

MCC VectorControl



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Troubleshooting manual

1.1 Preparations / safety instructions

Before attempting to localize errors on the MCC ^{VectorControl} frequency converter control unit, please carefully read and understand the setup installation / operating manual. This will expedite a pinpointing of error sources on the MCC from Albany Door Systems. Always keep this manual in its document box near the door. The manual is intended exclusively for use by qualified service personnel. In case of doubt, contact our service department.

The general instructions below should be observed at all times.

-  Before performing any work on the control unit, cables, connectors or electrically conductive components, always turn off and lock the main switch or disconnect and secure the CEE plug. Caution: The control unit's integrated capacitors harbour a hazardous contact voltage for up to 30 seconds (time needed for complete capacitor discharge) after the main switch has been turned off or the CEE plug has been removed.
- To prevent damage by electrostatic discharge, do not touch the control unit's motherboard or the display boards without having taken appropriate ESD measures (e.g. antistatic wristband).
- When opening the lid of the MCC control unit's housing, do not allow any moisture such as rainwater to enter the housing.
- Only qualified personnel with appropriate access authorization should be allowed to work on the electrical systems and connections.

The instructions below should be observed during error localization.

- During installation, ensure that no persons or vehicles pass through the doorway or remain inside it.
- The door is to be assembled in accordance with the installation instructions.
- All lines between the door, control unit and drive unit should be properly connected.
- All external pulse generators and safety devices should be properly connected.
- Unused inputs (normally closed contacts) must be connected or disabled as shown in the circuit diagram.
- The mains power supply should be connected.

Technical notes:

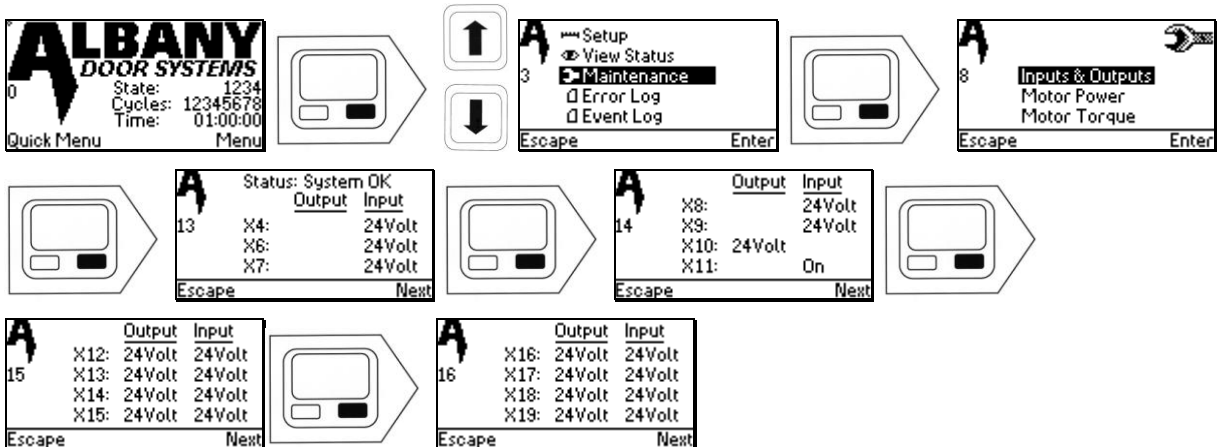
- The information in this operating manual is subject to technical amendments.
- For safety reasons, certain parameters are protected by access codes. The necessary access code level is indicated in square brackets after the chapter header. Detailed information on access codes can be found in the installation / operating manual.



When connecting shielded lines (for the motor, brake and rotation angle sensors), make absolutely certain that the shield braid makes firm and widespread contact in the cable gland, otherwise the door might malfunction.

1.2 Checking inputs and outputs

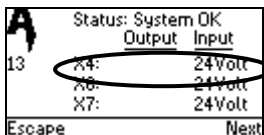
The views below can be used to readily determine the voltages present at each input and output.



