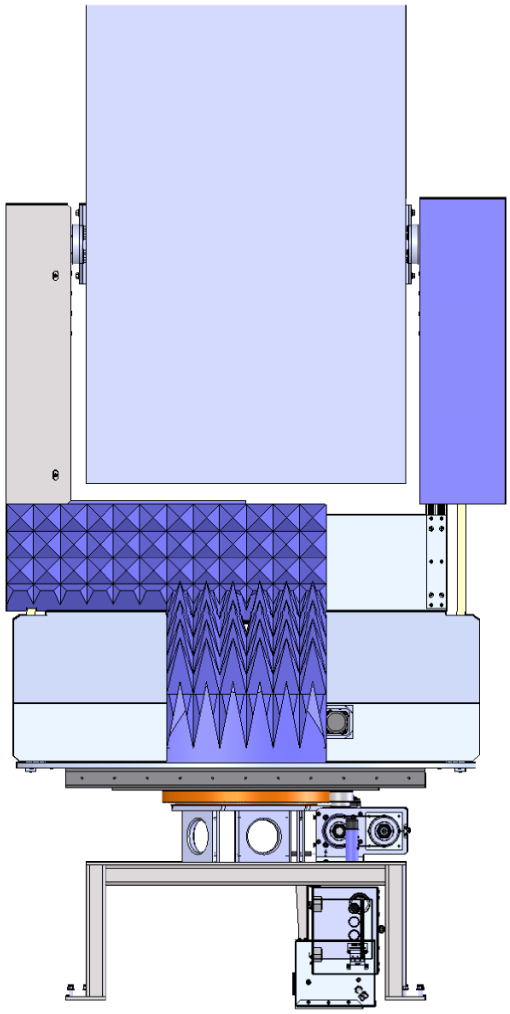
ETS-LINDGREN
An ESCO Technologies Company

2301-003

Positioner



User Manual

PN: 1743597

September, 2021

Rev A

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Revision Record

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NOTES, CAUTIONS AND WARNINGS

	Note: Denotes helpful information intended to provide tips for better use of the product.
CAUTION	**CAUTION:** Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.
WARNING	**WARNING:** Denotes a hazard. Failure to follow instructions could result in **SEVERE** personal injury and/or property damage. Included text gives proper procedures.

*All notes, cautions, and warnings will be located on the left column area of the page.

See the ETS-Lindgren **Product Information Bulletin** for safety, regulatory, and other product marking information

SAFETY INFORMATION

	See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.
	Refer to Manual: When product is marked with this symbol, see the instruction manual for additional information. Manuals are available for download at ets-lindgren.com, or contact ETS-Lindgren Technical Support.
	High Voltage: Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury or death.
	Only qualified personnel should operate (or service) this equipment. The electrical installation of this product should be accomplished by an individual who is authorized to so do by the appropriate local authority. The installation should be in compliance with local electrical safety codes.
	Heavy Object: Unassisted lifting can cause injury. Mechanical assistance is required.
	Never rock or tilt. Rocking or tilting equipment can cause injury and damage equipment.
	Stay clear of moving components during operation of equipment.
	Moving and/or falling equipment can cause serious injury.
	Keep hands clear: Moving parts can crush and cut.
	Pinch Points: Keep hands clear during operation.
	Moving Gears: Do not stick hand in or near machine during operation.
	Do not make any modifications to this unit without consulting the factory directly. **Before servicing:** Contact ETS-Lindgren. Servicing (or modifying) the unit by yourself may void your warranty. If you attempt to service the unit by yourself, disconnect all electrical power before starting. There are voltages at many points in the instrument which could, if contacted, cause personal injury. Only trained service personnel should perform adjustments and/or service procedures upon this instrument. Capacitors inside this instrument may still be charged even when instrument is disconnected from its power source.
	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. Before power is applied to this instrument, ground it properly through the protective conductor of the AC power cable to a power source provided with the protective earth contact. Any interruption of the protective (grounding) conductor, inside or outside the instrument, or disconnection of the protective earth terminal could result in personal injury.

INTRODUCTION

The ETS-Lindgren 2301-003 Positioner is designed to perform automated 3-dimensional pattern measurements. The positioner includes a vertical support column that will accommodate equipment under test (EUT) up to 74.84 kg (165 lb). The maximum moment load is 220 Newton meters.

The positioner is equipped with 200-240 VAC 50/60 Hz, 20 A, 3-phase motors. The servo motor drive, in conjunction with the provided command set, controls the movement of the unit. A 0.5 in conduit fitting is supplied for hookup to the electrical service. A 10 M (32.8 ft) fiber-optic cable is also provided.

Note:
See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

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.

Only qualified personnel should operate (or service) this equipment. If you have any questions concerning maintenance, contact ETS-Lindgren Technical Support. Warranty may be voided if housing is opened.

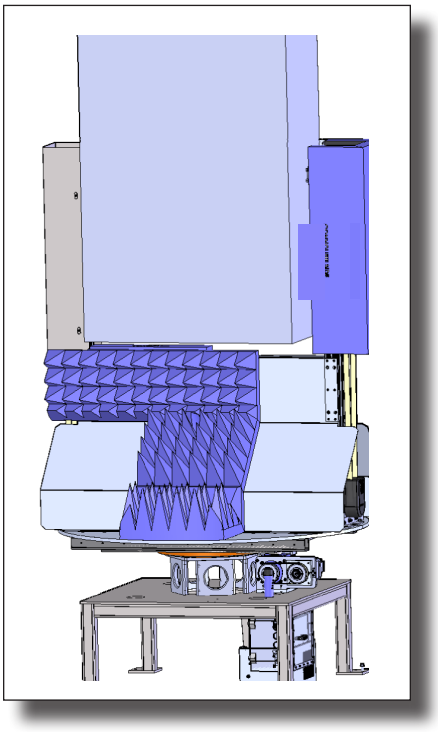
CAUTION

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

Standard Configuration

2301-003 Positioner Assembly

- Model 2301-003 Turntable Assembly
- Three-phase electric drive (200-240 VAC 50/60 Hz, 20 A)
- Servo drive
- Absorber
- 708043 Ethernet to Fiber Converter
- 705347-10 10.0 M (32.8 ft) Fiber-Optic Cable
- 257111 0.9 M (3.0 ft) Ethernet Cable
- 1743597 User Manual available as PDF



2301-003

Note:
See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

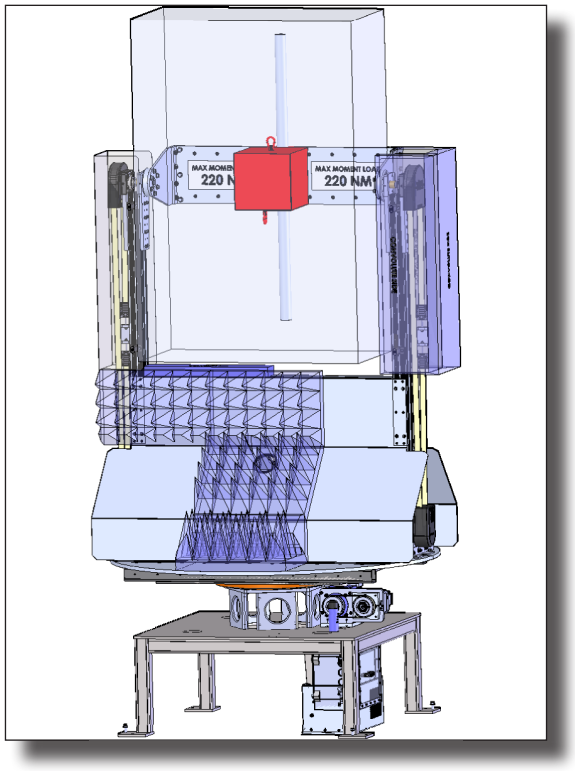
Optional Items

- EMQuest EMQ-100 Antenna Measurement Software (Standard Version)
- EMQuest EMQ-100 Lite Antenna Pattern Measurement Software
- RPI, Remote Positioner Interface

ETS-Lindgren Product Information Bulletin

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



Shown with Absorber Transparent

MAINTENANCE

Routine maintenance should be conducted prior to each use of the turntable. For assistance, contact ETS-Lindgren Technical Support.

WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.

WARNING

High Voltage:
Unsafe practice could result in severe personal injury or death.

CAUTION

Disconnect the power before proceeding with recommended maintenance. Do not perform maintenance while the positioner is operating.

