FT NavVision®

Sensorlist Manual

Publication type: Sensorlist Manual
Publication number:
Title: FT NavVision® Sensorlist Manual
Subject:
Issue: 1.3
Publication date: November 22, 2012
Total number of pages: 96

Author: Vince Kerckhaert

Quality Control:

1. Table of contents

Page #

2. Figures

3. Tables

4. References

Not applicable.

5. Introduction

In the course of time changing or altering settings in FT NavVision© has become quite time consuming. Due to the large infrastructure of the program, the vast amount of data and protocols we embed and the complexity of the large vessels that FT NavVision© is used on, just changing a simple connection type on a lot of sensors is a lot of work.

To automate this work we developed the “sensorlist” This list is a combination of a devicelist and a sensorlist in which all connections will be defined. The advantage is the fact that for changes, you can now work in a more simple “excel” document which allows you to change data more accurate and quicker and all in the same place.

This sensorlist has to be imported in FT NavVision© and after a new start-up the program will be up to date again.

This sounds easy. But you will need clear knowledge on how the sensorlist works to enjoy the full benefits of it. This manual will try to teach you everything you need to know about the sensorlist.

6. About the Sensorlist manual

The Sensorlist manual contains the following chapters:

- Chapter “Safety instructions” presents warning, caution and note information, which the user should pay attention to.
- Chapter “Human Machine Interface” Contains explanation on the look and feel of the visible part of FT NavVision®.
- Chapter “Duty Alarm System” explains how to work with the AM(C)S system and how the different parts are integrated in FT NavVision®.
- Chapter “Personal Alarm” Explains the work and feel of the different Deadman-systems provided within FT NavVision®.
- Chapter “Setting and adjustment” contains instructions on how to set and adjust FT NavVision®.
- Chapter “Performance” shows a tool for checking performance of the system on a deeper level.
- Chapter “Commissioning” contains a description of procedures to realize the acceptance test on-board the vessel.

 *: for specific information on interfaces, but also in depth information on here mentioned features, as well as here not mentioned features, we refer you to the specific manuals from FT NavVision © that can be obtained through Free Technics.*

Abbreviations list

AC	Alternating Current
AI	Analog IN
AO	Analog Out
CAN	Controller Area Network
COM	Communication
DAP	Duty Alarm panel
DI	Digital In
DIN	Deutsches Institut für Normung
DO	Digital Out
DM	Dead Man's
ECR	Engine Control Room
FT	Free Technics
GEA	General Engineers Alarm
GND	Ground
GPS	Global Positioning System
GRP	Group
ID	Identification
I/O	Input/Output
LAN	Local Area Network
LED	Light Emitting Diode
LPU	Local Processing Unit
MAC	Media Access Control
Mbps	Megabit per second
NC	Normally Closed
NMEA	National Marine Electronics Association
NO	Normally Open
OWS	Operator Work Station
PIN	Personal Identification Number
PLC	Programmable Logic Controller
Rx	Receive
SMS	Short Message Service
SRAM	Static Random Access Memory
TCP/IP	Transmission Control Protocol/ Internet Protocol
TFT	Thin Film Transistor
Tx	Transmit
UDP	User Datagram Protocol
USB	Universal Serial Bus

7. Safety instructions

:

This section provides only a summary of the most important safety requirements and notes, which will be mentioned in the individual sections. To protect your health and prevent damage to the devices, it is essential to read and carefully follow the safety instructions.

The indications NOTE, CAUTION and WARNING have the following significance:

NOTE:
An operating procedure, practice or condition etc., which it is essential to emphasize.

CAUTION

An operating procedure, practise or condition etc., which, if not strictly observed, may damage or destroy equipment.

WARNING

An operating procedure, practise or condition etc., which, if not carefully observed may result in personal injury or loss of life.

8. Revision history

Revisions issued since publication.

Issue	Date	Revision	Reason
1.0	November 22, 2012		initial release
1.1	December 13, 2012		Extended
1.2	June 24, 2013	Update	Divers

9. What is the Sensorlist

9.1 Introduction

The sensorlist is a validated description of the total FT system. Everything that is connected, whether it is a sensor, a serial connection, an engine etc. is represented in the sensorlist. The sensorlist is the start of where we build the topology, the network and all connected devices. Once imported, the sensorlist will be updated into a sensorlist_generated file that is pretty much automated. Missing files, wrong connections, etc. will be highlighted or even changed. New connections will be highlighted and fails will be highlighted as well.

