



# TELSCOPE INSTALLATION MANUAL

Version 2025-03-22

TELKO AS

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## DOCUMENT REVISION HISTORY

Ver No	Rev Date	Document Information
1.0	2025-03-19	TELSCOPE Installation
1.1	2025-03-22	Minor update, Rearrange Section and Task



## PHYSICAL INSTALLATION

- The following illustration provides an overview of mounting and wiring of TELSCOPE

### BEFORE YOU BEGIN

Check that you have all relevant information about IT Settings for the TELSCOPE installation this will normally be provided by the Integrator or Customer IT Department

- IP Address
- Subnet Mask
- Gateway IP
- Switch, Port Nr

Check with the responsible Integrator about which instruments that will be connected to TELSCOPE

Check with the responsible Integrator about which hardware options that will be connected to TELSCOPE

### MOUNTING

The processor unit can be mounted inside a console or other suitable space.

When selecting a mounting location, keep in mind the following points.

Select a location where vibrations are down to a minimum

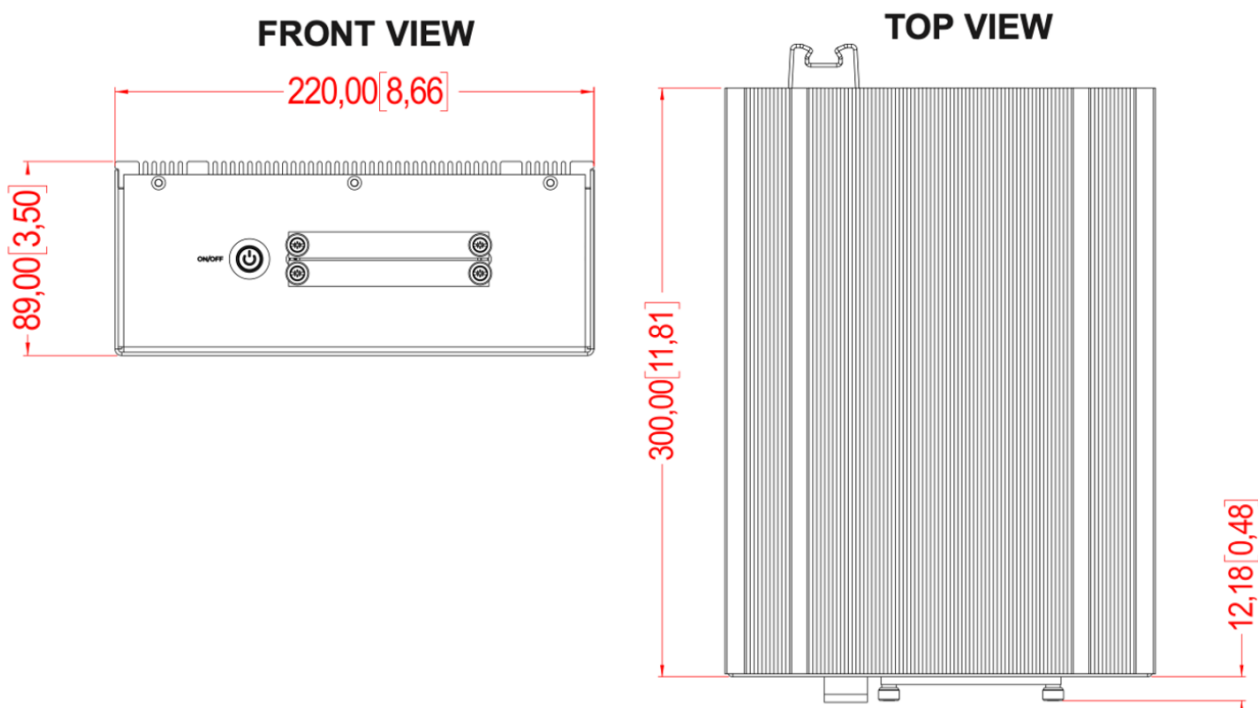
Locate the unit away from heat sources because of heat that can build up inside the cabinet

Locate the equipment away from places subject to water splash and rain

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

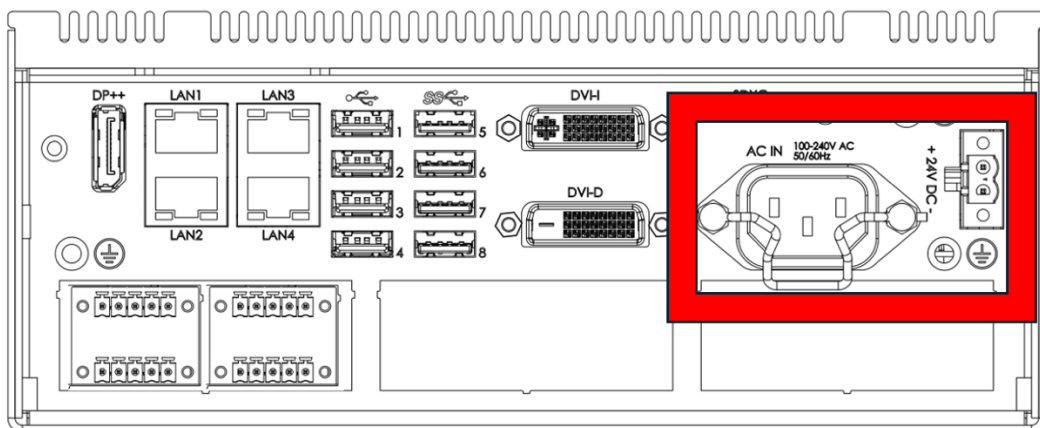
When the best location has been found, mount the TELSCOPE using the included brackets



