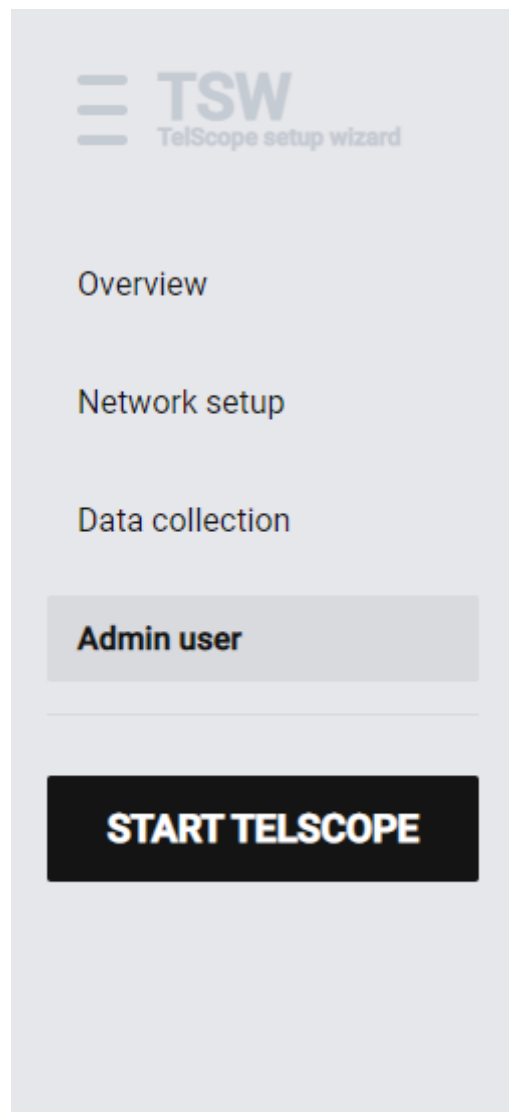


# TELSCOPE<sup>®</sup>

BY FURUNO

## Installation Manual



**Version 1.0** – 2022.11.11

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## Introduction

The goal of the onboard installation is to prepare the connections to the networks(s) on board, the data sensors, and the dual computer. The installation of the server must take place on the vessel and not in an office.

The server installation takes place in the config tool, so a display, keyboard, mouse, and a LAN cable for internet connection must be connected to the computer.

When this process is complete, the TELCSOPE software is ready to be started.

## Registration form

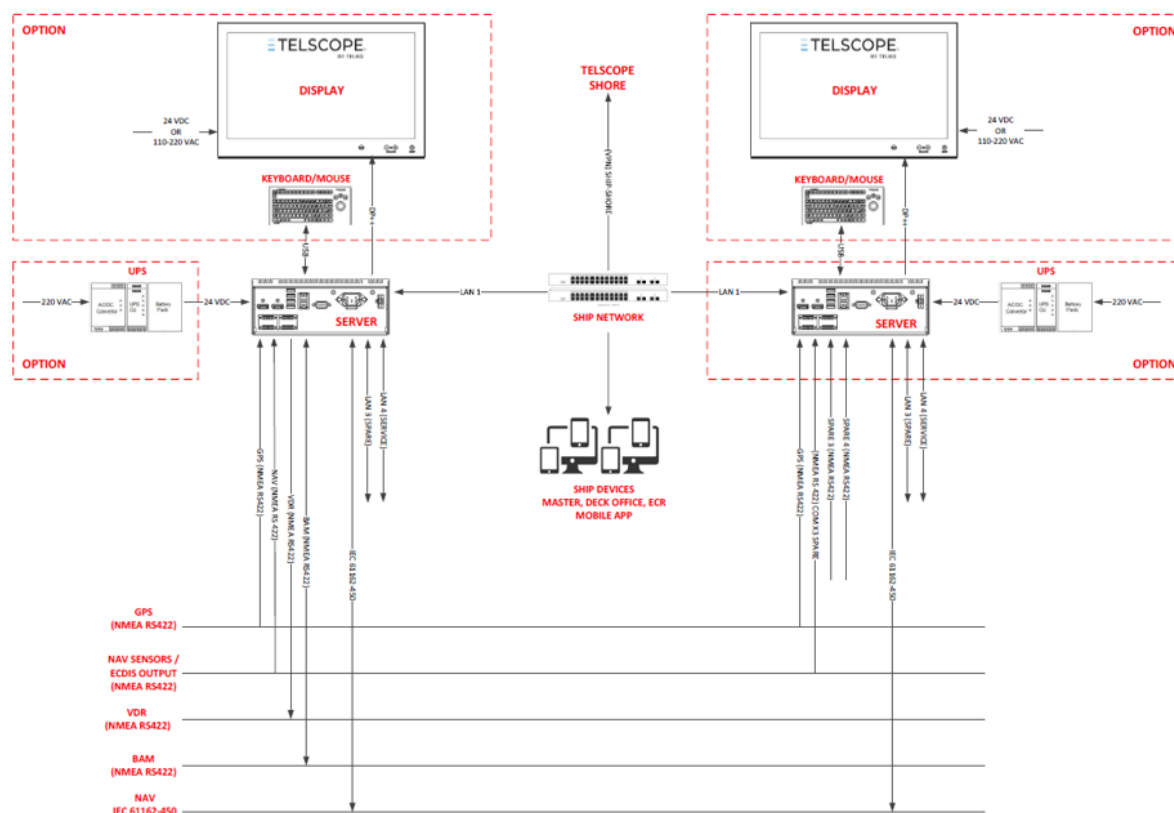
First of all, a registration form has to be filled out for the server to be ready to be installed. This is done either by the seller or the shipping company from this link: <https://telko.liveagent.se/789355-TELSCOPE-Registration-Form>

If the shipping company uses a static IP, this form is needed for the setup on the Telescope server.

## Installation Overview

The following illustration

TelScope. As a minimum, TelScope shall be connected to an IMO approved INS system or GNSS receiver (for example GPS) for position and time.



Monitor unit

The monitor unit can be flush mounted in a console panel or mounted on desktop using optional accessories. When selecting a mounting location, keep in mind the following points:

1. Select a location where the display unit can be viewed conveniently.
2. Select a location where vibrations are down to a minimum, try to avoid vibrations by adding strength to console where monitor is about to be installed.
3. Locate the unit out of direct sunlight and away from heat sources because of heat that can build up inside the cabinet.
4. Locate the equipment away from places subject to water splash and rain.
5. Leave sufficient space on the sides and rear of the unit to facilitate maintenance.
6. A magnetic compass will be affected if the monitor unit is placed too close to the magnetic compass. Observe the compass safe distances to prevent deviation of a magnetic compass.
7. An optional monitor bracket can be supplied for tabletop installations.

## Processor unit

The processor unit can be mounted inside a console or other suitable space. When selecting a mounting location, keep in mind the following points:

1. Select a location where vibrations are down to a minimum, try to avoid vibrations by adding strength to console where the processor is about to be installed.
2. Locate the unit away from heat sources because of heat that can build up inside the cabinet.
3. Locate the equipment away from places subject to water splash and rain.
4. Leave sufficient space on the sides and rear of the unit to facilitate maintenance and interconnection cabling.
5. A magnetic compass will be affected if the processor unit is placed too close to the magnetic compass. Observe the compass safe distances to prevent deviation of a magnetic compass.

Do not protrude the housing with screws to fasten the processor. Straps should be used to fasten the processor at its location, without protruding the housing. Straps are not supplied and must be arranged locally. Check that front of processor can easily be accessed and that cables can be easily arranged in the back of the processor.

The processor is suitable for 19" rack-mounting with optional rack mounting kit. Height is 3U. Two units can be mounted side by side in the rack with optional rack mounting kit.

## Keyboard and trackball

Keyboard and trackball must be mounted close together, such that both can be operated simultaneously by one person. When selecting a mounting location, keep in mind the following points:

1. Select a location where the control units can be operated conveniently.
2. Locate the units away from heat sources because of heat that can build up inside the cabinet.
3. Locate the equipment away from places subject to water splash and rain.
4. Determine the mounting location considering the length of the signal cable between the keyboard unit and the processor unit.