If the sensorlist is kept well up to date all changes to the system can be made from within the sensorlist. It will be your ultimate tool to easily change your setup, change names or even add new sensors or complete devices. Also the sensorlist is a fine tool to troubleshoot the system. It makes it easy to find double connections, wrong terminations, strange values etc.

Learn how to work with the sensorlist and you've got half the job done.

9.2 Excel

The sensorlist is composed in Microsoft Excel. Some knowledge on working with Excel is absolutely necessary. That part of training lies beyond the scope of this manual. We refer to books and courses for Microsoft excel to learn the basics.

It is enough to have basic knowledge because the sensorlist itself is merely a form you have to fill in with the appropriate data. The sensorlist exists of two parts (tabs) which are the "devicelist" and the "sensorlist". The devicelist (see Figure 9-1) contains all the devices where he system consists of and is namely an enumeration of the topology of the system. The sensorlist (see Figure 9-2) on the other hand is a list of all the sensors attached to the system together with the necessary information for the connection.

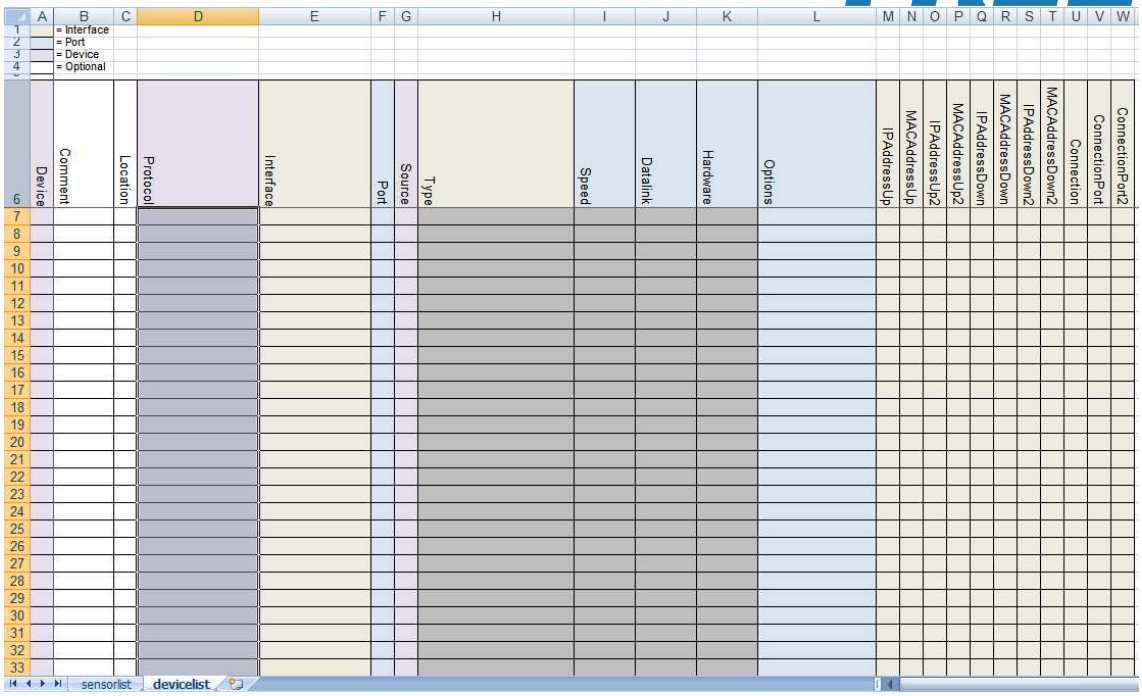


Figure 9-1: devicelist

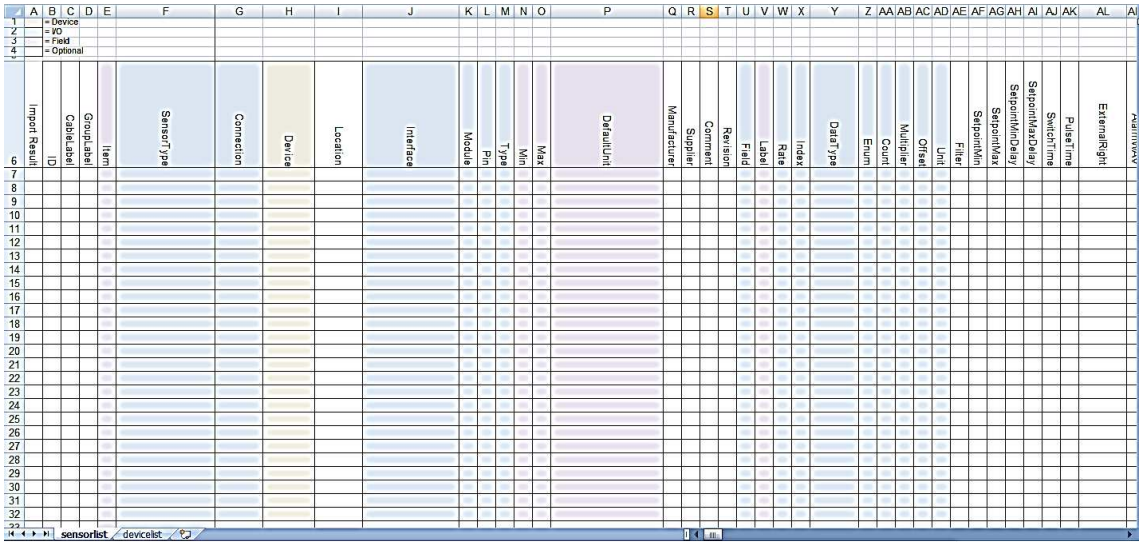


Figure 9-2: Sensorlist

