

9.9 The LED display menu

The front panel LED display menu displays useful information about the node and the system it is in. The different parts of the display can be seen in Figure 9-1:

1. The capacitive push button. This button can be used to navigate between the different menus of the display.
2. Here the currently selected menu is displayed (the meaning of each menu is described below).
3. Here different information is displayed, depending on which menu is selected.

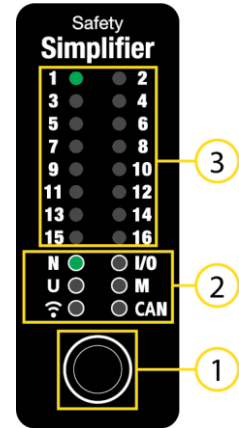


Figure 9-1

The different parts of the LED display menu

9.9.1 Navigation

To switch between the different menus the capacitive push button can be used. A firm short press (<1s) on the button cycles through the menus in the following order:

N ► I/O ► U ► M ►  ► CAN



Figure 9-2

The order the display menus are shown in.

Figure 9-2 shows the order of the menus on the display itself.

Each press of the capacitive button moves the menu to the next menu. Pressing the button in the CAN menu cycles the menu back to the N menu (this means that to go from the I/O menu to the N menu, the button must be pressed 5 times to cycle through all the menus back to N).

9.9.2 Sub-menus

Each menu also has one or more so called sub-menus. These can be reached by pressing and holding the button for 1 second. When jumping to a sub-menu, the LED indicating the menu will change colour from green (first level), to red (second level), to orange (third level). To go back to the first level menu, hold the button again until all sub-menus have been cycled through, and the LED turns green again. The display will also jump back to first level if it has not been touched for some minutes.

In Figure 9-3, the first sub menu of the N menu is shown. This menu displays the nodes in the system that this node has either CAN or radio connection to. A green LED indicates connection, and a red LED indicates no connection. The unit has connection to node 1 (which is itself) and node 2, but not to node 3.

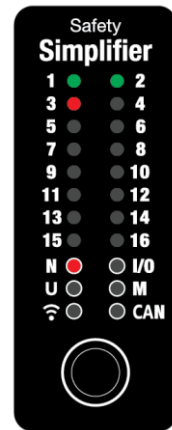


Figure 9-3
The first sub-menu of the N menu.



Note

The **U** and **CAN** menus have two sub-menus (three levels), while all other menus only have one sub-menu (two levels).

When in a sub-menu, the first level menu **cannot** be changed by a short press on the button. To cycle between the first level menus (i.e. from N, to I/O, to U, etc) the menu must be in the first level (i.e. the menu LED must be green). Short presses in a sub-menu changes the information displayed in that sub menu, for example in some menus to switch between looking at information from different nodes.

9.9.3 LED Display quick reference first level

When in the first level of a menu the menu LED is green. Switch between these menus by a firm quick press on the capacitive button. The display will also jump back to this menu if it has not been touched for some minutes unless it shows a fault.

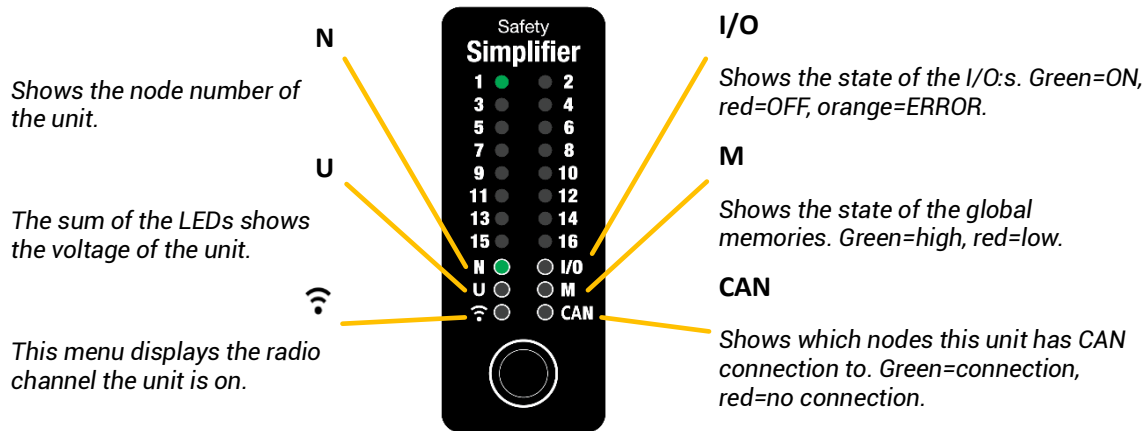


Figure 9-4
First level information

9.9.4 LED Display quick reference second level

To go to the second level of a menu, press and hold the button for one second. To switch back to the main menu, press and hold the button again (twice if you are in the **U** or **CAN** menus). When in the second level of a menu, the menu LED is red. Some second level menus display information from other nodes in the system. A firm short press on the button in those menus switches between the different nodes. The display will jump back to first level, showing node number, if it has not been touched for some minutes.

