TRAFFIC BARRIERS

The **SECTOR**, while technically part of the **D-Series** range, has its own unique set of error codes and as such is discussed separately in this guide.

HOW TO USE THIS GUIDE

The purpose of this guide is to equip users with the necessary skills for accurately diagnosing and resolving any technical challenges which may be encountered while working on Centurion access automation products.

The document is divided into different sections, each referring to a specific Centurion product or range of products, and each section is further divided into the different symptoms typical to the product in question.

Furthermore, diagnostic messages are categorised according to the stage of operation during which they are most likely to occur, be it during setup or normal operation. A category also exists for 'Information Screens'.

The information screen or indication will in each case be presented first, followed by a list of possible symptoms associated with the product in question, possible cause(s) of the diagnostic message and, lastly, all the possible means of resolving the problem will be documented. This system provides the user with a simple means of cross-referencing when performing troubleshooting and diagnostic exercises.

Icons used in this guide

DIAGNOSTIC INDICATION

This is the audible or visual feedback provided by the operator.

Symptom

Refers to the physical behaviour of the operator. For example, a gate not responding to a valid trigger would be a symptom.

LED output

The visual feedback provided by a system's Status LED, which will flash at a specific frequency to indicate a fault condition.

Audible feedback

The feedback provided by the controller's onboard buzzer.

Cause

The underlying reason for an operator behaving a certain way.

Solution(s)

The course of action needed to resolve a fault and return the device to normal operation.

PRELIMINARY CHECKS

The following is a list of standard checks to be performed prior to undertaking any of the advanced diagnostic exercises contained within this document. In the event that any fault condition is experienced, systematically go through the list to ensure that all the minimum site requirements are met.

1. Ensure that the following LEDs are illuminated at all times:
   a. ILP
   b. Lck/Stp
2. Check all drive connections, i.e. battery and motor wires.
3. Test battery voltage under load, it should be no lower than 11V DC.
4. Check all visible fuses.
5. Ensure that the barrier is firmly bolted onto its plinth.
6. Ensure that the pole is firmly held by the pole coupler.
7. If a loop has been fitted – check for continuity.
   a. The impedance should be <5Ω.
8. Check DOSS connections.
9. Ensure that the orientation of the spring corresponds with the orientation of the boom pole (Refer to the SECTOR installation manual for further information)

TYPICAL DIAGNOSTIC MESSAGES FOUND ON THE SECTOR CONTROLLER

DIAGNOSTIC MESSAGES DURING SETUP

Symptom: Unable to complete barrier setup

Possible causes

- DOSS is faulty or disconnected
- The gearbox is slipping

Solutions

- Replace faulty DOSS or reconnect the unplugged connections
- Contact an authorised agent to service the gearbox
- Tighten the drive-arm or contact an authorised agent

Symptom: Unable to complete barrier setup

Possible cause

- One or both Endstops are moving
- The gearbox is slipping

Solution

- Use a Phillips screwdriver to sufficiently tighten the open and closed Endstops. They should not move at all when subjected to force
- Tighten the drive-arm or contact an authorised agent

DIAGNOSTIC MESSAGES DURING NORMAL OPERATION

Symptom: Boom does not raise/lower, barrier runs a short distance and stops

Audible feedback

- Five beeps periodically for 30 seconds

Possible causes

This error indication is displayed in the event of excess current being drawn

- Incorrect spring orientation
- Incorrect spring tension
- Too many auxiliary components connected to 12V auxiliary output
- The maximum current that should be drawn by the SECTOR traffic barrier controller is 3A (momentarily) or 1A (continuous)
- One specific auxiliary device that is faulty, typically having a short circuit
- Charging voltage significantly higher than 14V DC due to faulty charger or controller

Solutions

- Ensure that the orientation of the spring corresponds with the orientation of the boom pole. Refer to the SECTOR manual for further details
- Check the spring balance by referring to the Spring Tension Diagnostic screen, and correct if necessary
- Ensure that the battery charging voltage is no higher than 14V DC. Refer to Appendix A on page 71 for a description of how to test battery and charging voltages
- Disconnect and reconnect auxiliary components one by one in order to isolate the problem

Symptom: Boom does not raise/lower, barrier runs a short distance and stops

Audible feedback

- Four beeps periodically for ten seconds

Possible causes

This error message will be displayed whenever no DOSS pulses are registered while the motor is supposed to be running

- The operator is encountering a fixed obstruction
- Loose drive connection (battery or motor terminal)
- Blown fuse
- DOSS unclipped from gearbox
- Faulty DOSS
- The gearbox is slipping
- The primary drive-arm is loose on the output shaft

