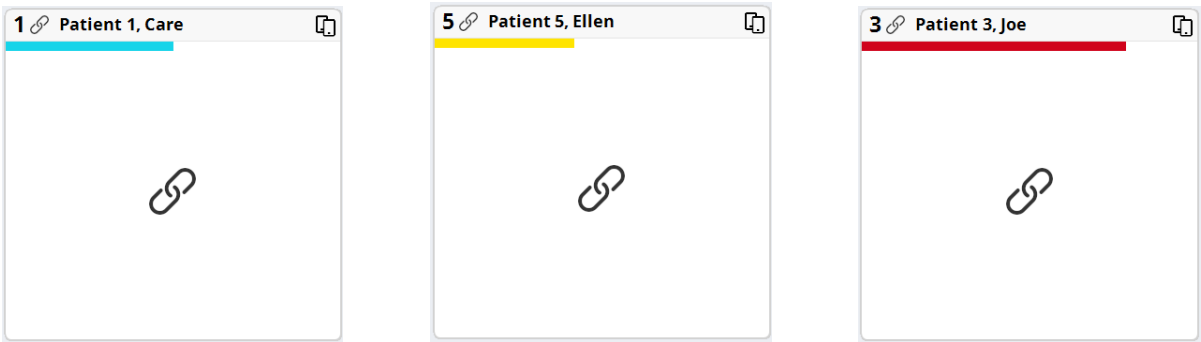


Fig 46

1.8.1 Alarms notification on Control Bar

Alarms are also notified on Control Bar, so that they are always visible in case other modules are installed and currently selected.

Fig 47

The color of the button depends on the alarm priority level (cyan=low; yellow=medium; red=high). In case of a high or medium priority alarms, the button also flashes.

- Click the button to display the notification area (Fig 47 **A**)

The notification disappears when the alarm conditions no longer exist.

1.9 Sound Check procedure

The Sound Check procedure shall be performed at least once per shift.

When Smart Central is started, it provides a specific sound indicating that the sound notification of alarms is working properly.

The user can perform a "Sound Check" procedure. To perform the "Sound Check" procedure

- Click the **Menu** button on Control Bar (Fig 48)

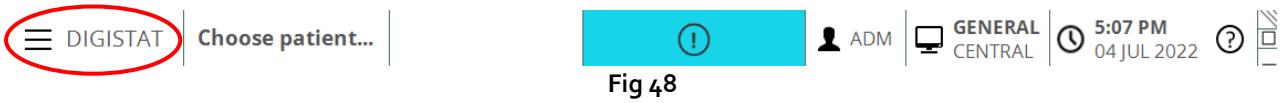


Fig 48

The following menu is displayed (Fig 49).

Fig 49

- Click on **Modules Configuration** (Fig 49 **A**)

The following menu opens (Fig 50).

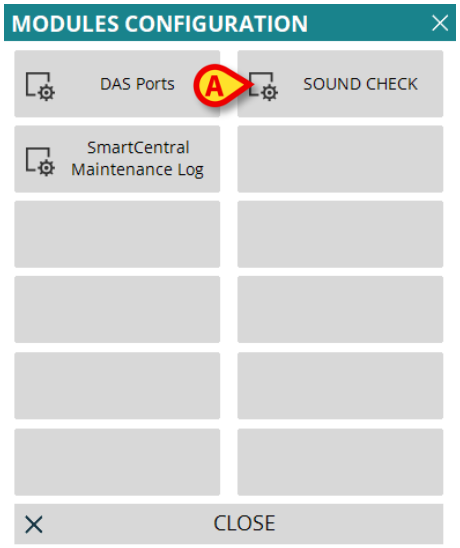


Fig 50

- Click on **Sound Check** (Fig 50 **A**)

The following pop-up window opens, asking whether a sound is heard or not (Fig 51).

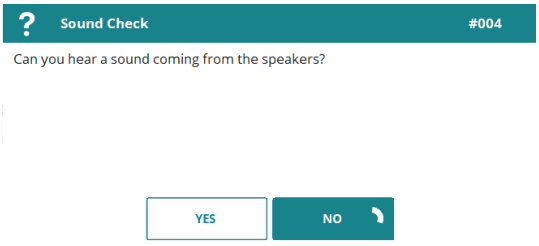


Fig 51

If a sound is heard, then click **Yes**. The pop-up window disappears and nothing else happens (meaning that the system is working correctly).
If no sound is heard, then click **No**. The pop-up window disappears and a notification is displayed on Control Bar, meaning that an error occurred while checking the sound notification system (Fig 52 and Fig 53).

Fig 52

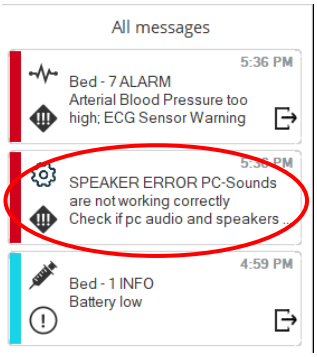


Fig 53

The notification remains while working with Smart Central. It disappears when another "Sound Check" procedure is performed and a "YES" answer is provided in the end.
The notification button can be clicked to display a more detailed explanation of the error occurred.

If the sound check fails, stop using the Smart Central module and promptly contact the technical assistance.

1.10 Notification Mute on Smart Central Mobile

The notifications can be muted in the Smart Central Mobile instances for a specified amount of time and for a specific bed. The "Mute" feature affects only the Smart Central Mobile application. Smart Central desktop continues to provide audio notifications and cannot be muted.

To enable this feature it is necessary to enable the global system options named ManageMobilityAlarms and SilenceMobilityAlarmsIntervals on the Digistat Configurator Web. See the *Digistat Suite Configuration Manual* for more information.

The mute procedure can be performed both on desktop and on mobile workstations, but only mobiles are affected.

1.10.1 On desktop workstations

If both the parameters are enabled, a new icon is displayed in the bed card (Fig 54 **A**):

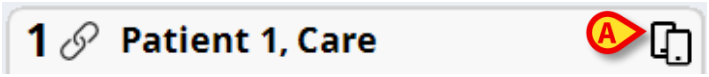


Fig 54

The two-mobile-phones icon indicates that notifications are enabled on Smart Central Mobile, for the selected bed.

- Click the icon to open a new popup window where it is possible to configure and specify the enabling and disabling of the notifications among multiple choices. Those are:
  - Notifications Enabled;
  - Notifications are disabled for, followed by configured X,Y,Z minutes options.

The X,Y,Z values are those specified in the configuration of the abovementioned SilenceMobilityAlarmsIntervals system option.

- Click **SAVE** or **CLOSE** to close the view.

If the notifications are disabled, the icon on the bed card header turns red, and a countdown number (the configured and chosen minutes) is displayed next to it (Fig 55 **A**).

Fig 55

When the countdown reaches zero, the icon turns black again, the countdown is removed and the notifications are restored. In the picture above, for example, the notifications on Smart Central Mobile are disabled for bed 7 for 20 minutes.

- Click the red icon to turn on the audio again or restart the muting countdown.

When the mobile notifications are disabled for a bed:

- On Smart Central Desktop there are no differences in the notifications communication.
- On Smart Central Mobile the notifications related to the muted bed are displayed but the audio and vibration are disabled for the specified amount of time.

1.10.2 On mobile workstations

To enable/disable the notifications on the mobile workstations:

- Click on a Bed Card to navigate to the bed details screen.

If the ManageMobilityAlarms and SilenceMobilityAlarmsIntervals parameters are enabled, a new icon is displayed on top of this screen, alongside the patient data (Fig 56 **A**):

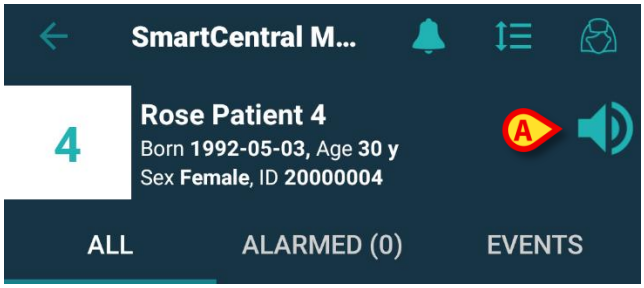


Fig 56

- Click the speaker icon to open a new popup window where it is possible to configure and specify the enabling and disabling of the notifications among multiple choices. Those are:
  - Enable notifications;
  - Disable for, followed by configured X,Y,Z minutes options.

The X,Y,Z values are those specified in the value field of the SilenceMobilityAlarmsIntervals system option.

- Click **OK** or **CANCEL** to close the view.

If the notifications are disabled, the speaker icon on the bed card turns red, and a countdown number (the configured and chosen minutes) is displayed below it (Fig 57) indicating the "mute time" chosen.

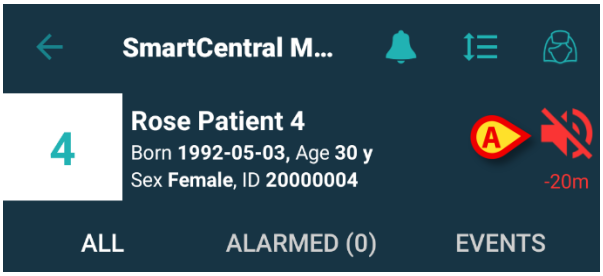


Fig 57

In Fig 57, for example, the notifications are disabled for 20 minutes on bed 4. When the countdown reaches zero the icon turns black again and the notifications are restored.
If notifications are disabled for a specific bed, also the corresponding bed card displays a mute icon (Fig 58 a/b shows the icon when on bed cards - left - and tiles/My Patients mode - right):

Fig 58 a/b

The possibility to mute the notifications on mobile devices is disabled by default. If this possibility is enabled, the healthcare organization requires a strong risk assessment to be sure to mitigate all possible risks. During a temporary muting of notifications it is required that Smart Central Desktop is always monitored by a user.

Unite integration
When the Digistat Suite is integrated with Unite and notifications are generated by the Axess application (or the equivalent app on Myco 2 devices), muting notifications on Smart Central affects the Unite integration as well.

1.10.3 Nurse Presence

When the system is configured to work with automatic nurse presence, using infrared, the silencing mechanism is automatically managed.
When nurse enters a patient room, alerts are automatically muted on mobile devices (same behaviour as manual silencing) for that specific bed. When nurse goes out of a patient room, alerts are enabled again. If there are many nurses inside the patient room, alerts are silenced (on mobile devices) as long as a nurse is inside the patient room.
The nurse presence mechanism is enabled thanks to the infrared functionality (present in the Myco 2 or Myco 3 devices). User must be aware that the smartphone must be always in a position where infrared beacons are visible to the smartphone itself. User must avoid to place the smartphone inside a bag or a closed pocket.
If the smartphone is detected inside a patient room and, after a configured amount of time, is not detected anymore, silencing is automatically disabled. This mitigation reduces the risk for nurses to leave the patient room forgetting the smartphone inside.
When nurse is inside a patient room, in the bed card, a "nurse" icon is displayed next to the silencing icon.

1.11 Smart Central Video

The Smart Central module can be configured to support video streams webcams. This feature enables the visual monitoring of the patient area.