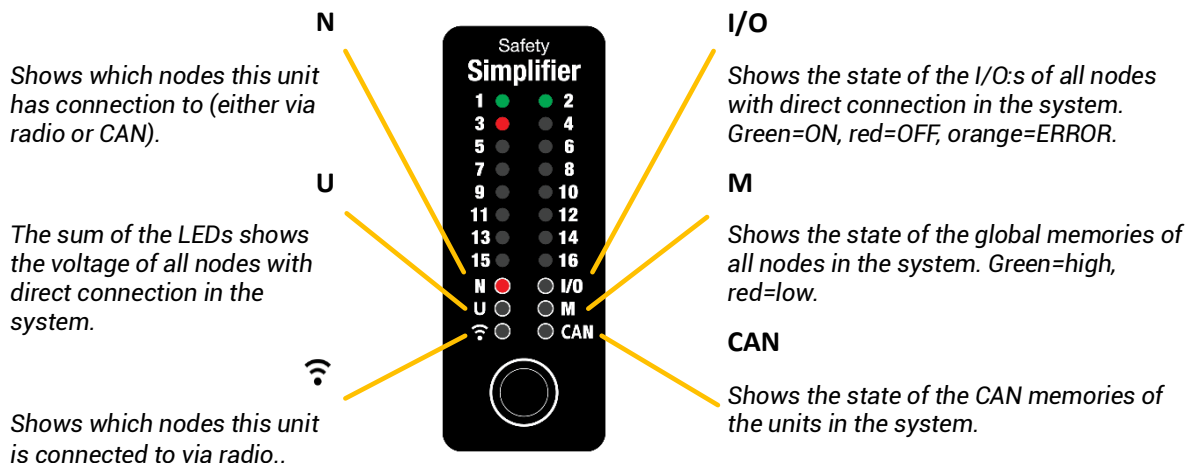


Figure 9-5
Second level information.

9.9.5 LED Display quick reference third level

The U and CAN menus have a third menu level. The third level menu is indicated by the LED turning orange.

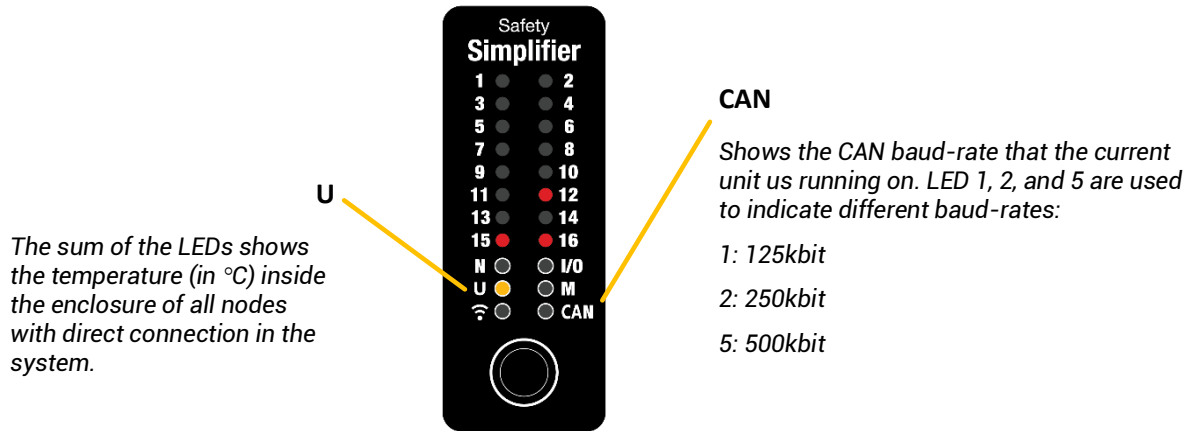


Figure 9-6
Third level information.

9.9.6 LED Display quick reference fatal error and configuration state

When an internal or external error is detected, the unit can enter error state, see Figure 9-7. For more information about fatal error state, see chapter 9.9.8.