## POWER

TELSCOPE have Multipower, with uninterrupted switchover if power loss occurs 100-240 VAC / 24 VDC (optionally via UPS) TELSCOPE need to be connected to 220 VAC or 24 VDC emergency power

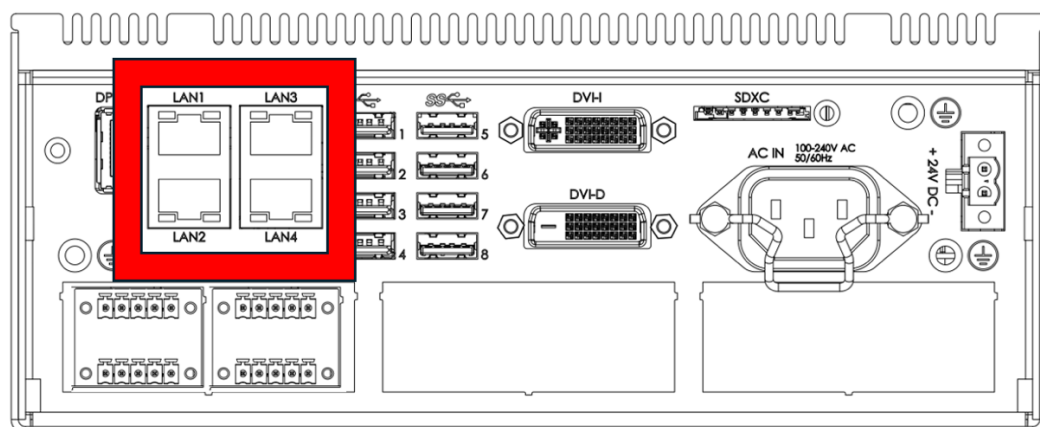
Power Consumption Max 50W, Normal 39W



## NETWORK

Ensure that the TELSCOPE network connectors are wired according to their intended purposes

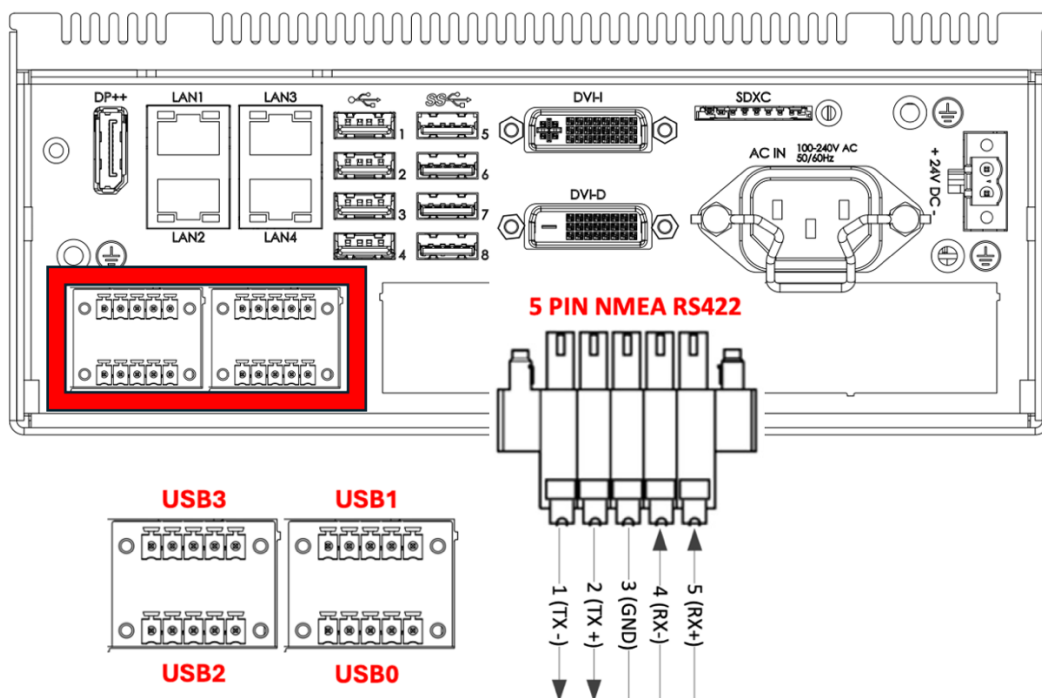
- LAN1 (enp3s0) - Ship Network (**Requirement**)
- LAN2 (enp4s0) - IEC 61162-450 VDR (Option read more section Configuration VDR)
- LAN3 (enp1s0) - Spare / Automation System (Option)
- LAN4 (enp2s0) - Service Port (Read more Section Setup Without Monitor)



## COMPORTS

The COM ports are equipped with Phoenix 5-pin connectors and are intended for IEC 61162-1 (NMEA) connections.