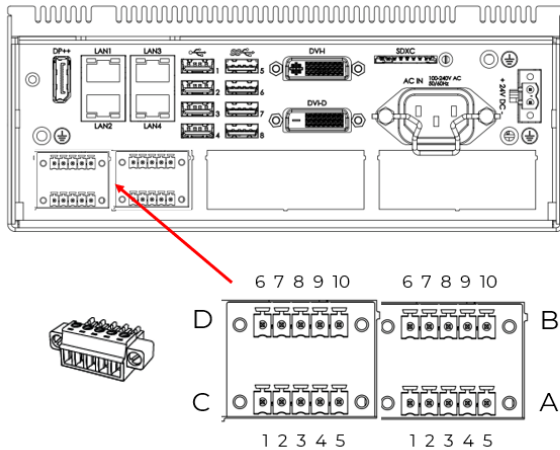
## Wiring and signal distribution

The installation overview shows an indication of possible means of signal distribution. During installation actual need for signal distribution must be verified by installer, depending on signals available and actual hardware installation on the specific vessel.

## Com Ports

The COM ports are equipped with Phoenix 5-pin connectors and are intended for IEC 61162-1 (NMEA) connections. As a minimum, TelScope shall be connected to an IMO approved INS system or GNSS receiver (for example GPS) for position and time.

**A** = USB 0 (GPS) **B** = USB 1(ECDIS) **C** = USB 2 **D** = USB 3 (VDR)



Pin	Channel	Port
1	TX-	A
2	TX+	A
3	GND	A
4	RX-	A
5	RX+	A
6	TX-	B
7	TX+	B
8	GND	B
9	RX-	B
10	RX+	B

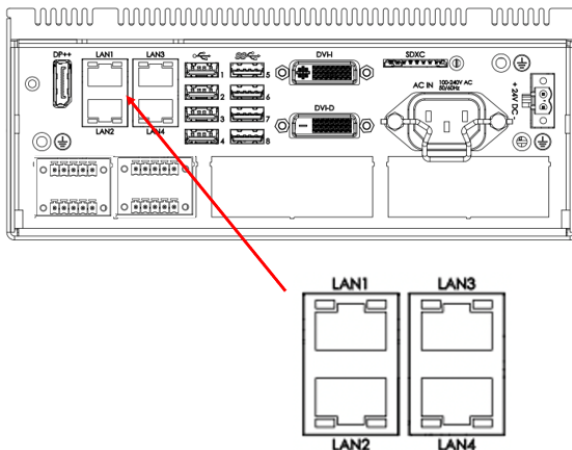
Pin	Channel	Port
1	TX-	C
2	TX+	C
3	GND	C
4	RX-	C
5	RX+	C
6	TX-	D
7	TX+	D
8	GND	D
9	RX-	D
10	RX+	D

Info
4 x RS-422/RS-485 isolated
5-pin Terminal Block RS-422 / RS-485 NMEA COM

## Network

Ensure that the processor unit network connectors are wired according to their intended purposes.

**LAN 1** = enp3s0 **LAN 2** = enp4s0 **LAN 3** = enp1s0 **LAN 4** = enp2s0

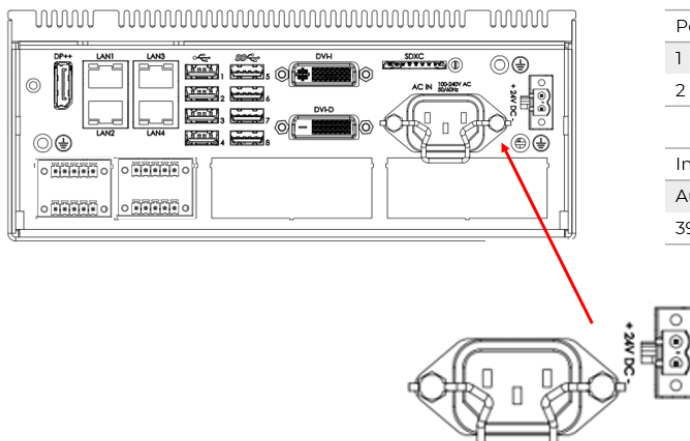


Port	Channel
1	Ship network (Internet)
2	IEC 61162-450
3	Spare
4	Service Port

Info
Gigabit LAN 10/100/1000Mbps

## Power

Ensure that the processor unit is connected to both 110-220 VAC and 24V emergency power with the following connectors (optionally via UPS).

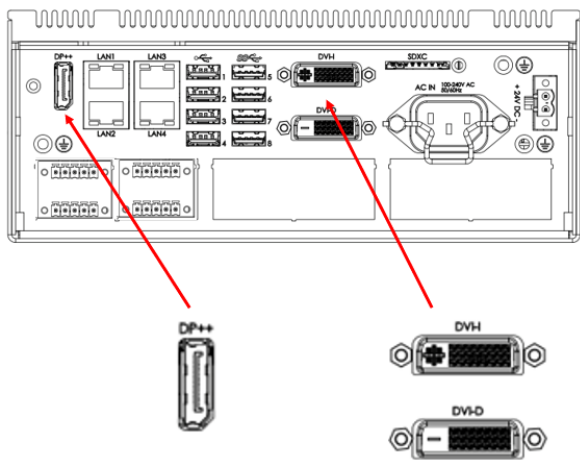


Port	Source
1	24 VDC
2	110-220 VAC

Info
Automatic fallback without downtime
39W power consumption

Video

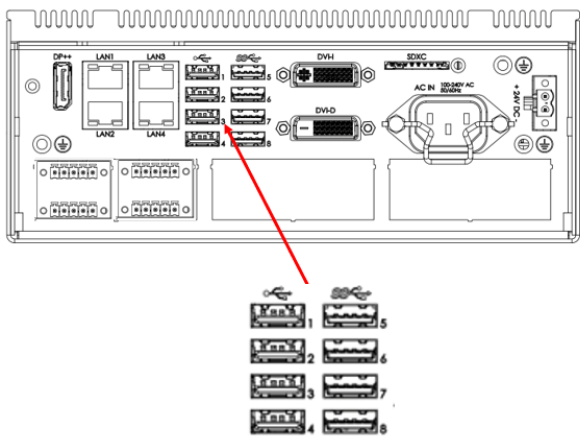
The monitor may be connected using any of the provided display connectors. Ensure that the processor and monitor units are mounted and wired with common ground.



Port	Channel
1	DP++
2	DVI-I
3	DVI-D

USB

Use the provided bracket to block out USB connectors that are not in use.



Port	Channel
2.0	4 x Ports
3.0	4 x Ports

## IT Prerequisites

### Shore Connection

TELSCOPE communicates with a cloud-based shore system through an encrypted VPN connection. It exchanges data and receives TELSCOPE and operating system updates. The relevant IP addresses of the shore system are mentioned below. The ship's network administrator must be aware of the installation and will usually have to add some firewall rules to allow TELSCOPE to connect to shore and make it available on the ship's network.

### Accessing TELSCOPE onboard

TELSCOPE is a web application and needs to be accessible for the users onboard. TELSCOPE is available through a URL on the form

**https://[IMO number].telescope.online.** For smaller ships without IMO number, the URL will be on the form **https://[call sign].telescope.online.**

Telko automatically deploys HTTPS certificates in order to encrypt the communication between the servers and the clients.

### DNS

Telko will add DNS records for this domain pointing to the local IP addresses of TELSCOPE's server. The DNS service on board needs to resolve this domain correctly. If public DNS is not available on the ship's network or DNS names resolving to private IP address are blocked, it's the ship's network administrator's responsibility to add the DNS name to a local DNS server. In that case, the domain should point to the IP of the server that was registered with the ship's IMO number first during installation on board (server's on-screen setup wizard). We refer to this server as the primary server and it's indicated on the overview page.