Solutions

- Ensure that nothing is hindering the trajectory of the boom pole
- Ensure that drive connections are secure
- Check 30A ATO fuse
- Ensure that DOSS is firmly clipped into the gearbox
- Replace faulty DOSS
- Contact local authorised agent to service gearbox
- Tighten the primary drive-arm or contact local authorised agent

Symptom: Boom pole will only move for a very short distance before termination of operation

Audible feedback

- Five beeps periodically for 30 seconds

Possible cause

- Controller hardware problem

Solution

- Replace faulty controller

Symptom: Boom does not raise/lower

Audible feedback

- Five beeps periodically for 30 seconds

Possible causes

- DOSS physically disconnected
- Poor connection on DOSS or controller side
- Faulty harness
- Faulty DOSS
- Faulty controller

Solutions

- Ensure that the DOSS is clipped firmly into its carrier and that the harness is plugged in on both the DOSS and controller side
- Check for bad connections
- Replace DOSS harness
- Replace DOSS unit
- Replace faulty controller

Symptom: Boom does not raise/lower

Audible feedback

- Five beeps periodically for 30 seconds

Possible causes

- Loose drive connections
- Faulty electric motor
- The H-bridge on the controller is damaged, possibly a blown FET
- The electric motor is faulty or has been disconnected

Solutions

- Check drive connections (motor and battery) and secure if necessary
- Replace faulty electric motor
- Check that the MOTOR, FUSE and DRIVE cells are all ticked in the information screen.
  An 'x', question mark or anything other than a tick indicates a fault. In the case of a damaged H-bridge, the display will typically indicate the part of the bridge that is damaged (i.e. Q1Q3, Q2Q4, etc.). For an explanation of the diagnostic screens found on the **D-Series** range of controllers, refer to Appendix B on page 73

- In the event of a Drive Fault, the controller must be repaired by an authorised workshop
- Ensure that the electric motor terminals are connected to the controller
- Check the function of the electric motor by referring to the information screen described above, or test the motor by connecting the motor terminals straight onto the battery
- If the motor does not run, the commutator is most probably faulty

Symptom: Barrier may continue to operate but movement will be accompanied by audible error indication

Audible feedback

- Three beeps periodically while boom is moving

Possible cause

- The spring tension is incorrect; it is too loosely / tightly wound

Solution

- A handy information screen, including graphic representation, can be found by scrolling upwards on the controller. Refer to Appendix B, on page 73 for further information. This will show you exactly how many turns are needed and in which direction (i.e. clockwise or counter-clockwise)

Symptom: Barrier does not raise/lower or barrier runs a short distance and stops

Audible feedback

- Four beeps periodically for ten seconds

Possible causes

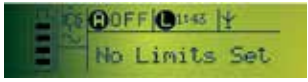
- The operator is encountering an obstruction and has reached the pre-set number of allowable collisions
- The controller collision force is set too sensitively
- Number of allowable collisions set to a low value, e.g. 1
- Faulty DOSS harness
- Incorrect spring tension
- Incorrect combination of springm gearbox, and pole length
- Loose drive connections
- Faulty DOSS
- Faulty or disconnected electric motor

Solutions

- Ensure that nothing is physically hindering the trajectory of the boom
- Increase the Collision Force (Menu 2: Safety)
- Increase maximum collisions value to a higher number, typically 4
- Replace faulty DOSS harness
- Ensure the correct spring and gearbox is used for the current pole length in use
- Check battery and motor terminal connections
- Replace faulty DOSS
- Ensure that the blue and black motor wires are connected to the controller. If they are and the barrier still won't operate, it might be necessary to replace the electric motor. Refer to the MOTOR information screen discussed in Appendix B on page 73 to determine whether the motor is read by the controller

- A handy information screen, including graphic representation, can be found by scrolling upwards on the controller. Refer to Appendix B, on page 73 for further information. This will show you exactly how many turns are needed and in which direction (i.e. clockwise or counter-clockwise)

Symptom: Boom does not raise/lower



Audible feedback

- Three short beeps for five seconds

Possible cause

- The End-of-travel limits have not been established

Solution

- Set the gate travel limits by accessing the Setting Limits menu (Menu1: Setting Limits) and following the onscreen prompts

Symptom: Boom does not raise/lower

Audible feedback

- Three beeps periodically for 30 seconds

Possible causes

- Poor connection between battery and controller
- The battery voltage is low or the battery is faulty or disconnected
- Faulty controller

Solutions

- Ensure that the battery terminals are properly connected
- Measure the battery voltage – it should be no lower than 11V DC when placed under load. Refer to Appendix A on page 71 for an explanation of how to accurately test battery voltage
- Check for corrosive build-up around the battery terminals. If there is corrosion, replace both the battery and terminals
- Replace the battery
- Ensure that the 'Mains Present' icon is solid
- Replace faulty controller

