# Commissioning

## Purpose

This chapter contains the information about the commissioning of NavVision ® onboard of the vessel.

## Preconditions

* All NavVision system components like computers, switches, PLC, interfaces, have to be mounted, connected and powered
* All components like sensors, engines, generators, I/O components must be connected to the corresponding sensors and interfaces of the NavVision system
* The server computer(s) as well as client computer(s) must be up and running
* All network and serial cables, must be connected
* The remote service unit must be connected and installed with a working GPRS Sim-cart
* Engines, generators, radar and all other equipment within the NavVision system must be ready for testing
* The alarm system(s) must be working and ready for testing
* During the time of commissioning and acceptance tests there need to be assistance from a technician who is familiar with the system installation.

## Safety information

Commissioning must not start until you have ensured that the machine in which the components described here are installed as described in the relevant Installation Manual.

**WARNING**

* **NavVision devices and software must only be commissioned by suitably qualified personnel**
* **The personnel must take into account the information provided in the technical customer documentation for the product, and be familiar with and observe the specified danger and warning notices**
* **When the machine or system is operated, hazardous movements can occur**
* **All of the work carried-out on the electrical machine or system must be carried-out with it in a no-voltage condition**
* **When electrical equipment and motors are operated, the associated electrical circuits are at hazardous voltage levels**
* **The successful and safe operation of these devices depends on correct transport, proper storage and installation, as well as careful operation and maintenance.**
* **In addition to the danger and warning information provided in the technical customer documentation, the applicable national, local, and system-specific regulations and requirements must be taken into account.**

## Commissioning steps

### Wiring schematics

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| **Check** | **Contents of check** | **Passed** |
| Wiring schematics | Verify that all wiring connections are in conformity with the latest version schematic. |  |
| Check USB connections vs. COM port connections. |  |
| Check LAN port connection vs. IP-address. |  |
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| Remarks |  | |

### Wiring, cables and connections

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| **Check** | **Contents of check** | **Passed** |
| Wiring / cables | Check that the correct category cable is used (e.g. UTP, STP, CAT5E etc.). |  |
| Check that the cables are free of kinks, knots or snags. |  |
| Check that the cables are not overstressed by overload. |  |
| Check that the cables are correctly tightened with tie wraps. |  |
| Check that the cables are properly supported. |  |
| Cable run:  Do not allow the cable to form right angles or sharp bends.  Check if the correct bend radius has been applied. |  |
| Check that the cables are not squeezed. |  |
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| Remarks |  | |
| **Check** | **Contents of check** | **Passed** |
| Connections | Check that the electrical connections are correct. |  |
| Check that contacts are clean and that parts are correctly installed to protect them from dust and dirt. |  |
| Check the switch port connections vs. fault indications. |  |
|  | Check if CAT5 cable connectors are properly prepared (use Fluke). |  |
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| Remarks |  | |

### System components

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| **Check** | **Contents of check** | **Passed** |
| System components | Verify that the components used are in conformity with the latest version schematic. |  |
| The mechanical and electrical environmental conditions at the installation site must be within the limits described in the technical data. Dusty, damp places, places susceptible to rapid temperature variations, powerful vibrations and shocks, surge voltages of high amplitude and fast rise time, hot places with no ventilation or AC, strong induced magnetic fields or similar extreme conditions should be avoided. |  |
| Check power and data connections. |  |
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| Remarks |  | |

### System start-up

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| **Check** | **Contents of check** | **Passed** |
| Software | Check if the appropriate software version (latest software release) is installed. |  |
| Ensure that all change log specifications are correct for this installation (check on all systems). |  |
| Anomalies | Check if there are any irregularities at and during startup. Look for long startup, error messages, boot loader problems, boot loader icon problems etc. |  |
|  | Push F11 (Performance) for detailed information on the network.  If there is an alarm right away, write it down for later investigation and check if the other servers show the same. |  |
| Input devices | After starting tests, shutdown all servers and clients except for one server where you will work on. Check all input devices. |  |
|  | Check boot loader network icons for connection. Look for device data at viewers.  In menu “Settings > Configuration > Network” verify if all network adapters are available and connected. |  |
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| Remarks |  | |