Moving and/or falling equipment can cause serious injury.

Stay clear of all moving components.

Routine Maintenance

- **Check absorber for damage.** Contact ETS-Lindgren to replace any damaged absorber.
- **Check belts for wear.** Replace any damaged belts.
- **Check for excessive rotation.** Attempt to rotate the turntable top by hand. Excessive rotation may indicate a loose drive component.
- **Listen for excessive noise.** Listen for excessive or unusual noise during turntable operation.
- **Check cables for wear.** Ensure they are clear of potential damage from moving parts.
- **Ensure bearing and pinion have adequate lubrication.**

12-Month Service

- **Lubricate gears.** Open gear lubricant (PN 880533) is supplied with unit.
- **Lubricate the main bearing race.** Lubricate the main bearing race with a grease gun containing good quality bearing grease. The grease fittings are located inside the race, 90 degrees apart, beneath the top. Three discharges from the grease gun in each fitting are adequate.

Note:
Contact ETS-Lindgren Technical Support for assistance with replacement parts.

Pinch Points: Keep hands clear during operation.

Moving Gears: Do not stick hand in or near machine during operation.

Keep hands clear:
Moving parts can crush and cut.

CAUTION

Damaged or crimped AC cords: Using damaged or crimped AC cords may damage the equipment and/or cause physical injury.

Never rock or tilt.

Replacement Parts

The following items are the part numbers for ordering replacement parts.

Part Description	Part Number
Replacement Belt	1743046
Replacement Belt	880534

Safety Precautions

- There are no user serviceable parts in this positioner. Contact ETS-LIndgren Technical Support for service. Attempting to open housings, etc. may void warranty. Stay clear of moving equipment.
- Moving and/or falling parts can cause serious injury.
- Removing front panel will expose AC power.
- Do not rock or tilt the equipment.
- Do not put your hands into moving equipment. Parts can crush and cut.
- Disconnect power before performing maintenance.

Service Procedures

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

SPECIFICATIONS

WARNING

Heavy Object:
Unassisted lifting can cause injury. Mechanical assistance is required.

Physical Specifications

Height:	114 in (289.60 cm)
Max Height with Pole:	144 in (365.76 cm)
Max Height with EUT:	150.00 in (381.00 cm)
Turntable Diameter:	68.90 in (175.00 cm)
Overall Weight:	Approximately 2002 lbs (908 kg)
Maximum Load Capacity:	165 lbs (74.84 kg)
Maximum Moment Load:	220 Newton Meters

WARNING

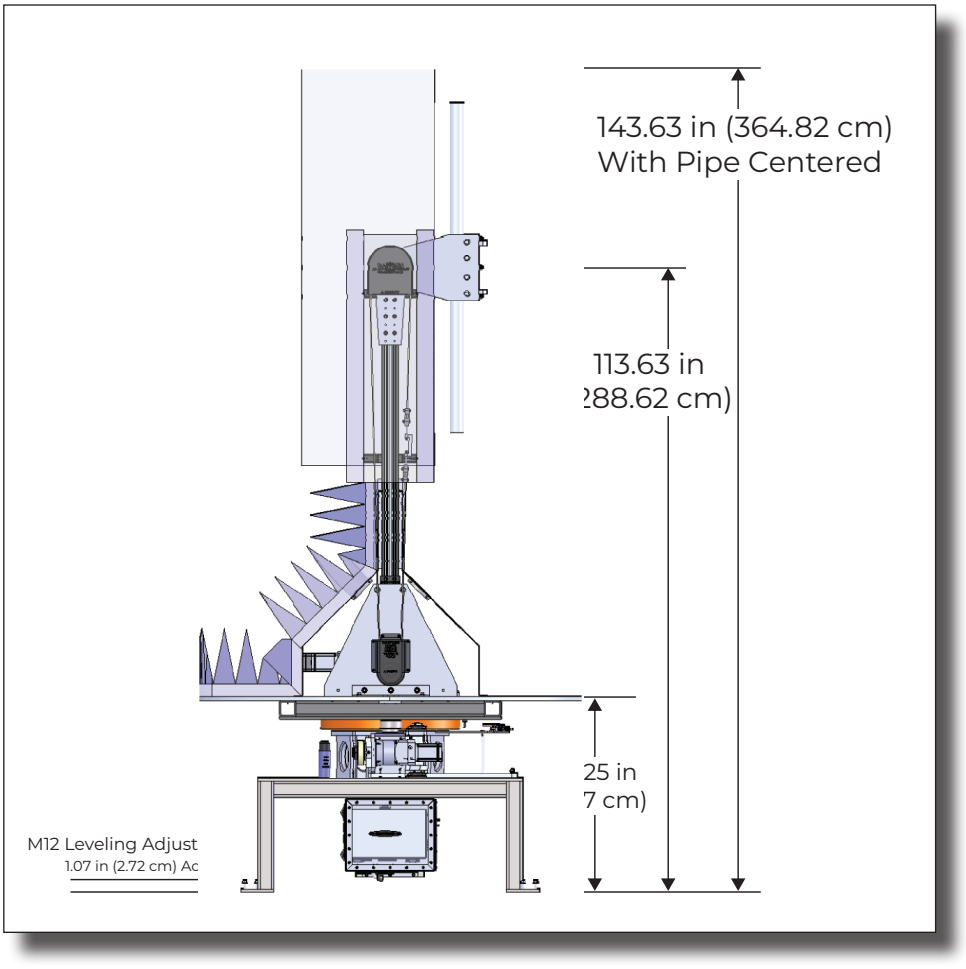
High Voltage:
Unsafe practice could result in severe personal injury or death.

