

# EMControl™ Positioner Controller Plug-In Card

Model 7006-001

Product Manual



## Copyright and Trademark

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## Revision Record

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### MANUAL, EMCONTROL | Part #399348, Rev. G

Revision	Description	Date
A	Initial Release	MAY, 2014
B	Updated EMCenter models	JUN, 2014
C	Updated commands	SEP, 2015
D	Updated commands	APR, 2018
E	Added commands	MAY, 2020
F	Added simulation; Updated format	SEP, 2022
G	Update	FEB, 2024

## Safety Information

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**High Voltage:** Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury or death.



**Protective Earth Ground (Safety Ground):** Indicates protective earth terminal. You should provide uninterruptible safety earth ground from the main power source to the product input wiring terminals, power cord, or supplied power cord set.



**Laser Warning:** Denotes a laser (class 1M) is part of the operating system of the device.



**Waste Electrical and Electronic Equipment (WEEE) Directive:** (European Union) At end of useful life, this product should be deposited at an appropriate waste disposal facility for recycling and disposal. Do not dispose of with household waste.

## Notes, Cautions, and Warnings

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**Note:** Denotes helpful information intended to provide tips for better use of the product.



**CAUTION:** Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.



**WARNING:** Denotes a hazard. Failure to follow instructions could result in SEVERE personal injury and/or property damage. Included text gives proper procedures.

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## Introduction

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The ETS Lindgren EMControl™ Positioner Controller Plug in Card is a versatile positioner controller which enables you to synchronize the simultaneous movements of up to two ETS Lindgren positioning devices (for example, towers or turntables) and the on/off operation of an additional auxiliary device, such as a LISN or EUT.

EMControl allows a target location to be entered manually or under software control to redirect the device from its current location to another position. EMControl incorporates advanced acceleration and deceleration algorithms to accurately control variable, high speed drives.

EMControl is designed for use with the EMCenter™ Modular RF Platform. Multiple EMControl cards can be utilized for applications with more than two positioning devices.



EMControl is fully compatible with ETS Lindgren towers and turntables manufactured in 2005 and later. Contact ETS Lindgren for additional information.

## Standard Configuration

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Standard configuration may vary by model; contact ETS-Lindgren for additional information.

- EMCenter Modular RF Platform
- EMControl Plug-In card

## Other Optional Items

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- Fiber Optic Cables
- Contact ETS-Lindgren for additional information on compatible positioner models.
- EMControl is fully supported by ETS-Lindgren TILE!™ (Totally Integrated Laboratory Environment), ETS-Lindgren EMQuest™ Data Acquisition and Analysis Software, and other test automation software packages. Contact ETS-Lindgren for additional information.

## **ETS-Lindgren Product Information Bulletin**

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See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

## Operation

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### Installation

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**CAUTION:** Before connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



**WARNING:** Always unplug the unit before starting maintenance to prevent electrical shock. Maintenance includes removal of the plug-in cards or the top panel.



**CAUTION:** Leave an empty slot or space 1U in height beneath the EMCenter to allow sufficient cooling through the bottom air inlets of the cabinet.

### Changing Plug-In Cards

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1. Before installing and inserting a new plug-in card make sure that the EMCenter is turned OFF and disconnect the AC Mains power cord.
2. Determine in which empty slot of the EMCenter you want to install the Plug-in Card. Looking at the back of the EMCenter, the slots are numbered 1 through 7 from left to right.



3. Remove the blank panel from the slot by removing the two screws at the top of the blank panel and the two screws at the bottom. Be careful not to lose the screws.
4. Carefully insert the card into the slot of the EMCenter. Position the plug-in card into the slot and slowly push it, using the lower part of the plug-in card. When it reached the end of the rail, gently push and lock the plug-in card into the backplane socket.
5. Secure the card by tightening the four previous screws using a Pozi type screwdriver head PZ1.

6. Plug the interlock into the connector on the back of the EMCenter.
7. Connect the desired device(s) to the correct plug-in card port.
8. **Optional:** Connect the EMCenter to a personal computer using Ethernet or GPIB.
9. Re-connect the AC mains power cord and turn ON the EMCenter. It can now be started by tapping the touch screen. The EMCenter will automatically detect the newly installed card.
10. The card installation is complete and the EMCenter is now ready for use. You can control all cards through the [touchscreen](#) or sending [remote commands](#).

