ETS·LINDGREN®
An ESCO Technologies Company

2006 Precision Azimuth Positioner

User Manual

May 2020

399410 Rev D

ETS-Lindgren Inc. reserves the right to make changes to any products herein to improve functioning or design. Although the information in this document has been carefully reviewed and is believed to be reliable, ETS-Lindgren does not assume any liability arising out of the application or use of any product or circuit described herein; nor does it convey any license under its patent rights nor the rights of others. All trademarks are the property of their respective owners.

Trademarks used in this document: The ETS-Lindgren logo is a registered trademark of ETS-Lindgren, Inc.

Revision Record
MANUAL, 2006 PRECISION AZIMUTH POSITIONER | Part # 399410 Rev D

Revision	Description	Date
A	Initial Release	June, 2017
B	Update to graphic on page 12	June, 2018
C	Correction to command set on page 18	October, 2018
D	Network config, specs, and connection info added	May, 2020

TABLE OF CONTENTS

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.

SAFETY INFORMATION

	**Refer to Manual:** When product is marked with this symbol, see the instruction manual for additional information. If the instruction manual has been misplaced, download it from ETS-Lindgren.com, or contact ETS-Lindgren Customer Service.
	**High Voltage:** Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury or death.
	**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.

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

GENERAL SAFETY CONSIDERATIONS

	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.
 	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.
	Only qualified personnel should operate (or service) this equipment.

INTRODUCTION

ETS-Lindgren's 2006 Precision Azimuth Positioner is designed to perform two-dimensional measurements (or manual three-dimensional measurements) of spherical antenna patterns. The positioner includes a vertical support column that will accommodate equipment under test (EUT) up to 25 kg (55 lb).

The height of the vertical support column is 87.6 cm (34.5 in). Custom column heights are available. Contact ETS-Lindgren to request a custom height. In order to minimize any potential RF obstruction or distortion of RF signals from low directive wireless transmit antennas, the positioner vertical support column is constructed of low dielectric materials.

The positioner is equipped with one motor, 208/220 VAC 50 or 60 Hz single phase. An IEC receptacle is the standard power input. The IEC rocker switch illuminates red when in the ON position. Current draw is fused at 6.3 A maximum. The motor drive, in conjunction with the provided command set, controls the movement of the unit. Optional EMQuest™ EMQ-1xx drivers are available with the purchase of EMQuest software. 10 M (32.8 ft) fiber-optic cable provided.

The 220 VAC motor power inlet is operated by an illuminated switch, and the inlet for the customer's EUT is operated by a non-illuminated switch. Labels on the top surface of the motor base indicate the location of each inlet.

Standard Configuration

- 125460 Model 2006 Turntable Assembly
- 1634890 Expanded Polystyrene Column, 87.6 cm (34.5 in)
- SMA RF Rotary Joint for Continuous Rotation, Rated at 26.5 GHz
- 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
- Slip Ring for EUT power 115/230 VAC, 10 A and for USB 2.0 Data/Control Interface
- 2 Year Warranty
- 399410 User Manual

Optional Items

- EMQuest EMQ-100 Antenna Measurement Software (Standard Version)
- EMQuest EMQ-100 Lite Antenna Pattern Measurement Software
- Additional EUT Columns, Custom Heights
- Custom EUT Mounts on top of the EUT Support Column

ETS-Lindgren Product Information Bulletin

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

- Warranty information
- 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

MAINTENANCE

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

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

Warranty may be void if the housing is opened.

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

Positioner Maintenance Recommendations

Annual Calibration

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

Periodic Maintenance

Check cables for wear. Ensure they are clear of potential damage from moving parts.

Replacement Parts and Optional Parts

Following are the part numbers for ordering replacement parts or optional parts for the 2006 Precision Azimuth Positioner.

Replacement Parts and Optional Parts	
Part Description	**Part Number**
Fiber-Optic Cable	705347-10
Rotary Joint	890817
Support Column, 87.6 cm (34.5 in) (Contact ETS-Lindgren to request a custom height.)	1634890
Tabletop Absorber	126260
Housing Absorber	126259
Adapter, Speag Head, 2006 Column	126229
Leveling Feet	1635141
Emergency+tr Stop Switch Assembly (IEC inlet and IEC outlet power connections)	1719562
User Manual	399410