Electrical Specifications

Phase:	3
Voltage:	200-240
Amperage:	20

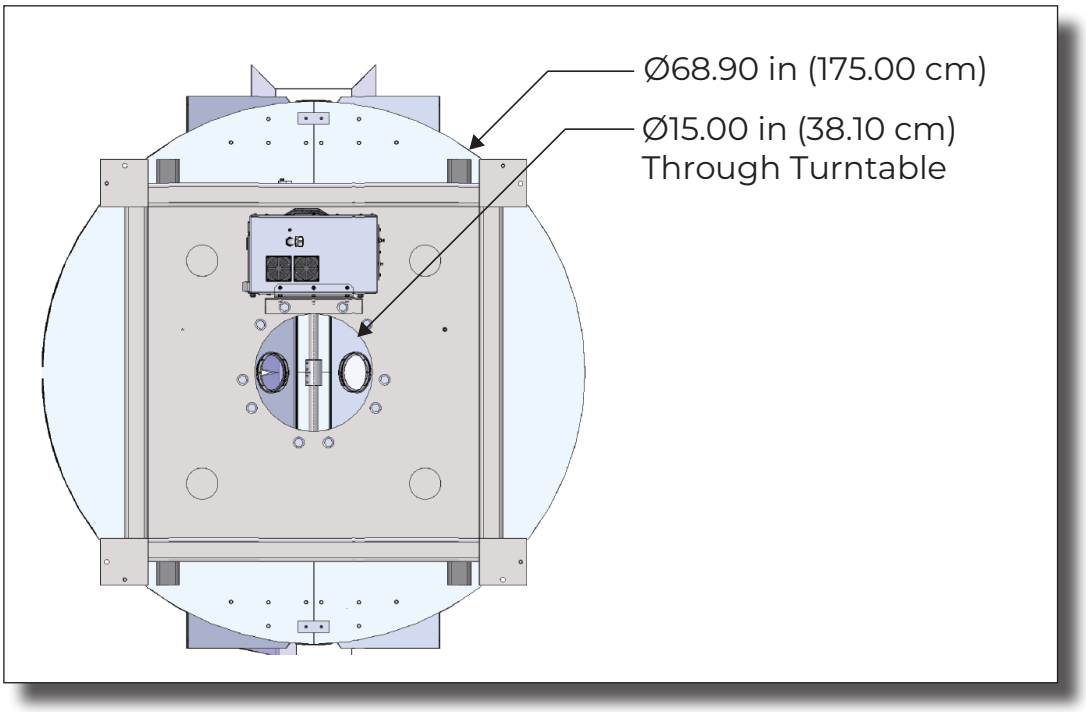
WARNING

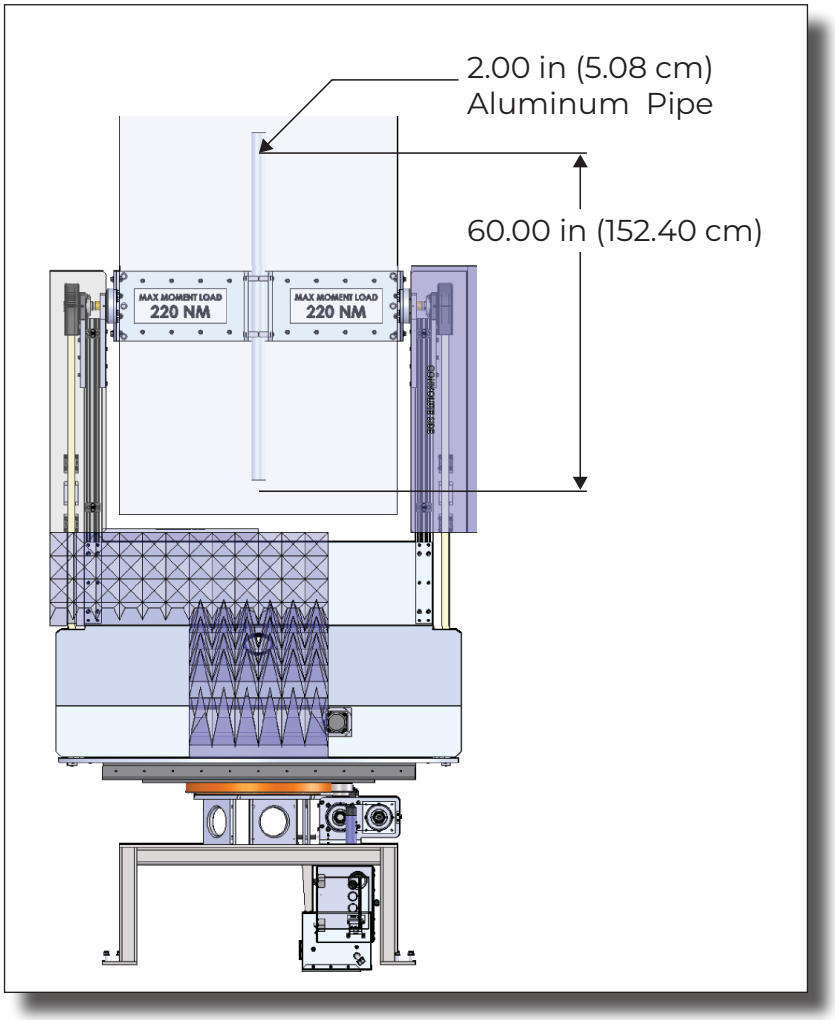
Electrical installation must be performed by a qualified electrician, and in accordance with local and national electrical standards.



WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.





INSTALLATION

The positioner will be assembled by ETS-Lindgren. Following are instructions for preparing the positioner for use.

WARNING

Before assembling, installing, or connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.

WARNING

Heavy Object:
Unassisted lifting can cause injury. Mechanical assistance is required.

WARNING

Moving and/or falling equipment can cause serious injury.

Never rock or tilt.

WARNING

Electrical installation must be performed by a qualified electrician, and in accordance with local and national electrical standards.

Assemble the Positioner

The upper assembly is heavy (200 pounds) and must be lifted by at least two people. At least two people must assist with steps 1-3.

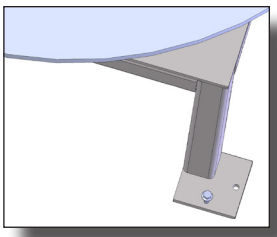
1. While holding the upper assembly in its vertical position, replace the vertical stop bar clamp (PN 1743036) and M12 Hex bolts (PN 1691907).
2. Replace clamps using M12 hex bolts.
3. Torque fasteners to 50 ft/lbs. (There are four fasteners on each side for a total of eight.)
4. Replace all items and hardware removed on both sides of positioner.

Secure the Positioner Base

Anchor holes are located at the legs of the base of the turntable.

Required:

- 0.5 in Anchor Bolts



1. Gather required tools and bolts.
2. Ensure that the positioner is level.
3. Mark off desired area in chamber for positioner.
4. Align base to markings.
5. Use bolts to mount the positioner to the chamber floor through the holes in the base.
6. Vacuum any debris left from drilling.

Attach Absorber

Absorber should be attached to the exterior of the turntable, the vertical columns, and protective shroud.

OPERATION

Firmware is installed in the positioner, and it is controlled by PC.

CAUTION

Read this manual completely before operating. Before and during operation, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

WARNING

Ensure the current travel limit settings will not cause damage to existing cables.

WARNING

Do not operate the 2301-003 Positioner in a stalled condition. Doing so can cause damage to the drive unit and will void the warranty. Ensure the positioner will continue to rotate under load at all speeds.

WARNING

High Voltage:
Unsafe practice could result in severe personal injury or death.

Stay clear of all moving components.

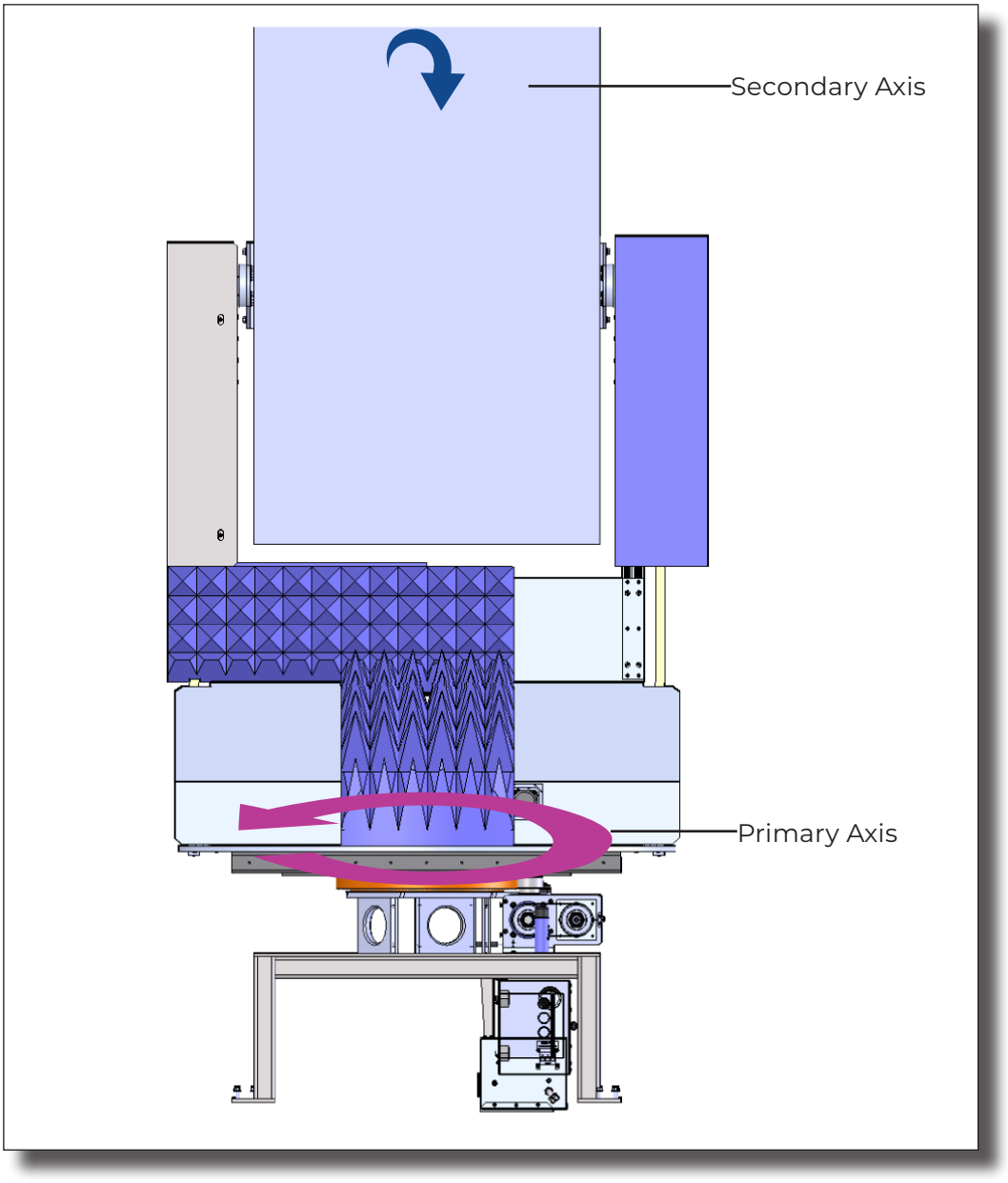
Keep hands clear:
Moving parts can crush and cut.