- USB0 - GPS (RX+ RX-) (GGA or GLL and RMC, ZDA, VTG) **(Requirement)**
- USB1 - INS/ECDIS (RX+ RX-) (Nmea Out - Gyro, Log, Wind, Sounder) **(Recommended)**
- USB2 - BAM / SPARE (RX+ RX- TX+ TX-) (Option read more section BAM)
- USB3 - VDR (TX+ TX-) (Option read more section VDR)

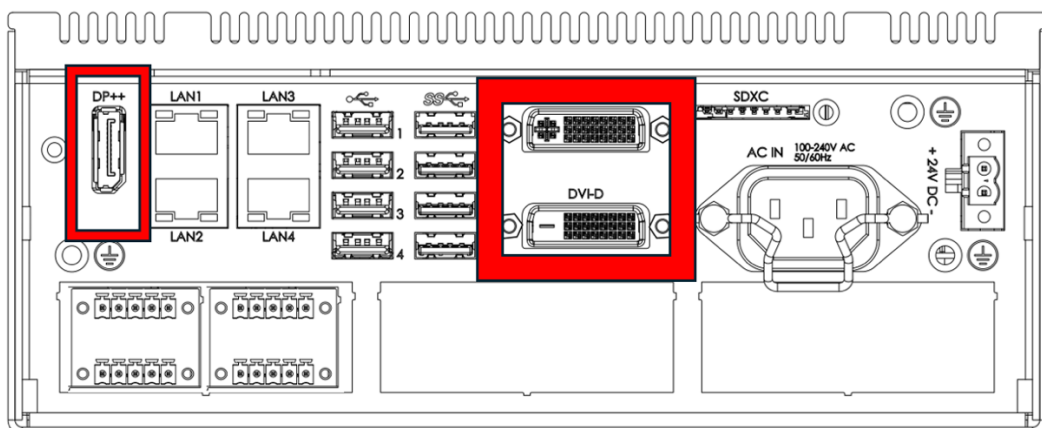


## VIDEO

TELScope can be used as a workstation with directly connected Display **(Option)**

The monitor may be connected using any of the provided display connectors.

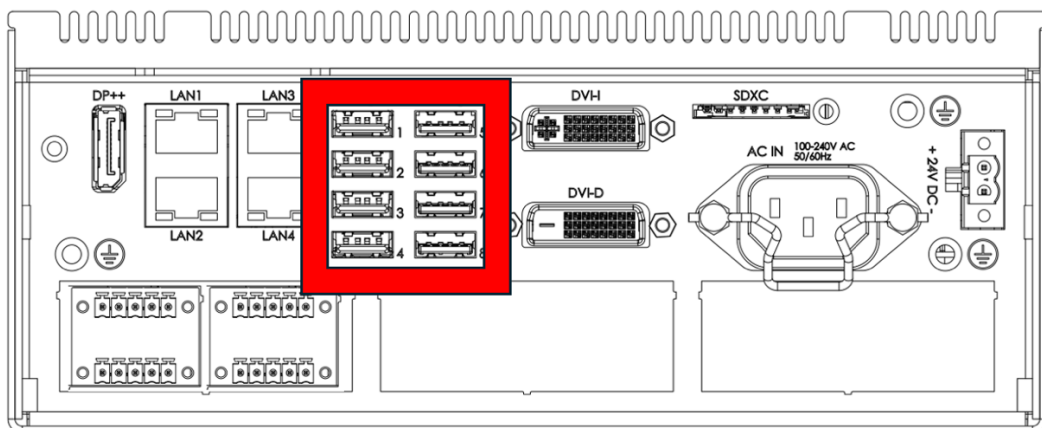
Ensure that the processor and monitor units are mounted and wired with common ground  
Primary: DP++ (X1), Secondary: DVI (X2)



## USB

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

- USB Port (X8)



## BAM

TELSCOPE can be connected to the BAM system using the IEC 61162-1 (NMEA 0183) protocol. Serial port USB2 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 ttyUSB2. The BAM configuration can only be done by TELKO remote. To test the connection, monitor the connection on the BAM side. TELSCOPE will send ALC sentences every 30 seconds (Talker is RC, so the sentences will start with \$RCALC).

## INCLUDED IN BOX

- 3x Cable Retainer
- 2x Mounting Bracket
- 1x Power Cable US Type
- 1x Power Cable European Type
- 4x 5-Pin Connectors (NMEA)
- 1x 2-Pin Connector (Power)

## VDR

VDR IEC 61996-1 ed2 (MSC.333(90)/5.5.20) Where a ship is fitted with an electronic logbook in accordance with the standards of the IMO the information from this shall be recorded.

VDR with lower requirements ed1 before July 2014 are not affected

TELSCOPE can provide data via Serial Or Network

### VDR - IEC 61162-450 (Edition 2.0 2018-05)

LAN2 (enp4s0) - IEC 61162-450 (Option)

"Binary file transfer using UDP multicast", which uses 60021 to 60030

### VDR -IEC 61162-1 (NMEA 0183)

Serial port USB3 (D) pin 1,2 / 38400 Baud Rate is used on the Telescope Primary Server

Note that Telescope data is only sent when data (event) is added in the logbooks.

All events are sent to VDR, if no events are made in TELSCOPE

the heartbeat will automatically start after 1 minute heartbeat is sent every 10 seconds

```
$RBTXT,01,01,07,{"type":"HEARTBEAT"}*33
```

The data is formatted as NMEA TXT sentences.