To exit a view, actuate the Escape key.

Example:

In the circuit diagram, the thermal contact is connected to X4. The resultant view is shown below.



In this example, the system status is OK, 24 V are present at the control unit's input, and the thermal contact appears to be in sound condition.

1.3 Reading the error log

The error log is divided into two areas:



0-999 => Information (e.g. configuration changed)

1000- => Error messages (e.g. emergency lever actuated)

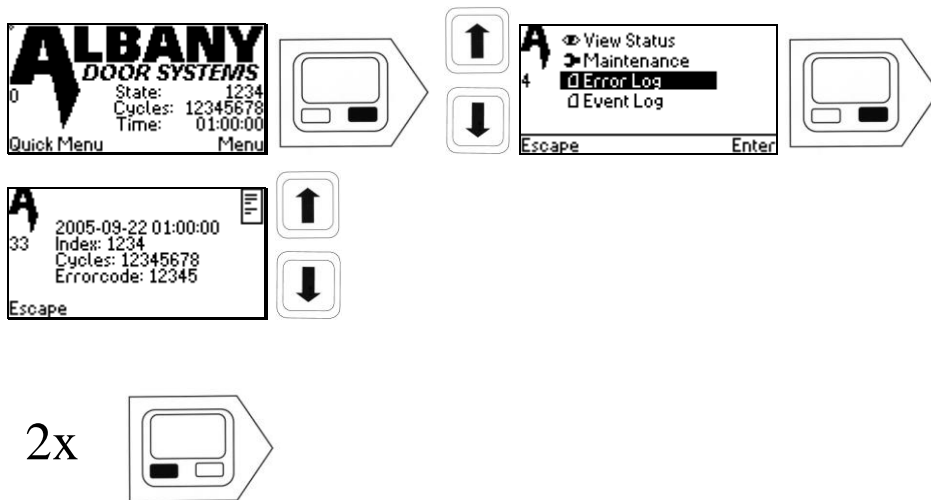
The control unit's error log logs the messages shown below, including their date and time. The views mentioned below are described in chapter 1.5.

Error description	Error code	Remedy / comments
General notice on system start	0	
Error log erased	1	Error log was erased
System start	2	Control unit was restarted
Programming PC connected	3	Programming computer connected to the MCC
Programming PC disconnected	4	Programming computer disconnected from the MCC
Configuration changed	5	MCC's configuration was changed
Emergency-stop actuated	6	Refer to view 151
Display's stop key actuated	9	Refer to view 104
Invalid data in EEPROM	10	Values could not be saved
Position tolerance of reference limit switch > 10 pulses	20	Only for product development
Position tolerance of reference limit switch > 20 pulses	21	Only for product development
Position tolerance of reference limit switch > 50 pulses	22	Only for product development
Position tolerance of reference limit switch > 100 pulses	23	Only for product development
Position tolerance of reference limit switch > 150 pulses	24	Only for product development
IGBT temperature > 60°C/140°F	30	Only for product development
IGBT temperature > 70°C/158°F	31	Only for product development
IGBT temperature > 80°C/176°F	32	Only for product development
IGBT temperature > 90°C/194°F	33	Only for product development
IGBT temperature > 100°C/212°F	34	Only for product development
Time changed	40	Control unit's system time was changed