Pinch Points:
Keep hands clear during operation.

Moving Gears:
Do not stick hand in or near machine during operation.

CAUTION

Damaged or crimped AC cords:
Using damaged or crimped AC cords may damage the equipment and/or cause physical injury.



2301-003 Positioner Command Set

The primary axis (turntable) is limited to ±180°. The secondary axis is limited to ±90°.

2301-003 Positioner Speeds

AXIS1				AXIS2			
Min Speed	0.25 RPM			**Min Speed**	0.25 RPM		
Max Speed	2.5 RPM			**Max Speed**	3.0 RPM		
S	**SS**	**RPM**	**Deg/s**	**S**	**SS**	**RPM**	**Deg/s**
1	0	0.25	1.50	**1**	0	0.25	1.50
2	28	0.50	2.98	**2**	23	0.50	2.99
3	57	0.75	4.52	**3**	46	0.75	4.48
4	85	1.00	6.00	**4**	70	1.00	6.03
5	113	1.25	7.48	**5**	93	1.25	7.52
6	142	1.50	9.02	**6**	116	1.50	9.01
7	198	2.00	11.98	**7**	162	2.00	11.98
8	255	2.50	15.00	**8**	255	2.50	18.00

The following command set is general and includes commands that may not apply to your specific positioner. Speeds listed in this generic list are representative only.

General Command Structure

Most of the following commands use this general structure:

[AXIS<n[-m]>:]COMMAND <argument_n>[,<argument_m>]

Where:

[ ]	Indicates optional.
< >	Indicates required.
COMMAND	The backwards compatible Model 2090 Multi Device Controller command. When used by itself, controls the first device in a multi axis system, and, when arguments are required, supports only a single argument.
The command prefix in optional brackets [ ] **[AXIS<n[-m]>:] COMMAND <argument_ n>[,<argument_m>]**	Required to access a specific axis or multiple axes at a time. Selects the desired axis or axes to control. A single index specifies a single axis (e.g. AXIS1 or AXIS2) with a single argument, while a range (e.g. AXIS1-2) specifies a range of axes with a corresponding range of arguments. Note that some commands only support single axis control.
<argument_n>	The single argument required for a single axis command.
[,<argument_m>]	Represents the additional arguments required for an optional multi-axis command (e.g. AXIS1-2:COMMAND 1,2).

System Commands

Device Identification Query	
Command:	*IDN?
Description:	Identification query. Determines the nature of device located at a given address on the network. The string returned ("ETS-Lindgren Inc.,2303 Precision Positioner,<Module Name>,PCA120518 FW N.NN") identifies this device as a 2303 Precision Positioner. The <Module Name> parameter is a place holder to identify a specific module. The N.NN parameter is a place holder for the firmware version identification.
Query:	*IDN?
Returns:	ETS-Lindgren Inc.,2303 Precision Positioner,<Module Name>,PCA120518 FW n.nn
Example:	*IDN? ETS-Lindgren Inc.,2303 Precision Positioner,Comm,PCA120518 FW 4.14

Module IP Address	
Command:	MOD:IP <nnn.nnn.nnn.nnn>
Description:	The device default IP address and subnet mask is 192.168.0.100, 255.255.255.0. The default address and subnet mask are assigned to the device by ETS-Lindgren and do not change even if your computer reboots. The IP address can be changed using the MOD:IP command. The port number is 1206.
Query:	MOD:IP?
Returns:	nnn.nnn.nnn.nnn
Example:	MOD:IP 192.168.0.55

Module Name	
Command:	MOD:NAME <Module Name>
Description:	The <Module Name> parameter in the *IDN? query response is a place holder to identify a specific device in a network. If you have more than one device you might want to identify them with different module names. For instance, “EMC LAB1” and “EMC CHAMBER”.
Query:	MOD:NAME?
Example:	MOD:NAME EMC LAB1

Module Subnet Mask	
Command:	MOD:NETMASK <nnn.nnn.nnn.nnn>
Description:	The device default IP address and subnet mask is 192.168.0.100, 255.255.255.0. This address and mask are assigned to the device by ETS-Lindgren and does not change even if your computer reboots. The subnet mask can be changed using the MOD:NETMASK command. The new subnet mask will not change even if your computer reboots.
Query:	MOD:NETMASK?
Returns:	nnn.nnn.nnn.nnn
Example:	MOD:NETMASK 255.255.0.0

Control Commands

Acceleration in Milliseconds	
Command:	A <nnnn>
Description:	Acceleration setting for variable speed devices. The number nnnn represents the time in milliseconds for the positioner to reach max speed. For high inertial loads, a longer acceleration time might be required.
Query:	A?
Returns:	The time in milliseconds for the positioner to reach max speed.
Example:	AXIS1:A 1000

Acceleration in Seconds	
Command:	ACC nn.n
Description:	Acceleration setting for variable speed devices. The number N.N represents the time in seconds for the positioner to reach max speed. For high inertial loads, a longer acceleration time might be required.
Query:	ACC?
Returns:	The time in seconds for the positioner to reach max speed.
Example:	AXIS2:ACC .5

Command Complete Query	
Command:	*OPC?
Description:	Informs if a seek or home command have been completed. Please see home command for an example of how to use the *OPC query.
Query:	*OPC?
Returns:	1 if a seek or home command have been completed, 0 otherwise.
Example:	AXIS3:*OPC?

Current Position	
Command:	CP nn.n
Description:	Changes the current position of the device. When editing limits or the current position setting, the software will not allow the current position to be set outside the software limits, nor can the upper or lower limits be adjusted below or above, respectively, the current position or each other.
Example:	AXIS1:CP 90
Query:	CP?
Returns:	Axis current position The value returned is either in XXX.X or XXX.XX format. Negative values are preceded by a "-" minus sign. Linear positioners return current position in centimeters, turntables return it in degrees..
Example:	AXIS1-3:CP? Response 10.5, -90.0, 70.0

Error Query	
Command:	ERR?
Description:	Queries the axis error register. The error register is cleared on read.
Query:	ERR?
Returns:	An error code (See list at the end of command set.)
Example:	AXIS3:ERR?

Homing Procedure	
Command:	HOME
Description:	The device has a mechanical home sensor. Every time the positioner is turned on, a home procedure must be performed so the current position is known by the firmware. To home the positioner, send the following commands: HOME *OPC? Keep querying the positioner by sending the *OPC? until it returns 1. *OPC? Will return 0 if the turntable is still being homed. *OPC? will return 1 if the home procedure is done. After *OPC returns 1, send the query HOME? to confirm that the positioner found the mechanical home sensor. HOME? returns 0 if the home procedure was not successful; result of a faulty sensor.
Query:	HOME?
Returns:	1 if the AXIS1 has been homed, 0 otherwise
Example:	AXIS1:HOME

Lower Limit	
Command:	LL nnn.n
Description:	Sets the lower/counterclockwise limit of the device. The specified value nnn.n must be less than the upper/clockwise limit.
Query:	LL?
Returns:	Lower or counterclockwise limit of the device in degrees.
Example:	AXIS1-2:LL 0,-10

Motion Direction	
Command:	DIR?
Description:	Queries the motion direction for the device.
Query:	DIR?
Returns:	<direction> Value indicating the current motion of the queried device. +1 Device is moving up/clockwise. 0 Device is stopped. -1 Device is moving down/counterclockwise
Example:	AXIS1-2:DIR? Response: 0,+1

Move Clockwise	
Command:	CW
Description:	Instructs the positioner to move in the clockwise direction. In non-continuous mode this movement is limited by the clockwise (upper) limit.
Example:	AXIS1-2:CW

Move Counterclockwise	
Command:	CCW
Description:	Instructs the positioner to move in the counterclockwise direction. This movement is limited by the counterclockwise (lower) limit.
Example:	AXIS2:CCW

Scan	
Command:	SCAN
Description:	Instructs the positioner to begin scanning between preset lower and upper limits.
Example:	AXIS1:SCAN