If the Smart Central Video feature is enabled and properly configured (*CameraConfig* generic System Option), the Smart Central main screen appears like shown in Fig 59.

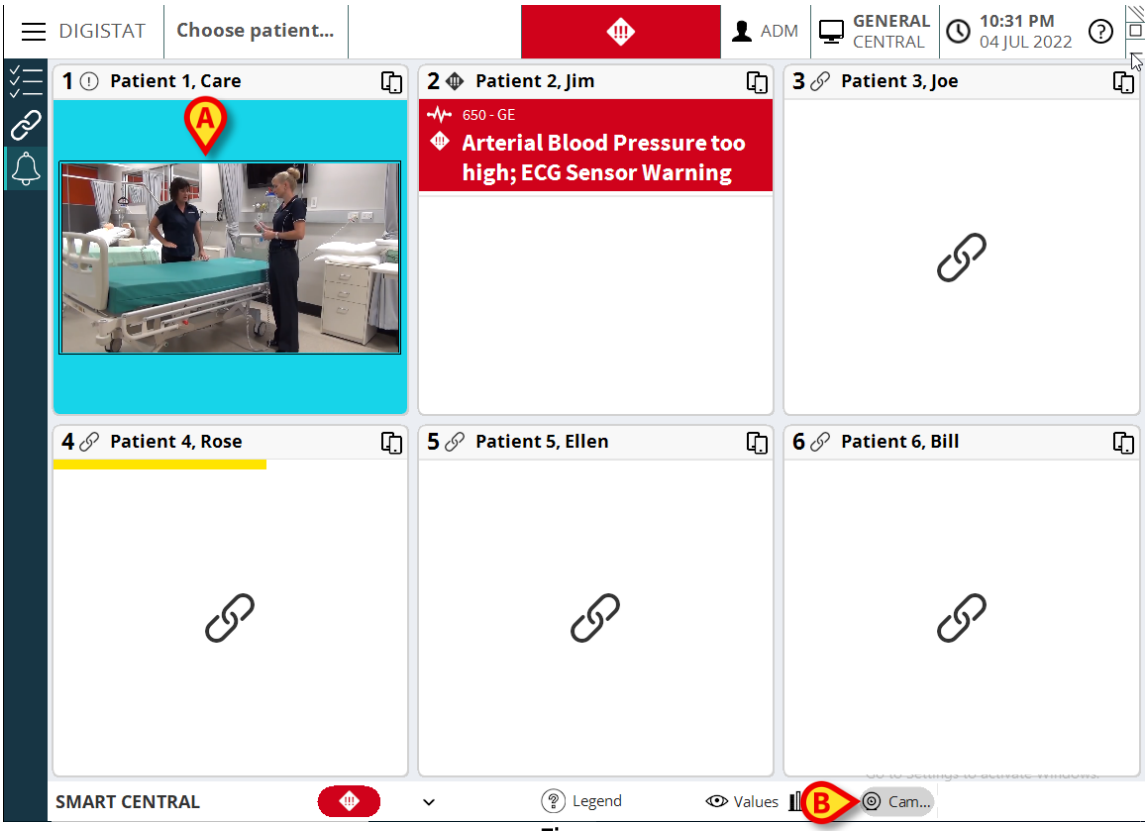


Fig 59

A thumbnail is displayed in the Bed Card, showing the real-time video stream of the webcam configured (Fig 59 **A**). The thumbnail size is also configurable.

An additional button is present in the Smart Central command bar.

- Touch the camera button to toggle (show or hide) the webcam thumbnail (Fig 60).

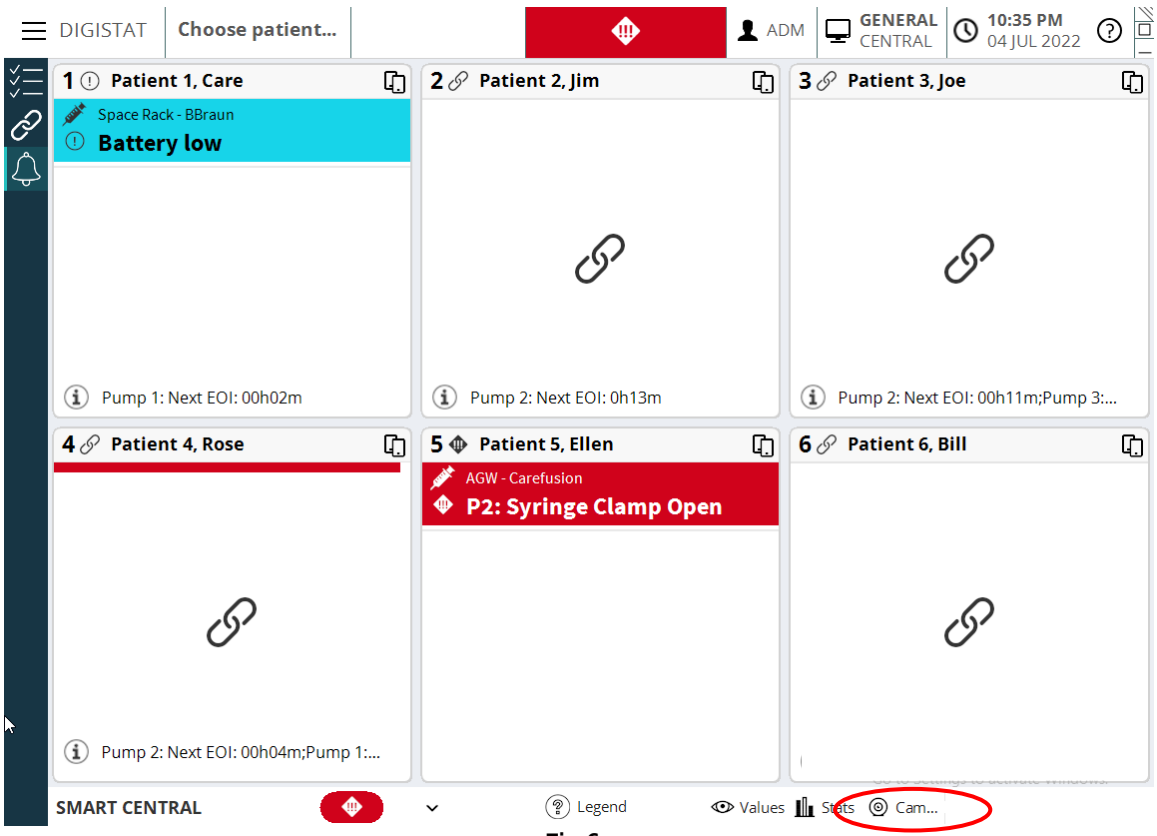


Fig 60

- Click the toggle button to show the camera and then click on the relevant Bed Card (Fig 59 **A**) to enlarge the video (Fig 61):

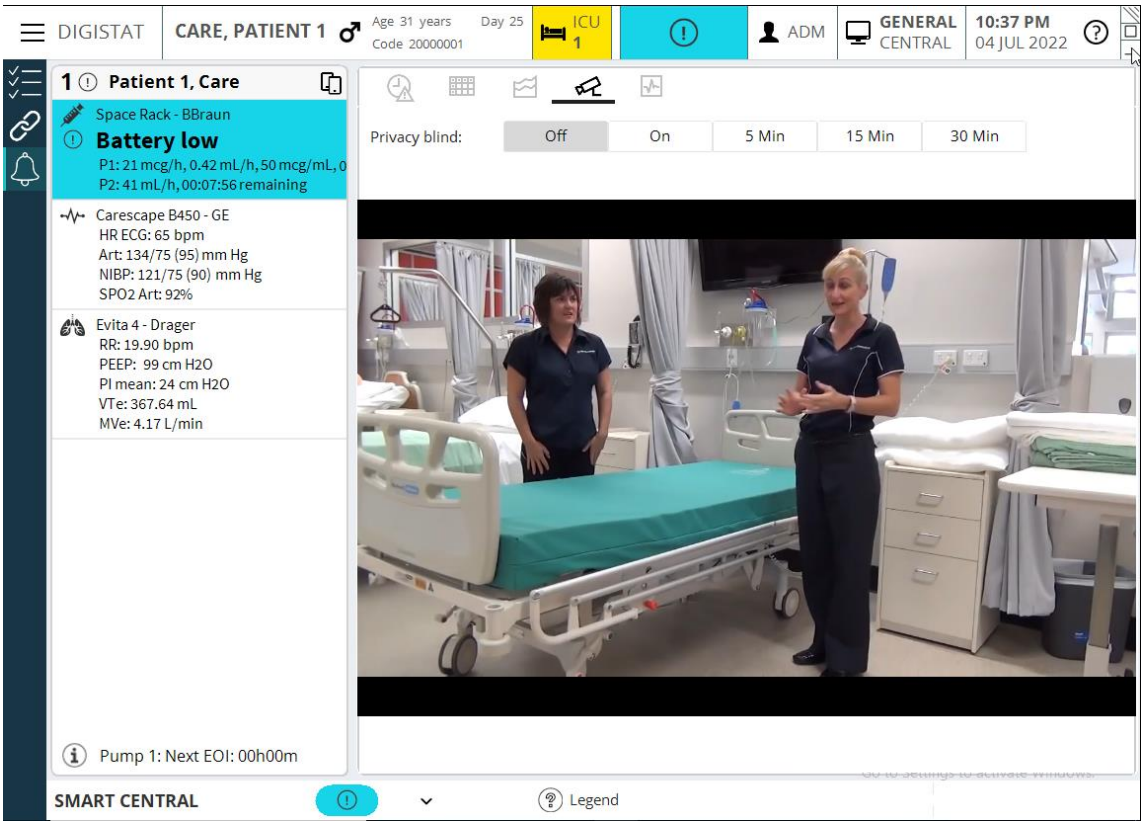


Fig 61

The patient Dashboard is directly opened on the camera tab.

If the camera toggle button is set to hide the camera, the video stream can still be accessed:

- First, select the relevant bed: the patient Dashboard displays the additional tab indicated by the camera icon.
- Click on the camera icon: the enlarged view of the video stream is provided.

The "Privacy Blind" feature allows the user to turn off the webcam of the selected patient: this can be done either permanently or for a chosen period of time, set from preconfigured available intervals. During the Privacy Blind mode no video stream can be viewed. The Privacy Blind mode is disabled by default.

The Privacy Blind mode is indicated by the icon in the Smart Central screen and in the Bed Card screen.

The Privacy Blind button bar is represented below:

- Touch the **On** button to enable the Privacy Blind mode.

Once selected, the **On** button is highlighted.

