

Reference manual

Start

The robot is started by pressing the On/Off button. After about 30 seconds the operator panel has booted and begins to initialize the robot. Please wait a few seconds until the initialization is done and the starting screen is shown, see figure XXX.

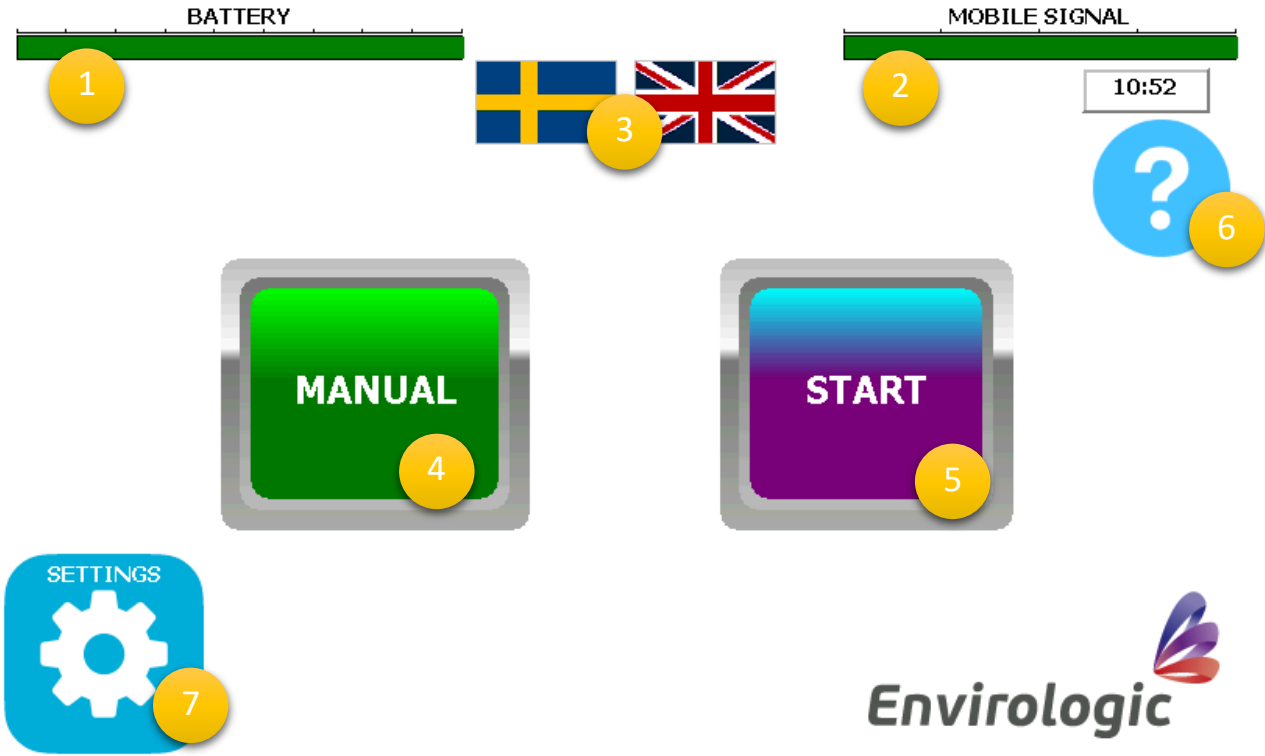


Figure 1 1) Battery bar 2) Mobile signal bar 3) Language switch buttons 4) Manual movement mode button 5) Automatic cleaning mode button 6) Help button 7) Programming and settings button

Common screen elements

There are a couple of common elements between the screens:

- Battery bar, see Figure 1
- Mobile signal bar, see Figure 1
- Help button (question mark), see Figure 1
- Alarm indication if active, see Figure 2

Alarms

There are two types of alarms:

- Hard alarms which halts automatic cleaning
- Soft alarms

See XXX for a complete list of alarms. The alarms are indicated by a blinking message at the top of the screen. If the alarm is stopping any further actions a big button which leads to the alarm list is displayed (this button is also shown when the emergency stop has been activated), see Figure 2.