Seek Negative	
Command:	SKN <nnn.n>
Description:	Instructs the device to begin seeking the specified target value in the negative (down/ counterclockwise) direction only. This command primarily supports continuous rotation mode. It allows forcing seeking a position from a particular direction. Thus, a SKN from 180.0 to 181.0 will rotate counterclockwise to reach the target value. In non-continuous rotation mode if the target is up/clockwise from the current position, no motion occurs. The target must be located between the current upper/clockwise and lower/counterclockwise limits.
Example:	AXIS1:SKN 30

Seek Position	
Command:	SK nnn.n
Description:	Instructs the device to begin seeking for a target position. In continuous rotation mode, the device will seek the target value by the shortest possible path. Thus, a seek from 350.0 to 10.0 will rotate clockwise, not direction.
Example:	AXIS1-2:SK 90,30

Seek Positive	
Command:	SKP <nnn.n>
Description:	Instructs the device to begin seeking the specified target value in the position (up/ clockwise) direction only. This command is provided primarily to support continuous rotation mode. It allows forcing seeking a position from a particular direction. Thus, a SKP from 181.0 to 180.0 will rotate clockwise to reach the target value. In non-continuous rotation mode if the target is down/ counterclockwise from the current position, no motion occurs. The target must be located between the current upper/ clockwise and lower/counterclockwise limits.
Example:	AXIS2:SKP 90

Seek Relative	
Command:	SKR [+|-]nnn.n
Description:	Instructs the device to begin seeking the specified target value relative to the current position. The specified value is added to the current position to obtain the target position. Thus, a positive value will cause up/clockwise motion and a negative value will cause down/counterclockwise motion.
Example:	AXIS1-2:SKR -10,10

Speed	
Command:	Sn Where n is a number between 1 and 8. The factory speed settings configuration is: Setting Deg/s 1 - 0.35 2 - 0.70 3 - 1.05 4 - 1.22 5 - 1.40 6 - 1.56 7 - 1.74 8 - 2.10
Description:	Changes the device speed
Query:	S?
Returns:	A number between 1 and 8
Example:	S3 Set AXIS1 current speed to 1.05 deg/s

Speed Preset	
Command:	SS<n> <speed>
Description:	Assigns a preset speed setting 0-255 to n, where n is a number 1-8. **Warning:** There can be no white space between the command and the register number. However, there must be white space between the register number and the speed value.
<speed>	Value from 0-255 representing the desired speed setting for the specified speed selection. A value of 0 represents the minimum available speed of the device. A value of 255 represents the maximum speed of the device. The actual speed of the device is given approximately by the formula: Actual Speed = (MaxSpeed – MinSpeed) / 255 + MinSpeed For Axis 1, 2, and 3: Min Speed = .18 deg/s Max Speed = 2.45 deg/s
Query:	SS#?
Returns:	Value between 0 (minimum) and 255 (maximum) speed.
Example:	SS2 127 Set speed 2 to half speed SS5 63 Set speed 5 to quarter speed

Stop Motion	
Command:	ST
Description:	Causes device motion to stop.
Example:	AXIS1-2:ST

Trigger Configuration	
Command:	TRIGGER (<ON|OFF>, <step size>,<reference>,<pre trigger delay>, <pulse length>,<post trigger delay>,<polarity>)
Description:	Use this command to configure the trigger. Where step size is the angular distance between trigger pulses in degrees, reference position is one of the positions where a trigger should occur (not necessarily a starting position), pre-trigger delay is the time between reaching the target encoder position and producing a trigger pulse, trigger pulse length is the active period of the trigger pulse, post trigger delay is the minimum inactive period after the trigger pulse before another trigger event can occur, and High/Low sets the polarity of the trigger signal. Time unit is milliseconds.
Query:	TRIGGER?
Returns:	Trigger configuration
Example:	TRIGGER (ON,15.00,0.00,0.10,1.00,0.00,LOW)

Upper Limit	
Command:	UL nnn.n
Description:	Sets the upper/clockwise limit of the device. The specified value nnn.n must be greater than the lower/counterclockwise limit.
Query:	UL?
Returns:	Upper or clockwise limit of the device in degrees.
Example:	AXIS2:UL 90

Error Codes

1 – Controller board Flash memory malfunction

2 – Axis not moving

3 – Motor not stopping

4 – Motor moving on wrong direction

5 – Hardware Limit hit

6 – Polarization limit violation

7 – Lost communication

9 – Encoder failure

10 – Trigger failure

11 – Motor overheat

12 – Relay failure,

13 – Position out of bounds

14 – Trying to move a locked axis

32 – Motor driver fault

100-399 – Command syntax error

400-499 – Home procedure failure

500-599 – Trigger command malformed

1000- – Firmware upgrade failure

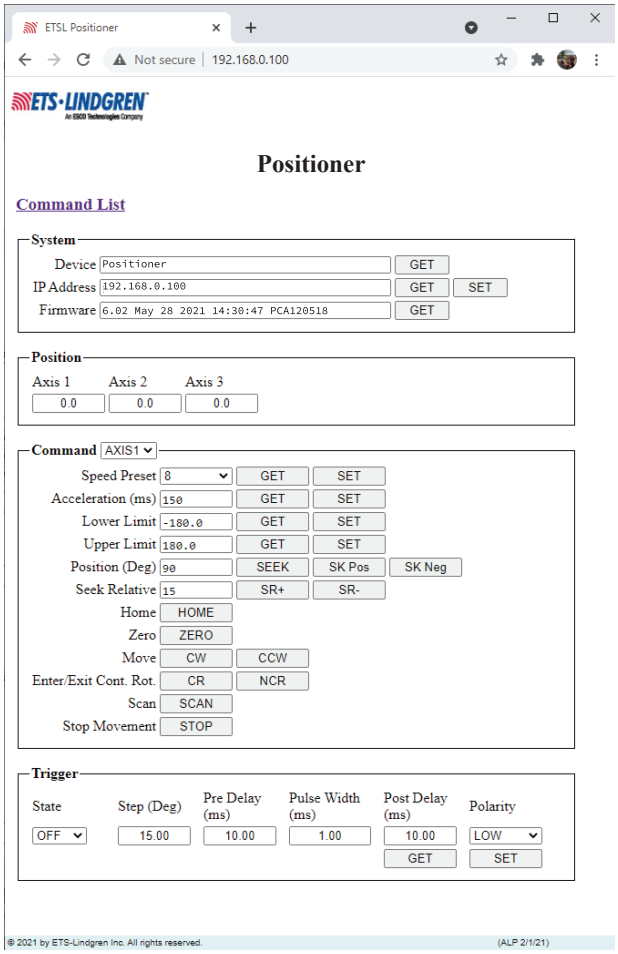
Network Factory Configuration

- IP Address.....: 192.168.0.100
- Net Mask.....: 255.255.255.0
- Gateway.....: 192.168.0.1
- Command Port...: 1206

Changing the Positioner IP Address

In a Local Area Network (LAN), there cannot be more than one device using the same IP address. The IP address of the device will need to be changed if more than one device is in the same (LAN). To change the IP address of an ETS-Lindgren Ethernet device, use its embedded web page.