Figure 9-8 shows the menu in configuration state. See chapter 9.9.9 for more information.

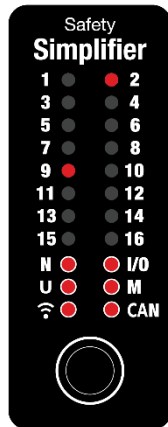


Figure 9-7
Display of a unit that is in fatal error state.

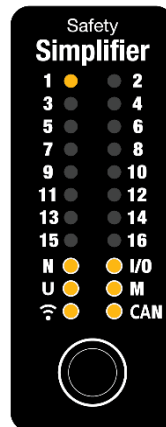



Figure 9-8
Display of a unit in configuration mode.

9.9.7 The menus

The following chapters describe what type of information each menu and its submenus display, and how the display can look in different menus.

 Note	<p>A long press of the capacitive push button is used to go to different levels of the menu.</p> <p>The display illustrations in the following chapters are examples, and will differ depending on the configuration, installation, and state of the system.</p>
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9.9.7.1 N (first level)

Displays the node number of the current unit (see Figure 9-9). This is the default menu when the unit starts up. The display will also jump back to this menu if it has not been touched for some minutes unless it shows a fault.

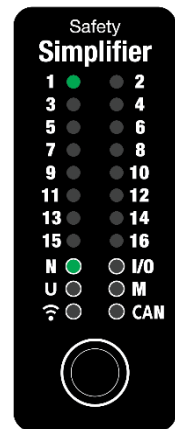



Figure 9-9
N level 1

9.9.7.2 N (second level)

Displays the connection to the other nodes in the system (note that the **N** LED is now red, indicating that the menu is in the first sub-menu of the **N** menu). If this unit has radio **or** CAN connection to another unit, it is displayed in green. If it does not have either radio or CAN connection, it is red.

In Figure 9-10, the unit has connection with node 1 (itself) and node 2 (via either radio or CAN). It has no connection to node 3. Having this type of connection means that the global memories between these nodes will always be heard. To see if the unit has connection via radio or CAN specifically, see the  and CAN menu descriptions further down in this chapter.

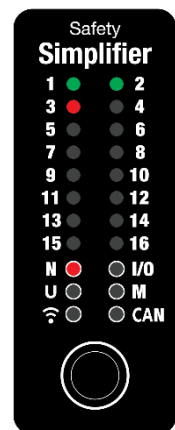


Figure 9-10
N level 2

9.9.7.3 I/O (first level)

This menu displays the state of the IO on the unit. An IO that is in the OFF state is shown in red, an IO that is in the ON state is shown in green, and the IO that are not programmed are turned off (black). In Figure 9-11, IO 2 and 4 are in the ON state, IO 6 and 8 are in the OFF state, relay 15 is in the OFF state, and relay 16 is in the ON state.

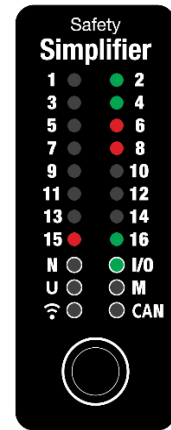


Figure 9-11
I/O level 1

External errors on inputs and outputs are indicated on the display by lighting the number corresponding to the terminal in orange. When an external error is detected the display will automatically jump to the I/O menu until the error has disappeared and been reset. If the error is currently present (i.e. the short circuit is still present, and the terminal is still detecting an external voltage), the LED is constant orange. When the error has disappeared and has not been reset in logic, the terminal LEDs blink orange.

Terminals that are in the same input/output function group as another terminal with an external error, are indicated by a short, fast, orange blink. This means that the terminal itself does not have an error but is in an IO function that has an error.

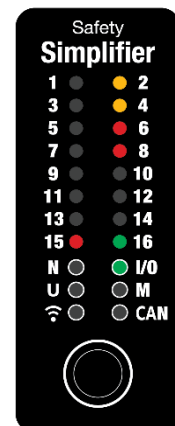


Figure 9-12
Terminal 2 and 4 are detecting external errors

9.9.7.4 I/O (second level)

This menu displays the state of all units IO (both inputs and outputs) that are in direct connection to each other. An IO that is in the OFF state is shown in red, an IO that is in the ON state is shown in green, and the IO that are not programmed are turned off (black). A short press on the button when in this level switches between the different nodes in the system. A short blink on an LED indicates the number of the node being looked at.