### Outbound firewall requirements

In case where there is any restrictions on outbound network traffic, TELSCOPE requires outbound access to the following IPs:

- 15.197.174.180
- 3.33.182.67
- 13.48.125.200
- 13.49.186.44
- 13.51.16.167

We do not recommend restricting traffic to these IPs by port or protocol as these are subject to change (with due notice) and there should not be any real security benefit to further restriction.

In the case where it is strictly required to further limit outbound access, the port range currently in use by TELSCOPE is TCP and UDP port 820-830. In addition, we recommend allowing ICMP traffic as it's helpful in diagnosing any network issues.



## Network Setup & Security

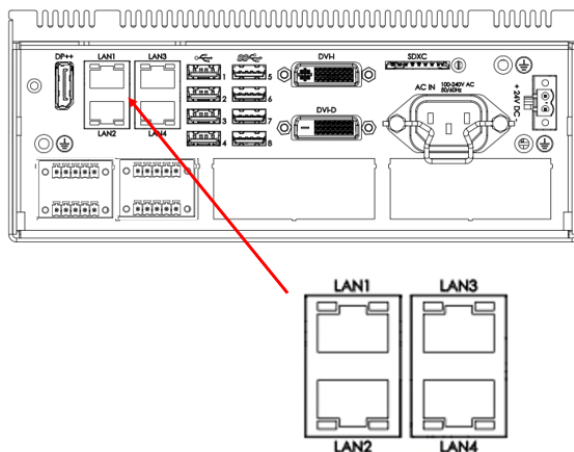
### General Information

Integration and connection of TELSCOPE to Ships IT-Infrastructure shall be done in cooperation with and be approved by the ship owners IT-department securing that the Installation complies to IT and Cyber Security rules and recommendations.

TELScope can work as a "Stand Alone" system with one TELSCOPE server also acting as a TELSCOPE Workstation with connections to Internet or be part of a larger ships network.

This chapter provides a guide to different level of TELSCOPE network integration.

TELScope have four network adapters that are configured so that traffic is separated and traffic between the networks are blocked.



Port	Channel
1	Ship network (Internet)
2	IEC 61162-450
3	Spare
4	Service Port
Info	
Gigabit LAN 10/100/1000Mbps	

### TELScope Network ports standard configuration

A standard TELSCOPE installation only requires that port enp3s0 (marked as LAN1 in the diagram above) be connected to a network with internet access. The remaining ports can be left unconfigured. TELSCOPE is configured to disallow any forwarding between networks, this is enforced by a firewall.

### TELScope Shore Connection

All TELSCOPE installations require a connection to shore via ships internet.

The following services will be available in TELSCOPE via the ship-shore connection:

- Software updates and remote configuration
- Synchronization of data and records between ship and shore
- Two-ways exchange of data and reports ship-shore-ship

TELScope doesn't require general internet access, only access to a handful of IP addresses. TELSCOPE will only make encrypted connections to these IP addresses. Once configured TELSCOPE will establish a persistent encrypted VPN (virtual private network) with the shoreside system, where all further communication will take place. Both TELSCOPE and the shoreside system has firewalls in place to ensure that only explicitly allowed communication can occur.

## Requirement

TELSCOPE shall be connected to internet in one of the following ways.

- Direct connection to the ships communication system.
- Connection to ships admin network (or other suitable network) via a managed switch that provide separation of traffic, firewall and cyber security.

## TELSCOPE Accessible from work stations via ships network

Ship's crew can access TELSCOPE via a network client from any workstation connected to ships admin network by navigating to any of the following addresses:

- <https://imo-number.telscope.online>
- <https://call-sign.telscope.online>
- <https://a.b.c.d> (TELSCOPE LAN IP, e.g., 192.168.10.100)

We recommend that TELSCOPE is accessed by the address containing the IMO number or the call sign as these will present a certificate signed by a trusted certificate authority.

Access may also be done using the TELSCOPE server's LAN IP address, though this is discouraged.

TELSCOPE only allows incoming HTTPS traffic (HTTP connections will be force upgrade to HTTPS), which means that any communication with TELSCOPE will be encrypted and protected.

## Requirement

- TELSCOPE shall be connected to ships admin network via a managed switch that provide separation of traffic, firewall and cyber security.
- Access to ships network to be protected in addition to TELSCOPE Login
- A DNS server shall be available in Ships admin network.

### TELSCOPE Accessible from Mobile Units via ships WLAN.

Ship's crew can access TELSCOPE from a mobile device via ships WLAN (if available) by navigating to any of the following addresses:

- <https://imo-number.telscope.online>
- <https://call-sign.telscope.online>
- <https://a.b.c.d> (TELSCOPE LAN IP, e.g., 192.168.10.100)

We recommend that TELSCOPE is accessed by the address containing the IMO number or the call sign as these will present a certificate signed by a trusted certificate authority.

Access may also be done using the TELSCOPE server's LAN IP address, though this is discouraged.

TELSCOPE only allows incoming HTTPS traffic (HTTP connections will be force upgrade to HTTPS), which means that any communication with TELSCOPE will be encrypted and protected.

### Requirement

Following is required to access TELSCOPE from a mobile device

- One or several protected wireless access points allowing access to Ships Admin network
- A Separate protected wireless network WLAN on the Bridge or in the Engine Area

### TELSCOPE Connection to - 450 Network.

Bridge Alert Management System (BAM) or other Bridge sensors or systems that provide data exchange via protocol in compliance to IEC 61162-450 can be connected directly to LAN port 2 if it is a single source.

For connection of several sources via -450 it is recommended to connect via a switch that manage and controls the traffic. If the supplier of the Navigation network provides a switch/Gateway and set up of network according to the requirements in IEC61162-460 it is recommended to connect TELSCOPE via this device.

## Requirement

For connection to Bridge Network or data via 450-network the following is required

- Point to Point information exchange via -450 network shall be connected to Lan Port 2
- Point to Point information exchange with ECDIS shall be connected to LAN Port 3

The above connection can be seen as part of a secure zone.

- Connection to several providers of Data via -450 network shall be connected via a managed Switch
- Connection to Dual ECDIS, INS, RADAR, Stability system, Automation System, Tank System etc shall be done via managed Switch.

The last two connections shall comply to the requirements stated in IEC 61162-460 where systems are logically separated in zones based on operational needs and security risk.

## TELSCOPE Connection to 3rd Party Systems

TELSCOPE can be connected to 3rd party systems for sharing of or receiving information via network.

This can be done either via data protocol other than described above or via an API.

## Requirement

If information is shared via the Ships Admin network, security rules to be defined by Ship Owner IT-department.

If information is shared via Navigation or Bridge Network security to be managed in the same way as for 450-data i.e., Compliance to IEC61162-460 is required.

## TECDIS link to TELSCOPE

TECDIS 4.8.3.6 s4 provides the following over link to TELSCOPE when "Serial\_PTKL\_port is set to a port number in the TELChart.ini

To activate the serial output to TelScope:

1. Edit C:\Program Files (x86)\TECDIS\TELchart.ini.
2. Locate the setting "serial\_PTLK\_port" in the [Options] section and set this to the serial port number connected to TelScope.

To add output:

1. Edit C:\Program Files (x86)\TECDIS\TELchart.ini.
2. Locate the setting "serial\_PTLK\_all" in the [Options] section and set this to 1.

To adjust the baud rate used by TECDIS for this port:

1. Open TECDIS Setup.
2. Temporarily select the serial port for use on one of the sensors.
3. Select the desired baud rate.
4. Deselect the serial port from the sensor used in (2) above again.