Service Procedures

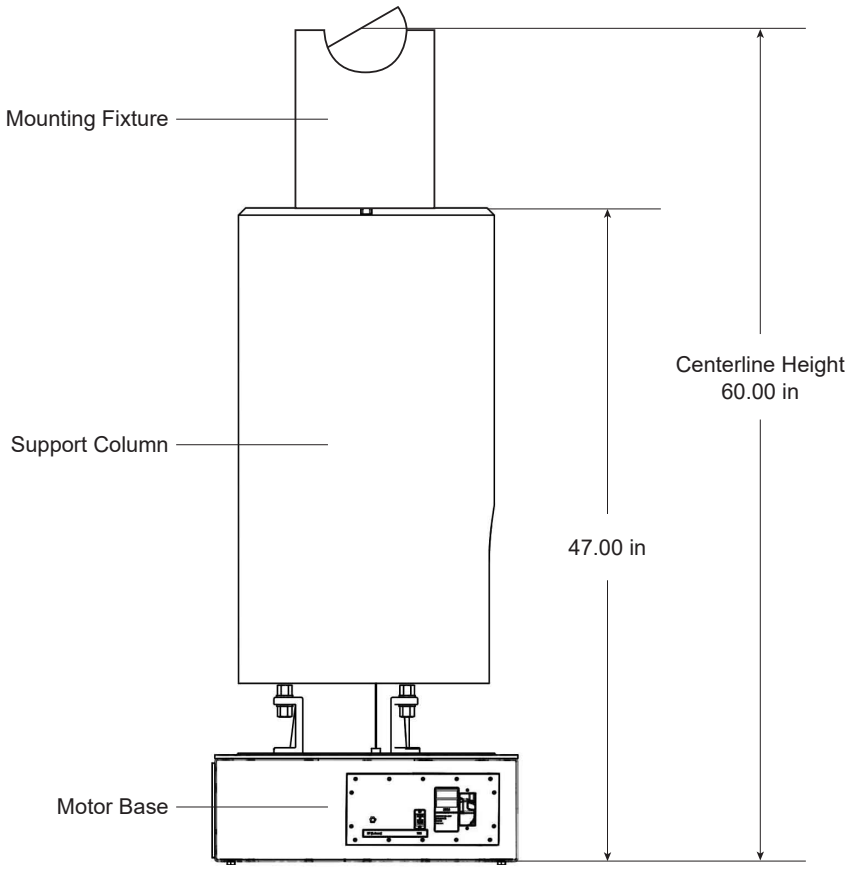
For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

Safety Precautions

- Removing top panel will expose AC power
- Do not use damaged or crimped AC power cords

SPECIFICATIONS

Physical Specifications



Mounting fixture not included in standard configuration. Contact ETS-Lindgren to request custom mount.

Base Height without Absorber:	21.0 cm (8.27 in)
Base Height with Absorber:	26.4 cm (10.39 in)
Support Column Height (P/N 126228):	87.6 cm (34.5 in) Custom heights available upon request.
Nominal Load Capacity:	25.0 kg (55.0 lb)
Nominal Overall Height:	121.9 cm (48.0 in)

Electrical Specifications

Phase:	Single
Voltage:	208/230 VAC, 50/60 Hz
Amperage:	6 A

PRE-INSTALLATION TASKS

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

CAUTION Ensure power is off and base is secured before proceeding with installation.

Pre-planning is essential for successful installation. Discuss requirements with your sales representative and request dimensional drawings prior to construction of your site.

Required Tools

- Flat-head screws for floor flange (not included)
- #2 Phillips screwdriver

ASSEMBLY AND INSTALLATION

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

Positioner Installation

Proper installation of the 2006 Precision Azimuth Positioner unit directly affects performance of the positioning system as well as the accuracy of the test results.

1. Uncrate all parts. Check all parts for any shipping damage. Ensure a clear area is available to assemble the positioner unit safely.

Do not discard packing material until the Turntable is fully assembled and correct operation is verified.

The 2006 Precision Azimuth Positioner consists of:

- Variable speed turntable
- Lossy foam absorber to cover the top of the turntable and enclosure
- Vertical column

Customer provides RF and USB cabling to the top of the unit and to the EUT.

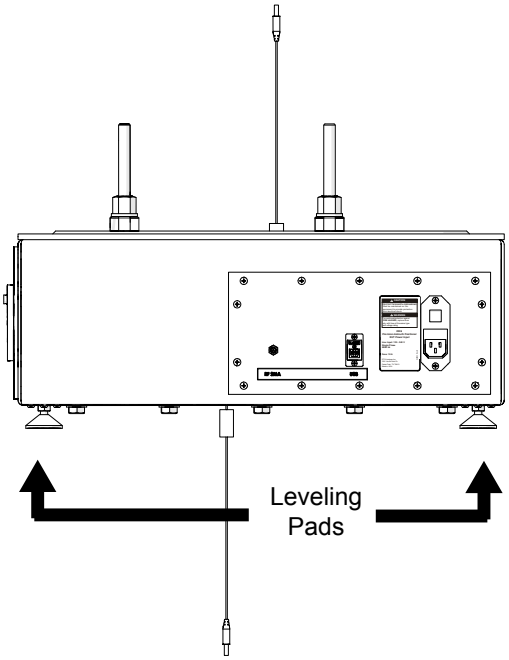
2. The center of rotation for the unit must intersect the line through the bore sight of the measurement antenna. It is recommended that a 5-beam laser level be utilized to verify the alignment and location.

3. Place the unit so the positioner connections are easily accessible and located closest to available feed through panels and power supply connections. Ensure the Model 2006 is connected to a power outlet that supplies 208-230VAC 50/60Hz. Use the power cord provided with the Model 2006 to make this connection to the system.

US shipments will include a NEMA type 6-15P electrical plug power cord.
International shipments will include a Schuko type electrical plug power cord.

The IEC power inlet assembly includes a filter and an illuminated power switch.

4. Connect the positioner to the included Ethernet-to-fiber optic converter using the included dual fiber optic cable with type ST connections. The converter connects to the host computer via the included 0.9 m (3.0 ft) Cat5 Ethernet cable. Ensure the fiber converter TX line is connected to the positioner RX input connector, and the fiber converter RX line is connected to the positioner TX output connector.



5. The Model 2006 Azimuth Positioner is configured with multiple EUT connections fitted with rotary joints to allow continuous rotation of the EUT. The maximum AC power for the slip ring is 250 VAC 10 A. Power is supplied to the system via an IEC power connection on the side of the 2006 unit. The IEC power connection includes a power filter and a non-illuminated power switch.