Endurance test started	41	Refer to view 150
Endurance test stopped	42	Refer to view 150
State changed externally	43	The software state was changed from an external computer
Invalid positions	44	Invalid positions on system start, e.g. when resetting toolbox positions
DSP, safety-edge actuation	100	Only for product development
DSP, 18 V missing	101	Refer to view 147
Overvoltage warning	103	Excessively high voltage in the intermediate circuit
IGBT overtemperature warning	105	Overtemperature warning from power semiconductor (IGBT)
Reference search on startup	107	A reference search was performed on start-up
Initialization on start-up	108	An initialization was performed on start-up
Overload warning	109	Overload warning from power semiconductor (IGBT)
Safety function activated	110	Refer to view 154
DSP error	111	Refer to view 147
Position error	112	Invalid positions; re-initialization needed
Invalid configuration file	500	The present configuration file is invalid or incomplete
Error at analog input	501	Not used
Error at digital input	502	Not used
Error in software logic	503	Not used
Internal DSP error	520-526	Refer to view 147
External "Stop" button actuated	1001	Refer to view 103
"Stop" button on foilkeys actuated	1002	Refer to view 104
Safety-edge circuit interrupted	1004	Refer to view 124
Safety edge actuated	1005	Refer to view 105
Thermal contact triggered	1006	Refer to view 106
Safety test failed	1007	Refer to view 107
Incorrect signals from position encoder	1009	Refer to view 136
Impermissible movement registered by position encoder	1010	Refer to view 127

Emergency lever / manual crank operated	1011	Refer to view 111
Reference limit switch circuit interrupted	1013	Refer to view 113
Crash indicator triggered	1015	Refer to view 115
Emergency-stop actuated (X7)	1016	Refer to view 151
Safety device 1 defective	1018	Not used
Doorline photocell interrupted	1019	Refer to view 119
Safety device 2 defective	1022	Not used
Internal frequency converter error	1023	Refer to view 147
Safety-edge circuit interrupted	1024	Refer to view 124
Internal error	1025	Refer to view 123
Reference limit switch interrupted	1026	Refer to view 113
Safety-edge input error	1027	Refer to view 124
Emergency-stop input error	1028	Refer to view 129
Emergency-stop input voltage too high	1029	Refer to view 238
Earth fault error in the 24 V circuit (low voltage)	1030	Refer to view 239
Earth fault error in the 24 V circuit (high voltage)	1031	Refer to view 240
Opening height not attained during cyclical self-test (only for doors forming part of escape and rescue routes)	1032	Check springs and door mechanisms for smooth operation
Frequency converter undervoltage	1100	Refer to view 130
Frequency converter phase error	1101	Refer to view 145
Frequency converter overvoltage	1102	Refer to view 134
Frequency converter overvoltage warning	1103	Warning message: Intermediate circuit voltage >770 V
Frequency converter error - incorrect mains voltage	1104	Refer to view 134
Frequency converter overcurrent	1105	Refer to view 144
Frequency converter error - motor blocked	1106	Refer to view 136
Frequency converter overload	1107	Refer to view 137
Frequency converter error - IGBT	1108	Refer to view 137

overload		
Frequency converter error - IGBT overload warning	1109	Overload warning message
Frequency converter error - safety edge	1111	Refer to views 124, 128
Frequency converter error - brake circuit overcurrent	1112	Refer to view 142
Frequency converter error - emergency-stop	1113	Refer to view 151
Frequency converter's total current too high	1114	Refer to view 144
Frequency converter - 3-phase error	1115	Refer to view 145



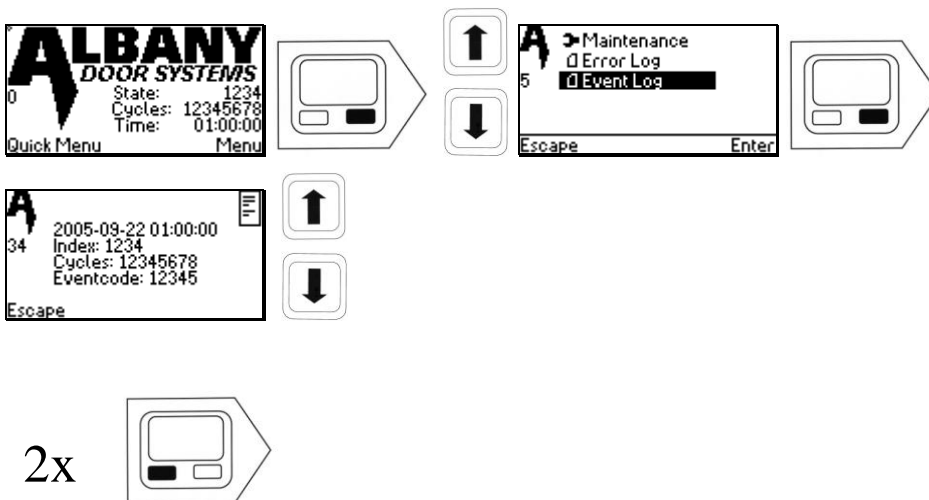
Each display indicates the error's date, time, index, cycle status and code. The index is a sequential counter incremented by one on occurrence of each new fault. It initially indicates the most recent fault. The foilkeys two arrow keys can then be used to scroll through all error messages.