### NavVision software

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| **Check** | **Contents of check** | **Passed** |
| NavVision ® software version | Check if the appropriate software version (latest software release) is installed. |  |
| If necessary, install the new version on every computer in the network. |  |
| Check for changed subfolders (icons, symbols.dat, boot loader etc.) see sub.2 to make sure that all the specifications in the change log are correct for the current installation. |  |
| Push F11 for detailed information on the network.  If there is an alarm right away, write it down for later investigation and check if the other servers show the same. |  |
| Input devices | After starting tests, shutdown all servers and clients except for one server where you will work on. Check all input devices. |  |
| Check boot loader network icons for connection. Look for device data at viewers.  In menu “Settings > Configuration > Network” verify if all network adapters are available and connected. |  |
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| Remarks |  | |

### Firmware devices

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| **Check** | **Contents of check** | **Passed** |
| V-Linx serial  interface | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| Axis IP camera | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| ICP DAS | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| Victron Mk2.2b | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| Moxa serial  interface | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
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| Remarks | Latest versions are to be found on the manufacturers website. | |

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| **Check** | **Contents of check** | **Passed** |
| Victron  J1708 – J1939 | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| GPRS modem | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| Ethernet  J1939 interface | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| Wago | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
| NavVision | Check the current firmware version. |  |
| If necessary, upgrade the system with the latest version. |  |
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| Remarks |  | |

### LAN and serial connections

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| **Check** | **Contents of check** | **Passed** |
| LAN connections | Test all LAN network connections.  If necessary, use the Fluke network-tester to test every individual LAN cable. |  |
| Check if crossed cabling (TX to RX) is used.  Use F11 for network information. |  |
| Serial connections | Test all serial connections.  Check the LED indicators (see supplier manual). |  |
| Check if the correct (type and brand) cabling (e.g. shielded twisted pair, CAT5e) is used.  Check that NavVision recognizes the connection. |  |
| Use Debug mode to see if there is any data transfer. Look at the RX/TX LEDs to see if data is transmitted.  For NMEA look under menu “Tools > Settings > NMEA” to see if the proper strings are coming in. |  |
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| Remarks |  |  |

### CAN bus connections

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| **Check** | **Contents of check** | **Passed** |
| CAN bus connections | Verify the FT viewer readouts to ensure that the CAN bus connections are correct. |  |
| Check if the correct cabling (type and brand) is used. |  |
|  | If no connection is established, make a log of the specific Can bus channel. If a CANOP/ICP is used, check the RX/TX LEDs. |  |
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| Remarks |  |  |

### Wago

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| **Check** | **Contents of check** | **Passed** |
| Sensor list | Use the enclosed sensor list to functional test each slice and pin. Use the sensor list as checklist.  Make sure it is recorded if there is no data on a pin. Notify the responsible technician or shipyard. :  Do not intend to repair it yourself.  Making changes in the Wago is recommended only at completion of the relevant commissioning steps. If faults need to be corrected, use the sensor list as the update mechanism. |  |
| Check the Wago for its actual performance.  Go to menu “FT > Tools > Settings > Wago” to verify the status of operation.  Make sure the operating mode switch on the station is in the top (RUN) position.  Check if station is supplied with electrical power (see voltage status LED). Verify that the Wago slices are correctly installed and connected (monitor error LED). |  |
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| Remarks |  |  |

### PLC program

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| **Check** | **Contents of check** | **Passed** |
| PLC program | Make sure you have the latest release PLC program with you. Test if the program is running with CODESYS on your laptop and connected to the Server. |  |
| Test the PLC program. Test each line of the program by running it on the server while checking it in CODESYS.  :  Modifying the PLC program software must only be done at completion of the relevant commissioning steps. |  |
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| Remarks |  |  |

### Wago performance

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| **Check** | **Contents of check** | **Passed** |
| Actual performance | Check the Wago for its actual performance. Go to menu “FT > Tools > Settings > Wago” to verify the status of operation. |  |
| Make sure the operating mode switch on the station is in the top (RUN) position. Check if station is supplied with electrical power. Verify that the Wago slices are correctly installed and connected (see wiring schematic). |  |
| Performance connected devices | Check each device pin for proper connection. Use sensor list to mark if the right data is on the pin and if data is coming in. |  |
| Check all the pins one by one. Verify if the right sensor is connected (see wiring schematic). |  |
| If necessary change or adjust instrument in NavVision ®.  Continue until all slices have been done. Inform technician or shipyard for every connection that has no data or is wrongly connected. |  |
| Trigger the sensor and verify if the status indication LED on the Wago is blinking (digital slices). |  |
| If I/O must trigger another I/O, make sure that it works correct. |  |
| If it is an analogue IN signal, check the NavVision ® viewer to verify that data gets in. |  |
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| Remarks |  |  |