In Privacy Blind mode the Bed Card is like the one shown below (Fig 62):

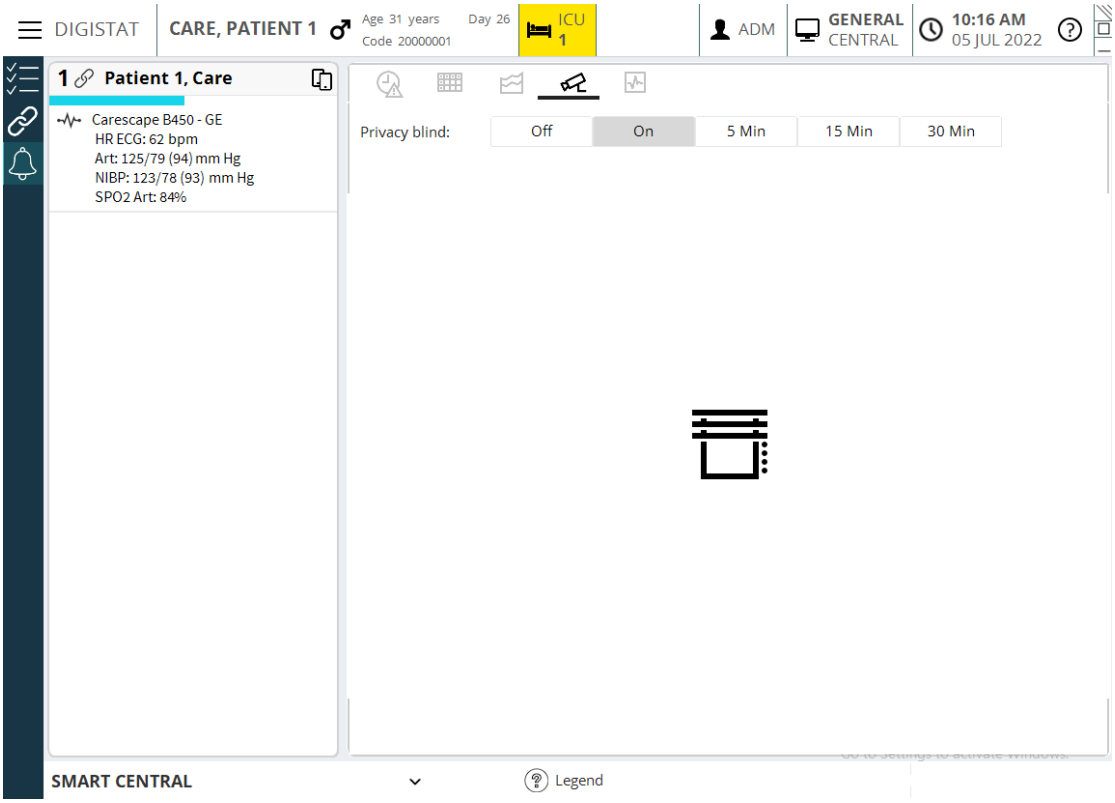


Fig 62

In Privacy mode the Smart Central screen is like the one shown below (Fig 63):

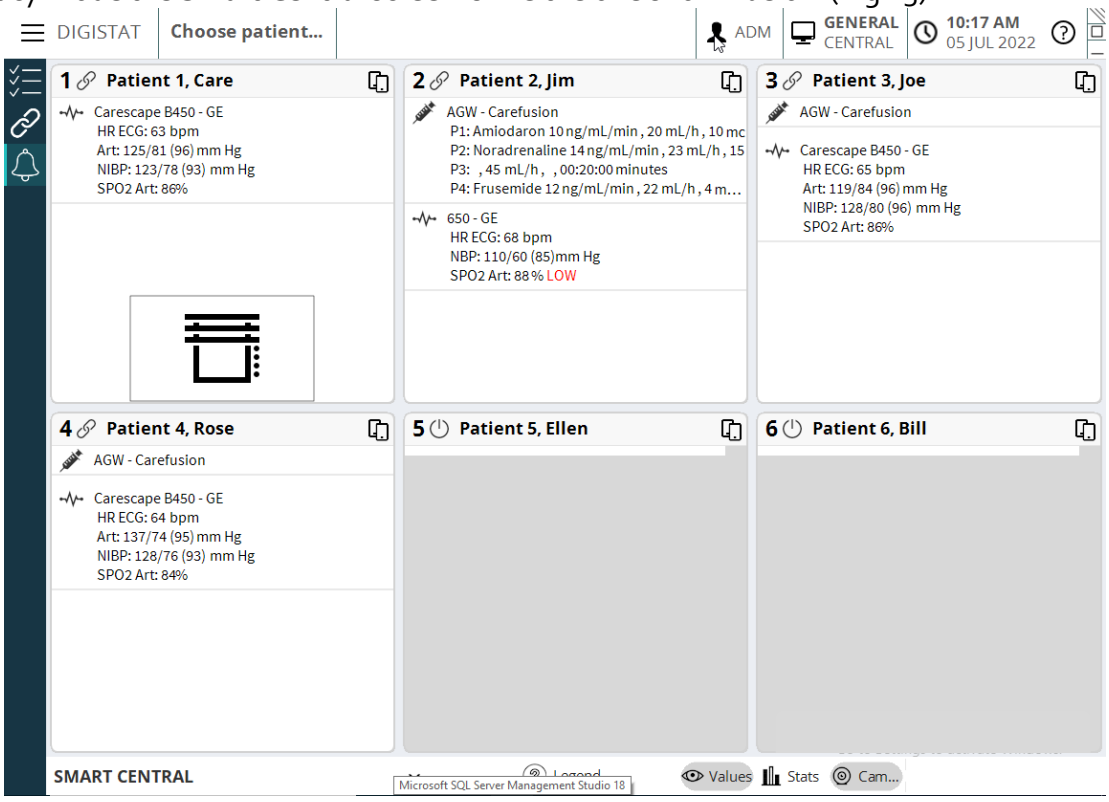


Fig 63

- Touch the **Off** button to disable the Privacy Blind mode.

To activate the Privacy Mode only for certain time interval:

- Touch the **5 mins** or **15 mins** or **30 mins** buttons to enable the Privacy Mode for 5 or 15 or 30 minutes.

The selected button in the button bar is highlighted.

Once the chosen and set time interval is passed, the Privacy Mode turns off automatically.

A configuration option makes it possible to activate the camera for a bed only if, on that bed, there is an alarm with a given priority. For example: the camera activates on a bed only when there is an alarm with high priority. The cameras on beds that are not alarmed remain turned off. Refer to the system administrators for the available options.

1.12 Smart Central Statistics Chart

The Smart Central module can be configured to support the visualization - on the main view screen - of a chart containing the distribution of alerts in the last X configurable minutes (e.g. 120 minutes).

If the Smart Central **Stats** feature is enabled and properly configured, the Smart Central main screen appears like the one shown in Fig 64.

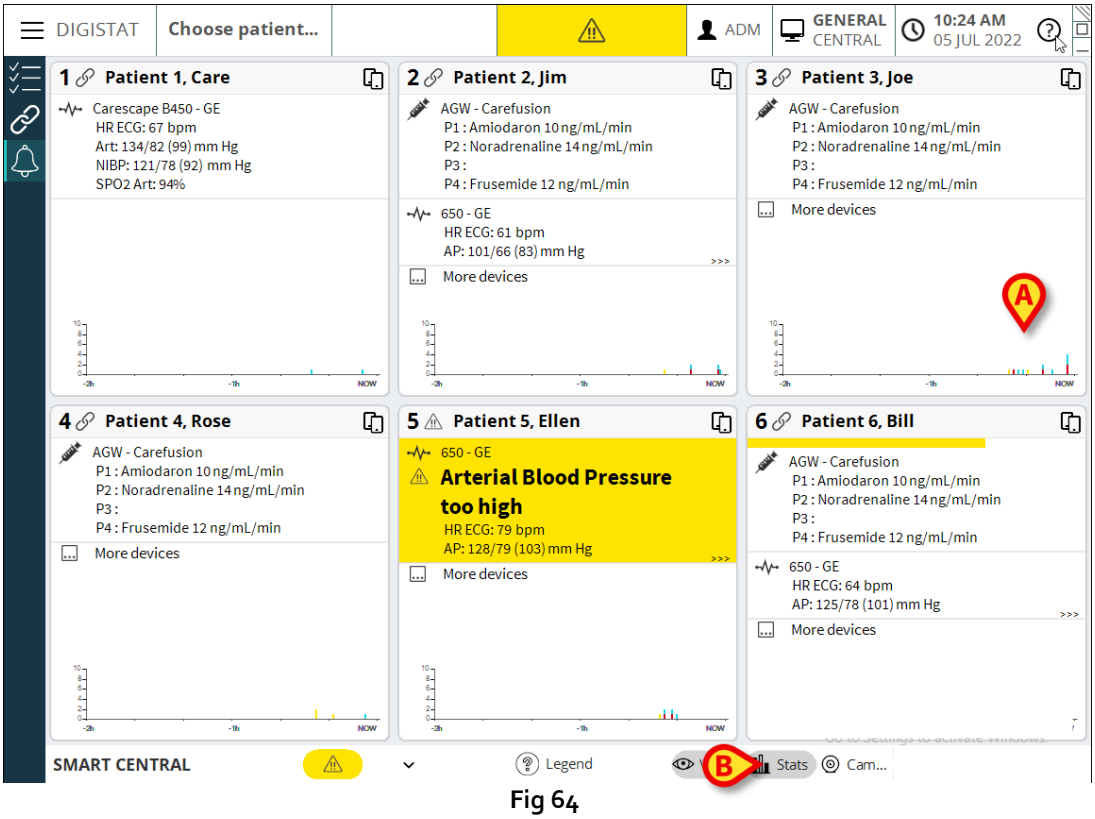


Fig 64

A chart is displayed in the Bed Card, showing the distribution of alerts in the latest hours (Fig 64 **A**).

An additional button is present on the Smart Central command bar.

- Touch the button 

to toggle (show or hide) the statistical charts (Fig 64 **B**).

The chart displays the minutes on the X axis, where the right value is the NOW and the left value is the first minute according to the configured time span. The Y axis represents the number of alerts occurred in that specific minute (on all medical devices). The bar is colored with the three priority colors (red, yellow, cyan), according to the distribution of alert levels.
The chart is refreshed every minute and the visual effect is that the chart values are moved to left, adding a new column on the right (if there are alerts, otherwise the column is empty).

It is possible to configure:

- The number of minutes displayed, from beginning to the NOW moment.
- The maximum number of alerts displayed in the Y axis (example: if value is 5 then the highest value in the Y axis is 5).
- The height of the chart, in pixels.

This chart can be used to highlight a situation where there are too many alarms for a patient, causing high alarm fatigue in the ward (and for the patient). When a user detects too many alerts he can click on the chart to generate a statistical report about the distribution of recent alerts for the selected patient (see section 1.6.3 on Alarm Statistics). In this case the time span is automatically selected according to the number of minutes displayed in the chart. Click GENERATE to generate the statistical report. The statistical report can highlight the more frequent alerts. The user can operate consequently, directly to the alarm source to reduce the frequency (for example: changing thresholds or checking sensors positioning).

1.13 Waveforms

Smart Central can display near real time waveforms collected from medical devices. To enable this functionality it is necessary to enable at least one waveform parameter in the configuration section of the driver capabilities.
To access this functionality

- Click the relevant Bed Card.
- Click the "Waveforms" tab (Fig 65 **A**).