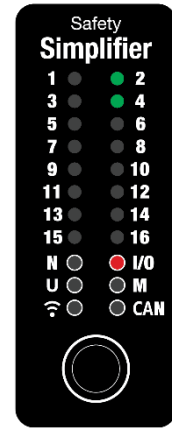


Figure 9-13
I/O level 2

9.9.7.5 U (first level)

Shows the voltage of the unit. The voltage is the sum of the LED numbers (for example on Figure 9-14, the voltage is 8+16=24V). When the voltage is less than or equal to 16, only one LED is on. If the voltage is close to the specified max/min voltage of the unit, the voltage will show in red instead of green.

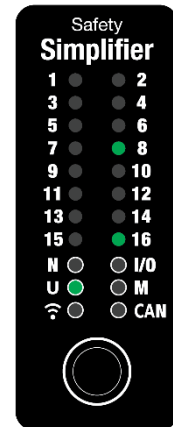


Figure 9-14
U level 1

9.9.7.6 U (second level)

Shows the voltage of all the units with direct connection to each other in the system. The voltage is the sum of the LED numbers (for example on Figure 9-15, the voltage is 8+16=24V). A short press on the button when in this level switches between the different nodes in the system. A short blink on an LED indicates the number of the node being looked at.

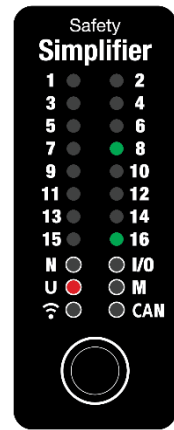


Figure 9-15
U level 2

9.9.7.7 U (third level)

The third level of the U menu indicates the temperature inside the enclosure of all the units with direct connection to each other in the system. The temperature is the sum of the LEDs on the display (for example on Figure 9-16 the voltage is 12+15+16=43°C). A short press on the button when in this level switches between the different nodes in the system. A short blink on an LED indicates the number of the node being looked at.

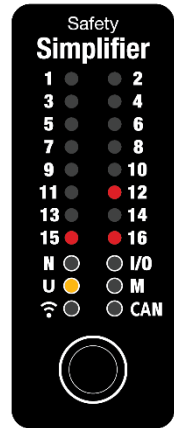


Figure 9-16
U level 3



Note

The temperature is measured directly on the PCB which is warmer than the ambient temperature due to heat generated from different components.

9.9.7.8 M (first level)

This menu displays the state of the 16 global memories from this unit. A green LED indicates that the memory is high. A red LED indicates that the memory is OFF. If the LED is turned off it means the memory is not configured in logic. In Figure 9-17 global memory 1 is high, global memory 6 and 8 are low, and the rest are not configured.

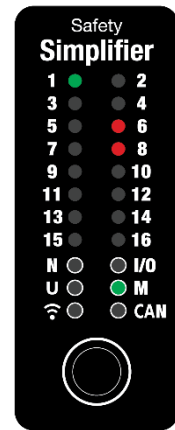


Figure 9-17
M level 1

9.9.7.9 M (second level)

This menu shows the state of the global memories of all units in the system. A short press on the button when in this level switches between the different nodes in the system. A short blink on an LED indicates the number of the node being looked at.

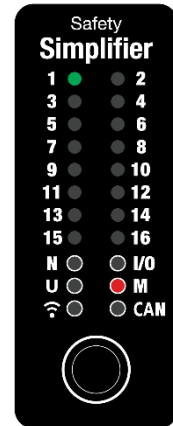


Figure 9-18
M level 2

9.9.7.10 📶 (Radio) (first level)

This menu displays the radio channel the unit is on. In Figure 9-19 the unit is on channel 5.

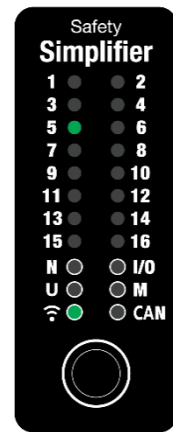


Figure 9-19
Radio level 1

9.9.7.11 📶 (Radio) (second level)

The second level displays the nodes that this unit has direct radio connection to. A green LED indicates good connection. An orange LED indicates OK/poor connection. A red LED indicates no connection. In Figure 9-20 the node has connection to node 1 (which in this case is itself), it has poor connection to node 2, and no connection to node 3.