i Each time the main switch is turned off, an undervoltage warning is saved in the error log.

1.4 Reading out the event log

The control unit's event log saves the actions listed below.

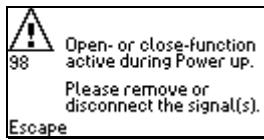



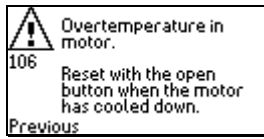
Event	Event code
Event log erased	1
Configuration file changed	2
Application software changed	3
Message text in event log supplemented / modified	5
Door requires servicing	10
Door servicing complete	11
Control cycle counter reset	20
Door cycle counter reset	21
Input/output functions modified	22
Time changed	23

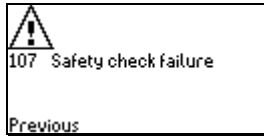
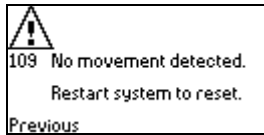
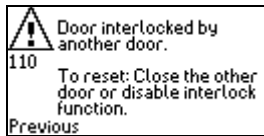

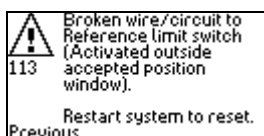









Each display indicates the event's date, time, index, cycle status and code. The index is a sequential counter incremented by one on occurrence of each new event. It initially indicates the most recent event. The foilkeys two arrow keys can then be used to scroll through all event messages.









1.5 Error views (only for doors equipped with a display unit)





The error views below are listed in ascending order by display number. Regardless of the selected language, this number is indicated on the display field's left-hand side, e.g. 103 is assigned to the "Door stopped" message.








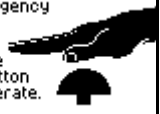
View no.	Display	Meaning	Cause / remedy
98		When the MCC system is started (on activation of the voltage supply), an "open" or "close" command is issued by the control unit.	- Disconnect / disable the "open" or "close" signal, e.g. by exiting a radar detector's range after the control unit has been turned on.
103		The door was stopped by an external command.	- The external "Stop" button was actuated. Unlock the "Stop" button and operate the "Open" or "Close" button to acknowledge the error.
104		The door was stopped by a panel command.	- The display's "Stop" key was actuated. Perform a reset by operating "Open" or "Close" on the foilkey.
105		A safety edge or pre-running photocell was activated.	- A safety edge or prerunning photocell has been actuated. Operate "Close" on the foilkey to acknowledge the error.
106		Overtemperature in motor windings.	<ul style="list-style-type: none"> - Turn off the control unit and let the engine cool. - Check the door mechanisms for smooth operation. - If necessary, clean the motor's ventilation slots. - To acknowledge the error, turn on the control unit again after it has cooled down. - Check for short circuits / earth faults in the 24 V circuit. Check the 24 V circuit. - Check the brake circuit and brake voltage. - Check whether the motor has a delta connection. - For testing, connect the control unit's thermal contact. If the error