GENERAL INFORMATION SCREENS

Symptom: None

Audible feedback

- 4KHz tone for 30 seconds

Possible causes

- The closing loop has been activated while the boom is lowered
- Inadvertent activation of the Break-in Alarm feature

Solutions

- Remove any metal objects from the closing loop
- Check the loop wiring and impedance (should typically be <5Ω)
- If not required, disable the Break-in Alarm feature in Menu 6: Loop Detector

Symptom: Boom does not raise from fully lowered position

Audible feedback

- One beep periodically for 30 seconds

Possible cause

- The Holiday Lockout feature has been enabled

Solutions

- Ensure that the green Lck LED is illuminated
- Press the transmitter button or switching device that invoked Holiday Lockout Mode
- Bridge the Lck input to Com or reset the controller to factory defaults (Menu 10: General Settings)
- Check for any Auto-activations pertaining to Holiday Lockout. Refer to the Time-barring and Auto-activation matrix, a depiction of which is given in Appendix B on page 78

Symptom: None

Audible feedback

- 4KHz tone until closing loop is cleared

Possible causes

- The closing loop has been activated for the time specified in Menu 6.5.1.2: Presence Time
- Inadvertent activation of the Presence Alarm feature

Solutions

- Remove any metal objects from the closing loop
- Check the loop wiring and impedance (should typically be <5Ω)
- If not required, disable the Presence Alarm feature in Menu 6: Loop Detector

APPENDIX B

EXPLANATION OF INFORMATION SCREENS

The following screens can be accessed by using the triangular up and down buttons. The information is very useful when doing fault finding to provide the user with better feedback of the various diagnostic conditions or when acquiring general operational information.

Voltages

- Charger voltage - should be approximately 14V DC for the **D5-Evo/D5-Evo Low-Voltage/SECTOR/V-Series** and 27V DC for the **D10/D10 Turbo**
- Battery voltage - the unit will not operate if the voltage falls more than 3V DC under load. A quick way of checking the battery's voltage under load is to apply a force in the opposite direction to the movement of the gate; the battery voltage should never drop more than 2V DC. The system will enter Battery-low state at 10V DC **(D5-Evo/D5-Evo Low-Voltage/SECTOR/V-Series)** or 21.0V DC (**D10/D10 Turbo**) and will shut down, allowing the batteries to charge

Speed

- This display indicates the speed at which the gate/**SECTOR** is travelling in metres per minute; the speed of the **SECTOR** is indicated in degrees per minute
- Say, for example, that the gate has been set to run at maximum speed, but this information screen indicates that it is not running at maximum speed, it is an indication that the gate is heavy or it might be time to change the wheels

Current / Collision Count and Lost

- This screen will display the instantaneous current drawn during operation; typically it should be between 6A and 8A for the **D5-Evo/D5-Evo Low-Voltage**, between 3A and 6A for the **D10/D10 Turbo** and around 2A for the **SECTOR**. Note that the current drawn by the various operators could vary greatly depending on the load. A heavy gate would naturally result in more current being drawn. The maximum current draw is limited to 15A
- This screen will help determine whether the gate is running properly or not. If the current drawn is much higher than 6A, it could be an indication that the gate weight is excessive or something is obstructing the free movement of the gate. Check for dirt on the rail and ensure that the wheels move freely; the maximum current may be zeroed at any stage by pressing the oblong pushbutton on the controller
- **ColCnt** – indicates the number of collisions encountered during a specific cycle. The counter will reset to zero after every successful cycle
- **Lost** – if a system encounters six consecutive collisions, it will enter a realignment procedure to try and determine the true positions of its Endstops and Origin Marker

Position Count

- Open, Close and Current - compares the open/close count in the fully open/closed position with the current count in these positions; it should be within ten counts
- For example, if the gate is in the fully closed position and the Closed Count displays 5, but the Position Count is 16, it indicates a problem. See the point that follows:

- **Open**, **Close** and **Current** - compares the open/close If not, it is safe to assume that the encoder sensor is not counting the pulses accurately or that electrical noise is present around the DOSS system. Equipment such as GSM modules, switch mode chargers or other electrical devices with high electrical noise could contribute to problems in this area

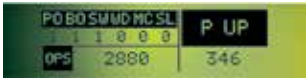
Magnet Position

- The display will indicate the position of the magnet relative to the position of the motor. When the display is contradicting the fact, it is an indication that the magnet polarity is incorrect

PWM

- This is an indication of the percentage of battery power that the controller is able to deliver to the motor. The heavier the gate, the lower this percentage is likely to be. If the system is running at full speed but only 80% of battery power is being delivered to the battery, it might be time to change the gate wheels