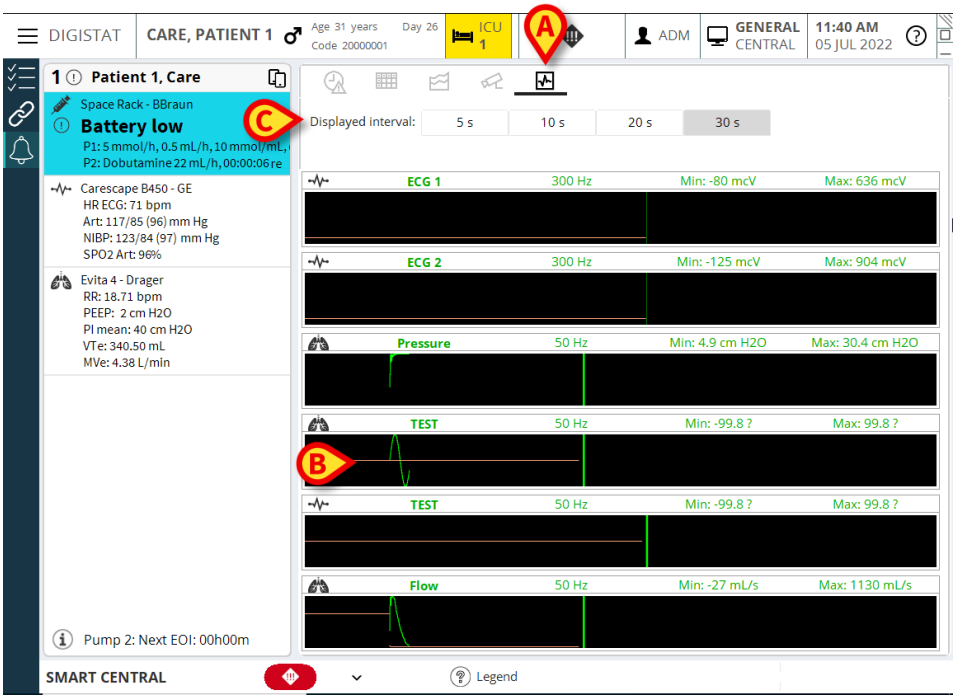


Fig 65

The Waveforms screen is displayed (Fig 65 **B**).

The waveform view contains all the configured waveforms, updated in near real time. For every waveform, on the left side, the following values are displayed:

- Name of the waveform.
- Source device icon: the device that is producing the waveform (ex. Patient monitor).
- Maximum and minimum values: the maximum and minimum values calculated from the instant the waveform is displayed to current time.
- Unit of measure: unit of measure of the waveform.

The buttons indicated in Fig 65 **C** allow to change the time interval displayed (30 seconds are set in the example).

1.14 CDSS Configurator

The CDSS Configurator is enabled only for specifically trained users having appropriate permissions.

Smart Central can be used to activate/deactivate rules configured in the Digistat Clinical Decision Support System and to modify the rule settings according to the patient requirements and needs. First, it is necessary to enable the *CDSSManagerEnabled* System Option of SMARTCENTRAL Application, flagging the value checkbox and setting it to True. This way, the CDSS icon tab appears in the Patient Dashboard view. At least a previously created or imported CDSS rule is necessary. Otherwise, once the CDSS tab is selected, the "No CDSS Rules configured or associated to these locations" message is given.

To access this functionality:

- Click the relevant Bed Card;
- Click the CDSS tab (Fig 66 **A**).

The CDSS screen is displayed (Fig 66 **B**). If the current user has not the adequate permissions, then the CDSS screen is displayed in read-only mode. Users with specific permissions are enabled to access the CDSS screen and configure rules.

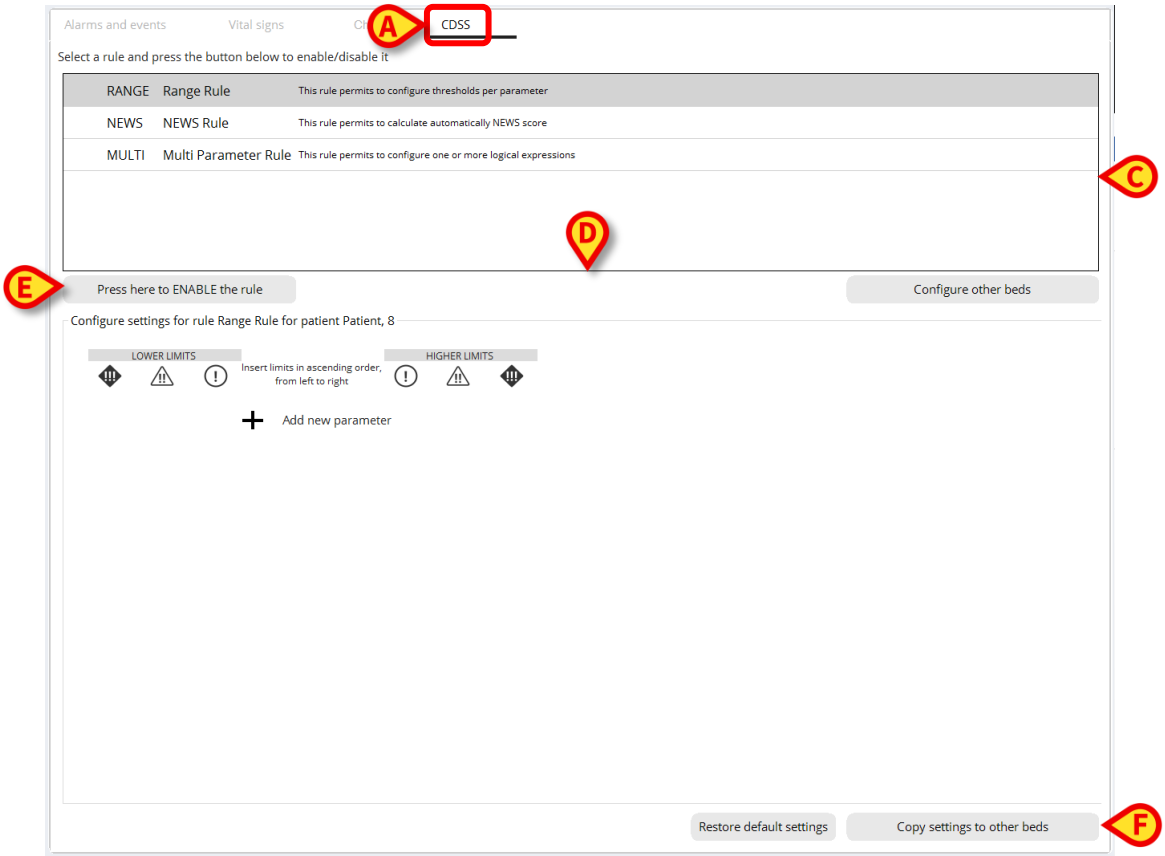


Fig 66

The CDSS view is split in two sections:

- The grid in the upper part (Fig 66 **C**) displays the list of configured rules enabled for this workstation. The rules can be selected just clicking on their tiles.
- The lower part (Fig 66 **D**) displays the rule settings of a selected rule.

The grid (Fig 66 **C**) contains the list of configured rules. For each rule the following fields are available:

- **Activation icon**  : if displayed it means that rule is enabled and active for the selected patient;
- **Code**: unique rule code;
- **Name**: the name of the rule;
- **Description**: rule description.

When a rule is active for a specific patient, the code of the rule is displayed in the bed card, below the patient name (Fig 67 **A**):

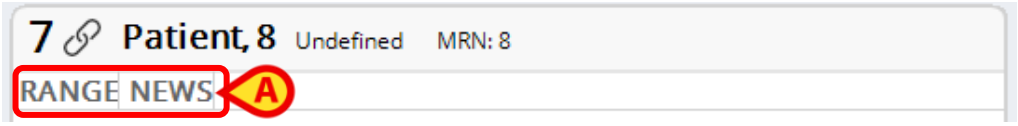


Fig 67

Fig 67 shows the Bed Card of the patient 8 having the rules RANGE and NEWS currently active.

1.14.1 Activating/Deactivating a Rule

To activate/deactivate a rule:

- Select the rule in the grid (Fig 66 **C**).
- Press the **Enable/Disable** button (Fig 66 **E**) to activate/deactivate the rule.
- Confirm.

When a rule is active, a checkmark icon is displayed in the grid. When the rule is not active, no checkmark icon is displayed.

If the **Enable/Disable** button (Fig 66 **E**) is disabled, it means that the rule cannot be activated/deactivated by the user (one of the options was already set during configuration).

It is possible to activate/deactivate the current rule for multiple patients. To do this:

- Click on the **Configure other beds** button (Fig 66 **F**) to open a view displaying the beds available for the current workstation.

The following window opens (Fig 68).

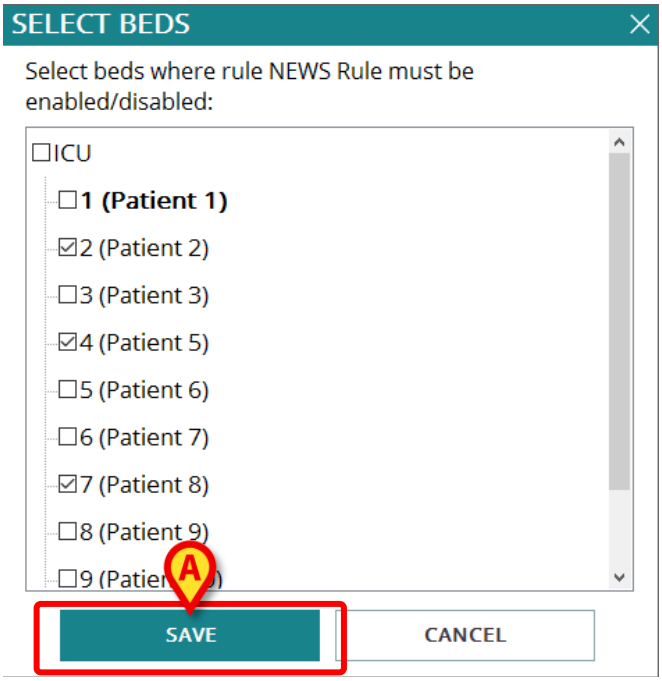


Fig 68

- Select/Deselect beds for which the rule must be activated/deactivated (selecting/deselecting a ward name enables/disables all beds belonging to that ward). If there is a patient admitted to a bed, the patient name is displayed alongside the bed name.

- Click **Save** (Fig 68 **A**).

A Confirmation request with a summary is displayed.

- Confirm the request.

If the **Configure Beds** button (Fig 66 **F**) is disabled it means that the user has not the permission to perform this procedure.

1.14.2 Modifying the rule settings

CDSS Rules have a set of configuration parameters that are used by the CDSS engine to modify the behavior of the rule. For example: a rule can generate a notification if the "Temperature" parameter is higher than a threshold value. The "threshold" is a default value embedded in the rule which can be customized according to specific patient needs.