Sentence \$PTLKC:

Value	Units	Fetcher field
ECDIS Palette (day/dusk/night)	-	ECDIS.PALETTE
Speed trough water	Knots	STW
Depth bellow keel	Meters	DPTH.KEEL
ECDIS license number	-	ECDIS.LIC
True Wind direction	-	WIND.TRUE.DIR
True Wind speed	Meter/Sec	WIND.TRUE.SPD
Rate of turn	Degrees/minute	ROT
ECDIS configured vessel draught	Meters	DRAUGHT
Relative wind direction	Deg	WIND.REL.DIR
Relative wind speed	Meter/sec	WIND.REL.SPD
Bow transverse speed over ground	Knots (starboard +)	SOG.TRANS.BOW
Stern transverse speed over ground	Knots (starboard +)	SOG.TRANS.STERN
Longitudinal speed over ground	Knots (forward +)	SOG.FORW
Relative measurement of rudder angle	- (starboard +)	RUDDER
ECDIS number (1 or 2, or 3+ on multiple installs	-	ECDIS.ID

When route monitoring is active, this is added:

Sentence \$PTLKW:

Value	Units	Fetcher field
Course to steer	Deg	WP.CTS
Next course to steer	Deg	WP.CTS2
Distance to wheel over line	NM	WP.DWOL
Time to go to next waypoint	Hours	WP.TTG
Cross track error	NM (starboard +)	WP.XTD
Route leg width to port	NM	WP.XPORT
Route leg width to starboard	NM	WP.XSTBD
Deviation from course to steer	Deg (clockwise +)	WP.DEV
Distance to wheel over line after next waypoint	NM	WP.DWOL2
Distance to go to end of route	NM	ROUTE.DTG
ID of next waypoint	String	WP.ID
ECDIS number (1 or 2, or 3+ on multiple installs)	-	ECDIS.ID

When “serial\_PTLK\_all” is set to =1 (activated) in TELChart.ini:

Sentence \$EIRMC:

Value	Units	Fetcher field
Position	“n.nnn, e.eee”	POS
Speed over ground	Knots	SOG
Course over ground	Deg	COG
Time	“YYYY-MM-DD HH:MM:SS.SSSS”	TIME
Position mode	Enum	POS.MODE

Sentence \$EIHDT:

Value	Units	Fetcher field
Heading	Deg	HDG

Sentence \$PTLKL:

<b>Value</b>	<b>Units</b>	<b>Fetcher field</b>
Type	-	-
LOP	-	-
Estimated Position	-	-

## Connection to bridge alert management systems (BAM)

TelScope can be connected to the BAM system using the IEC 61162-1 (NMEA 0183) protocol.

Serial port com 3 should be used for this connection.

TelScope exchanges messages as specified in ISO-21745 (Electronic record books for ships) and in accordance with the IEC 62923 (Bridge alert management) specification.

The following alerts may be transmitted on this interface:

- Storage fault - Alert ID: 3063, Instance 1
- Lost recording - Alert ID: 3009, Instance 1
- UTC in fallback - Alert ID: 3113, Instance 1
- Full 30-day log - Alert ID: 3133, Instance 1
- Security breach - Alert ID: 3136, Instance 1

Note that all alerts are category B, priority Caution. This implies that no acknowledgements on the BAM are required.

### Configuring TelScope to connect to the BAM system

Connect TelScope to the BAM system via serial port com 3. The baud rate can be configured in the TSV. On the BAM side configure the connection with the same baud rate.

To test the connection, monitor the connection on the BAM side. On a working connection TelScope will send ALC sentences every 30 seconds (TelScope's talker is RC, so the sentences will start with \$RCALC).



## VDR

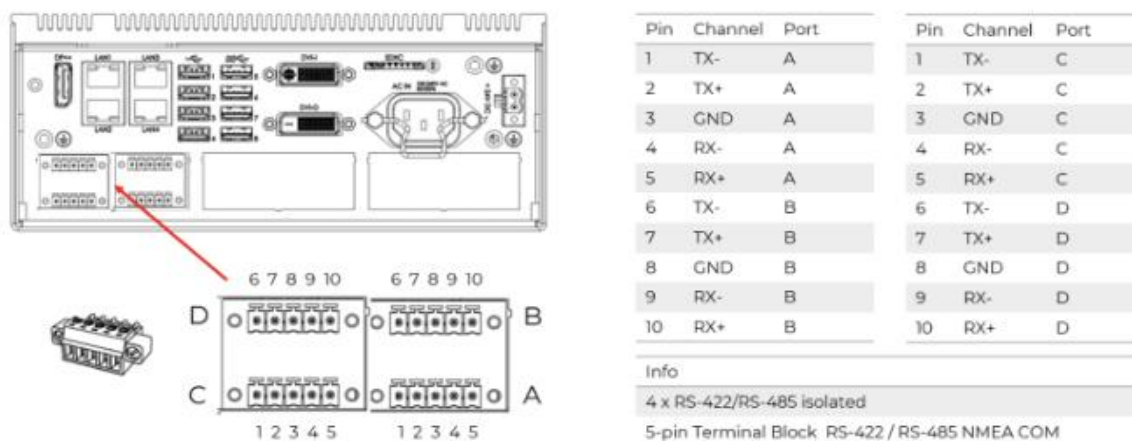
TelScope sends logbook data to the VDR through a serial connection.

Serial port USB3 (D) pin 6,7 / 38400 is used.

Note that data is ONLY sent when data is added to the logbooks.

In the VDR setup the signal must be set to Time Stamp check at the port to (0) otherwise the VDR will alarm.

The connection is undirected, i.e., no data is sent from the VDR to TelScope.



The data is formatted as NMEA TXT sentences. The talker is RB. The data will typically span several sentences. The logbook entry contains an ID. Later messages that regard this logbook entry will to this ID. Examples of messages that refer to logbook entries like this are:

- Strike through of entries.
- Master's signature.
- Remarks
- Verification of entries.

The format of the text encoded in the NMEA TXT sentences is json.

Example of logbook entry:

```
$RBTXT,15,01,01,{"creation_time":"2022-05-10-11-57-30"^2C"data":{"collected_d*7C
$RBTXT,15,02,01,ata":{"STREAM:TELScope.POS":{"collect_failure":false^2C"label*27
$RBTXT,15,03,01,":{"Position"^2C>manual_update":false^2C"value":[58.8919^2C10.*5C
$RBTXT,15,04,01,33065]]^2C"STREAM:TELScope.SHIPTIME.UTC_OFFSET":{"collect_
fai*6F
$RBTXT,15,05,01,lure":false^2C"label":"Ship time offset"^2C>manual_update":fa*2C
$RBTXT,15,06,01,lse^2C"value":120.0}}^2C"entrytype_category":"Notes & Other"*75
$RBTXT,15,07,01,^2C"entrytype_id":"builtin:deck_lights"^2C"entrytype_name":"D*26
$RBTXT,15,08,01,eck lights"^2C"summary":"Off"^2C"user":{"enabled":true^2C"fir*57
$RBTXT,15,09,01,stname":"Benjamin"^2C"id":"040d1777-99dc-4551-8224-
beb7ed2707*47
$RBTXT,15,10,01,46"^2C"position":"Dev"^2C"shortname":"BeKe"^2C"status":"on_du*
32
$RBTXT,15,11,01,ty"^2C"surname":"Kehlet"}^2C"user_data":{"onOff":{"datafield_*72
$RBTXT,15,12,01,type":null^2C"label":"On/Off"^2C"type":null^2C"value":"Off"}}*40
$RBTXT,15,13,01,]^2C"event_type":"LOGBOOK_ENTRY_ADDED"^2C"id":"a5773add-
473e-*3C
$RBTXT,15,14,01,4551-97f2-45cad52bd255"^2C"parent_id":"","^2C"time":"2022-05-
10*1E
$RBTXT,15,15,01,-11-57-
30"^2C"topic":"TELScope.LOGBOOKS.DECK"^2C"user_id":"","}*18
```

This data is completely self-contained in the sense that it contains everything to reproduce the logbook report.

## Setup TELSCOPE without connecting a monitor

TELScope can be setup without connecting a monitor by connecting a laptop through the "service port" enp2s0 (lower right).

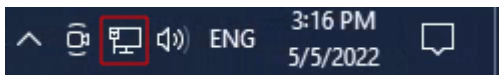
The TELSCOPE setup service is reachable at <http://10.10.10.10>.