### Buttons

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| **Check** | **Contents of check** | **Passed** |
| Buttons and mimics | Check all hardwired buttons to verify if they trigger the right pin on the Wago. When triggering a sensor check the respective mimic response. |  |
| In case of any irregularities or malfunctions please inform the shipyard or technician on their responsibilities. |  |
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| Remarks |  |  |

### Alarms and viewers

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| **Check** | **Contents of check** | **Passed** |
| Alarms and viewers | Trigger the sensors (one-by-one) and verify if the respective alarm message is shown via NavVision ® (where applicable). |  |
| Check instruments, viewers and mimics to ensure that analogue data is presented. |  |
| In case of any irregularities or malfunctions please inform the shipyard or technician on their responsibilities. |  |
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| Remarks |  |  |

### Tank calibration

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| **Check** | **Contents of check** | **Passed** |
| Calibration | Calibrate all analogue slices (especially tanks). |  |
| Where possible, fill up tank with a small amount of liquid (ratio = 1 to 20), and note the associated voltage on the calibration screen. |  |
| List all successive measurements (calibration screen) until the tank is full. |  |
| Where necessary, fine-tune instrument scaling (see “Tune” button). |  |
| Adjust min/max setting for each instrument to match the right instrument scale. |  |
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| Remarks |  |  |

### Servers and clients

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| **Check** | **Contents of check** | **Passed** |
| Servers and clients | Check servers and clients for connectivity. |  |
| Select F11 to check connections. |  |
| Make sure that one of the servers (master) has all the connections. |  |
| Check if the viewers on the other servers and clients show the same data. |  |
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| Remarks |  |  |

### Alarms

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| **Check** | **Contents of check** | **Passed** |
| Servers and clients | Check if incoming alarms are shown on all servers and clients. Check that silencing and acknowledging of alarms on each server / client functions in accordance with the unique alarm station setting. |  |
| Make sure there are no irregularities in the settlement on the different servers and clients. Make settings according to the respective entitlements of the specific station. |  |
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| Remarks |  |  |

### Network connection

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| **Check** | **Contents of check** | **Passed** |
| Monitoring network connection | Disconnect the network cables one-by-one, and check if the system shows the right alarms and/or takeover the connection to other servers. |  |
| Check OWS takeover. |  |
| Check if renaming of cables and serial connections is right. |  |
| Check if connections come back quickly after disconnecting / connecting a network cable. |  |
| Check serial connections for alarms. |  |
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| Remarks |  |  |

### Viewer and mimics

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| **Check** | **Contents of check** | **Passed** |
| Tuning of viewers and mimics | Adjust viewers and mimics to meet the customer’s demands. |  |
| Carry out small / minor adjustments.  No major changes in the mimics, only minor adjustments. Setting of instruments in the viewer and personal alarms.  :  Do not alter the layout of the mimics. |  |
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| Remarks |  |  |

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| **Check** | **Contents of check** | **Passed** |
| Taskbar | Change taskbar settings to meet the customer’s demands. |  |
| Set the viewers that are available on the taskbar.  Set the viewer to startup automatically on which screen. |  |
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| Remarks |  |  |

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| **Check** | **Contents of check** | **Passed** |
| Users | Setup a new user for the customer. |  |
| Setup a new user as an operator. Ensure that this new user starts up automatically. |  |
| Ensure that the new user has the proper user rights. |  |
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| Remarks |  |  |

### Cold start and completion of test

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| **Check** | **Contents of check** | **Passed** |
| Cold start and completion of test | Shutdown full system and restart it. Ensure system functions correctly. |  |
| Verify all adjustments and settings as set before. |  |
| Make sure the system works properly. |  |
| Simulate sample alarms to verify if it functions properly. |  |
| Backup all the systems for storage. |  |
| Check electrical schematics and sensor list to see if you wrote down all adjustments. |  |
| Startup in export-mode to make a sensor list for storage. |  |
| :  Check if all “Warranty void” stickers are in place and in good condition. Replace / renew where necessary. |  |
| Ensure that the new user has the proper user rights. |  |
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| Remarks |  |  |

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| --- |
| Special remarks: |
| Owner’s/representative remarks: |
| Unfinished business: |
| Remarks for sales representative (contact, work to do, new quotation etc.) |

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