			<p>disappears, check the motor and cable.</p> <ul style="list-style-type: none"> - The display was disconnected with the control unit active. Operate the "Open" key to acknowledge the error.
107		A test of the safety photocells failed.	<ul style="list-style-type: none"> - Check the stationary and pre-running photocells for soiling, and clean the optical elements with a soft cloth if necessary. - Check for reflections from neighbouring photocells. - To acknowledge the error, turn the control unit off and on again.
109		No door movement was detected even though movement should have taken place.	<ul style="list-style-type: none"> - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - The motor or winding shaft is blocked. - Check the door mechanism for smooth operation.
110		This door is interlocked by another door.	<ul style="list-style-type: none"> - Disable the interlock via the display (quick menu). - Close the other door. - Check the interlock.
111		The emergency lever was operated or the hand crank was attached.	<ul style="list-style-type: none"> - Check the emergency lever and adjust it if necessary. - Check the hand crank switch. - To acknowledge the error, operate the display unit's "Open" key. - Check the emergency limit switch on the motor (not applicable to all door types).
113		The reference limit switch was activated outside the door position range accepted by the position encoder.	<ul style="list-style-type: none"> - The connection cable for the reference limit switch is broken. - Check the reference limit switch and its actuation tag, and perform adjustments wherever necessary.




<p>115</p>	 <p>Door is hit. Self repairing (SRD): Close with Close button Non-self repairing door: Reset crash function manually and close Previous</p>	<p>The door was hit and the crash indicator triggered.</p>	<ul style="list-style-type: none"> - If the door does not have a self-repairing crash system, acknowledge the error by closing the door fully after performing the repair. - If the door has a self-repairing crash system, close the door until the bottom profile engages automatically and the lower limit is attained. - Check the crash contact, including its actuation mechanism and cable. - Check for short circuits in the 24 V circuit. Check the 24 V supply.
<p>119</p>	 <p>Doorline Photocell defect 119 Close in hold to run with down button. Leave with stop button. Previous</p>	<p>The stationary photocell on the lateral section is defective.</p>	<ul style="list-style-type: none"> - Check the photocell and its cables. - For testing, deactivate the safety device. Connect input X10;1 to X9;2 on the control unit. If the error disappears, check the photocell and cable. - Check for reflections from neighbouring photocells.
<p>122</p>	 <p>Safety Device defect! 122 Close in hold to run with close button. Leave with stop button. Previous</p>	<p>The auxiliary safety device is defective.</p>	<ul style="list-style-type: none"> - Check the safety device and its cable (connections are indicated in the circuit diagram). - For testing, re-program the input function to code 22 (disabled). This disables the safety device. Use only for testing!
<p>123</p>	 <p>Internal communication failed. 123 Restart system to reset. Previous</p>	<p>Internal control error</p>	<ul style="list-style-type: none"> - Turn the control unit off and on again. If the error persists, replace the control unit.
<p>124</p>	 <p>Broken Safety edge/ Safety edge circuit/ Pre-running photocell. 124 Close/Open in hold to run with panel or display. Previous</p>	<p>The safety edge or pre-running photocell is defective.</p>	<ul style="list-style-type: none"> - Check the safety edge and its cable. - Disconnect any flashlights which are present (error in MCC circuit caused by xenon flashlight).
<p>125</p>	 <p>Permanent open function active. 125 Press reset to go back to normal mode. Reset</p>	<p>The "permanent open" function is active.</p>	<ul style="list-style-type: none"> - To restore the normal mode, actuate the reset key on the left below the display.
<p>126</p>	 <p>External permanent open function activated. 126 Deactivate the permanent open button to go back to normal mode.</p>	<p>The external "permanent open" function is active.</p>	<ul style="list-style-type: none"> - Disconnect the "permanent open" signal to disable the function. - Check the "permanent open" switch and its cable.