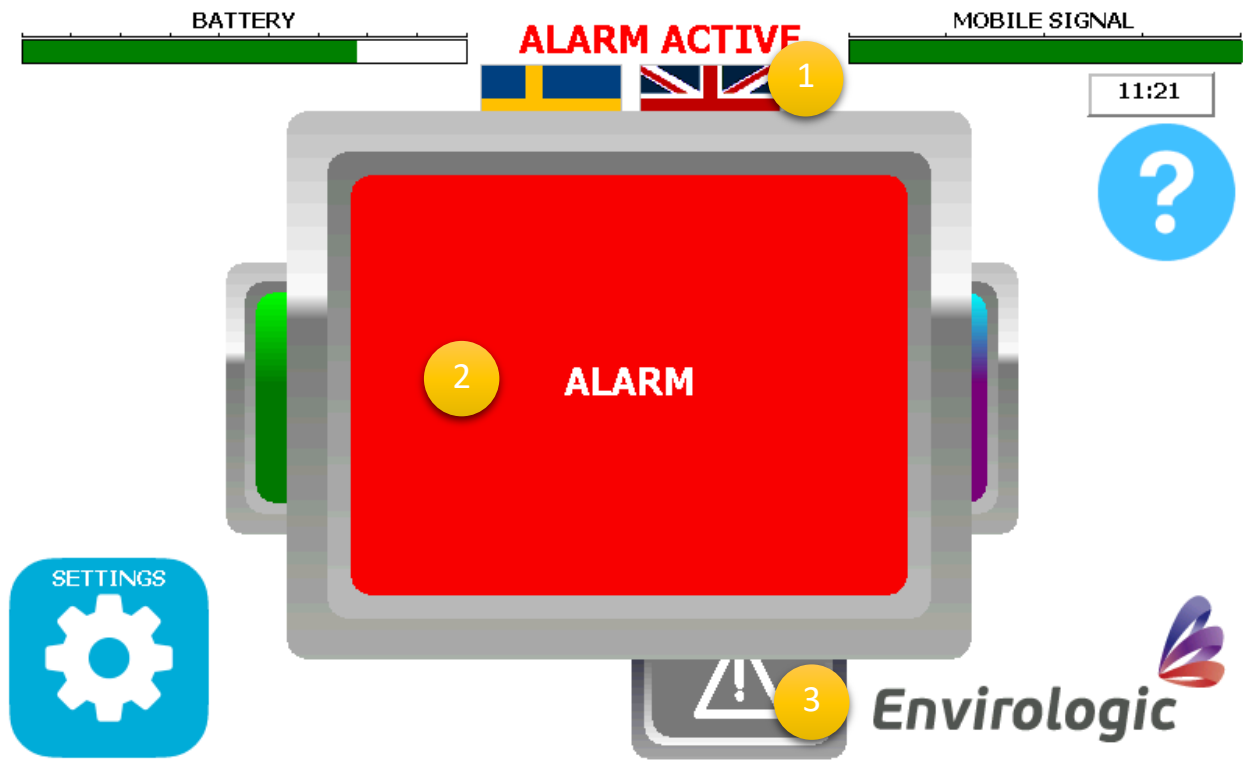


Figure 2 1) Alarm indication 2) Alarm button 3) Alarm list button

Alarm screen

To check active alarms, either click the alarm button or the alarm list button on the start screen or the settings screen. This will lead to the alarm screen, see Figure 3.