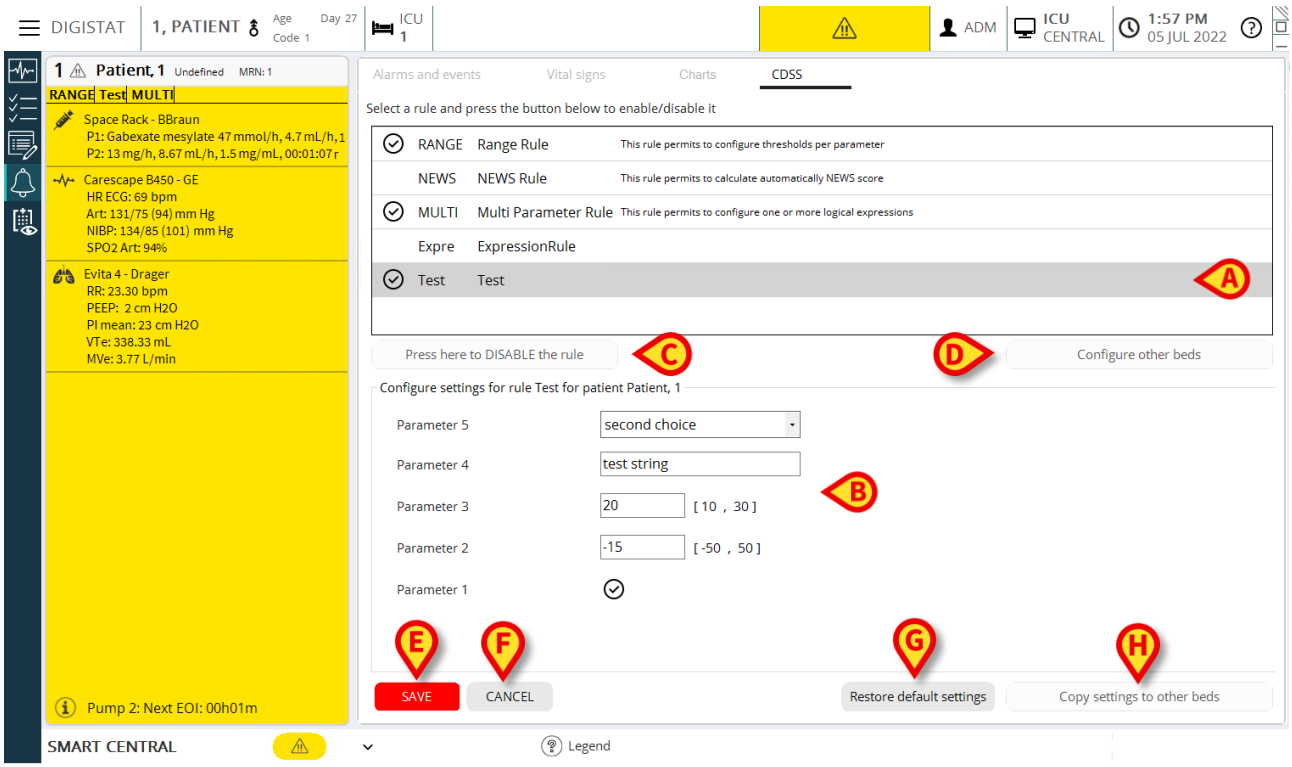


Fig 69

To modify the rule settings:

- Select the rule in the grid (**Fig 69 A**).

The corresponding settings are displayed in the lower area (**Fig 69 B**).

- Edit the available settings according to the requirements of the currently selected patient (when editing, a blinking "SAVE" button is displayed).

- Click the **SAVE** button (**Fig 69 E**) and confirm. Otherwise click **CANCEL** button (**Fig 69 F**) to discard the changes made and to restore the initial settings.

The **Restore default settings** button (**Fig 69 G**), always available, restores the default settings.

It is possible to copy the current rule settings to a single or a group of beds. To do this:

- Click the button **Copy settings to other beds** (**Fig 69 H**).

The following window opens (Fig 70):

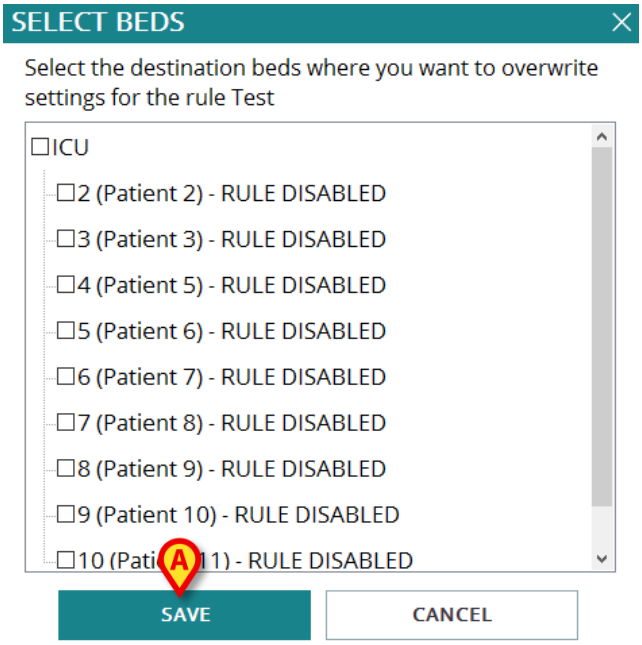


Fig 70

- Select the destination beds.

For each bed the following information is displayed:

- bed name;
- admitted patient (if any);
- rule enabled/disabled.

If the rule is disabled for a bed, copying the rule settings to the bed does not automatically enable the rule. The rule must be explicitly enabled.

- Click **Save** button (Fig 70 **A**) to copy the rule settings to all the selected beds.

*You cannot switch patient while editing a CDSS Rule. Click on CDSS section and either **SAVE** settings or **CANCEL** procedure.*

1.14.3 Rule Setting Types

The rule settings are displayed according to their type (i.e. a "boolean type" is displayed as true/false checkbox, a "text type" as text box field, etc...).

The possible setting types are:

Boolean

Value: true/false. Click the circle to enable/disable.

Fig 71

Numeric

Value: numeric (integer or decimal). Type the value. If decimal values are not allowed, then they are disabled. The numbers in brackets are the higher and lower limits.

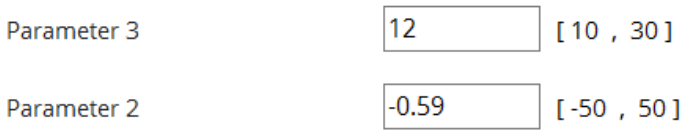


Fig 72

List

Value: multiple choice list. Click the arrow to display the available choices in a drop-down menu. Click the required choice. The selected choice is displayed in the field.

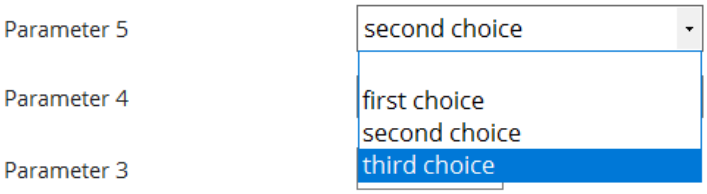


Fig 73

Text

Value: free text. Enter a free text (empty is allowed).

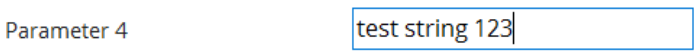


Fig 74

Range

This setting defines, for each parameter, the thresholds after which the different notifications are triggered. The notifications are generated according to the defined intervals. In the example shown in Fig 75 a low priority notification (blue) is triggered if the value for the considered parameter is between 40 and 50 or between 120 and 130. A medium priority notification (yellow) is triggered between 30 and 40 or between 130 and 140. A high priority notification (red) is triggered below 30 and above 140.
If a value is empty, then the corresponding notification is not triggered.

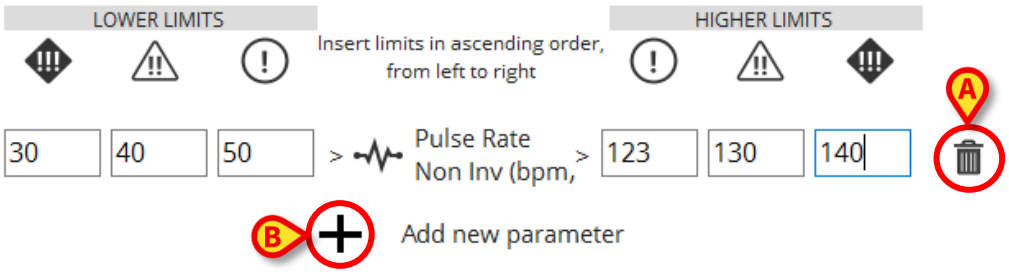


Fig 75

- To remove a parameter click the button (Fig 75 **A**).

The parameter is removed from the list of configured parameter.

- To add a parameter click the **+** button (Fig 75 **B**).

The "SELECT PARAMETER" window opens (Fig 76).

- Select a parameter in the window (Fig 76 **A**).
- Click **Select** (Fig 76 **B**).

The parameter is added to the list of configured parameter.

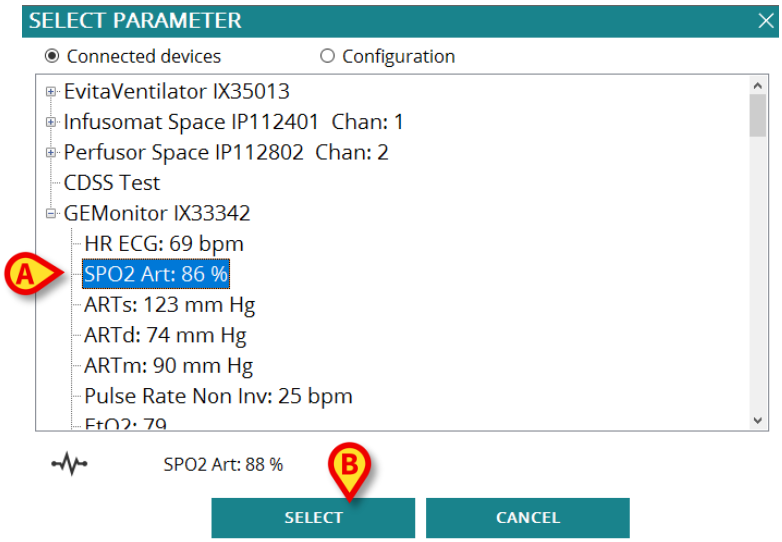


Fig 76

SELECT PARAMETER window description:

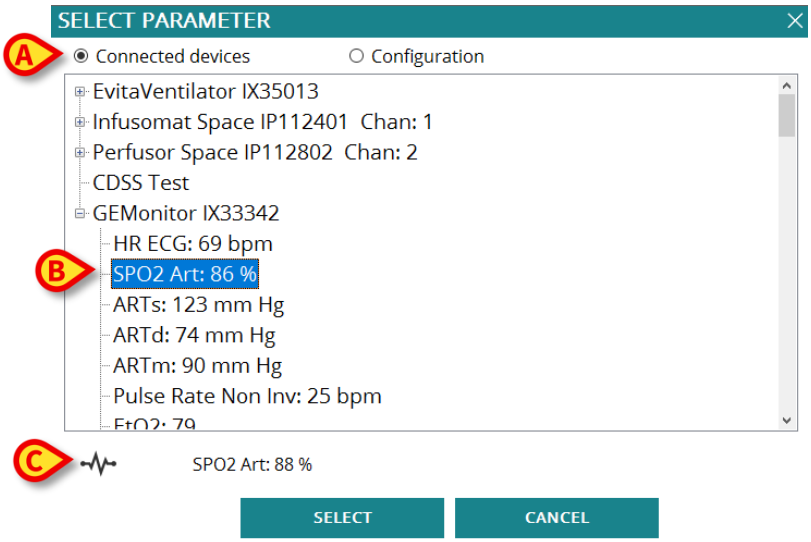


Fig 77

Use the buttons on top (Fig 77 **A**) to select which set of parameters is displayed:

- **Connected Parameters**: list of parameters that are currently dispatched by the medical devices connected to the current patient. Parameters are grouped by medical device. Name, unit of measure and value (updated in near real time) are displayed for each parameter.
- **Configuration**: list of available parameters according to the overall system configuration. It contains all possible parameters according to the configured drivers.