CAUTION

Ensure all connections have been made correctly, and that the power connection for the motor drive has not been confused with the power connection for the EUT. The 220 VAC motor power inlet is operated by an illuminated switch, and the inlet for the customer's EUT is operated by a non-illuminated switch. Labels on the top surface of the motor base indicate the location of each inlet.

A USB 2.0 connection is provided for the EUT through the rotary joint as well. A 2.4 mm coaxial rotary joint is mounted at the center of the rotation axis. The rotary joint is rated to 26 GHz, and its connection can also be found on the side of the 2006 unit.

6. Once the unit is correctly positioned, the table must be leveled. Using a leveling instrument (torpedo laser level or other leveling device) level the unit by turning the level mount pads on the bottom of the motor base. When the unit is level, tighten all lock nuts on the leveling pads to lock the height of the unit into place.
7. Place the center circular absorber piece over the support pegs.
8. Place the remaining two absorber pieces on the outer portion of the motor base.
9. Install the vertical support column onto the motor drive mount by placing it over the column supports on top of the motor base.
10. Using gauge 126183, rotate the unit under power and indicate the gauge until it runs true. This can be adjusted using the lock-nuts and column supports which are threaded. These are locate at the base of the column.
11. Floor absorber (ordered separately) may be placed around the motor base to prevent RF interference from the positioner itself.

Electrical Installation

CAUTION Electrical connection should only be performed by a qualified electrician and subject to location electrical codes.

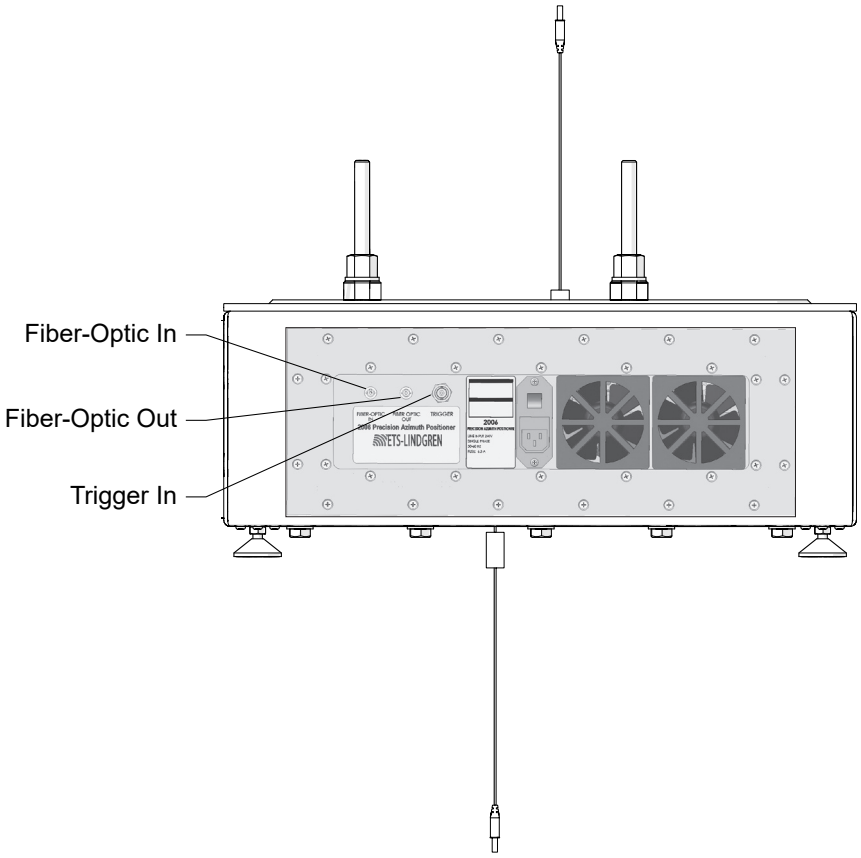
The Model 2006 Precision Azimuth Positioner is designed to operate using 208/230VAC single phase 50 or 60 Hz AC power. The motor drive will not operate on a lower voltage, such as 110VAC. The power inlet assembly has an integral 10 A fuse, however the branch circuit supplying power to the motor drive must be protected from excess current according to local electrical codes. Normal current draw for the drive is less than 6 A.

Ensure the distance from the mains power source is appropriate for the wire gauge used and that the wire gauge is adequate for the motor load.

CAUTION Using undersized wire gauge will result in a higher than expected voltage drop in the power conductors, reduced starting torque, and potentially premature motor failure.

CAUTION Prior to servicing the turntable, remove the power connection.

Input / Output connections



Trigger

The positioner is equipped with a TTL-compatible output. This output is capable of driving a 50 ohm load that can be used to trigger a measurement sweep on a network analyzer (or other measurement device equipped with a TTL-compatible external trigger input option). The trigger BNC connector is located on the same side of the unit as the 220 VAC motor power inlet.

Fiber Optic

The positioner is equipped with a fiber-optic inlet and a fiber-optic outlet. The fiber-optic connectors are located on the same side of the unit as the 220 VAC motor power inlet. Connect the positioner to the included Ethernet-to-fiber optic converter using the included dual fiber optic cable with type ST connections. The converter connects to the host computer via the included 0.9 m (3.0 ft) Cat5 Ethernet cable. Ensure the fiber converter TX line is connected to the positioner RX input connector, and the fiber converter RX line is connected to the positioner TX output connector.