First the laptop must be configured to be in the 10.10.10.0/24 network.

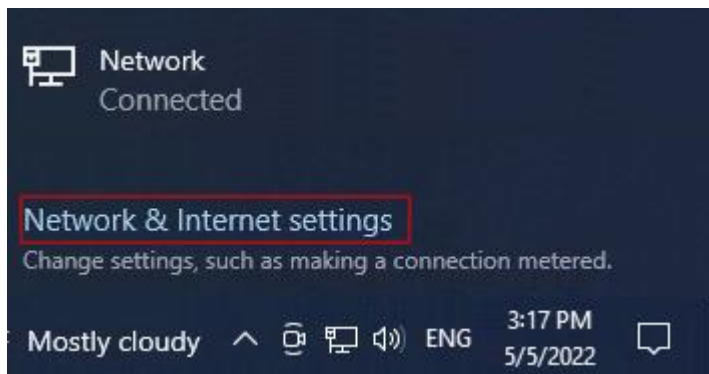
This can be done by following these steps:

(These steps are for Windows 10 but are similar for other operating systems).

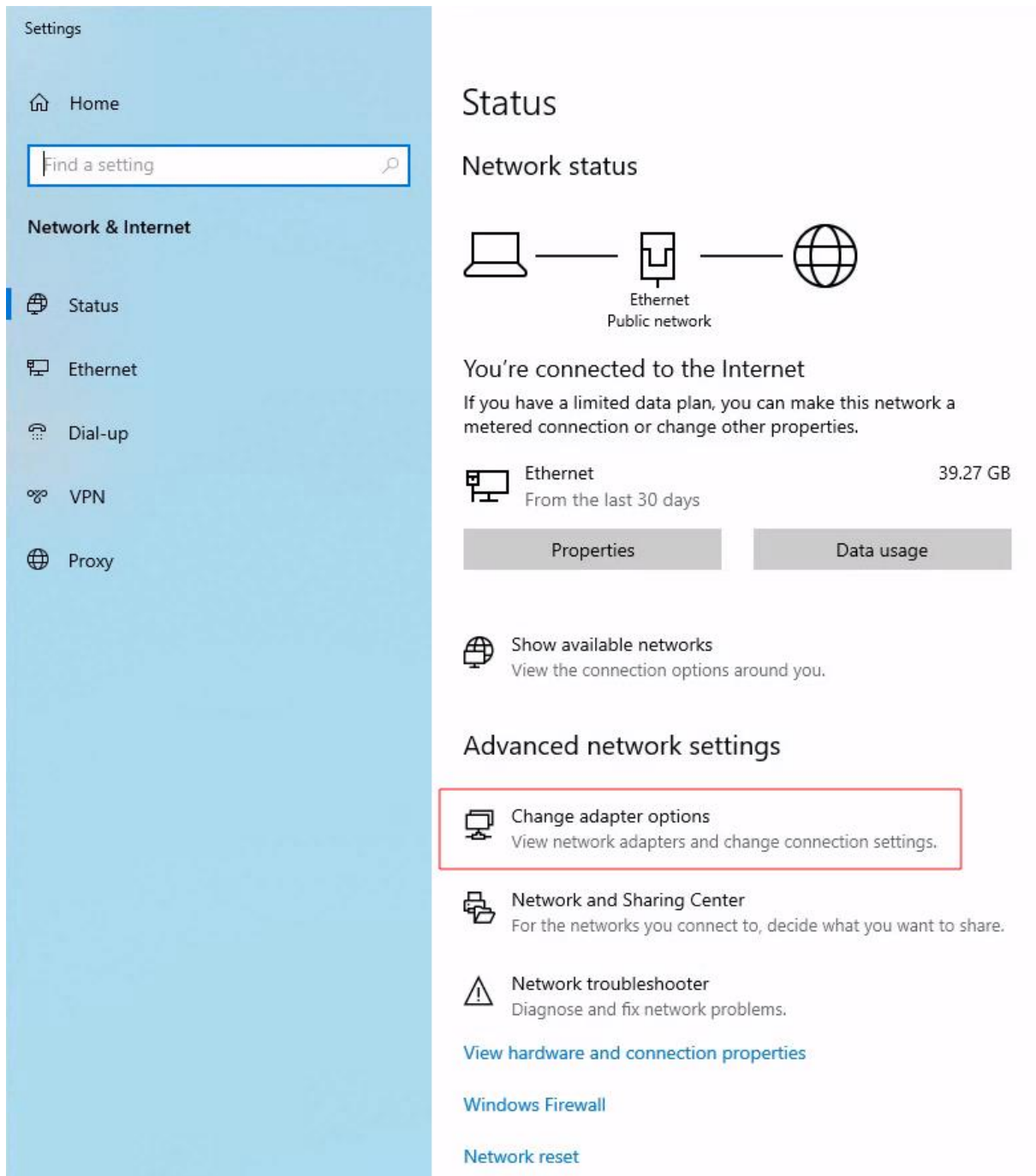
1. Click the network tray icon.



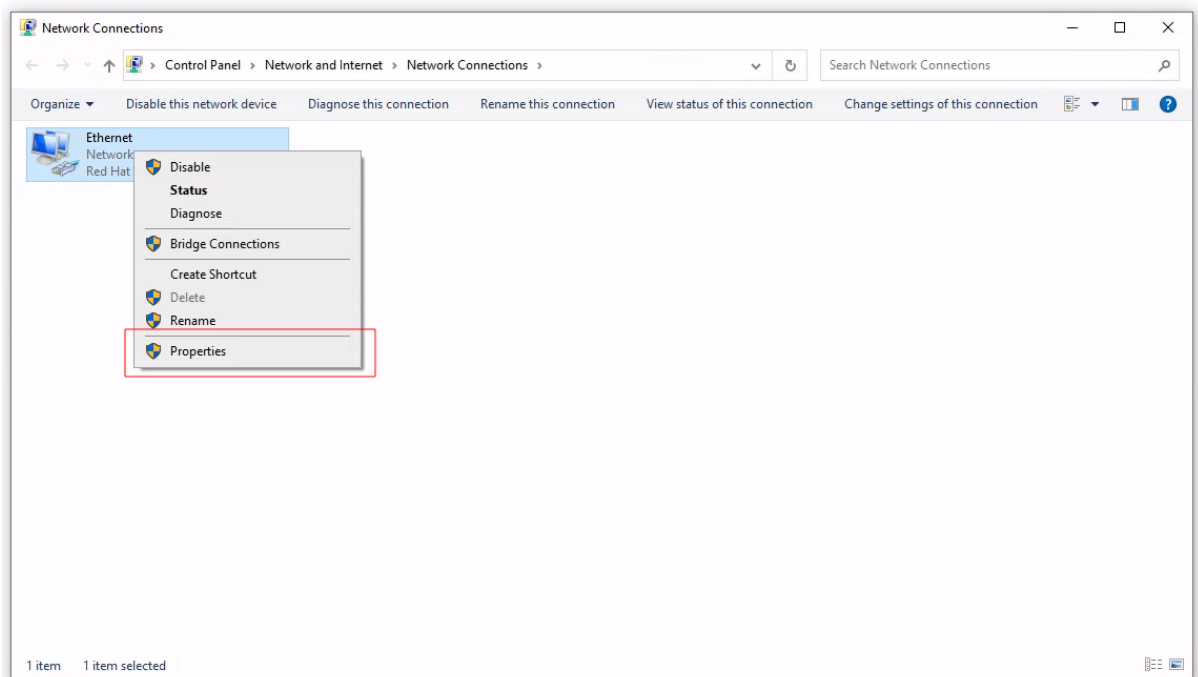
2. Click "Network & Internet settings".