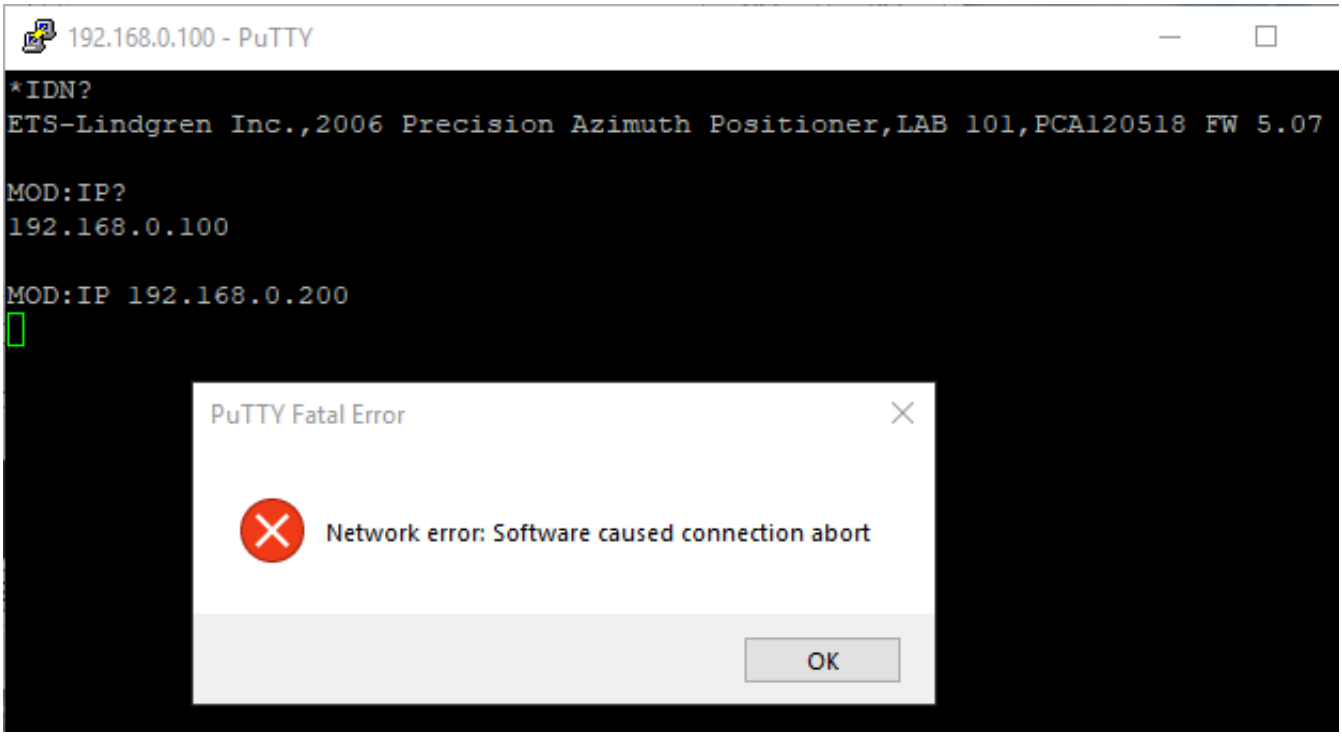
1. Point your browser to 192.168.0.100 or the address you have previously set your device to.
2. Type the new IP address as highlighted below and click 'SET'.



A second method for reseting the IP configuration of the device is to connect to the device using any TCP/IP capable terminal application, and sending commands to it. PuTTY is a terminal emulator available for use. PuTTY is a free (MIT licensed) Windows Telnet and SSH client and can be downloaded from https://www.putty.org/.

Run PuTTY, and point it to Host 192.168.0.100 Port 1206. Then set Connection type to Raw and click Open.

Ensure the connection is working by typing *IDN? then pressing the Enter key on the keyboard. The device will respond with an identification string such as the one shown below.



The IP address can be changed using the **MOD:IP** command. To check the current IP address by typing ***MOD:IP***?

To change the IP address to 192.168.0.200, type ***MOD:IP 192.168.0.200*** and press the Enter key on the keyboard. The device will set the new address and reset the connection.

Reset to Factory Default

To reset configuration, press the reset button for at least 6 seconds. It will reset the IP address back to factory configurations, 192.168.0.100, Mask = 255.255.255.0.

If your positioner does not have a reset button, please follow these instructions to reset the network configuration,

Start with the device powered off for at least 5 seconds

1. Turn the device ON for 5 seconds
2. Turn the device OFF for 5 seconds
3. Turn the device ON for 5 seconds
4. Turn the device OFF for 5 seconds

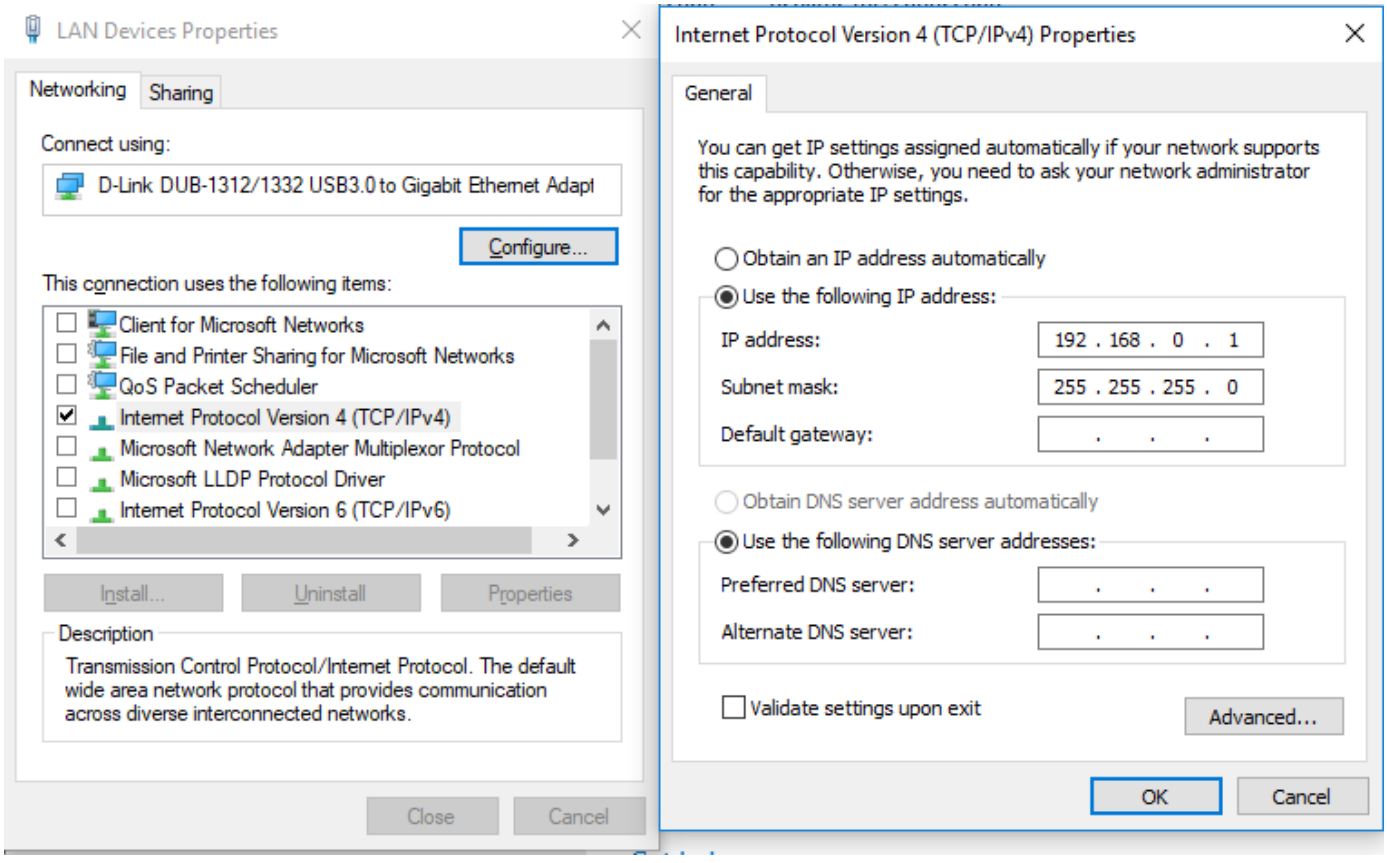
5. Turn the device ON for 5 seconds
6. Turn the device OFF for 5 seconds
7. Turn the device ON for 5 seconds
8. Turn the device OFF for 5 seconds
9. Turn the device ON for 5 seconds
10. Turn the device OFF for 5 seconds

Make sure you wait 5 seconds between power cycles.

This reset procedure only works on devices running on firmware version 5.7 or later

Computer Network Configuration

Connect to an ETS-Lindgren Ethernet by setting the computer Ethernet interface to the selections shown below.