The talker is RB. The data will typically span several sentences

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,15,05,01,lure":false^2C"label":"Ship time offset"^2C>manual_update":fa^2C
```

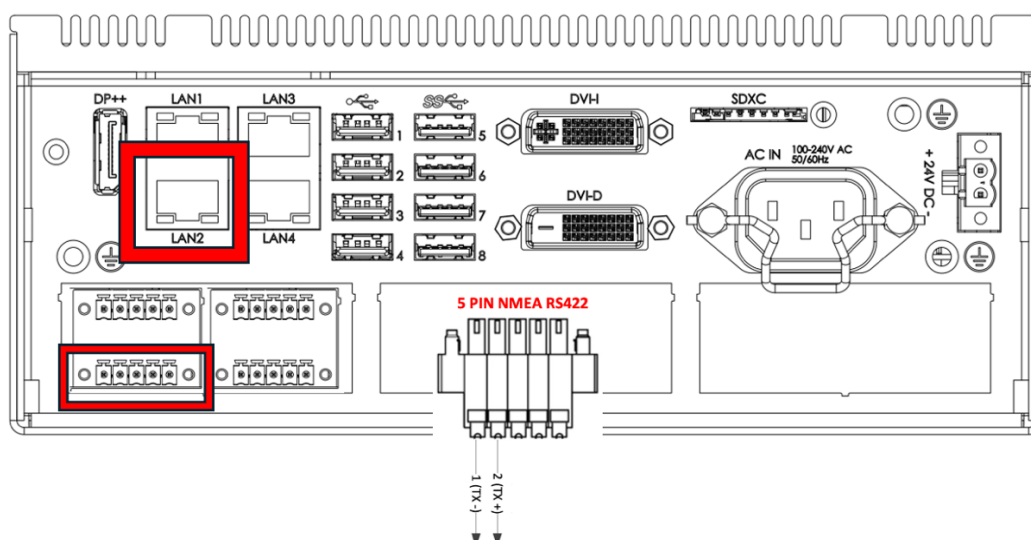
```
$RBTXT,15,06,01,lse^2C"value":120.0}}^2C"entrytype_category":"Notes & Other"*75
```

```
$RBTXT,15,13,01,}^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 MONITOR (SERVICE PORT)

You can set up the TELSCOPE server without connecting a monitor by using a laptop connected via the "service port"(network interface enp2s0 – lower right port on the server).

### Step 1: Configure Your Laptop's Network

- You must assign your laptop an IP address within the same network (10.10.10.0/24). Follow these steps to set a static IP (instructions for Windows 10):

#### 1. Open Network Settings

- Click the network icon in the system tray (bottom right).
- Click "Network & Internet settings".

#### 2. Change Adapter Settings

- Click "Change adapter options".

#### 3. Open Ethernet Properties

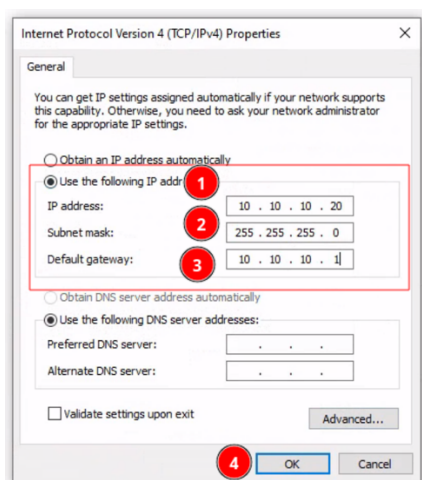
- Right-click the Ethernet adapter that is connected to the TELSCOPE server.
- Click "Properties".

#### 4. Set IPv4 Address

- Select "Internet Protocol Version 4 (TCP/IPv4)" and click "Properties".
- Choose "Use the following IP address" and enter:
  - IP address: 10.10.10.20
  - Subnet mask: 255.255.255.0
  - Default gateway: 10.10.10.1
- Click "OK" to save the changes.

### Step 2: Access the TELSCOPE Setup Interface

- Open any web browser on the laptop.
- Navigate to: <http://10.10.10.10>
- The TELSCOPE setup page should load and allow configuration.







## TECDIS LINK TO TELSCOPE

TECDIS 4.8.3.6 s4 provides the following link to TELSCOPE

To activate the serial output to TELSCOPE:

Edit C:\Program Files (x86)\TECDIS\TELchart.ini.

Locate the setting "serial\_PTLK\_port" in the [Options] section, and set this to the serial port number connected to TelScope.

To add output:

Edit C:\Program Files (x86)\TECDIS\TELchart.ini.

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:

Open TECDIS Setup.

Temporarily select the serial port for use on one of the sensors.

Select the desired baud rate.

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 vesseldraught	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 measurment 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 wheelover 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 wheelover 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

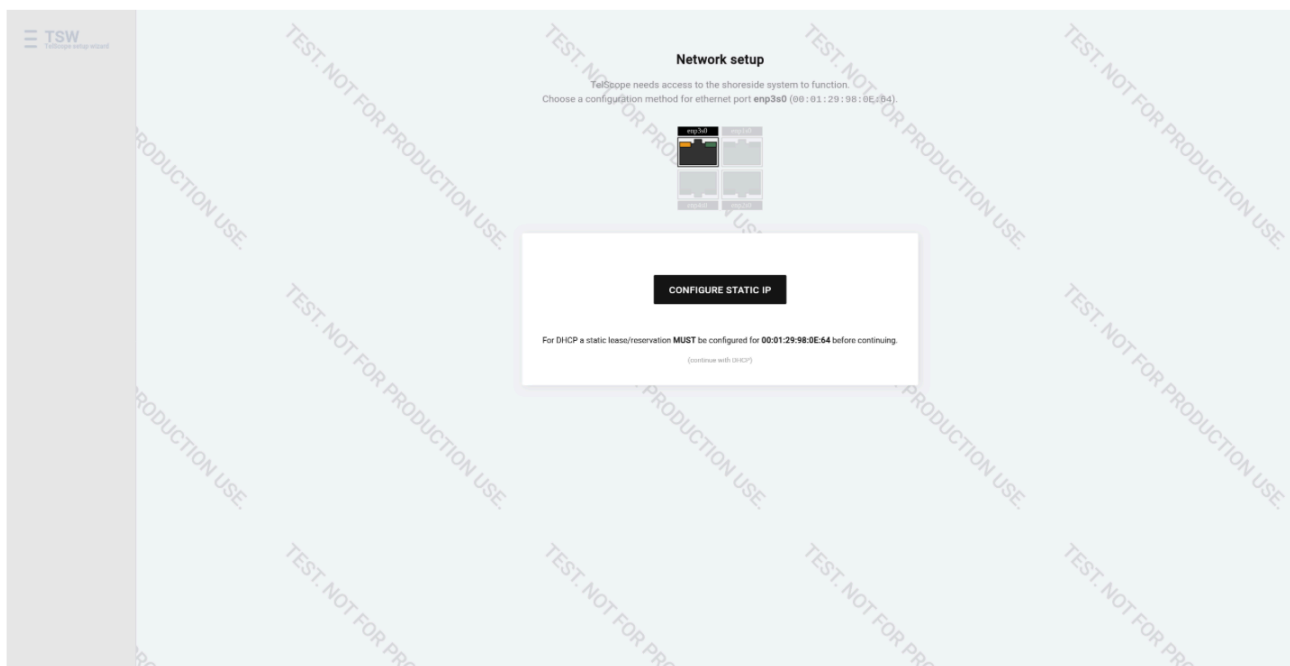
Sentence \$PTLKL:

Value	Units	Fetcher field
Type	-	-
LOP	-	-
Estimated Position	-	-

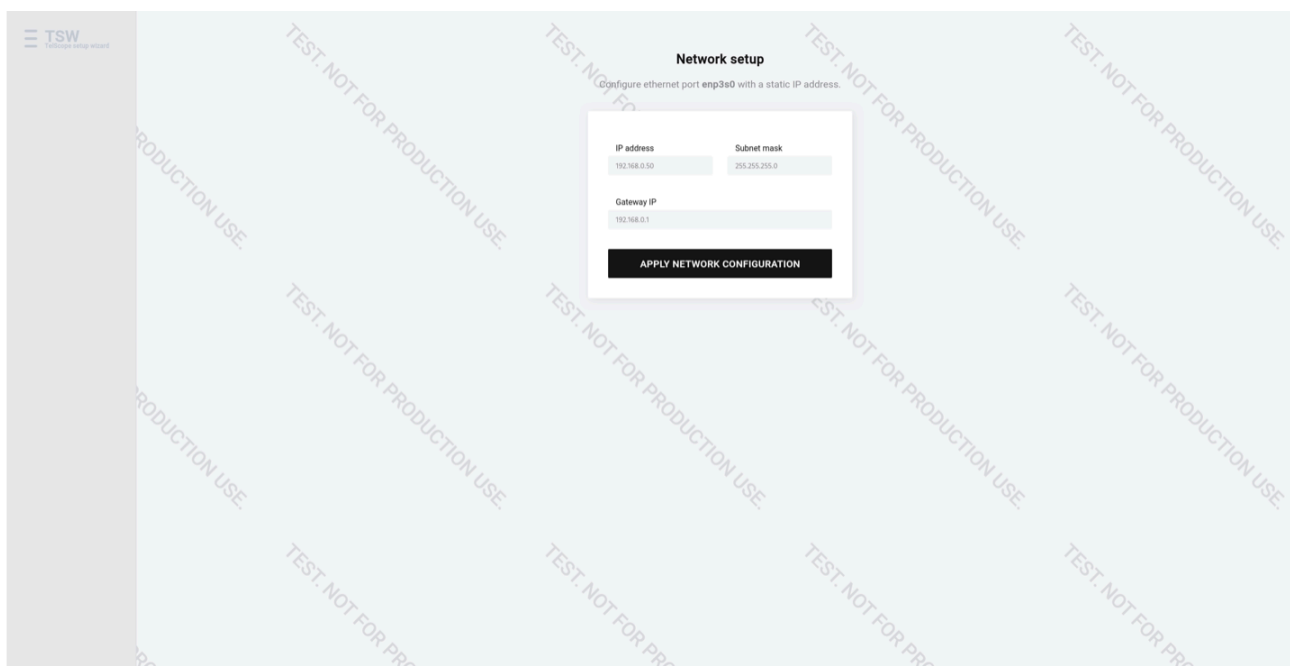


### NETWORK SETUP

Turn the system on and connect a LAN cable in the back of the system in the port named enp3s0  
For DHCP a static lease/reservation must be configured



Setup (Static IP) button to access the next step where you will enter your static IP address.  
The IP address must be in the RFC1918 range 10.0.0.0/8, 172.16.0.0/12 or 192.168.0.0/16