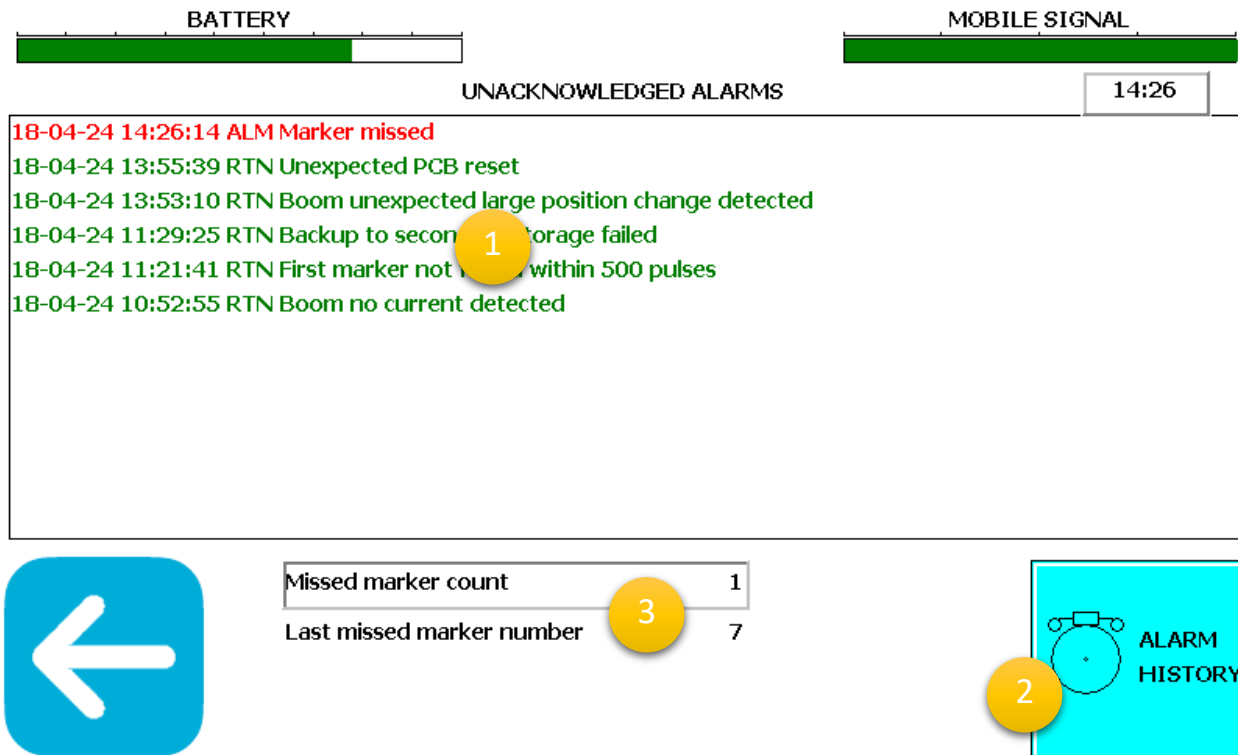


Figure 3 1) List of recent alarms 2) Alarm history button 3) Missed marker information

The alarm screen displays a list of recent alarms. New alarms are shown in red and previously viewed alarms are shown in green. The alarm history button leads to a list of archived alarms.

If any markers have been missed they are counted on the alarm screen. The number of the last missed marker (in the numbered sequence of markers of that location in question) is shown as well.

Alarm list

Table 1 Complete list of alarms

Alarm text	Description	Troubleshooting	Type
First marker not found within 500 pulses	No marker was detected when searching for the first marker during automatic cleaning, location creation or teach-in	Check that the magnetic switch arm is in the correct position Check that the marker is mounted properly Check that the magnetic switch is working Check that the robot was placed within 1 m of the first marker	Hard
File operation failed during teach	An error occurred while writing to program file during teach-in	None, the program must be recreated	Hard
Robot stuck too many times	A motor has stuck, i.e. no movement has been detected during a couple of seconds	Check that the motor is working Check that the robot has not run into anything	Hard

	when the motor was expected to move		
Unexpected PCB reset	The control electronics has reset unexpectedly	Contact service	Hard
File operation failed during recipe edit	An error occurred while writing to recipe file during recipe creation	None, the program must be recreated	Hard
PCB communication failure	The control electronics failed to answer a request from the operator panel	Contact service	Hard
PCB communication watchdog triggered	The control electronics detected a communication lapse	Contact service	Hard
Hose reel stuck	The hose reel has stuck	Check the hose and hose reel can move freely Check that the hose reel motor is working	Hard
Battery voltage low	The battery voltage has gone under 21 V	Charge batteries fully	Soft ¹
Over current detected	The total current consumption has gone over 18 A	Check if any motor runs strained	Soft
Marker missed	A marker has not been detected within an expected area during automatic cleaning	Check that the magnetic switch arm is in the correct position Check that the markers are mounted properly Check that the magnetic switch is working	Soft
Marker magnetic switch failure	The magnetic switch has been active for too long	Check that the magnetic switch is working	Soft
Boom missing pulses in downward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Boom missing pulses in upward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Tower missing pulses in left direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Tower missing pulses in right direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Wheels missing pulses in forward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft