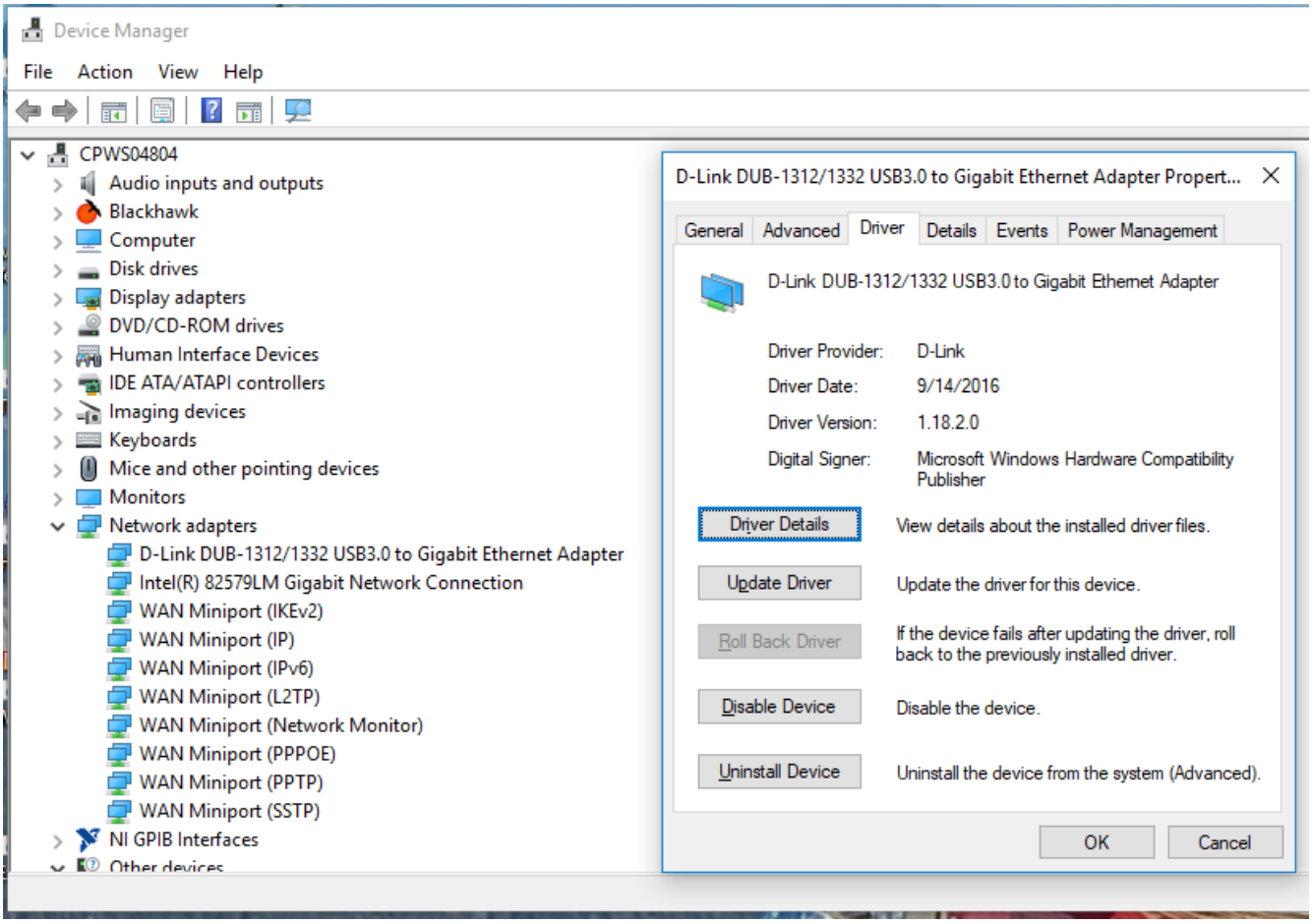


Background Information

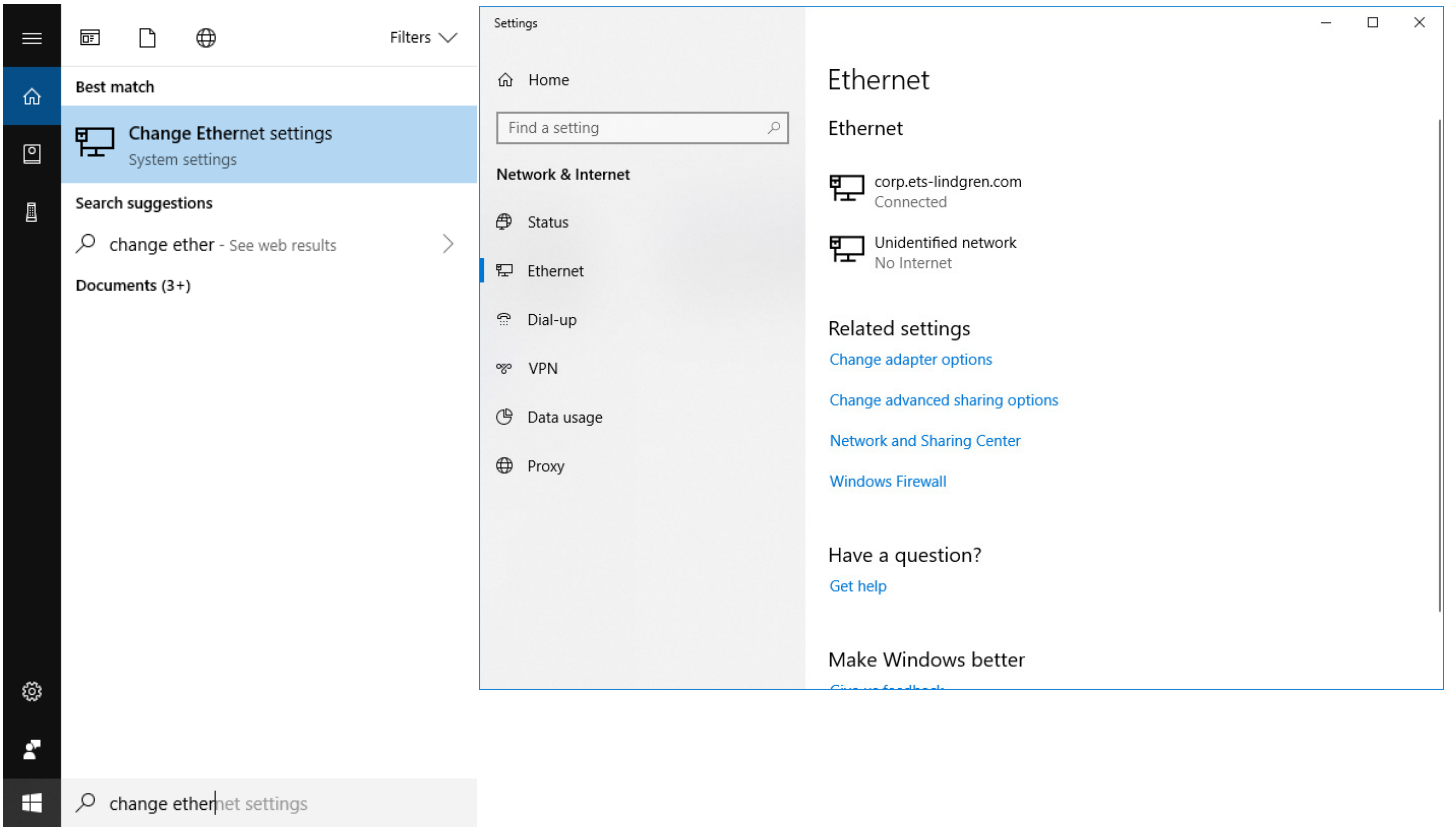
Preparing a computer for connection is relatively simple if you have an Ethernet adapter installed. An Ethernet adapter, also called a network card, network interface card, or network interface controller, provides a physical port for networking mediums such as Ethernet cables. It also communicates with the computer and allows it to access a network device.

Follow these steps on a Windows 10 PC to configure the Ethernet adapter.