OPERATION

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

2006 Precision Azimuth Positioner Command Set

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.,2006 Precision Azimuth Positioner,<Module Name>,PCA120518 FW N.NN") identifies this device as a 2006 Precision Azimuth 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.,2006 Precision Azimuth Positioner,<Module Name>,PCA120518 FW n.nn
Example:	*IDN? ETS-Lindgren Inc.,2006 Precision Azimuth 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 new address will not change even if your computer reboots. 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:	This is the 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:	A 3000

Acceleration in Seconds	
Command:	ACC nn.n
Description:	This is the 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:	ACC 3.0

Continuous Rotation Mode	
Command:	CR
Description:	Set the positioner in continuous rotation mode. In the continuous mode of operation the positioner is allowed infinite movement. The turntable travels from 0 – 359.9 and the limits are ignored. Also, 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 counterclockwise.
Query:	CR?
Returns:	1 when in continuous rotation mode, 0 otherwise
Example:	CR

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; the reason could be a faulty sensor.
Query:	HOME?
Returns:	1 if the positioner has been homed, 0 otherwise

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:	LL 0.0

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

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:	CW

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

Move Counterclockwise	
Example:	CCW

Non-Continuous Rotation Mode	
Command:	NCR
Description:	Set the positioner in non-continuous rotation mode. In the non-continuous mode the positioner motion is restricted between the upper and lower limits. A seek from 350.0 to 10.0 will rotate Counterclockwise.
Example:	NCR

Scan	
Command:	SCAN
Description:	Instructs the positioner to begin scanning between preset lower and upper limits.
Example:	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 is provided primarily to support 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:	SKP 180.0

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. If the target is not located between the current upper/clockwise and lower/counterclockwise limits, motion will continue in the target direction until a limit is hit.
Example:	SK 60.0

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:	SKP 180.0

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:	SKR -10.5

Speed	
Command:	Sn Where n is a number between 1 and 8. The factory speed settings configuration is: S RPM 1 .25 2 .5 3 1.0 4 4.0 5 8.0 6 12.0 7 18.0 8 25.0
Description:	Changes the device speed
Query:	S?
Returns:	A number between 1 and 8
Example:	S3 Set current speed to 1 RPM

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 = <speed> (MaxSpeed – MinSpeed) / 255 + MinSpeed The minimum speed for this device is 0.25 RPM. The maximum speed is 25 RPM.
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.

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:	UL 359.9

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)

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

WARNING Do not operate the 2006 Precision Azimuth 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.

NETWORK CONFIGURATION

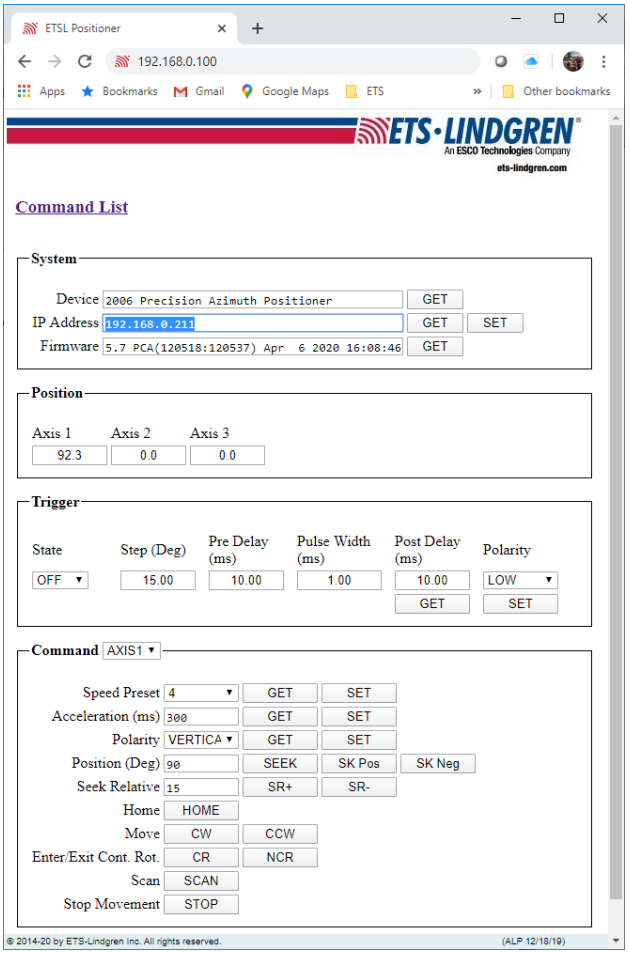
Network Factory Configuration

- 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.