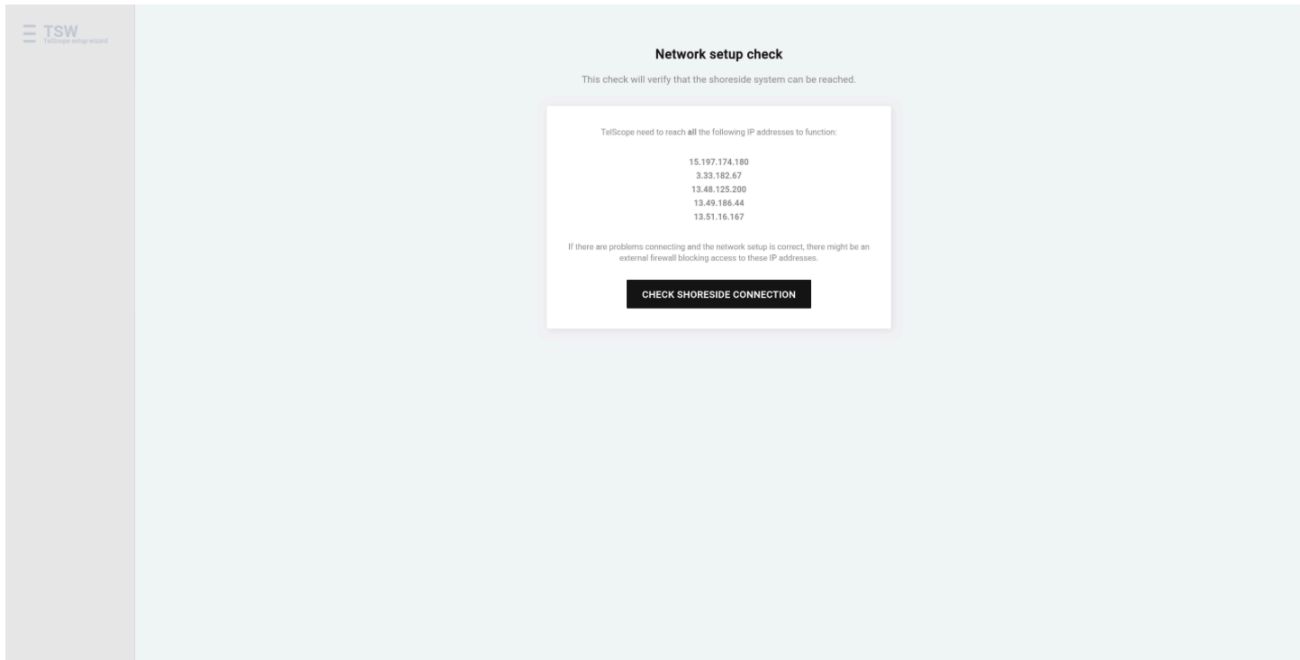


At this stage Network Setup Check page will be shown.

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

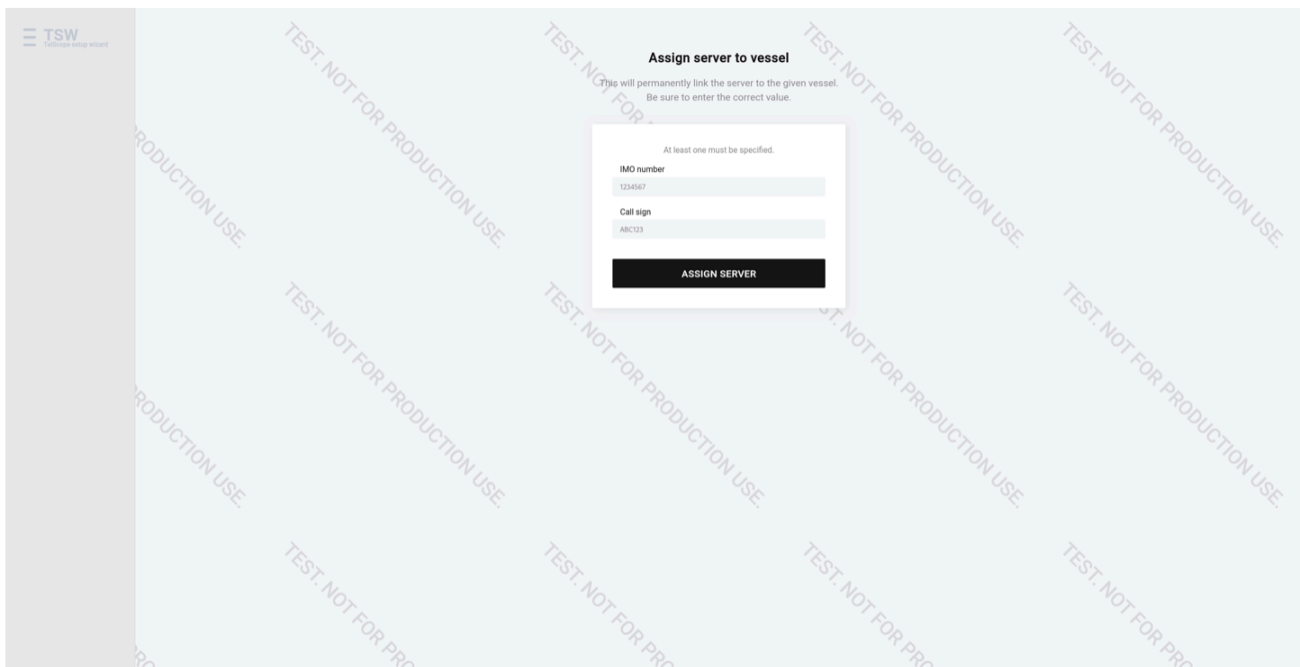
Press the Check Shoreside Connection button to continue