127	 <p>127 Not allowed movement. Restart system to reset. Previous</p>	<p>The position encoder indicates door movement although the door is stationary, or the direction of rotation (direction of the position encoder's pulses) is incorrect.</p>	<ul style="list-style-type: none"> - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - Check the brake for wear.
128	 <p>Safety edge input test faulty! 128 Switch off power to reset. Contact service if the error remains! Previous</p>	<p>The self-test by the safety edge's input failed.</p>	<ul style="list-style-type: none"> - Turn the control unit off and on again. If the error persists, replace the control unit.
129	 <p>Emergency stop input test faulty! 129 Switch off power to reset. Contact service if the error remains! Previous</p>	<p>The self-test by the EMERGENCY-STOP input failed.</p>	<ul style="list-style-type: none"> - Turn the control unit off and on again. If the error persists, replace the control unit.
130	 <p>130 Power supply Under voltage. Previous</p>	<p>Undervoltage in the mains power supply.</p>	<ul style="list-style-type: none"> - Check the mains voltage and compare it with the control unit's mains voltage setting. - The power cable has an inadequate cross-section. Over the door's travel, the voltage drop caused by the flow of current through the cable is too large.
131	 <p>131 Power supply phase fault. Check power supply. Restart system to reset. Previous</p>	<p>Phase fault in the supply voltage.</p>	<ul style="list-style-type: none"> - Check all 3 phases of the supply voltage. To acknowledge the error, turn the main switch off and on again. - Check all 3 mains fuses in the MCC.
132	 <p>Over voltage 132 Turn off power! Check chopper resistor/ call service. Restart system to reset. Previous</p>	<p>Overtoltage in the control unit.</p>	<ul style="list-style-type: none"> - Turn off the main switch and check the brake resistance. - Check the mains voltage and compare it with the control unit's mains voltage setting. Changes to the mains voltage setting become effective only after the main switch has been turned off and on again.
134	 <p>134 Power supply over voltage/not conforming with set net voltage. Restart system to reset. Previous</p>	<p>Overtoltage in the control unit's power supply.</p>	<ul style="list-style-type: none"> - Check the supply voltage. - The mains voltage parameter is set incorrectly.
135	 <p>135 Phase current to motor > 25A. Check motor. Restart system to reset. Previous</p>	<p>The motor current is too high (> 25A).</p>	<ul style="list-style-type: none"> - Check the drive (delta circuit connection). - Check the door mechanism for smooth operation.

			<ul style="list-style-type: none"> - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - The position encoder's channels might have been interchanged. Switch the channels on the MCC (X5 terminals 2 and 6). - Check the brake's venting.
136	 <p>136 The motor's rotor is locked/encoder failure. Check door condition. Restart system to reset. Previous</p>	The motor or door mechanism is blocked. The position encoder supplies incorrect signals.	<ul style="list-style-type: none"> - Check the door mechanism for smooth operation. - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - Check the brake's venting. - Check whether the wind load is too high.
137	 <p>137 Overload Previous</p>	The control unit is overloaded.	<ul style="list-style-type: none"> - Check the door mechanisms for smooth operation.
138	 <p>138 Over temperature in the Control system. Let the system cool down and restart system to reset. Previous</p>	The control unit is overheated.	<ul style="list-style-type: none"> - Turn off the main switch and let the control unit cool down. - Check the door mechanism for smooth operation. - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - Check the brake's venting. - Check the brake voltage on the display (from version 1.04). - Clean the MCC's heat sink (housing). - There might be an earth fault between the brake resistor or connection line and the MCC's housing.
142	 <p>142 Over current in Hold brake circuit. Check hold brake/cable. Restart system to reset.</p>	The braking circuit's current is too high.	<ul style="list-style-type: none"> - Check the brake and its line (possibility of a short circuit / earth fault in the brake circuit).