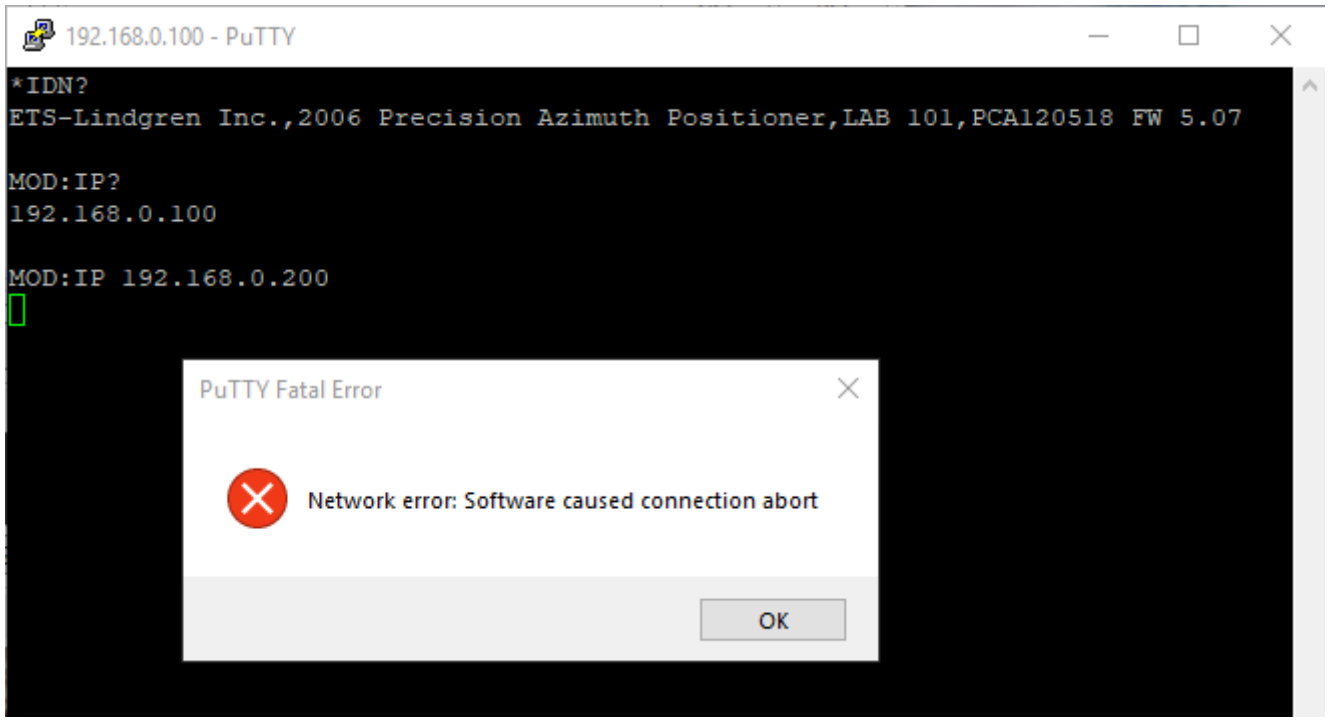
1. Point your browser to 192.168.0.100 or the address you have previously set your device to.
2. Type the new IP address as highlighted below and click ‘SET’.



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

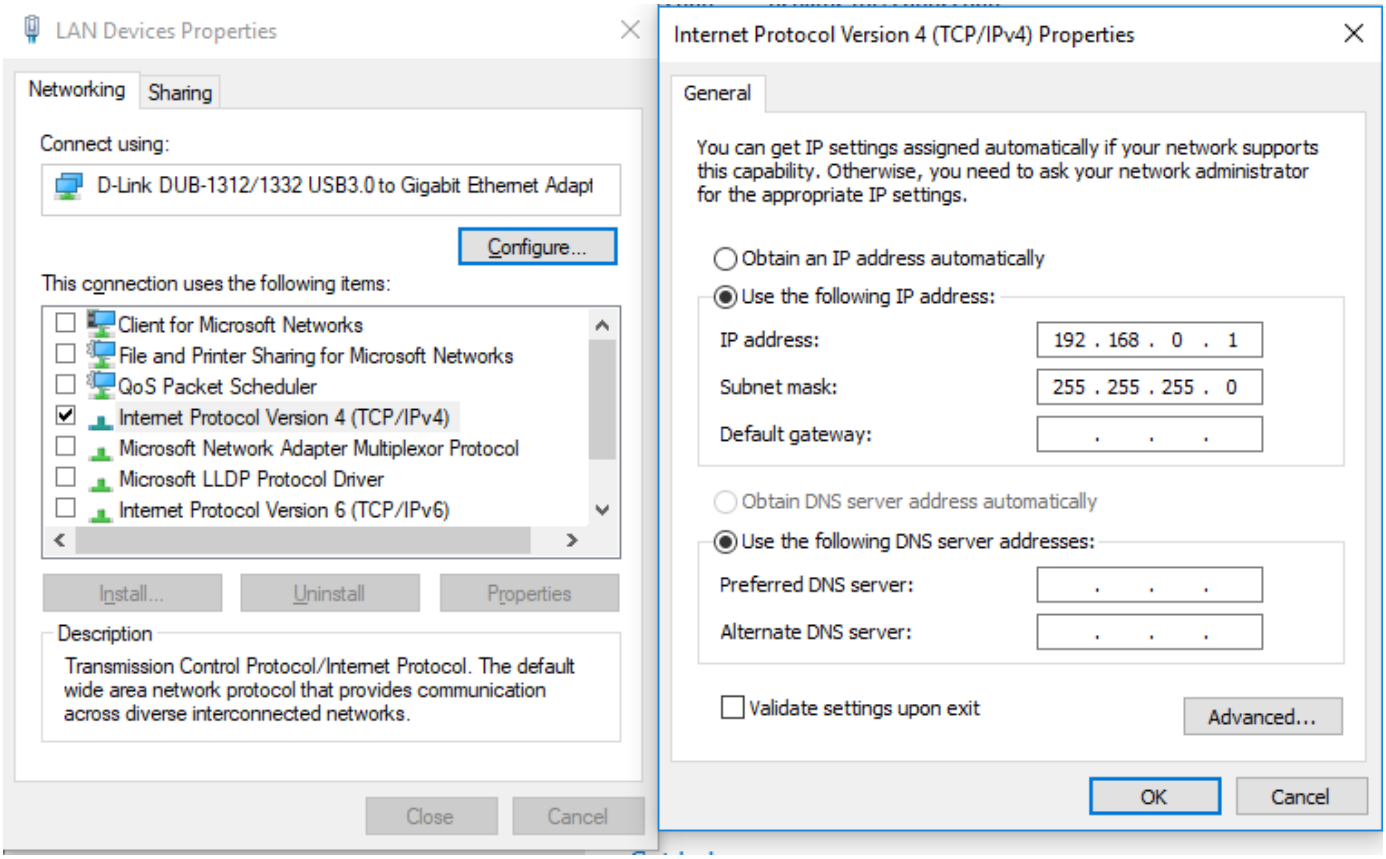
This reset procedure only works on devices running on firmware version 5.7 or later. To reset the device network configuration, complete the following steps:

1. Start with the device powered off for at least 5 seconds
2. Turn the device ON for 5 seconds
3. Turn the device OFF for 5 seconds
4. Turn the device ON for 5 seconds
5. Turn the device OFF for 5 seconds
6. Turn the device ON for 5 seconds
7. Turn the device OFF for 5 seconds
8. Turn the device ON for 5 seconds
9. Turn the device OFF for 5 seconds
10. Turn the device ON for 5 seconds
11. Turn the device OFF for 5 seconds

Use a watch or timer to ensure each step is completed for a full 5 seconds.

Computer Network Configuration

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

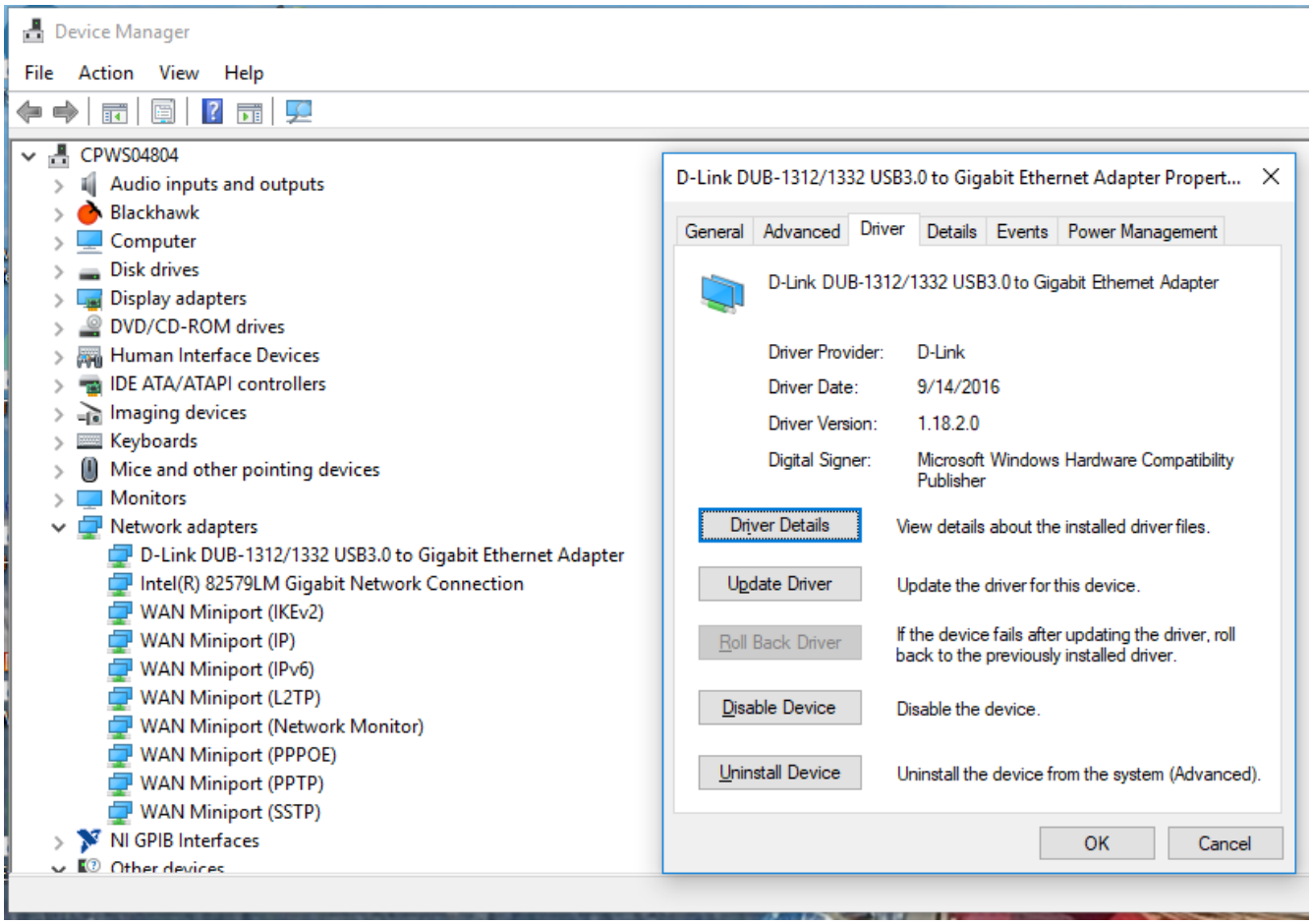


Background Information

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.