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



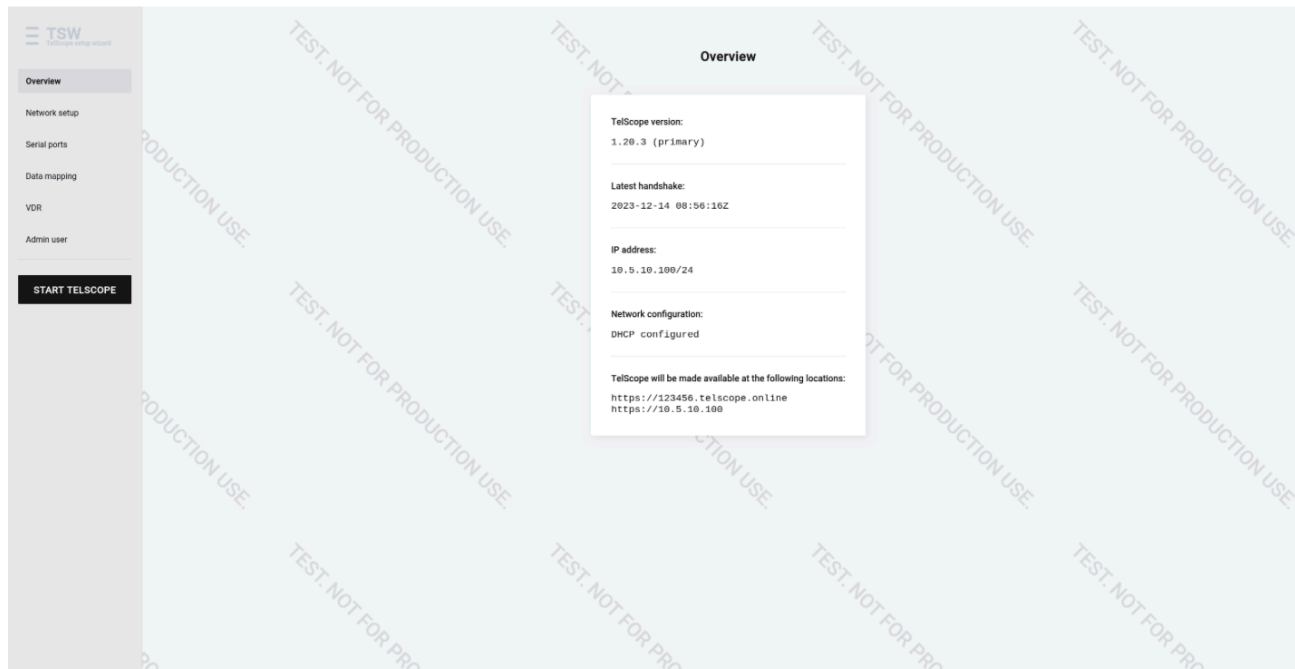
Assign Server to shore, In this step an IMO number or call sign is entered.

This will permanently link the server to the given vessel, so make sure to enter the correct value



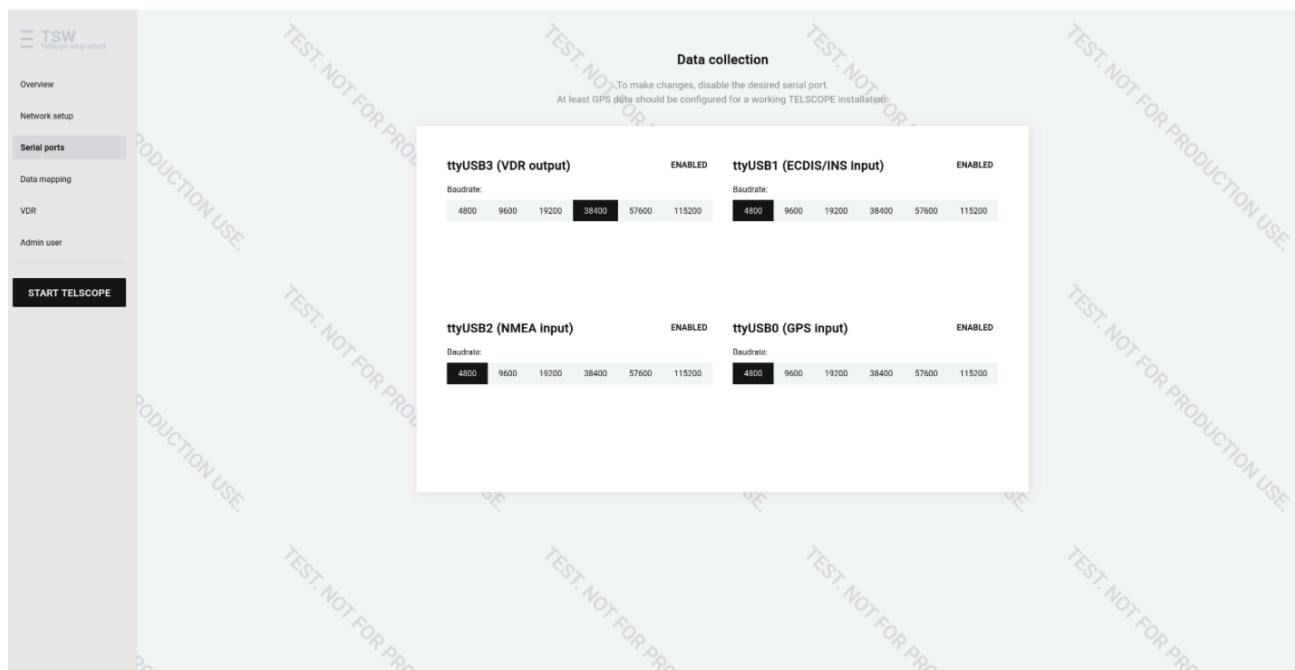
## OVERVIEW

At this stage, TELSCOPE has now received a connection to the shore and information about which TELSCOPE Version, Latest Handshake, IP Address, Network Configuration, Target IP or URL



## DATA COLLECTION SERIAL

At least GPS (USB0) data should be configured for a working TELSCOPE installation. The Comports at the back of the TELSCOPE server are labeled with the same text as in this page. Data will be shown (if received) in the box below change to correct Baudrate



## DATA MAPPING

Please select the sources that should be used for the readings

**Data mapping**

Please select the sources that should be used for the readings listed below.  
If a source is missing make sure the corresponding serial port has been configured first.