Operations/Power ups



- The **OPS screen** acts as a trip counter and counts and stores the number of operations completed over a period of time
- For example, the diagnostic screen above indicates that the gate in question has completed 2880 cycles (open and closed) in total
- **P UP** – Indicates the total number of times that the controller has had the power cycled (power removed and reapplied). A high number of power-ups on a battery backed-up system indicates a problem with either the battery or the charger.
- Both these counters can be reset by removing the power to the controller, holding in all four buttons and reapplying power
- **PO** – Power-on-reset has occurred. This reset condition occurs if the control card is powered up from a completely powered down state, meaning that no power is connected to the control card and the super-cap is completely discharged
- **BO** – A Brown-out-reset has occurred. Generally this condition occurs if the voltage to the microprocessor drops below some critical threshold value. The device is held in reset in such situations to prevent abnormal operation. If this flag is set on its own, it's a good indicator that there may be something wrong with the electrical supply to the operator. The system should be checked by a qualified service technician. During a power-on-reset (see above), the BO flag is always set simultaneously with the PO flag. This is completely normal, and should not cause concern
- **SW** – A Software-reset has occurred. This flag is set in the event of abnormal software execution, device failure, or after the system powers up following recovery from Sleep Mode. The device enters sleep when all power is removed from the controller, but the super-cap continues to power the real-time clock circuitry. If the control card is powered up before the super-cap discharges and the time is lost, the system will generate a software reset and set the SW flag
- **WD** – A Watchdog-reset has occurred. This flag is set in the event of abnormal software execution, or some form of device failure. The system should be checked by a qualified service technician if the event is flagged repeatedly

- **MC** – A Master-Clear-reset has occurred. This flag is set in the event of abnormal software execution, or some form of device failure. The system should be checked by a qualified service technician if the event is flagged repeatedly
- **SL** – The device has entered and recovered from Sleep Mode. This flag is infrequently set, as it is cleared during a device reset which usually follows the exit from Sleep Mode. It is not relevant to normal controller operation, and should not be a cause for concern if it does happen to be set

Drive, Fuse and Motor

- **DRIVE** – This indicates whether all the transistors present in the H-bridge are operational
- **FUSE** – Fuse in working condition
- **MOTOR** – Motor is connected

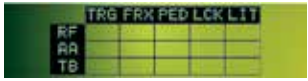
Example

- The screen pictured above indicates a faulty H-bridge, blown fuse and a motor in an unknown state

Serial Number and Firmware version

- **M** and **C** – Indicates the software version loaded on the controller
- **SN** – Serial Number of controller
- **E** – Displays the EEPROM version number

Input Matrix



- This screen aids in indicating which inputs are active
- **RF** – This row determines whether any inputs (in this case RF inputs) are being activated by RF functionality. If any cell in this row has an ellipse icon in it, the respective RF input is currently being activated. The activation may arise from a latched remote control transmission, or from a currently active pulsed remote control transmission
- **AA** – This row determines whether a physical input is being activated by an Auto Activation Time-Period
- Any cell with an ellipse icon in it indicates that the respective input is active due to some currently active Auto Activation Time-period
- **TB** – This row determines whether a physical input is inhibited from affecting the control card by a time-barring Time-period. Any cell with an ellipse icon in it indicates that the respective physical input is prevented from affecting the controller
- **TRG** – The trigger input column
- **FRX** – The free-exit input column
- **PED** – The pedestrian input column
- **LCK** – The Holiday Lockout input column
- **LIT** – The Courtesy Light LIT input column

Example

- The screen picture above shows that an Auto Activation is present for the Free-exit function

Remote Control Information

- **ID No** – Displays the identification number of the last remote used to trigger the system
- **LB** – A black dot will appear in this field if the battery of the remote being activated is nearing the end of its functional life
- **PL** – Will indicate the type of input/output (pulsed or latching)
- **TB** – A dot in this field indicates that the remote is time-barred
- **Button** – Indicates which remote button was used for the last valid trigger
- **1/500** – Indicates the memory usage, i.e. how many buttons have been learned into the controller's memory
- The field towards the centre of the display will indicate what function the particular remote button has been assigned to activate, i.e. TRG, FRX, LCK, etc.

Example

- The screen pictured above indicates that the last transmitter button to be pressed had the ID number 737 and it was a pulsed input activating the TRG input. Button one of the transmitter was used and only three transmitter buttons out of the possible 500 programmable buttons have been used

SECTOR Spring tension screen

- This screen indicates how many turns of the spring tensioning nut are needed and which way it should be turned, i.e. clockwise or counter-clockwise