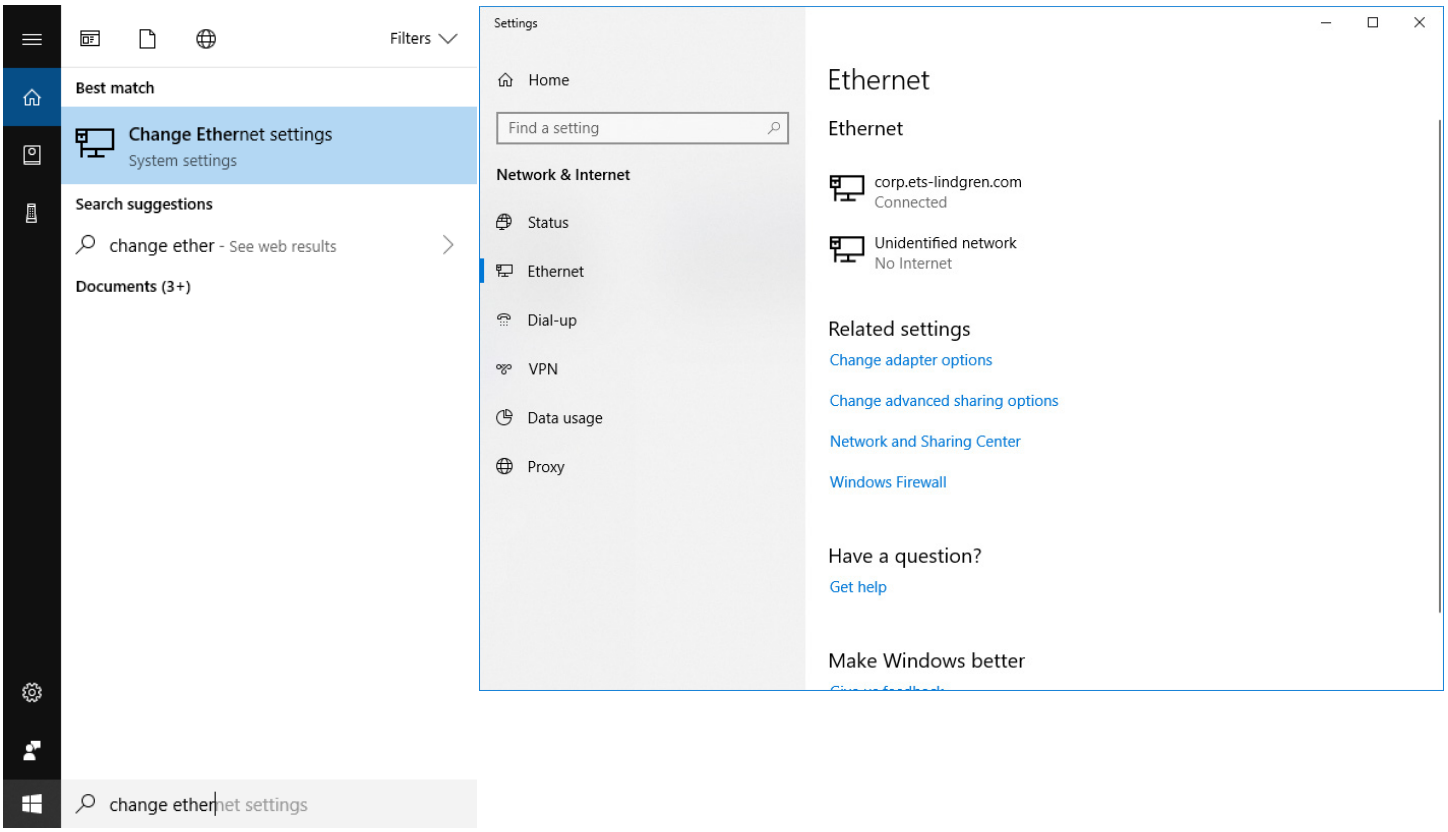
1. Ensure that the Ethernet adapter is installed

To verify the Ethernet adapter driver is already installed, Open Device Manager and select Network adapters. Right-click the network adapter, then click Properties. The information in the Properties window will indicate whether or not your Ethernet adapter is installed and working.