			- Check the brake voltage.
144	 <p>144 Sum of the Frequency converter currents is too high.</p>	The frequency converter's total current is too high.	<ul style="list-style-type: none"> - Check the door mechanism for smooth operation. - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - Check the brake's venting.
145	 <p>145 3-Phase Fault Check power supply. Previous</p>	A supply voltage phase has failed.	<ul style="list-style-type: none"> - Check all three phases of the mains voltage as well as the power cable fuses. - Check all three mains fuses on the MCC. - The error message is also saved on deactivation of the voltage supply (main switch).
146	 <p>146 Communication error Frequency converter <--> Main processor. Previous</p>	Communication error between the frequency converter and control unit.	- Turn the main switch off and on again; if the fault persists, replace the control unit.
147	 <p>147 Internal error in the Frequency converter. Contact service.</p>	Internal frequency converter error.	- Turn the main switch off and on again; if the fault persists, replace the control unit.
149	 <p>149 Safety edge/ Pre-running photocell was activated. Press close button. Previous</p>	The safety edge or pre-running photocell was actuated.	<ul style="list-style-type: none"> - To perform a reset, operate the "Open" or "Close" key. - Ensure that the closure level is clear. - Clean the pre-running photocell.
150	 <p>150 Endurance test activated. The door will open repeatedly. Previous</p>	Automatic endurance test is activated.	- Deactivate the endurance test from the display console, or turn the control unit off and on again.
151	 <p>151 Emergency stop Release stop button and operate. Previous</p> 	The emergency-stop function was actuated or the hand crank was attached.	<ul style="list-style-type: none"> - Unlock the emergency-stop mechanism or remove the hand crank; start the door by means of the "Open" or "Closed" command. - Check the connection line for the emergency-stop / hand-crank contact. - Check for short circuits in the 24 V circuit. Measure the voltage and rectify the short circuit.

<p>153</p>		<p>The door comes to a stop. A "Door stopped after error" message is issued.</p>	<ul style="list-style-type: none"> - The emergency lever was actuated, e.g. due to an excessively tensioned cord or a short-circuit / earth fault in the line. - A reset can be performed by operating the "Open" key. - Read out the latest error message from the error log and acknowledge it as required.
<p>154</p>		<p>The door's safety function is active. This implies a fault on one or more of the door's safety devices.</p>	<ul style="list-style-type: none"> - The connected safety devices' current statuses can be viewed on the display. Once all safety devices have been fixed, the mode can be exited by operating the "Stop" button. - If an additional safety device becomes defective, the corresponding input in the control unit can be deactivated (code 22) for testing. If the error disappears, check the photocell and cable. - If the doorline photocell becomes defective, connect the control unit's input (X10;1 to X9;2) for testing (safety device is disabled). If the error disappears, check the photocell and cable. - If the safety edge becomes defective, connect the control unit's input (X11;2 to X11;3) with a 8.2 kΩ resistor for testing (safety device is disabled). If the error disappears, check the safety edge and its cable. - Check all safety devices including their cables and connections.
<p>164</p>		<p>The upper reference limit switch was not activated within the position encoder's tolerance range.</p>	<ul style="list-style-type: none"> - Check the reference switch, including its cable and actuation tag / switching distance, and perform adjustments wherever necessary. - Check the position encoder (spacing between the electronics and magnetic ring) and perform adjustments wherever necessary. - Check the door mechanisms.

			- Check the brake's venting.
238	 <p>Voltage in emergency stop input to high! 238 Check wiring to emergency stop. Switch power on/off to reset. Previous</p>	The voltage at emergency-stop input X7 is too high.	<ul style="list-style-type: none"> - Check the wiring of the emergency-stop circuit. - Turn the control unit off and on again. If the error persists, replace the control unit.
239	 <p>Earth fault in 24V-System detected! 239 Voltage PE-GND (24V) Low-Fault! MCC stopped! Check wiring to all 24V devices. Previous</p>	An earth fault was detected in the 24 V circuit.	<ul style="list-style-type: none"> - Check the wiring of the 24 V circuit. - Disconnect all 24 V consumers (including the display, position encoder etc.); connect the safety inputs, thermal contact and emergency lever; turn on the control unit. If the error persists, replace the control unit.
240	 <p>Earth fault in 24V-system detected! 240 Voltage PE-GND (24V) High-Fault! MCC stopped! Check wiring to all 24V devices. Previous</p>	An earth fault was detected in the 24 V circuit.	<ul style="list-style-type: none"> - Check the wiring of the 24 V circuit. - Disconnect all 24 V consumers (including the display, position encoder etc.); connect the safety inputs, thermal contact and emergency lever; turn on the control unit. If the error persists, replace the control unit.