Click a parameter to select it. The selected parameter is highlighted (Fig 77 **B**). The name of the parameter and the related device type (pulmonary ventilator, patient monitor, infusion pump, etc..), are displayed in the area indicated in Fig 77 **C**.

Formula

This setting defines formulas involving multiple vital parameters. A sample formula is:

HR > 130 AND SpO2 < 90 AND Arterial Pressure > 150.

To add a new formula:

- Click the **+** button (Fig 78 **A**).

To delete an existing formula:

- Click the **X** button (Fig 78 **B**).

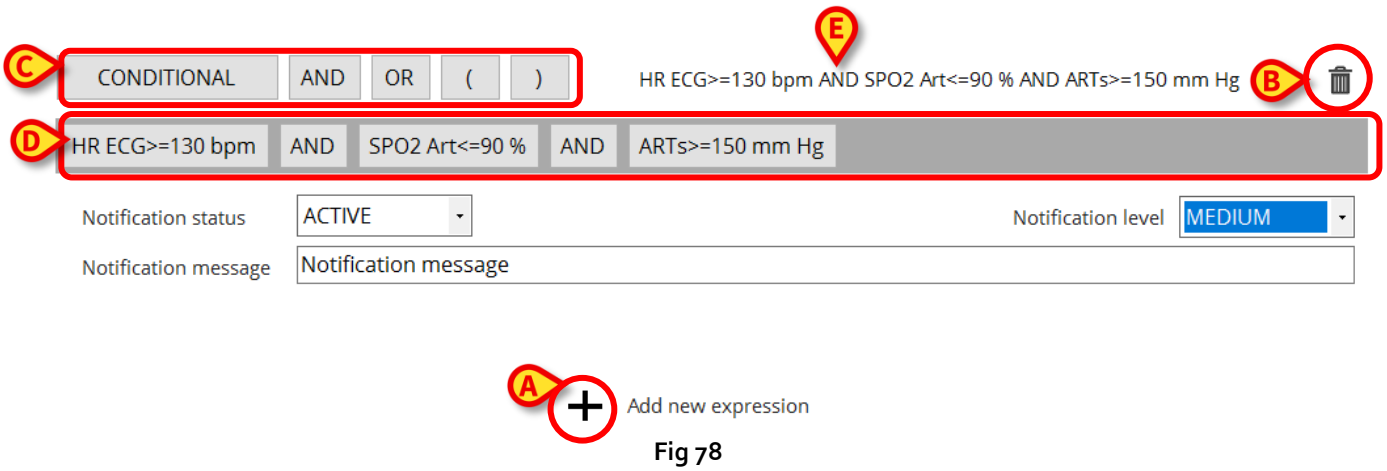


Fig 78

To build a new formula or edit an existing one:

- Drag and drop the "logical" items from the "Operators" panel (Fig 78 **C**) to the "Formula" panel (Fig 78 **D**).

The current formula is previewed in the area indicated in Fig 78 **E**.

If the background of the Formula panel (Fig 78 **D**) is pink, then the formula is not logically valid and cannot be saved.

To valorize a CONDITIONAL item (Fig 79 **A**).

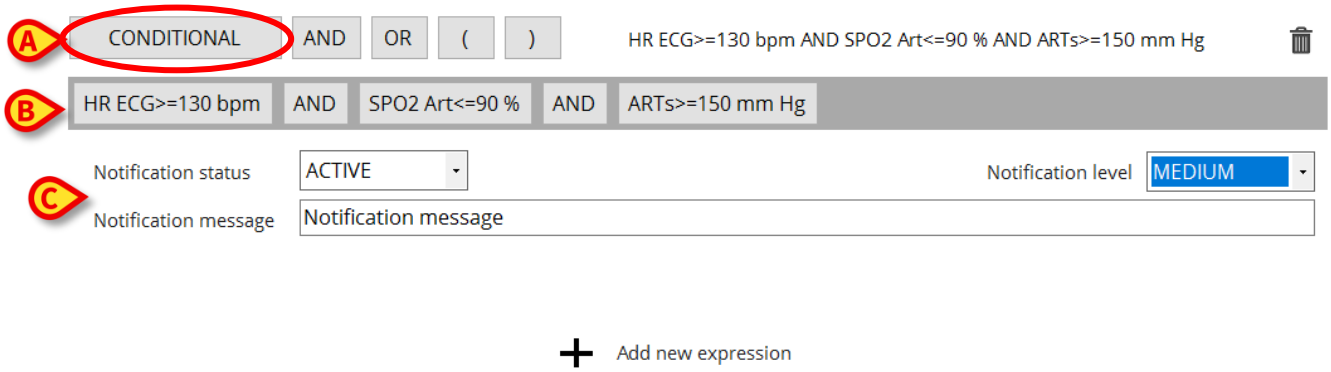


Fig 79

- Drag "CONDITIONAL" (Fig 79 **A**) to the Formula panel (Fig 79 **B**).

The "SELECT PARAMETER" window is displayed (Fig 80).

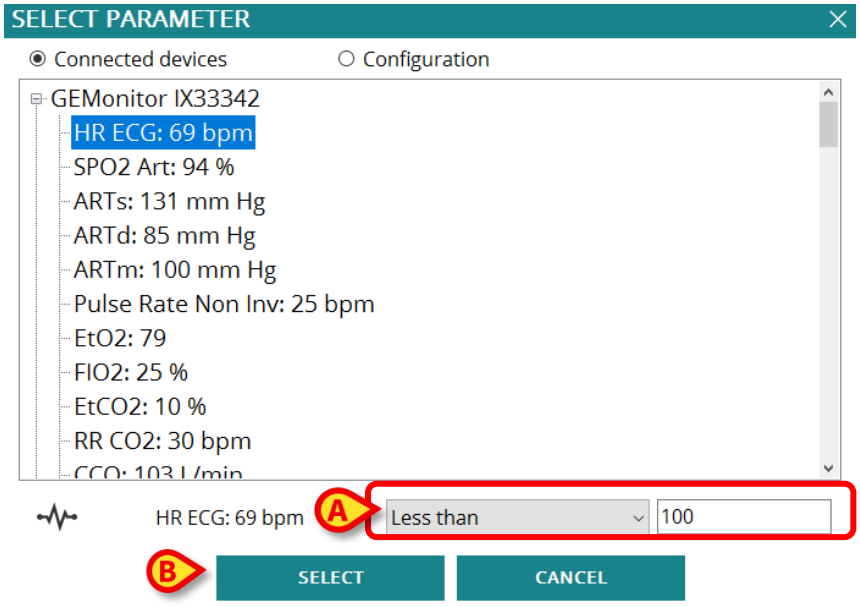


Fig 80

- Select a parameter as described above for the "Range" type.

A comparison operator and a value specification field are available for the selected parameter (Fig 80 **A**).
Value can be numeric or textual according to the parameter type.

- Specify the operator and the corresponding value (Fig 80 **A**).

- Click **Select** (Fig 80 **B**).

The "CONDITIONAL" item is valorized accordingly. Fig 81 shows an example.

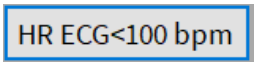


Fig 81

The formula is continuously (or according to the configuration) executed in background at CDSS level. If the formula is "true", then a notification is generated.

A formula can generate notifications for the user and those notifications are defined in the fields indicated in Fig 80 **C**.

- **Notification Status**: if "ACTIVE", the formula is enabled and it triggers notifications. If "PAUSED", the formula is paused and no notification is triggered.
- **Notification Level**: specifies the level of the triggered notification. The possible values are: low (cyan), medium (yellow), high (red).
- **Notification Text**: text of the notification that will be displayed to the user.

Table

A table allows to configure rules using a tabular view. For example: scores typically have multiple parameters contributing to the final score, and for every parameter it is possible to define its thresholds. Instead of having many different rule settings, it is possible to have all thresholds aggregated in a table view.

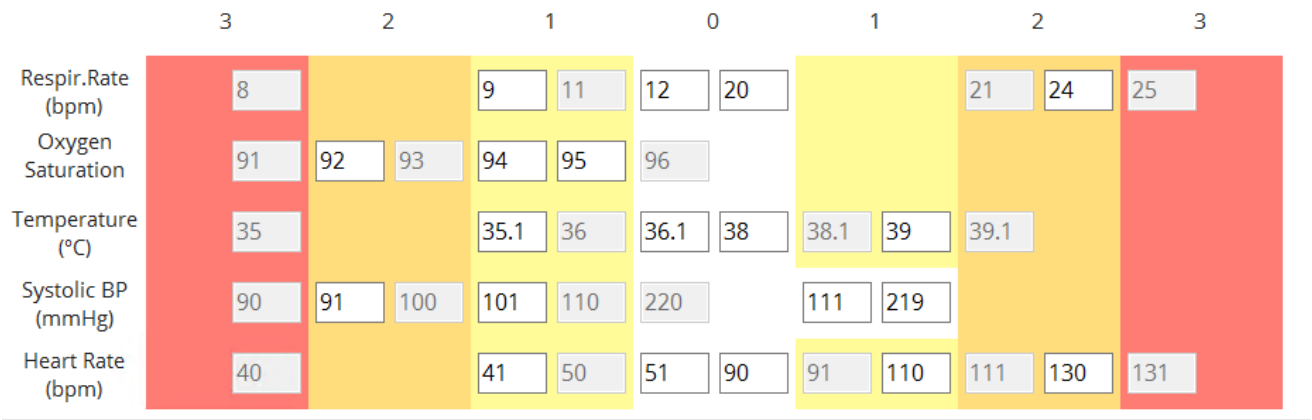


Fig 82

The colors define the notification level (from white to red). It is possible to configure only the thresholds that are not disabled. Values in disabled fields are automatically calculated from the other values. Example: in the first row, changing the value 12 to 10, automatically changes the value 11 to 9.
Depending on the kind of rule, it is possible to either trigger a single notification considering the overall score value or multiple notifications considering the single parameters values.