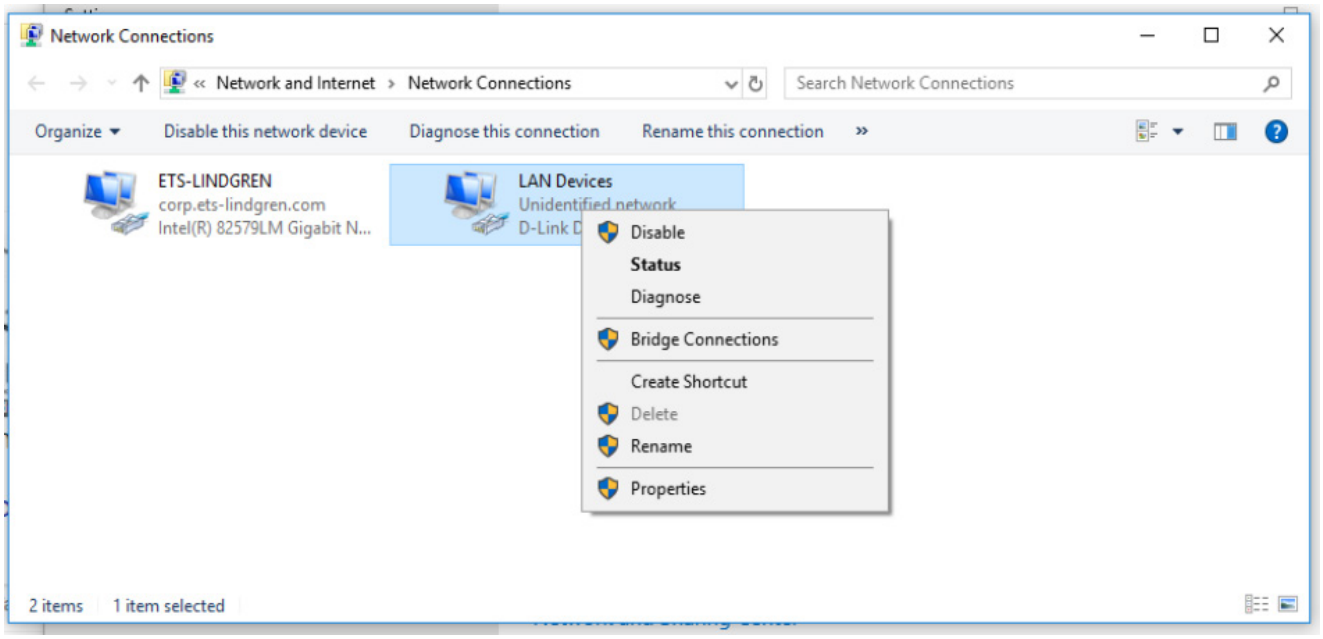
1. Verify that the Ethernet adapter is installed:
    a. Open Device Manager.
    b. Select "Network adapters."
    c. Right-click the network adapter.
    d. Click "Properties." The information in the "Properties" window will indicate whether or not your Ethernet adapter is installed and working.



1. Configure the Ethernet Adapter
    a. In Windows, click into the Start toolbar.
    b. Type “change Ethernet settings.”
    c. In the search results, click “change Ethernet settings.”
    d. In the Settings window, click “Change adapter options.”



e. Right click on the Ethernet adapter you intend to configure, and select “Properties.” (Ensure you are logged into an administrator account to change the configuration.)



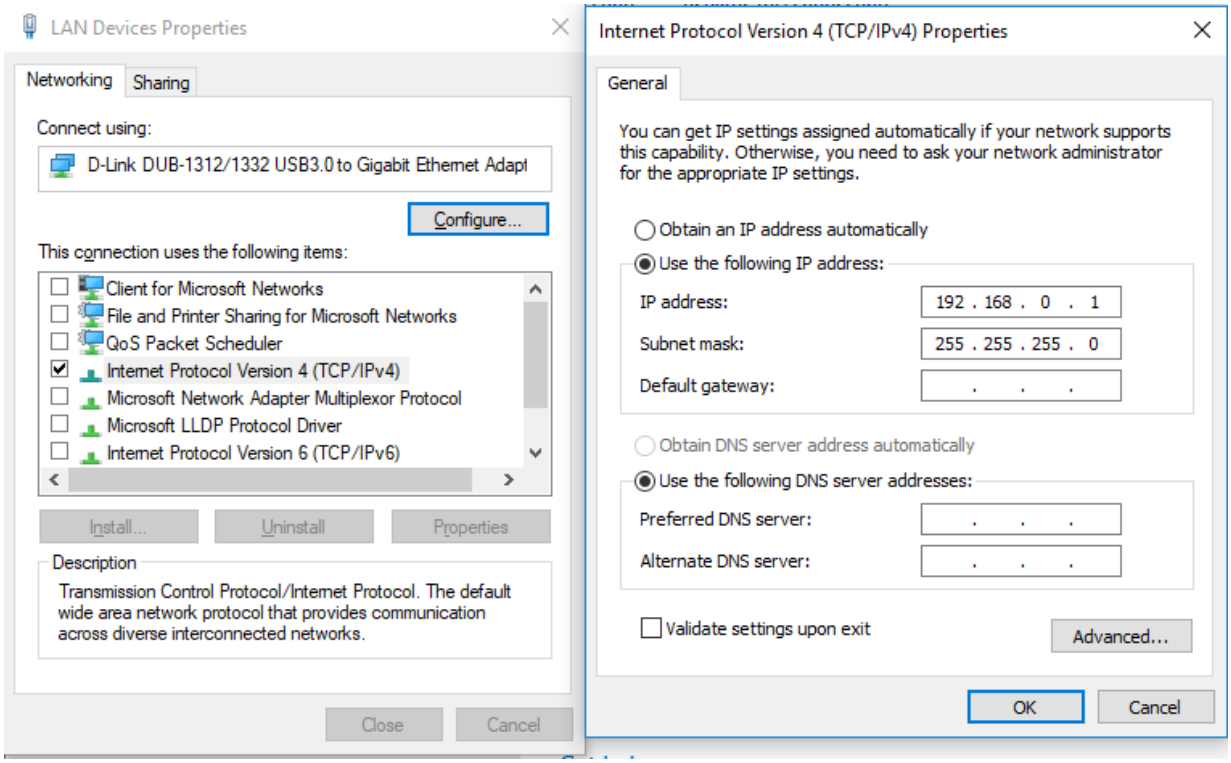
f. Select “Internet Protocol Version 4 (TCP/IPv4)", then click “Properties”. Select “Use the following IP address”, then enter the addresses as follows:
IP address: 192.168.0.1

Subnet mask: 255.255.255.0

Default gateway: blank

g. Select “Use the following DNS server addresses” and leave Preferred and Alternate DNS server fields blank.

h. Click OK.

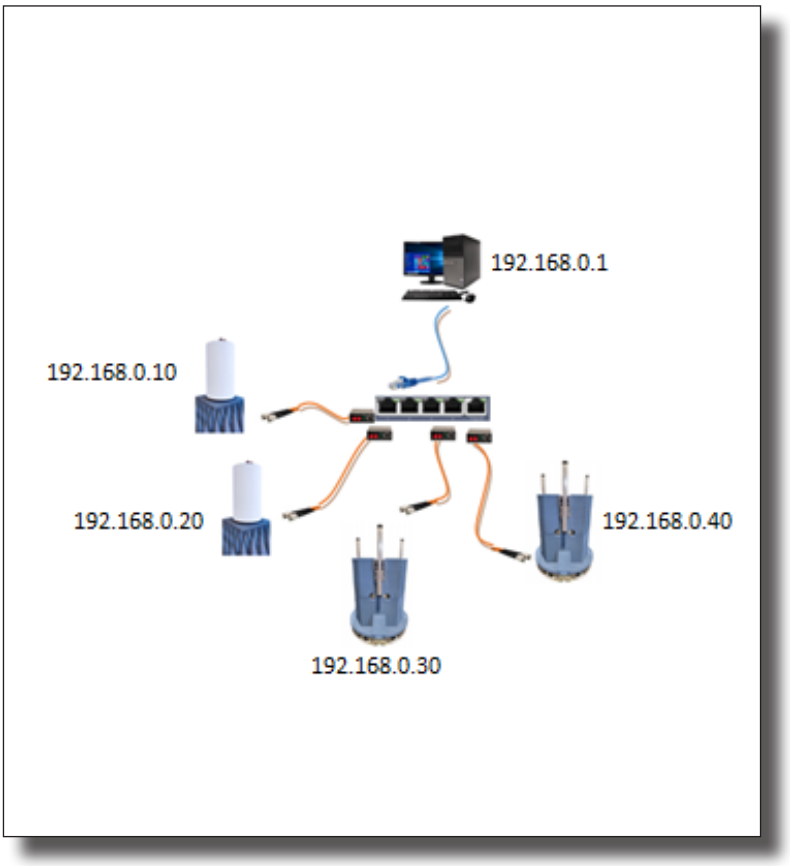


Information about subnet mask can be found online at the following two locations:

https://www.iplocation.net/subnet-mask

https://searchnetworking.techtarget.com/definition/subnet

Multiple Devices in a LAN

When using more than one positioner, there is no need for a separate server for each positioner. An Ethernet switch can be used to connect as many devices as necessary to a single computer. Such a configuration requires each device have a unique IP address. If using more than one positioner in a LAN, change the device's IP address. Point your browser to the device (192.168.0.100) and set a new IP address.

Multiple Device LAN