## **Connecting Devices to EMControl**

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### **Device 1 / Device 2: Towers and Turntables**

To connect a tower or turntable to EMControl, use the dual fiber optic cable included with the device. The dual fiber optic cable provides two ST connectors at each end; either end can be connected to EMControl.

1. Plug an ST connector at one end of the fiber optic cable to the IN port of the device, and plug the ST connector at the other end to the OUT port on the EMControl card.
2. Plug the remaining ST connector at one end of the fiber optic cable to the OUT port of the device, and plug the remaining ST connector at the other end to the IN port on the EMControl card.

### **Aux: Additional Devices**

Connect additional devices such as LISNs and EUTs to the AUX 1 and AUX 2 ports on the EMControl card. Use AUX 1 if connecting a single additional device.

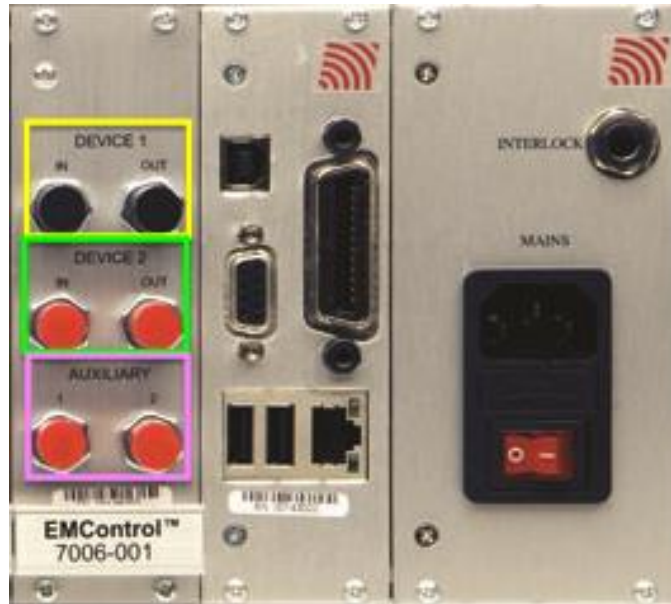


## Manual Control

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### Back Panel

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#### Device 1/ Device 2

EMControl provides IN and OUT ports for connecting any combination of towers and turntables, up to two devices.

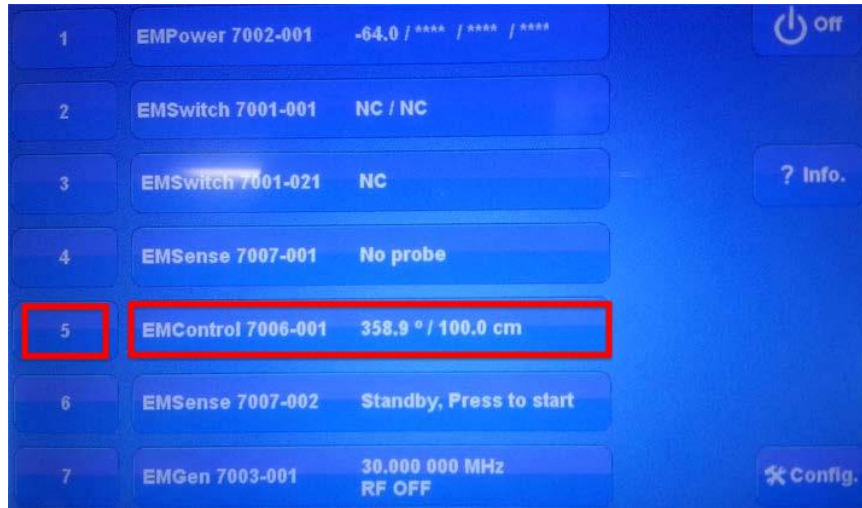
#### Auxiliary (AUX 1 and AUX 2)

EMControl also provides two ports for connecting additional devices, such as LISNs (Line Impedance Stabilization Network) and EUTs (Equipment Under Test). They may be connected in any combination, up to two devices.

## Touchscreen

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### Home Screen



To control the movement of the connected positioning equipment and change settings, on the Home screen press the status box to the right of the slot number for the installed EMControl plug in card.