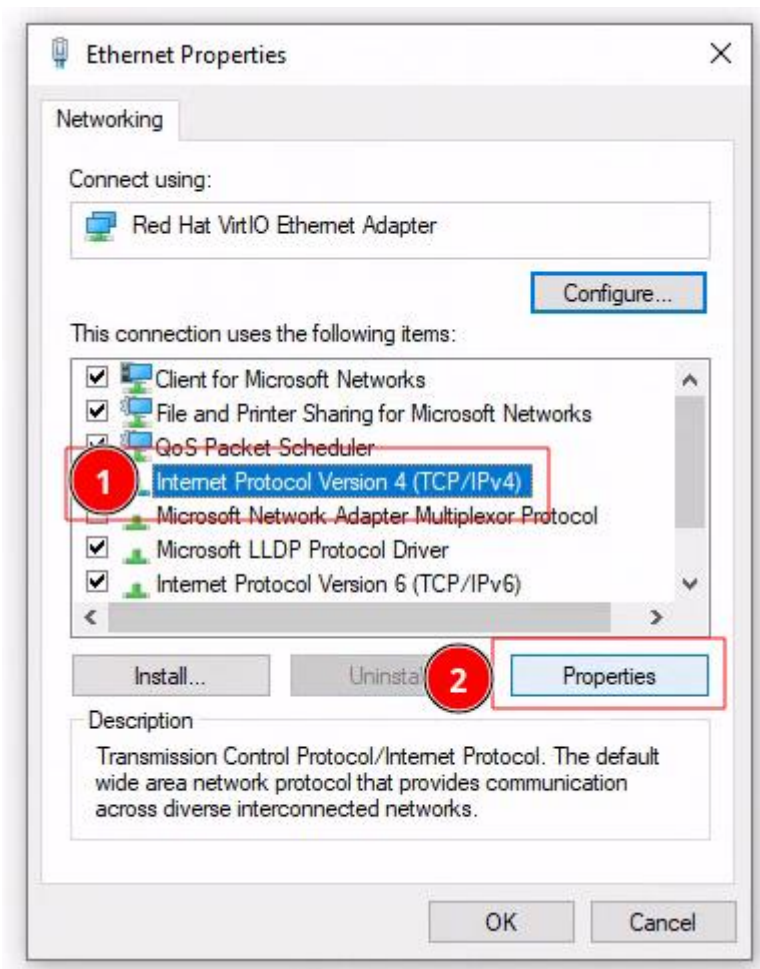
3. Click "Change adapter options".



4. Right click the ethernet adapter currently connected to the TELSCOPE server and click "Properties".



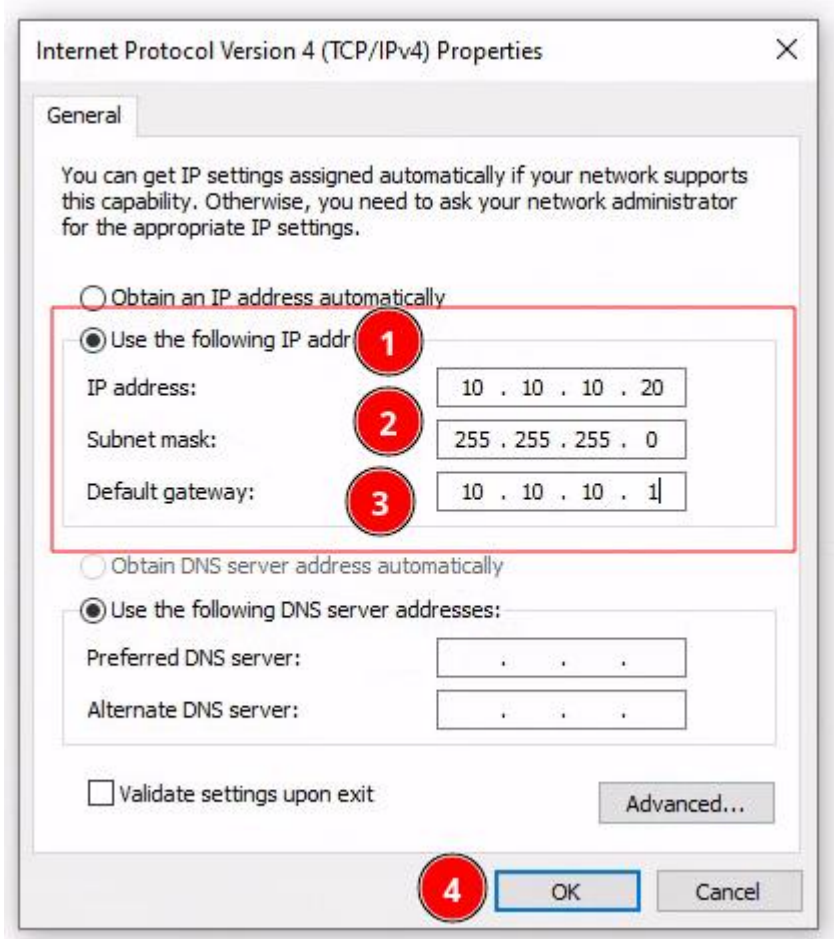
5. Select "Internet Protocol Version 4 (TCP/IPv4)" and click "Properties"



6. Choose "Use the following IP address" and configure the following properties:

- IP address: 10.10.10.20
- Subnet mask: 255.255.255.0
- Default gateway: 10.10.10.1

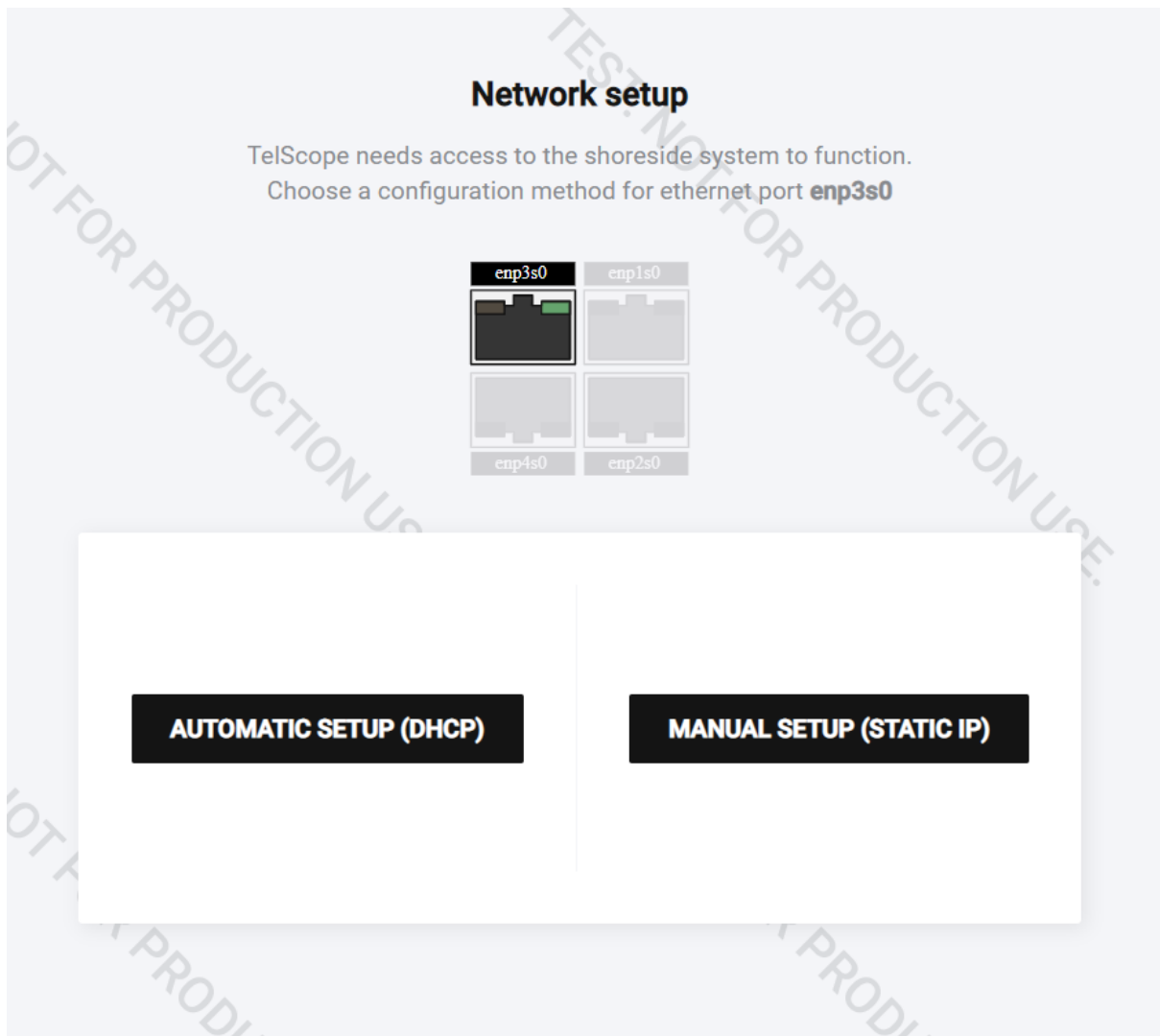
Then click "OK".