¹ Although the alarm type is soft, a new recipe cannot be started until batteries are charged sufficiently

Wheels missing pulses in backward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Telescope missing pulses in inward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Telescope missing pulses in outward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Arm missing pulses in inward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Arm missing pulses in outward direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Nozzle missing pulses in counter-clockwise direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Nozzle missing pulses in clockwise direction	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Reel missing pulses	No movement detected when motor was commanded to move	Check that the motor is working	Soft
Boom stuck in upward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Boom stuck in downward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Tower stuck in right direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Tower stuck in left direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Wheels stuck in backward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Wheels stuck in forward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working	Soft

		Check that the robot has not run into anything	
Telescope stuck in outward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Telescope stuck in inward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Arm stuck in outward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Arm stuck in inward direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Nozzle stuck in clockwise direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Nozzle stuck in counter-clockwise direction	No movement detected for a couple of seconds while target position has not been reached	Check that the motor is working Check that the robot has not run into anything	Soft
Water turned off due to stuck motors	No movement detected for any motor for too long during automatic cleaning	Check that the motors are working Check that the robot has not run into anything	Soft
Missing zero position sensor for tower	The zero-position sensor was not detected when expected	Check that the sensor is working Check that homing sequence has been performed Check that the slip clutch has not released	Soft
Missing zero position sensor for telescope	The zero-position sensor was not detected when expected	Check that the sensor is working Check that homing sequence has been performed	Soft
Missing zero position sensor for arm	The zero-position sensor was not detected when expected	Check that the sensor is working Check that homing sequence has been performed Check that the slip clutch has not released	Soft

Missing zero position sensor for nozzle	The zero-position sensor was not detected when expected	Check that the sensor is working Check that homing sequence has been performed	Soft
Boom unexpected large position change detected	A large change in position has been detected	Check that homing sequence has been performed	Soft
Tower unexpected large position change detected	A large change in position has been detected	Check that homing sequence has been performed Check the tower magnet Check that the slip clutch has not released	Soft
Wheels unexpected large position change detected	A large change in position has been detected	Check that the markers are mounted as they were during teach-in Check that the wheels are not slipping	Soft
Telescope unexpected large position change detected	A large change in position has been detected	Check that homing sequence has been performed	Soft
Arm unexpected large position change detected	A large change in position has been detected	Check that homing sequence has been performed Check that the slip clutch has not released	Soft
Nozzle unexpected large position change detected	A large change in position has been detected	Check that homing sequence has been performed	Soft
Boom no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft
Tower no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft
Wheels no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft
Telescope no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft
Arm no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft
Nozzle no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft
Reel no current detected	No current detected to the motor when commanded to move	Check that the motor is working	Soft

Backup to secondary storage failed	Backup of location, program or recipe to secondary USB storage failed	Contact service	Soft
Remote backup preparation failed	Preparation of online backup of location, program or recipe storage failed	Contact service	Soft
Remote backup communication error	Online backup of location, program or recipe	Check that the mobile signal strength is sufficient	Soft

Battery

The battery bar shows the current battery voltage. A full bar indicates 25 V or higher while an empty bar indicates 21 V or lower.

A numeric value of the battery voltage can be seen in the detailed view on the manual screen, see XXX.

Charging

When the voltage goes below 21 V a charging indication is displayed as shown in figure XXX. The voltage needs to be restored to 25 V or higher to be able to start a new recipe during automatic cleaning.



The robot needs to be shut off during charging.

Help

Mobile connection