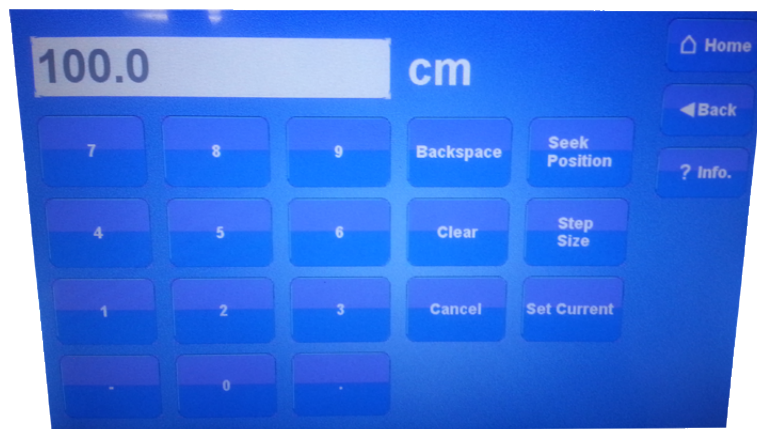
### EMControl Main Settings Screen

This will display the following EMControl screen:



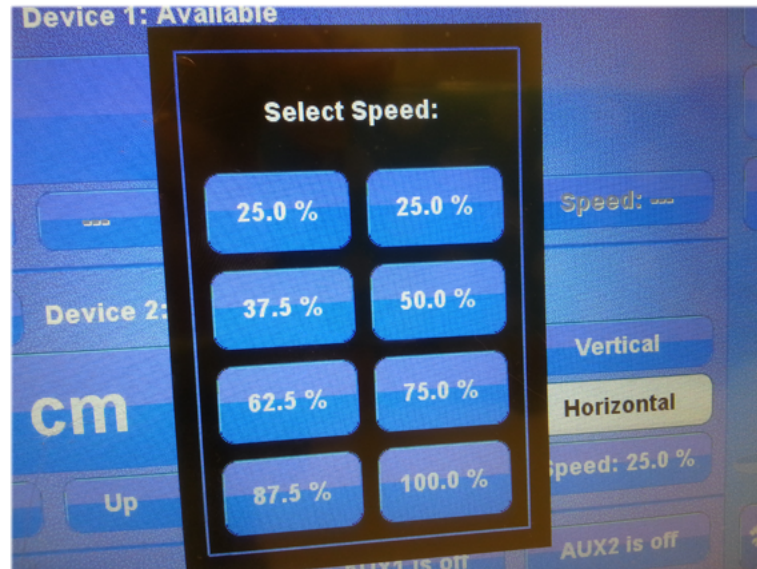
Following is a description of each function you can perform from the EMControl screen:

- **Initiate Movement** — From the EMControl screen use the Down button or Up button for a linear device like an antenna mast; use the CCW button or CW button for a rotational device like a turntable. Depending on the mode, these buttons will cause a different reaction. The mode can be set to **Jog**, **Step**, or **Run**.
  - **Jog mode** — Movement continues as long as the button remains pressed. Releasing the button will stop the movement.
  - **Step mode** — Each button push will result in motion defined by the step size. Step size is configured in **StepSize** on the Configuration screen.
  - **Run mode** — A button push initiates movement. Movement stops only when the **Stop** button is pressed.
- **Seek to a Specific Position for Connected Tower/Turntable** — From the EMControl screen press the button displaying the current position. When the following Settings screen displays, enter the new number at the keypad, and then press Seek Position to move to this position.



- **Stop Movement** — From the EMControl screen press **Stop**.
- **Initiate Movement Between Upper And Lower Limit** — From the EMControl screen press **Scan** to initiate movement between the upper and lower limit for the number of cycles set in the Scan Cycle Count on the Configuration screen. Limits are also configured in the [Configuration screen](#).
- **Change Current Position** — From the EMControl screen press the button displaying the current position for the connected turntable or tower. When the Settings screen displays, enter the new number at the keypad, and then press Set Current to set this value as the current position.