You should now be able to setup TELSCOPE by opening your internet browser and navigating to <http://10.10.10.10>

## Network setup

Turn the system on and connect a LAN cable in the back of the system in the port named **enp3s0**, this is an important step for the rest of the setup to work.



Press the **Automatic Setup (DHCP)** button to let TELSCOPE automatically setup IP settings. If you want to use a static IP provided by another source press the **Manual Setup (Static IP)** button to access the next step where you will enter your static IP address.

### Network setup check

After either Automatic setup or Manual setup are done, a network setup check page will be shown. This check will verify that the shoreside system can be reached. Press the **Check Shoreside Connection** button to continue.

## Network setup check

This check will verify that the shoreside system can be reached.

**CHECK SHORESIDE CONNECTION**

If shoreside connection fails, double check that you have the LAN cable in the correct LAN port and check if your static IP is entered correctly.  
If the shoreside connection is complete, an overview page will be shown.

### [Assign server to vessel](#)

In this step an IMO number and call sign is entered. This will permanently link the server to the given vessel, so make sure to enter the correct value.



## Assign server to vessel

This will permanently link the server to the given vessel.  
Be sure to enter the correct value.

At least one must be specified.

IMO number

1234567

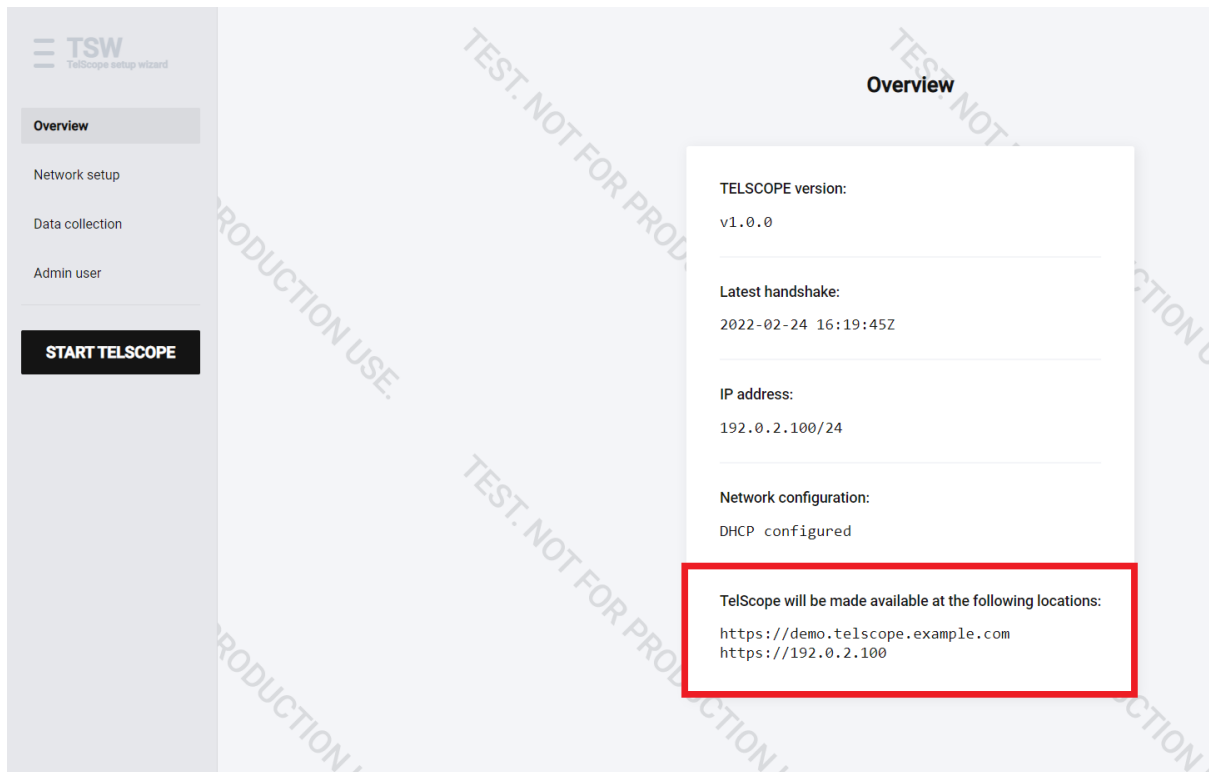
Call sign

ABC123

**ASSIGN SERVER**

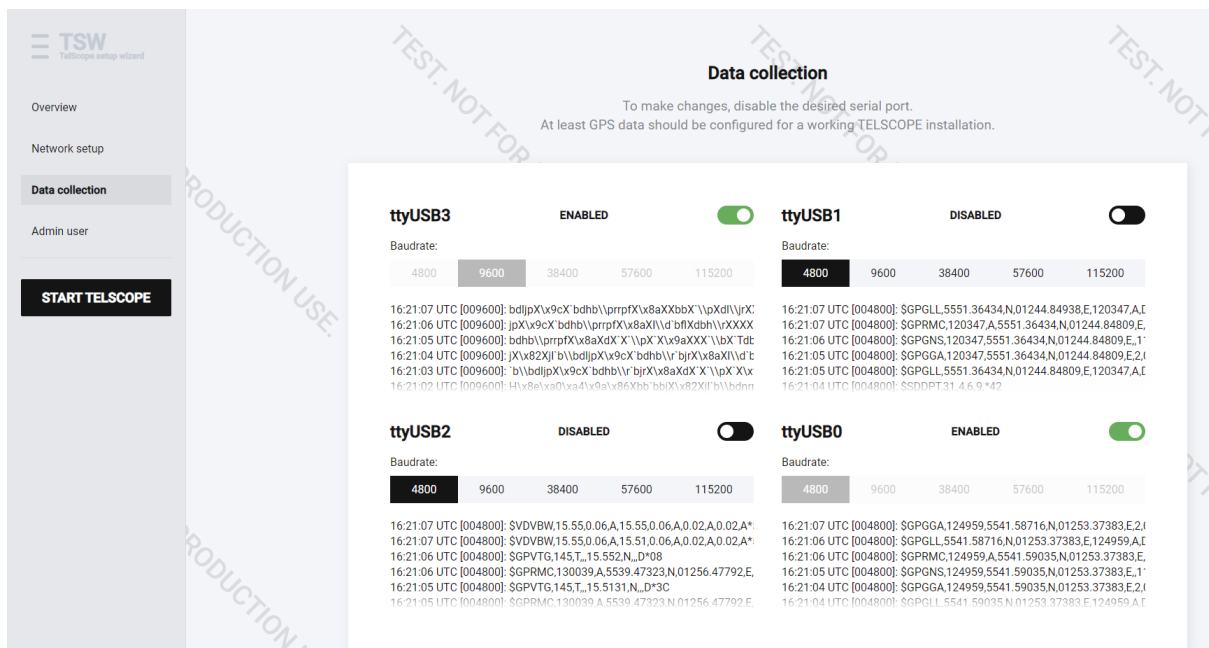
### Overview

Network setup is now complete, but you can always go back and make changes by using the side menu on the left side of the page. In the overview page information about TELSCOPE version, latest handshake, IP address and network configuration is shown. A link is shown containing either IMO-number or call sign. This is the link that should be used.