1.6 Problems during installation

1.6.1 Limits cannot be set during installation

During attempts to set limits, the door stops even though the "Door open" limit switch was not triggered. The "Door open" limit status cannot be saved.

- ⇒ The position encoder's channels are interchanged.
- ⇒ Switch the channels on the MCC (X5 terminals 2 and 6).

1.6.2 The "Door closed" limit status cannot be saved with the stop button

- ⇒ The reference limit switch is actuated.
- ⇒ The reference limit switch's cable is broken.

1.6.3 The "Door open" limit cannot be set

The display keeps showing "Set *door closed* limit". The door only moves slowly.

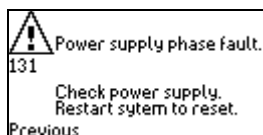
- ⇒ The position encoder's channels have been interchanged.
- ⇒ Switch the channels on the MCC (X5 terminals 2 and 6).

1.6.4 Installation is not possible because the foilkeys are disabled

- ⇒ The display lights up but the foilkeys does not work.
- ⇒ Check the display cable and plug contacts.

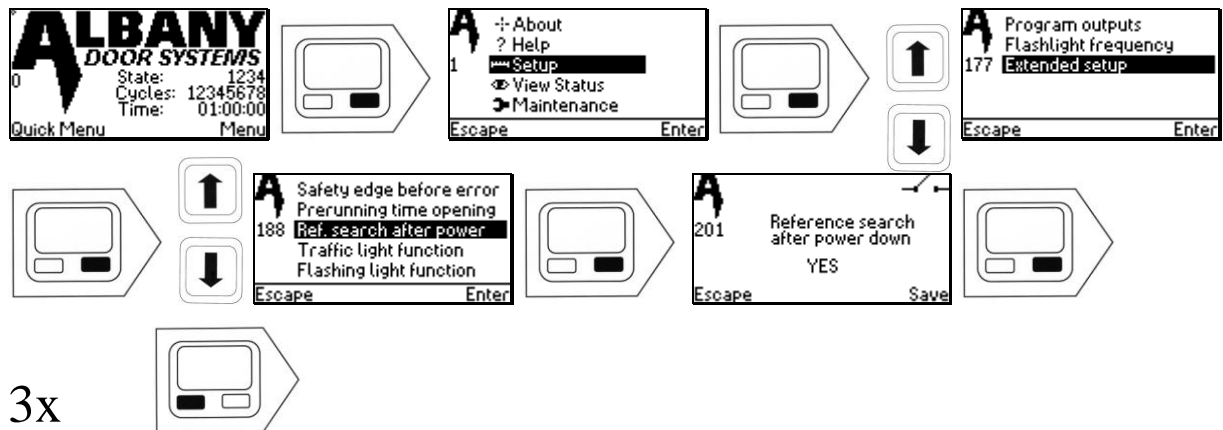
1.6.5 Overshoot of the upper limit after operation of the emergency lever

The upper limit is overshoot if the emergency lever is operated after failure of a mains phase (view 131). Operation of the emergency lever changes the door's current position. Once the phase has been restored and the main switch turned off and on again to acknowledge the error, the limit is overshoot.



- ⇒ This is a bug only in software versions up to and including 1.03. Versions from 1.04 have been fixed.
- ⇒ Activate the function "Reference search after power down". As a result, a reference search is needed automatically after every power failure.

Procedure for activating reference search:



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