It goes unsaid that for filling in the sensorlist properly, you need to make sure that you have all the appropriate data form the shipyard available.

Always ask Free Technics for the latest sensorlist. The sensorlist changes with upgrades in FT NavVision©.

9.3 Saving and naming

For working with the sensorlist always make sure that you use the latest version of Microsoft Excel. At this moment this is Microsoft Excel 2010. Although it is also possible to work with an earlier version, we will use this version as an example in this manual.

While working on the sensorlist, make sure that you save your work regularly to prevent loss of data. Goto startbutton>save as>Excel workfolder (See Figure 9-3).

Make sure you choose the right folder to save to and the right format (in this case .xlsx) and save the sensorlist with a distinctive name. When working on ship A you can use for example “sensorlist_shipA_v1.1.xlsx”. When renewing or changing the sensorlist you can add a new version number to distinguish the different versions (i.e. “sensorlist_shipA_v1.2”).

When working on the ship or on the original configuration, make sure that, together with the newest sensorlist, you take a backup of the complete NavVision folder.

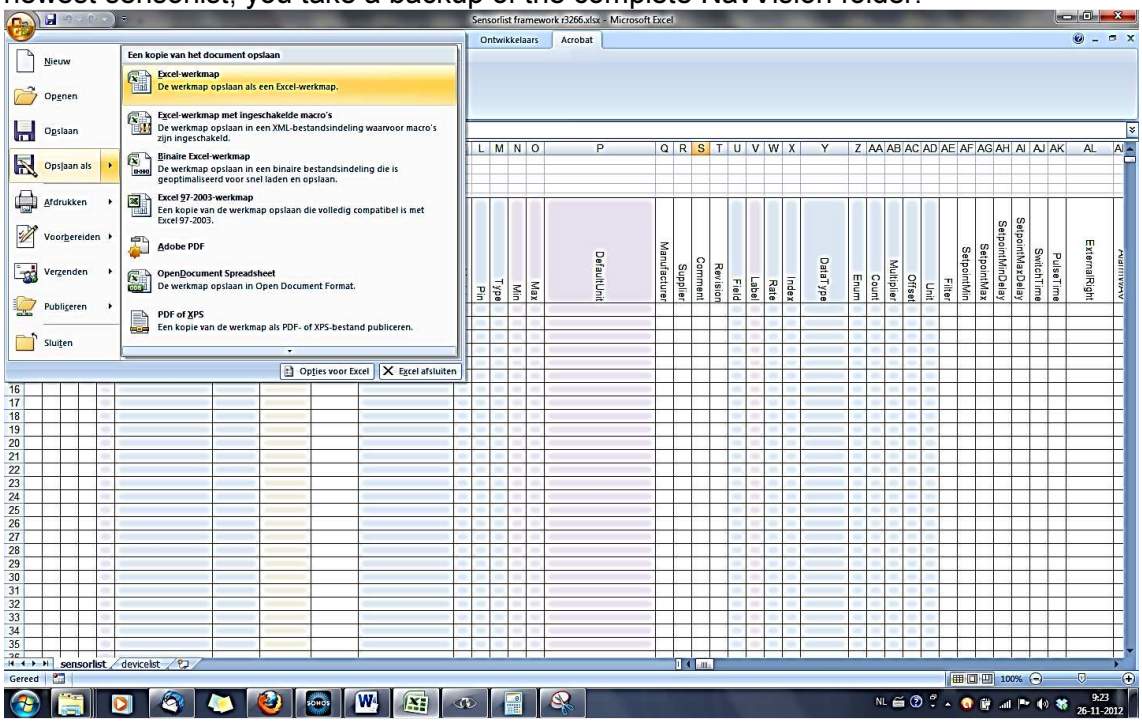


Figure 9-3: Excel saving

9.4 Saving as sensorlist for import

When saving the sensorlist to be used as import-file for FT NavVision© you need to do two things:

After choosing “save as” you go to the drop-down menu for the file type and choose “Excel 97-2003-workfolder (*.xls)” (see Figure 9-4) while this is the supported format for importing a sensorlist.

Save the sensorlist as “sensorlist.xls” no capitals.

Save this “sensorlist.xls” in the same folder as the sensorlist.xlsx you derived it from, so you can always check what has been changed and/or you can get back to previous versions.

For importing the sensorlist into FT NavVision© we refer you to Chapter 12.

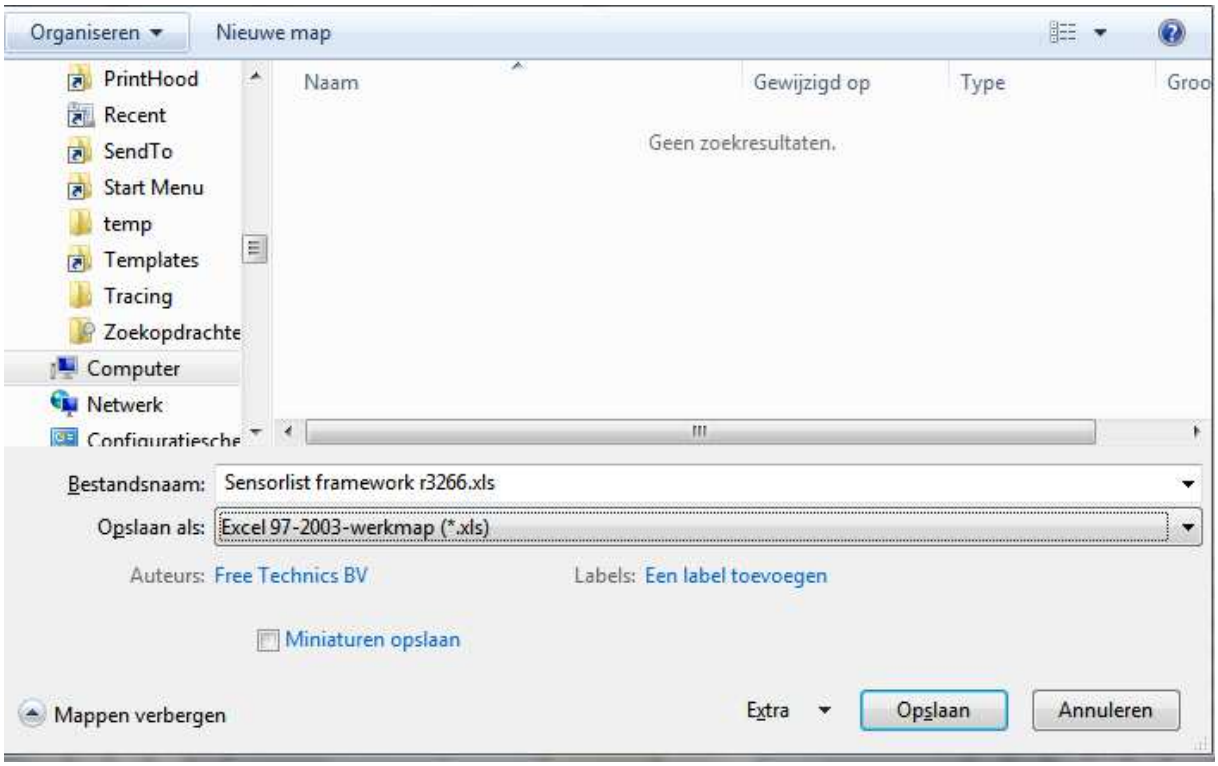


Figure 9-4: saving as sensorlist.xls

10. Devicelist

The devicelist is the part of the sensorlist that contains all the devices that are connected to FT NavVision© together with all the specific data concerning that connection. When opening a sensorlist framework you will see 2 tabs from which you will have to choose the tab named “devicelist”. (see Figure 9-1).