1.15 Patient admission, selection and search

For users having specific permissions, it is possible to use patient admission, search and selection tools. These tools are part of the Patient Explorer module. See the Patient Explorer user manual (*USR ENG Patient Explorer*) for instructions.

	Other modules can be configured for the patient selection in place of Patient Explorer, depending on the configuration of the Digistat Suite. If this is the case, see the specific documentation for instructions.

1.16 Bedside configuration

The Smart Central system can be configured to be "locked" to a single bed. In this case the screen displays the data of the connected bed in full-screen mode. In Fig 83 the workstation is locked to bed 1. To do that, go to Configurator Web Page, General > System Configuration > Network Configuration and configure the Network from the Edit Network Window. Set the Type to **BedSide,** then select one and only one bed in the Bed Selection window. Finally, mark the **LockBed** checkbox and **Save**.

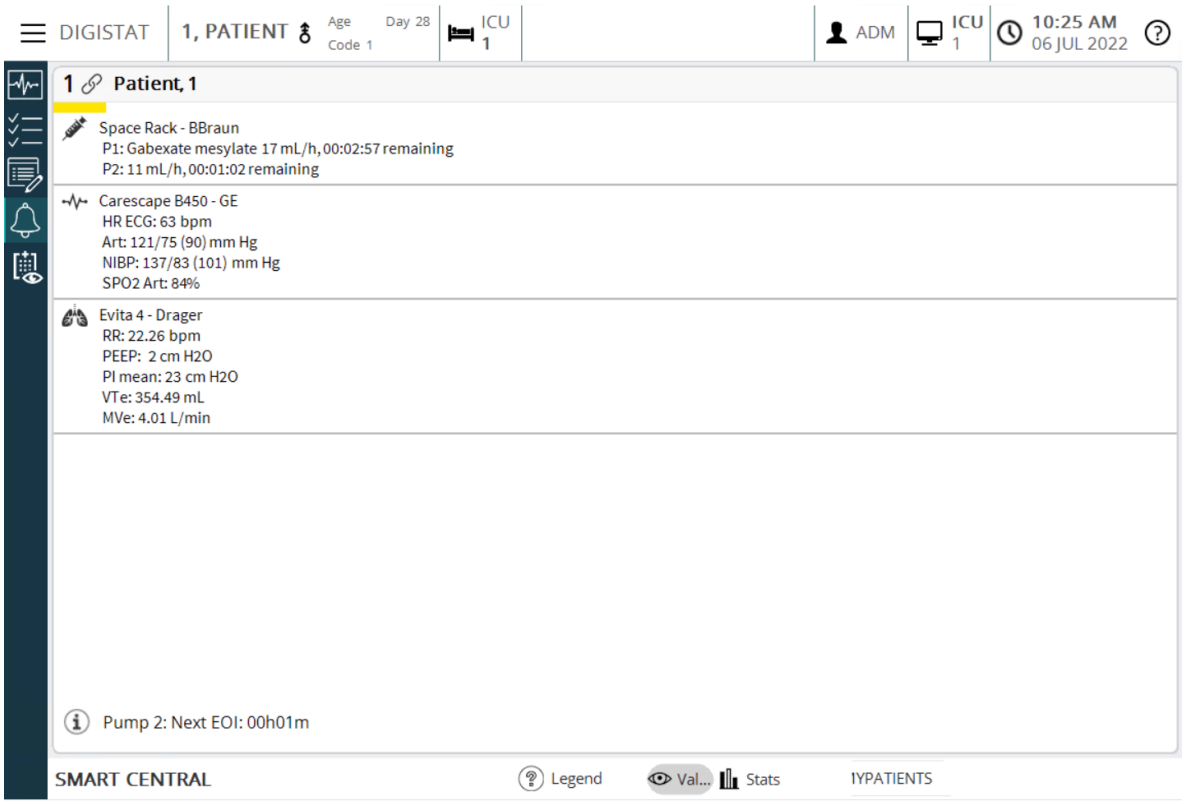


Fig 83

The Bed Card is the same as described above.

Three buttons are in the command bar.

Use the **Legend** button to display the "Legend" window explaining the meaning of the different icons (see paragraph 1.4.1).

Use the **Values** button to display the device values when no alarm is provided (see paragraph 1.3.1).

Use the **MyPatients** button to select other beds to be displayed on the screen (see next section).

1.16.1 My Patients

The "My patients" functionality makes it possible to display up to 4 additional Bed Cards on a "Bedside" workstation (maximum 5 in total, depending on configuration).

To use this functionality:

- Click the **MyPatients** button on the command bar

The following window opens (Fig 84).

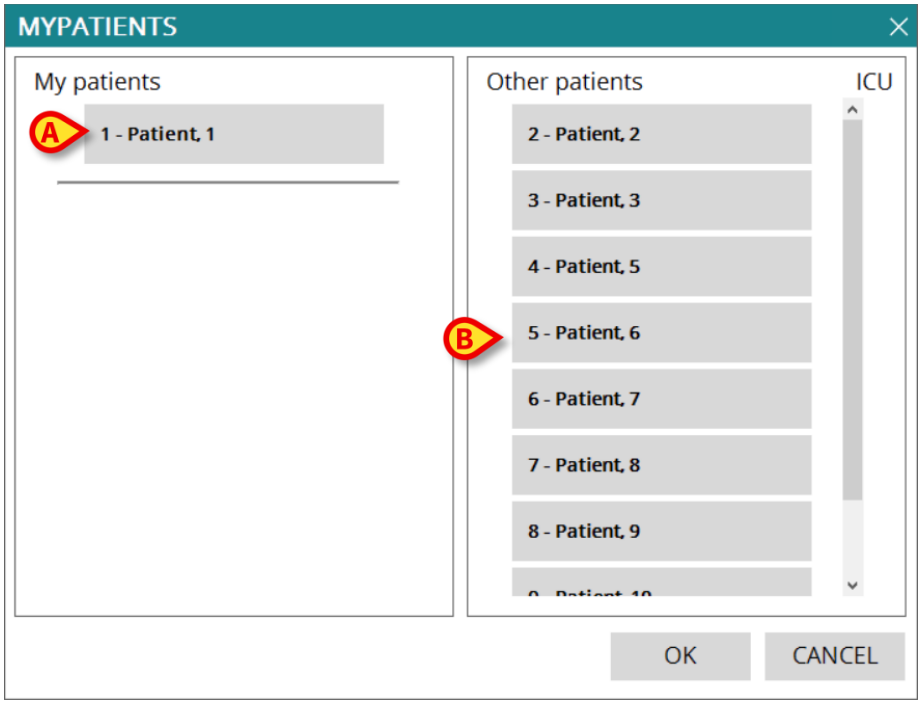


Fig 84

On the left, in the "My patients" column, is the list of Bed Cards currently displayed (Fig 84 **A**). Each box represents a Bed Card. The box on top represents the patient to which the workstation is locked.

On the right, in the "Other Patients" column, all the existing Bed Cards are listed (Fig 84 **B**).

To select a Bed Card to be displayed on screen,

- Click the corresponding box for the patient in the "Other Patients" column

The box disappears from the "Other Patients" column (right) and is displayed on the "My Patients" column (Left). A maximum of 3 additional Bed Cards can be selected (depending on configuration).

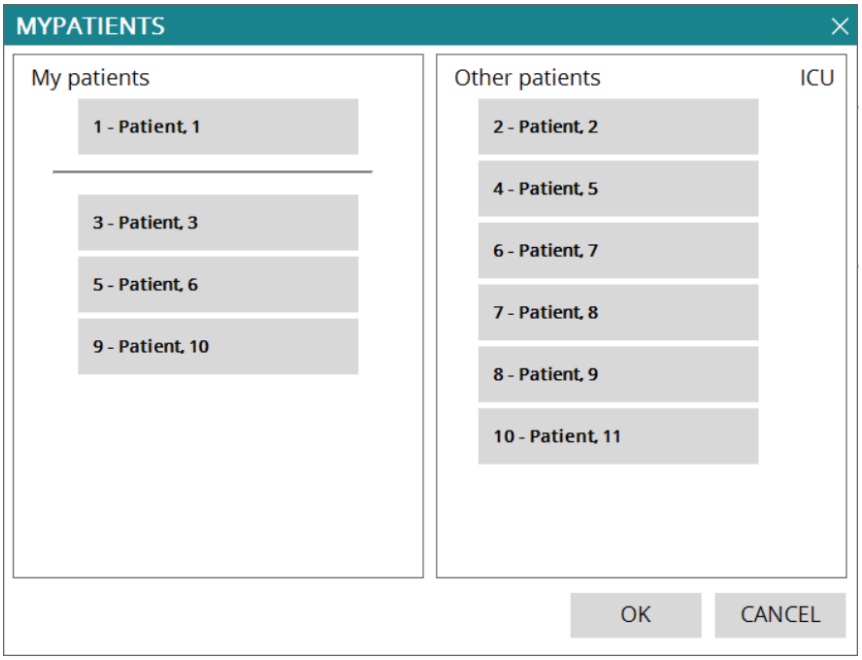


Fig 85

In Fig 85 Bed Cards 3, 5 and 9 are selected.

- Then click the **Ok** button

The Smart Central screen is displayed as shown in Fig 86.

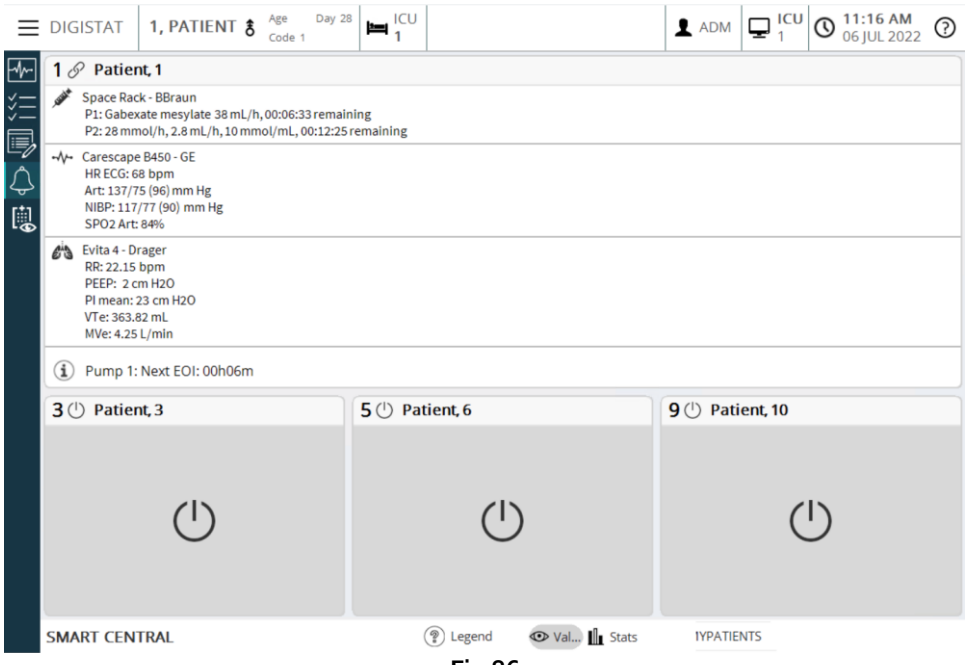


Fig 86

The Bed Card to which the workstation is locked is number 1 (large, on top). Bed Cards 3, 5, 9 are displayed underneath the locked Bed Card and are smaller.
The additional Bed Cards can be enlarged.