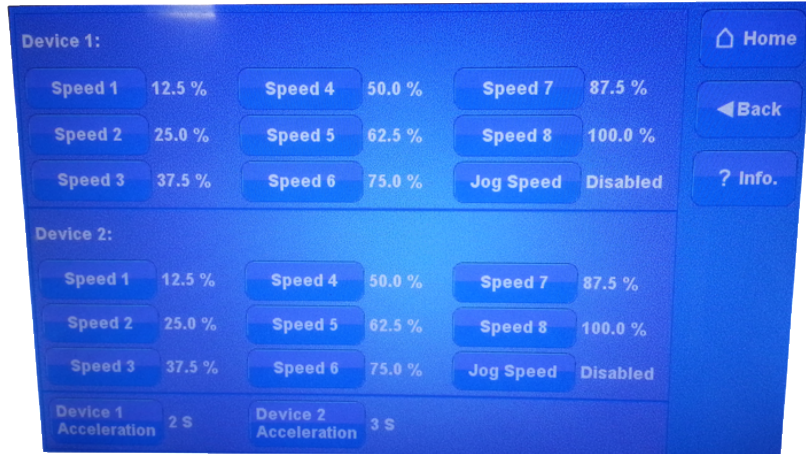
- **Change Speed** — Speed is expressed as a percentage of maximum speed; there are eight speeds to choose from. To change the speed, from the EMControl screen press **Speed** and then select the required speed from the Speeds screen. The eight preset speeds available are configured by using the Speed Presets button in the [Configuration screen](#).



- **Control Auxiliary Devices** — To toggle the auxiliary ports 1 and 2 between on and off, from the EMControl screen press the AUX1 and AUX2 buttons.
- **Define Speed Presets** — The Speed Presets screen enables you to define the eight speeds available for the positioner as a percentage of the maximum speed. Speeds can be preset for each device.
  - From the EMControl screen press **Config** to display the Configuration screen, and then press **Speed Presets** to access the [Speed Presets screen](#).
- **Change Other Settings** — To change other settings for the connected positioning equipment, from the EMControl screen press **Config** to display the following [Configuration screen](#).
- **Set Up Devices** — The Device Setup screen contains information about the device. From the EMControl screen press **Config** to display the Configuration screen, and then press [Device 1 Setup or Device 2 Setup](#).

## Speed Presets Page

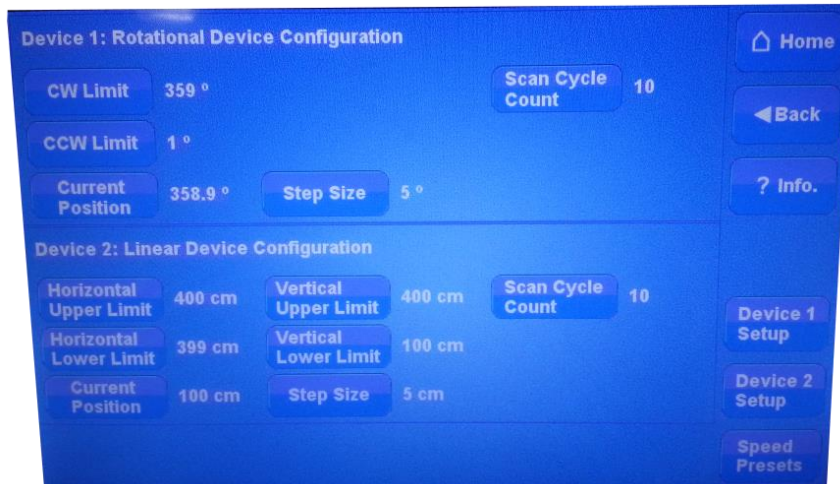
From the EMControl screen press **Config** to display the Configuration screen, and then press **Speed Presets** to access the Speed Presets screen.



- Press **Speed**, use the keypad to enter the percentage of maximum speed, and then press the % button.
- The jog speed can be set to a value different from the other speeds. Set jog speed to **Disabled** to use the same speed in jog mode.
- **Device Acceleration** sets the time to ramp up to the set speed from stop and the time to ramp down from set speed to stop. This can be set for each device individually. Press **Device Acceleration**, enter the time using the keypad, and then press **s** (seconds).