## Data Collection

At this page the serial ports on the back of the system is either enabled or disabled. At least GPS data should be configured for a working TELSCOPE installation. To make changes, disable the desired serial port. The USB ports at the back of the TELSCOPE server are labelled with the same text as in this page. Data will be shown (if received) in the box below baud rate selection.



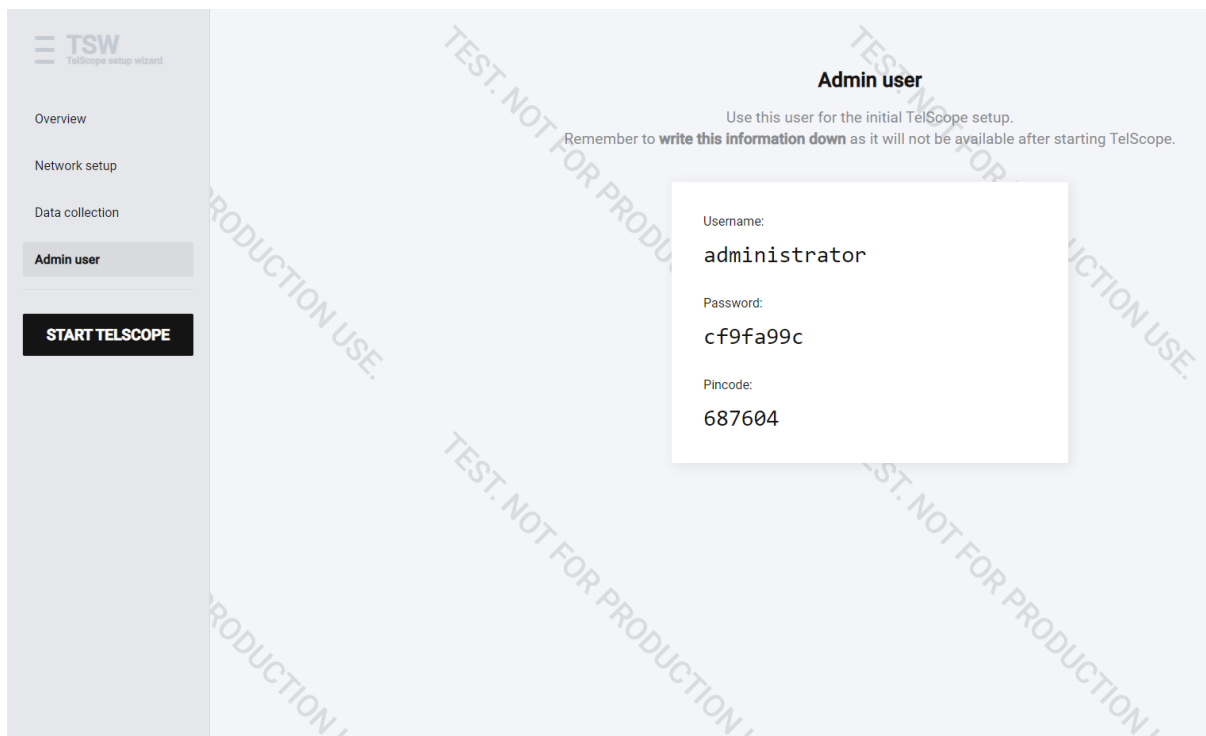
## IEC 61162-1 / NMEA Sentences in use

TelScope can make use of the following IEC 61162-1 / NMEA sentences:

- Time: GGA, GLL, GNS, RMC, ZDA
- Position: GGA, GLL, GNS, RMC
- Course over ground (COG): RMC, VTG, OSD
- Speed over ground (SOG): RMC, VTG, OSD
- Speed through water (STW): VBW, VHW, OSD
- Heading (HDG): HDT, THS, VHW, OSD
- Depth (DPT): DBT, DPT
- Wind: MWV

## Admin user

**Write the information on this page down**, this is important as it will not be available after starting TELSCOPE. This user will be used for the initial TELSCOPE setup.



The screenshot shows the 'TelScope setup wizard' interface. On the left is a sidebar with navigation links: Overview, Network setup, Data collection, and Admin user (which is highlighted). Below the sidebar is a large black button labeled 'START TELSCOPE'. The main content area is titled 'Admin user' and contains the following text: 'Use this user for the initial TelScope setup. Remember to **write this information down** as it will not be available after starting TelScope.' Below this text is a white box containing the following information:

Username:	administrator
Password:	cf9fa99c
Pincode:	687604

The background of the setup wizard has a diagonal watermark that reads 'TEST. NOT FOR PRODUCTION USE.'

## Commissioning form

**Ship name:**

**IMO:**

**Flag state:**

**TelScope software version:**

Yes No N/A

☐ ☐ ☐

Data Collection (GNSS) / Master Server

Verify that Telscope receiving data

Yes No N/A

☐ ☐ ☐

Data Collection (GNSS) / Backup Server

Verify that Telscope receiving data.

Yes No N/A

☐ ☐ ☐

Data Collection / Master Server

Verify that all connected ports are receiving data.

Yes No N/A

☐ ☐ ☐

Data Collection / Backup Server

Verify that all connected ports are receiving data.

Yes No N/A

☐ ☐ ☐

BAM connection / Master Server

Verify that the port is receiving and transmitting data.

Yes No N/A

☐ ☐ ☐

VDR connection / Master Server

Verify that the USB3 port D is transmitting data.

Yes No N/A

☐ ☐ ☐

Access to Internet / Master Server

Verify that TelScope are online

Yes No N/A

☐ ☐ ☐

Access to Internet / Backup Server

Verify that TelScope are online

Yes No N/A

☐ ☐ ☐

Access to TelScope

Verify that TelScope is available via the url [https://\[imo\].telscope.online](https://[imo].telscope.online)

Yes No N/A

☐ ☐ ☐

Display / Master Server

If a display is connected to the TelScope server, verify that screen resolution is at least 1920 x1080

Yes No N/A

☐ ☐ ☐

Display / Backup Server

If a display is connected to the TelScope server, verify that screen resolution is at least 1920 x1080

Yes No N/A

☐ ☐ ☐

Keyboard, mouse / Master Server

If keyboard and mouse are connected and functioning properly

Yes No N/A

☐ ☐ ☐

Keyboard, mouse / Backup Server

If keyboard and mouse are connected and functioning properly

Yes No N/A

☐ ☐ ☐

Power / Master Server

Telscope connected to EM source

Yes No N/A

☐ ☐ ☐

Power / Backup Server

Telscope connected to EM source

Yes No N/A

☐ ☐ ☐

Roles

Verify that at least a master/captain role has been created. The role should have general access to all parts of the system

Verify that a role called "User manager" has been created. The role should have read and write permissions for user management

Yes No N/A

☐ ☐ ☐

User login

Verify that at least one user has been created with "User manager" role

Yes No N/A

☐ ☐ ☐

System status

Verify that the system status is green and Telscope and is fully operational

Yes No N/A

☐ ☐ ☐

Documentation / Master & Backup Server

Verify ships installation drawing and connection

Yes No N/A

☐ ☐ ☐

Ship details / Vessel particulars

Verify that that "Ship credentials" section of settings has been completed

Yes No N/A

☐ ☐ ☐

Tank config

Verify that the tank setup has been configured in the "Tank" section of "Settings"

Yes No N/A

☐ ☐ ☐

Machinery config

Verify that the machinery setup has been configured in the "Machinery" section of "Settings"

Yes No N/A

☐ ☐ ☐

Logbook configurations

Verify that all logbook configurations are imported: For each logbook click "Add log entry" and verify that the list of entry types is not empty

**Service engineer:**

**Service engineer signature:**

**Company:**

**Date:**

**Location:**

**Master:**

**Master signature:**

# FURUNO

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