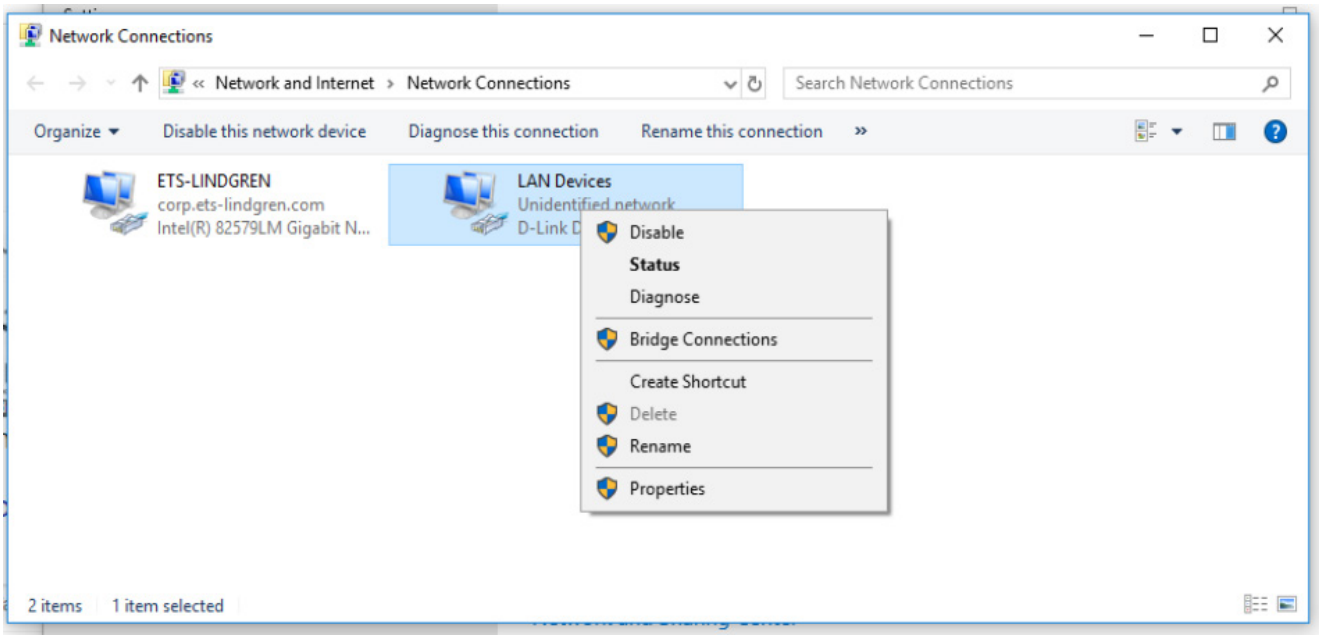


2. Configure the Ethernet Adapter

In Windows, click in the Start toolbar, then type in “change Ethernet settings.” In the search results, click “change Ethernet settings.” In the Settings window, click “Change adapter options.”



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.



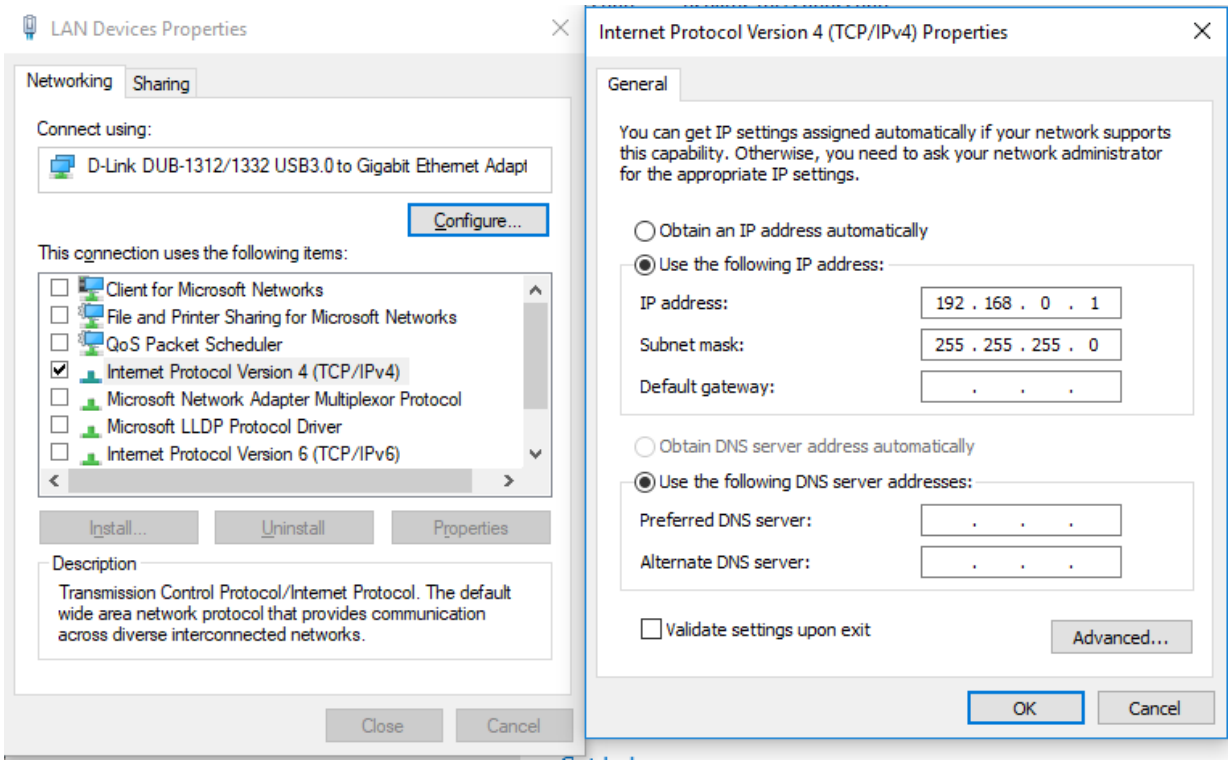
Select “Internet Protocol Version 4 (TCP/IPv4)", then click “Properties”. Select “Use the following IP address”, then enter the addresses as follows:

IP address: 192.168.0.1

Subnet mask: 255.255.255.0

Default gateway: blank

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

APPENDIX A: WARRANTY

See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your 2006 Precision Azimuth Positioner.

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to the duration specified in the table.