- Click on one of the additional Bed Cards to enlarge it. Click again to bring it back to the original proportions

In order to remove one or all the additional Bed Cards,

- Click the **MyPatients** button on the command bar

The "My Patients" window is displayed (Fig 85).

To remove an additional Bed Card,

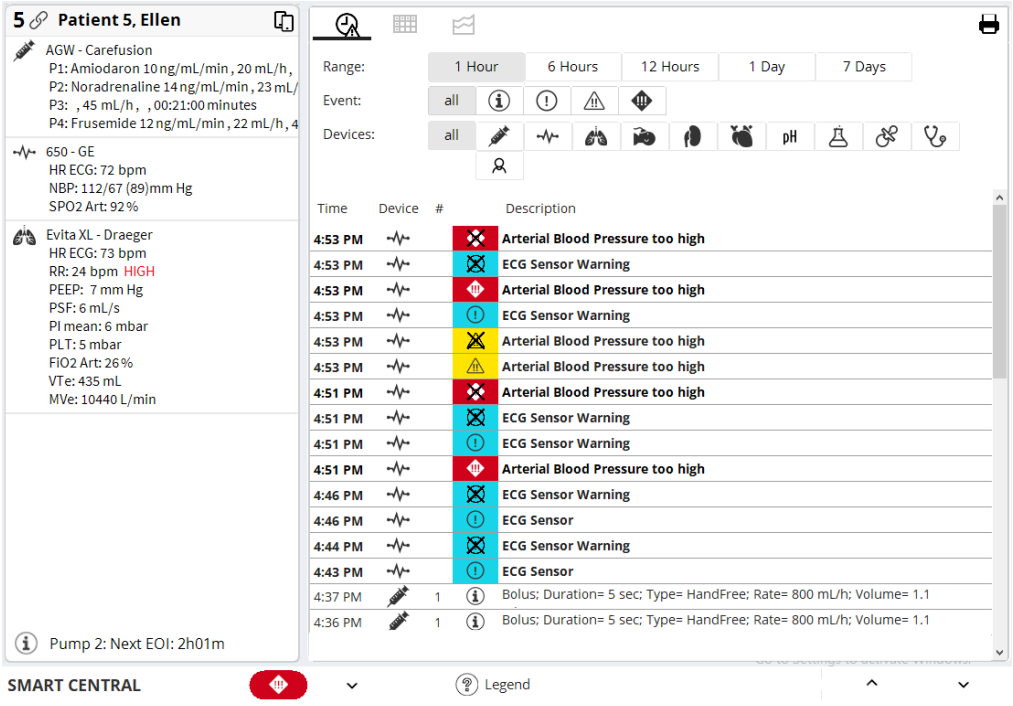
- Click the box corresponding to the Bed Card to be deselected in the "My Patients" column

The box disappears from the "My Patients" column (left) and is displayed on the "Other Patients" column (Right). The deselected Bed Card will not displayed anymore.

2. Annex – Examples of user workflows

2.1.1 Display patient events

1 – Click a Bed Card to display the patient events.

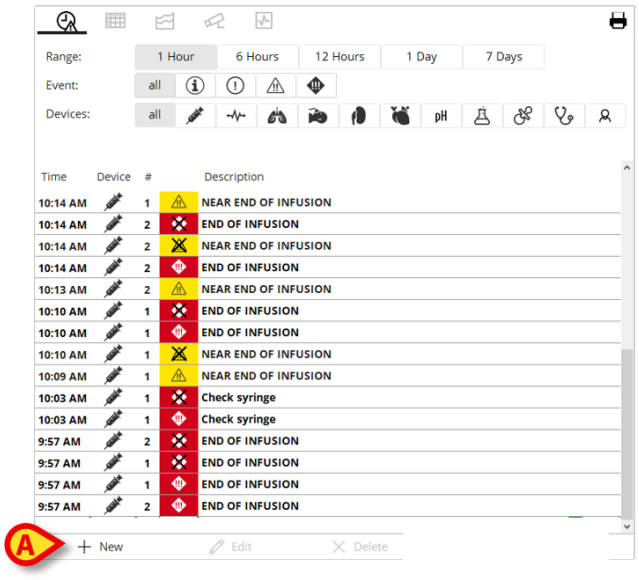


The patient events are displayed on the right.

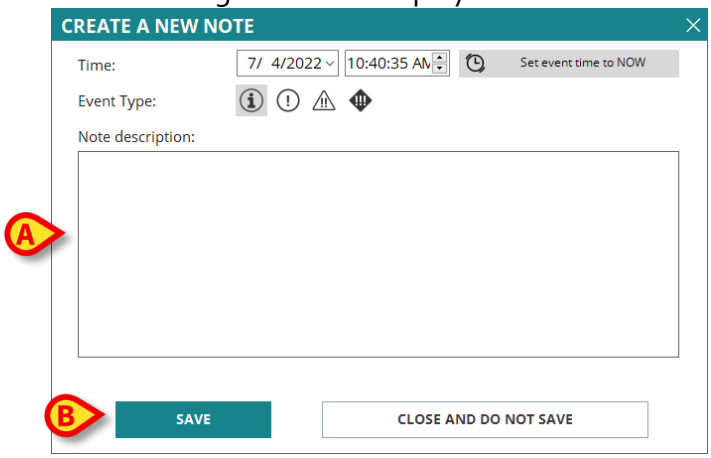
2.1.2 Add user event

1 – Click the **New** button (**A**)

.



The following window is displayed.



2 - Type the note in the "Note description" field (**A**).
3 - Click **Save** (**B**).

2.1.3 Edit user events

To edit a user event, on the events grid:
1 - Click the row corresponding to the user event
2 - Click **Edit** on the action bar.
The window shown in the above figure is displayed.
3 - Edit the event (Date/time, priority, description).
4 - Click **Save**.

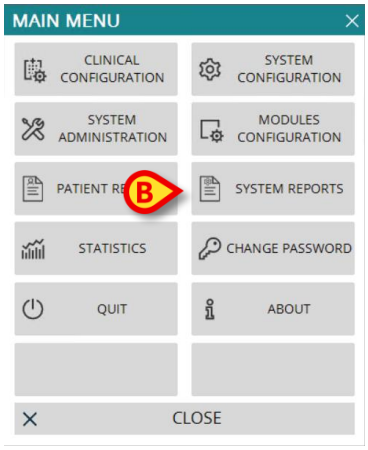
2.1.4 Delete user events

To delete a user event, on the events grid:
1 - Click the row corresponding to the user event.
2 - Click **Delete** on the action bar. User confirmation is required.
3 - Click **Yes** to delete the event.
The corresponding row disappears from the events grid.

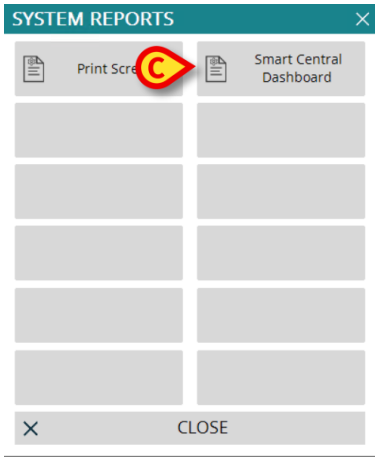
2.1.5 Alarm Statistics Report

To print an Alarm statistics report:
1 - Click the **Menu** button on "Control Bar" (**A**).

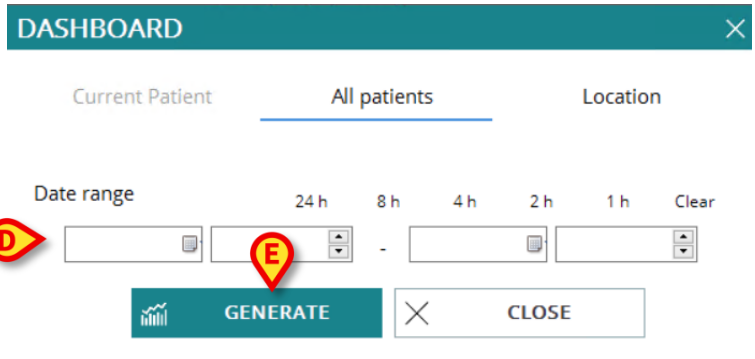
The following menu opens:



2 - Click on **System Reports** (**B**). Another menu opens.



3 - Click **Smart Central Dashboard** (**C**). The following window opens.



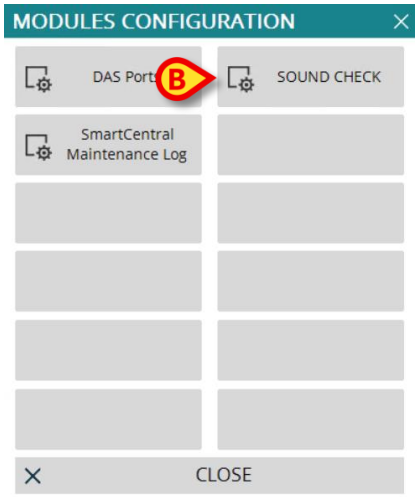
Select the date range for either the current patient or all patients (**D**).

4 - Click the **Generate** button (**E**). A print preview is displayed.

2.1.6 Perform "Sound Check" procedure

To perform the "Sound Check" procedure:

1 - Click the **Menu** button on "Control Bar" (**A**). The main menu opens.
2 - On the main Menu, click on **Modules Configuration**. Another menu opens.



3 - Click on **SOUND CHECK** (**B**).

A pop-up window opens, asking whether a sound is heard or not.
If a sound is heard, then click **Yes**. The pop-up window disappears and nothing else happens (meaning that the system is working correctly).
If no sound is heard, then click **No**. The pop-up window disappears and a notification is displayed on "Control Bar", meaning that an error occurred while checking the sound notification system.
The notification only disappears when another "Sound Check" procedure is performed and a **Yes** answer is provided in the end.

If the sound check fails, stop using the Smart Central module and promptly contact the technical assistance.

2.1.7 "Privacy Blind" mode on smart central video

If the Smart Central video functionality is activated for a patient, the "Privacy Blind" feature allows the user to turn off the webcam either permanently or for a certain time interval. If the Privacy Blind mode is enabled, then no video stream is viewed. The "Privacy Blind" mode is disabled by default.
The "Privacy Blind" mode is indicated by the icon. To activate the "Privacy Blind" permanently:

1 - Click the relevant Bed Card to enter the patient detail screen.
2 - Select **On** on the upper bar (**A**).

To activate the "Privacy Blind" for a pre-defined period:
2 – Select the wanted period on the upper bar (5 mins, 15 mins, 30 mins).

2.1.8 Display Waveforms

To display the Waveforms screen:

1 - Click the relevant Bed Card to enter the patient detail screen.
2 – Click **Waveforms** on the upper bar.