## EMControl Config Page

To change other settings for the connected positioning equipment, from the EMControl screen press **Config** to display the following Configuration screen:



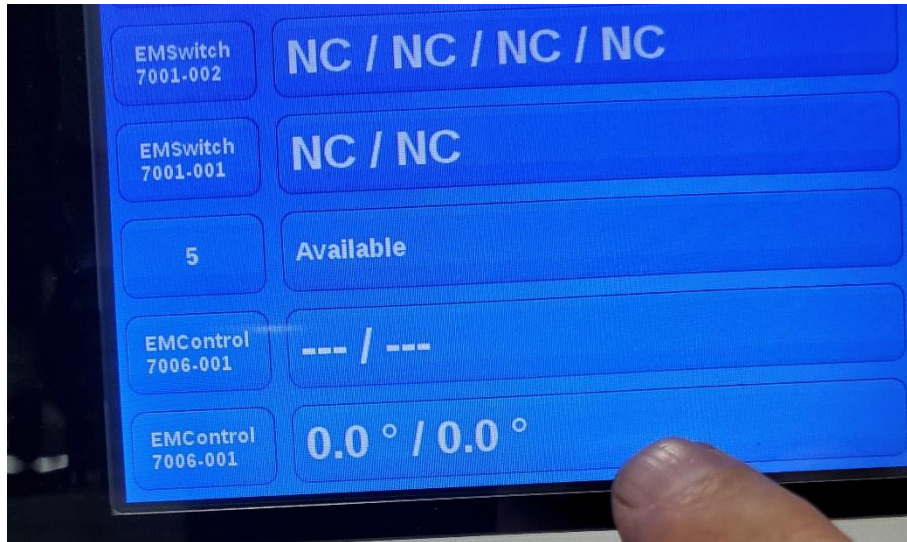
- **Upper Limit/CW Limit** — Displays the current setting for the device. Upper limit is for towers and CW limit for turntables. To change the current setting, press **Upper limit / CW Limit**, enter the new number at the keypad, and then press **degr.** (for turntable) or **cm** (for tower).
- **Lower Limit/CCW Limit** — Displays the current setting for the device. Lower Limit is for towers and CCW limit is for turntables. To change the current setting, press **Lower limit/ CCW Limit**, enter the new number at the keypad, and then press **degr.** (for turntable) or **cm** (for tower).
- **Current Position** — Displays the current position for the device. To change the current setting, press **Current position**, enter the new number at the keypad, and then press **degr.** (for turntable) or **cm** (for tower).
- **Scan Cycle Count** — Displays the scan cycle count, the number of times the positioner will move between the upper and lower limit while scanning. To change the current setting press **Scan Cycle Count**, enter the new number at the keypad and press **Enter**.
- **Step Size** — Displays the step size, the number of degrees or cm the positioner will move in Step mode. To change the current setting press **Step Size**, enter the new number at the keypad and press **Enter**.
- **Simulation Mode** – A special feature of the ETS-Lindgren EMControl motor base allows you to do software development with just the EMCenter and EMControl when you do not have a physical positioner attached.

- If you send commands to move an axis, it will “move” virtually. If you then ask the EMCenter where the axis is, it will be at that position (after the ‘virtual movement time’).
- That can be useful for you to verify your software before you start actually moving real positioners. See the section [Simulation Mode Setup](#) for instructions.

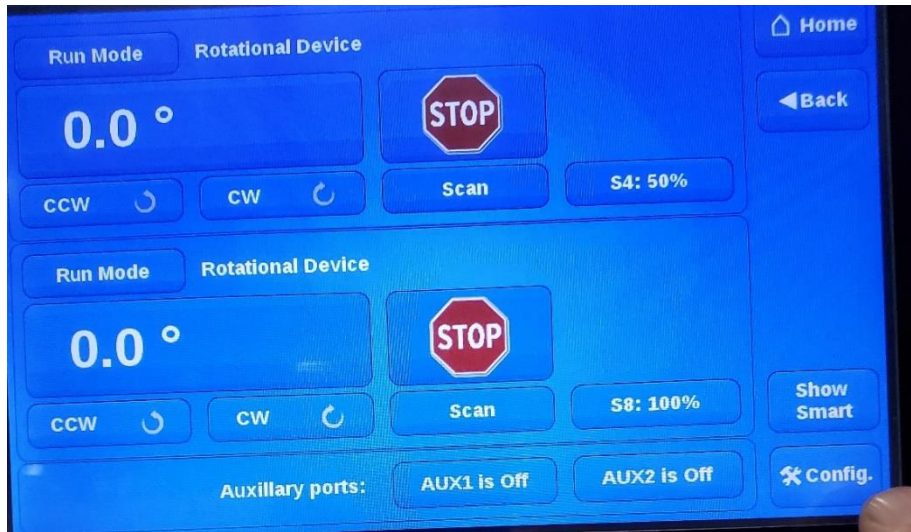
## Simulation Mode Setup

This example assumes that you have an EMCenter and at least one EMControl card installed.