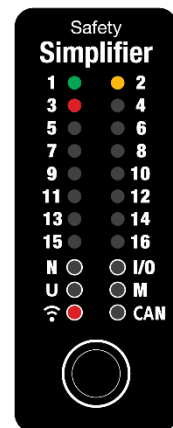


Figure 9-20
Radio level 2

9.9.7.12 CAN (first level)

This menu shows which nodes this unit has CAN connection to. In Figure 9-21 the unit has CAN connection to node 1 (itself), and node 2, indicated by green. It does not have CAN connection to node 3, indicated by red.

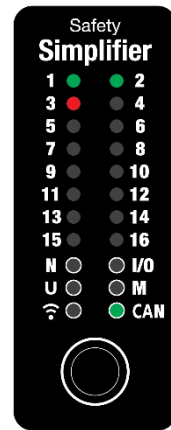


Figure 9-21
CAN level 1

9.9.7.13 CAN (second level)

This menu shows the state of the 16 CAN memories on this unit. A green LED indicates that the memory is high. A red LED indicates that the memory is OFF. If the LED is turned off it means the memory is not configured in logic. In Figure 9-22 CAN memory 1 and 16 are high, and CAN memory 15 is low.

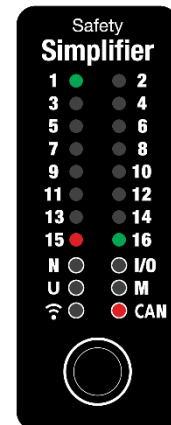


Figure 9-22
CAN level 2

9.9.7.14 CAN (third level)

This menu indicates which baud-rate the unit is using on LED 1, 2, or 5:

1: 125kbit

2: 250kbit

5: 500kbit

In Figure 9-23 the unit is using a baud-rate of 250kbit (LED 2 is green).

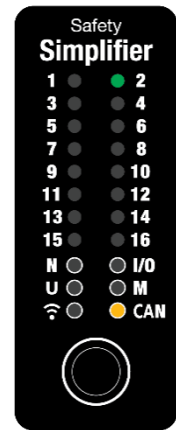


Figure 9-23
CAN level 3

9.9.8 Fatal error mode

When an internal or external error is detected, the unit can enter error state. In this state all I/O are turned off, the radio and CAN communication stops, and the unit displays an error code on the LED display.

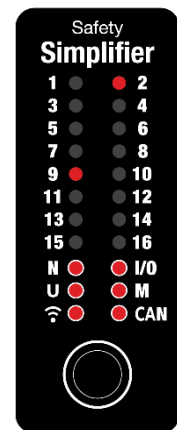


Figure 9-24
Display of a unit that is in fatal error state.

9.9.8.1 Fatal error codes

The error codes are indicated on the LED display by all six menu LEDs lighting in red (N, I/O, U, M, etc), and one or more numbered LEDs lighting up in red (in Figure 9-24 LEDs 2 and 9 are lighting, indicating an undervoltage error). The error can be decoded by looking at the display and seeing which LEDs are lighting up and finding the corresponding row in Table 9-1: Fatal error codes and descriptions on page 54

Display LEDs	Code	Name	Description	Solution
2	0x0002	NO_NETWORK_ID	No configured network ID.	Download a new configuration to the unit.
1 & 4	0x0009	SETTINGS_SERIAL_NUMBERS	Invalid serial number settings.	Download a new configuration to the unit.
2 & 4	0x000A	SIO_OVER_CURRENT_IRQ	Overcurrent protection. There is an output connected directly to ground.	Disconnect the faulting terminal.
1 & 2 & 3 & 4	0x000F	BAD_CFG_NODE_NR	Invalid node number settings.	Download a new configuration to the unit.
9	0x0100	PWR_SUPPLY_TOO_HIGH	Voltage is higher than the configured max voltage.	Check power supply, and project settings.
9 & 2	0x0102	PWR_SUPPLY_TOO_LOW	Voltage is lower than the configured min voltage.	Check power supply, and project settings.
15 & 16 & 1-8	0xC001 to 0xC0FF	USER_FATAL_ERROR	User fatal error triggered from logic.	See program logic for this unit.

Table 9-1: Fatal error codes and descriptions.

9.9.9 Configuration mode

During downloading of software, the unit enters configuration mode. This is indicated on the display by the bottom six menu LEDs, and LED 1, in orange, as shown in Figure 9-25.

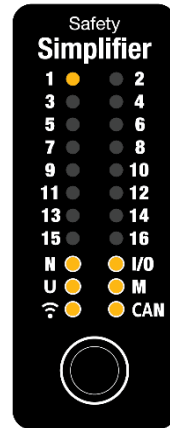


Figure 9-25
Display of a unit in configuration mode.