Name	Source
Position:	GPS - GP.GLLPOS
Course over ground:	GPS - GP.VTG.COG
Speed over ground:	GPS - GP.VTG.SOG
Heading:	MISC - HE.HDT.HDG
Speed through water:	MISC - VD.VBW.STW
Depth:	MISC - SD.DPT.DPTH
True wind direction:	None
True wind speed:	None
Relative wind direction:	MISC - WLMWW.WIND.REL.DIR
Relative wind speed:	MISC - WLMWW.WIND.REL.SPD

**SAVE CHANGES**

## VDR - IEC 61162-450 Edition 2.0 2018-05 (OPTION)

Configure TELSCOPE to send Logbooks Entries  
LAN2 (enp4s0) - IEC 61162-450 (Option)

"Binary file transfer using UDP multicast", which uses 60021 to 60030  
Fill in all relevant information (IP, Subnet, SFI, Destination SFI, Device, Channel)

**VDR (IEC 61162-450)**

Configure Telescope to send logbook entries via IEC 61162-450 binary file transfer (UDP multicast) to VDR.  
Ethernet port **enp4s0** (00:03:29:98:0E:65) shall be used when connecting to a IEC 61162-450 network.

Successful transfers: -  
Failed transfers: -  
Unrecognized headers: -  
Retransmissions: -

IP address: 192.168.4.50 Subnet mask: 255.255.255.0

Multicast address: 239.192.0.21 (60021) [source-transmittable]

SFI: 60021 Destination SFI: 60001

Device: 1 Channel: 1

**CONFIGURE**

## ADMIN USER

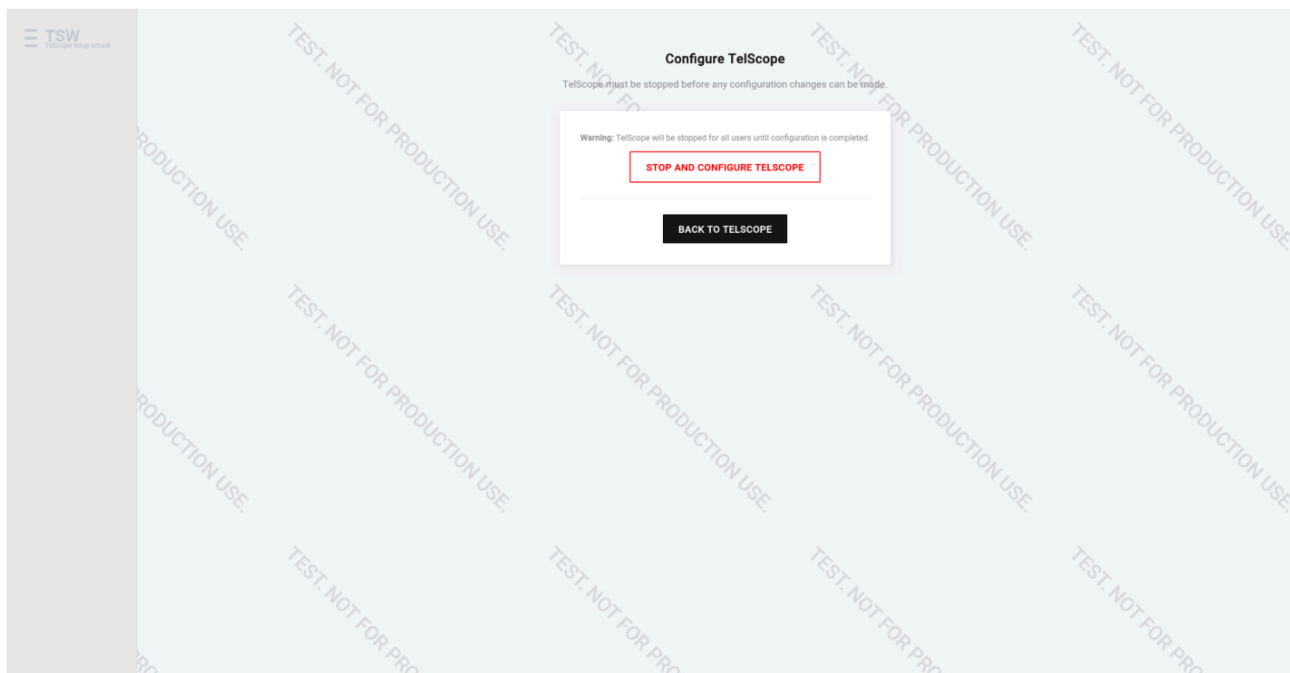
Write the information on this page down, this is important as it will not be available after starting TELSCOPE. This user will be used for the initial TELSCOPE setup.

## INSTALLATION REPORT

Fill in the relevant data and submit

## START / STOP

When all configuration is complete press Start TELESCEPE, In order to access the configuration tool, TELESCEPE must be stopped first



## TELSCOPE INSTALLATION AND COMMISSIONING

After installation is complete, it is a requirement to complete the Installation Checklist. The installer must complete all relevant information on page 1.

Page 2 is handed over to the Master to save on board (Master Statement)

If there is no Installation Checklist in the TELESCEPE box, it is the installer's responsibility to download and print  
See link below

<https://telko.liveagent.se/436336-TELSCOPE-Installation-Checklist>