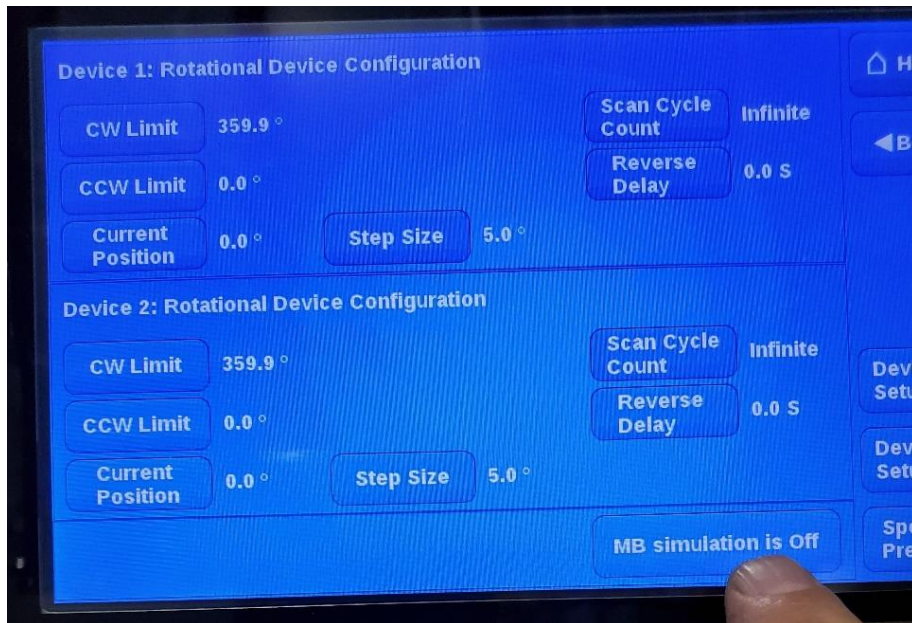
1. To start, press the button for the EMControl card (located in slot 7 in this case):



2. Once you see this page, you will need to press the Config button on the lower right to enter the Configuration page as shown below:

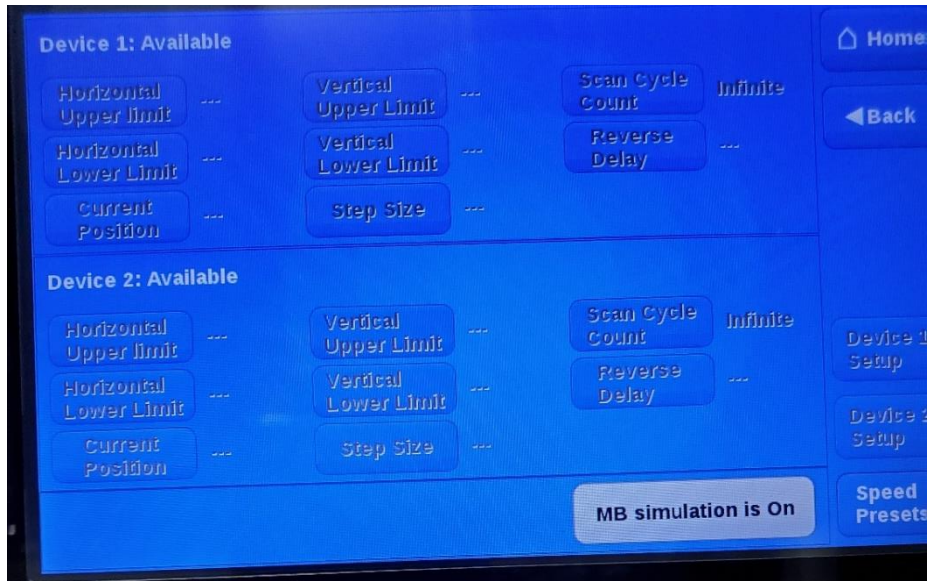


3. In the most common scenario, the motorbase simulation will be OFF, which means that real physical positioners such as towers and turntables.



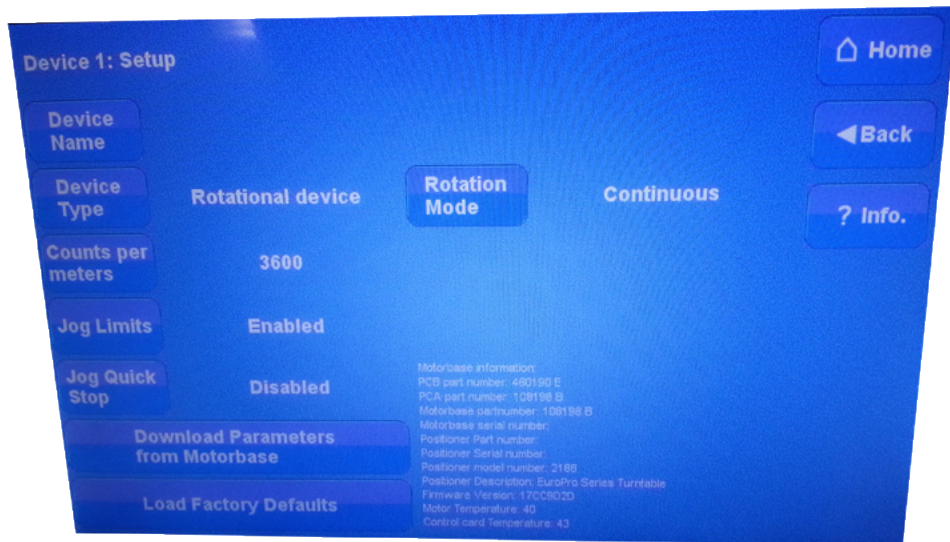


- To turn the simulator on, press the button once. You will see it light up. When you are done testing, press it again to turn it off:

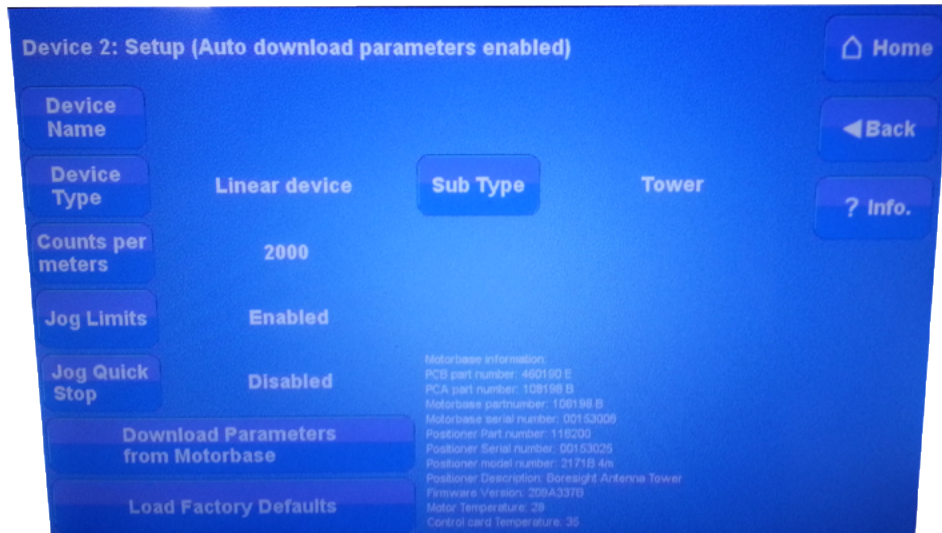


### Device 1 / Device 2 Setup Pages

The Device Setup screen contains information about the device. From the EMControl screen press **Config** to display the Configuration screen, and then press **Device 1 Setup** or **Device 2 Setup**.



EMControl Device 1 Setup screen



*EMControl Device 2 Setup screen*

- Press **Device Name** to enter a custom name for the device.
- Press **Device Type** to select the type of device: linear (tower) or rotational (turntable). For rotational devices, a **Continuous** or **non-Continuous** mode sub type can be selected; for linear devices a **Tower** or **Bore Sight Tower** sub type can be selected.
- In the **continuous mode** of operation a turntable is allowed unlimited movement. The counter readout is from 0 to 359.9 and the software limits are ignored. In the non-continuous mode, the turntable is restricted between upper and lower software limits.
- In **jog mode**, users can select whether limits are respected. If **Jog Limits** is set to **Enabled**, movement is stopped when software limits are reached. If set to **Disabled**, movement can continue beyond software limits.
- When **Jog Quick Stop** is disabled, stopping when in jog mode uses the device acceleration parameter to stop slowly. If **Jog Quick Stop** is enabled, releasing the button will result in an immediate stop.
- For Bore Sight Towers, the distance to the equipment under test (**Bore Sight Distance**) and the correction (**Bore Sight Correction**) can be set. Bore Sight Correction can be **Standard**, **Alternate**, or **Dual-Mast**.
- Press **Download Parameters** to download device parameters from the motor base and press **Load Factory Defaults** to use factory defaults.



**Note:** All devices with an ETS-Lindgren motor base incorporate a counter or encoder. The number of counts per meter must be set to ensure accurate movement. Normally this number is factory set and should not be changed.

## Remote Control

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To use the EMControl remote commands, read the [manual 399342 EMCenter](#) for examples and a full command list.

## Maintenance

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**CAUTION:** Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



**WARNING:** Maintenance of the EMCenter is limited to external components such as cables or connectors. If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.



**Note:** If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.

### Fiber Optic Maintenance

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Fiber optic connectors and cables can be damaged from airborne particles, humidity and moisture, oils from the human body, and debris from the connectors they plug into. Always handle connectors and cables with care, using the following guidelines.



**WARNING:** Fiber optic cables and connectors are easily broken if twisted or bent. Make sure the fiber optic cabling does not hang unsupported from where it connects to the EMControl card. Keep the cables as straight as possible from the connector to the protective sheath.



**CAUTION:** Before performing any maintenance, disconnect fiber optic cables from the unit and turn off power.

- When disconnecting fiber optic cables, apply the included dust caps to the ends to maintain their integrity.
- Before connecting fiber optic cables, clean the connector tips and in-line connectors.
- Before attaching in-line connectors, clean them with moisture-free compressed air.
- Failure to perform these tasks may result in damage to the fiber optic connectors or cables.

## Service Procedures

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### Contacting ETS-Lindgren

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**Note:** Please see [www.ets-lindgren.com](http://www.ets-lindgren.com) for a list of ETS-Lindgren offices, including phone and email contact information.

### Replacement and Optional Parts

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**Note:** ETS-Lindgren may substitute a similar part or new part number with the same functionality for another part/part number. Contact ETS-Lindgren for questions about part numbers and ordering parts.

Model Number	Part Description
7006-001	EMControl™ Positioner Controller Plug-In Card

### Sending a Component for Service

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For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

### Calibration Services and Annual Calibration

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See the *Product Information Bulletin* included with your shipment for information on ETS-Lindgren calibration services.

## Specifications

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### Performance Specifications

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Linear Resolution:	0.1 cm
Rotation Resolution:	0.1°
Form Factor:	Occupies one slot of EMCenter
Fiber Optic I/O:	<ul style="list-style-type: none"><li>• Device 1: In (1), Out (1)</li><li>• Device 2: In (1), Out (1)</li><li>• Auxiliary (2)</li></ul>

## Appendix A: Warranty

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**Note:** See the *Product Information Bulletin* included with your shipment for information for the complete ETS-Lindgren warranty.

### Duration of Warranties

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All product warranties, except the warranty of title, and all remedies for warranty failures are limited to three years.

Product Warranted	Duration of Warranty Period
EMControl™ Positioner Controller Plug-in Card	3 Years

## **Appendix B: EC Declaration on Conformity**

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ETS-Lindgren Inc. declares these products to be in conformity with the following standards and provisions:

**Product**     **EMControl Positioner Controller Plug In Card**  
**Models:**

**Directives:** EMC-Directive 2004/108/EC

**Emission:** EN 61326 1:2006, Class B  
Electrical equipment for measurement, control, and laboratory use.

**Immunity:** EN 61326 1:2006, Industrial level, performance criteria A  
Electrical equipment for measurement, control, and laboratory use.

Technical Construction Files are available upon request.