10.1 Introduction

The devicelist is separated in different columns which need to be filled with the right data. A few of the columns are optional and merely there for you to put your own comment. These columns are white. The other columns are almost all necessary for the proper working of the system and are colored differently. These colors belong to the different groups which can be divided into interface, port and device. Columns with the same color belong to the same group.

By defining all the devices the right way in the devicelist you will get a properly closed network once you import the sensorlist into the system. To do so you need to make a plan on how you need the network to be applied, a list of all the devices and a list of how everything will be connected. To make it visual it is best to make a single-line drawing of the topology for reference (see Figure 10-1).

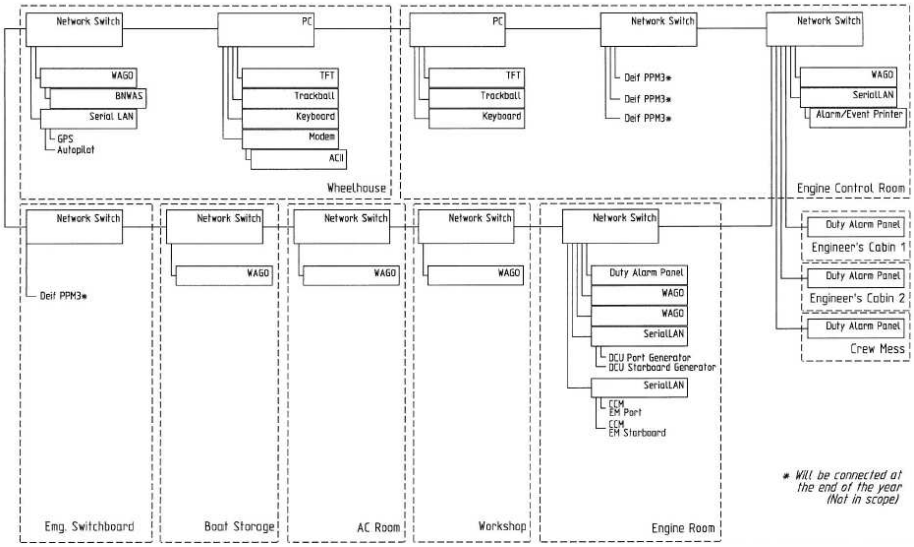


Figure 10-1: single line drawing

10.2 Columns

The columns in the devicelist are labeled in the first row. The fields underneath can be filled with free text or have a drop-down menu where you can choose a tag. These tags are mandatory and the devicelist won't except tags that are not in the list for these columns.

The following columns are in the devicelist:

Column	Type	Description
Import Result	Text	Checking value by FT NavVision©
ID	Text	Any given ID you want or need.
Device	Text	Identification of the device where the sensor/control or serial device is connected to. This text should be unique for each FT NavVision® device. The text is case sensitive
Comment	Text	Freely to add comment
Location	Text	Identification of the substation where the sensor/control is connected to in the FT NavVision® system. (i.e. ER or WH)
Protocol	Select	The protocol used for serial connections. (for options see Table 10-2)
Interface	Text (Index)	Choose the appropriate interface to distinguish the different interfaces in the system (for options see Table 10-3)
Port	Value (Index)	Port number on the FT NavVision® interface. For MOXA serial servers it's 1 or 2. On a WAGO it's always 1.
Source	Value (Index)	Identification of multiple devices on a bus protocol. Used for example for Mod bus (ID byte) and CAN bus (SA byte). Default address is 1.
Server	Text	In some cases (like with OPC and WatchIO), you need to specify a server name.
Type	Text (Index)	defines the type of module used to read/control the I/O. (for options see Table 10-4)

Speed	Value (Index)	The Baudrate the device is communicating with. See devices manual for the appropriate speed.
Datalink	Value (Index)	Defines the parity, databits and stopbit. See devices manual for appropriate settings
Hardware	Value (Index)	Serial communication protocol
Options	Text (comma separated)	Divers special settings for various devices. See devices manual for need of these special demands. (for options see Table 10-5).
IPAddressUp	IP-address	IP address of the FT NavVision® interface that's connected to the device or sensor/control. Up-side (for explanation see Chapter 10.3).
MACAddressUp	MAC-address	MAC address of the FT NavVision® interface that's connected to the device or sensor/control. Up-side (for explanation see Chapter 10.4).
IPAddressUp2	IP-address	IP address of the FT NavVision® interface that's connected to the device or sensor/control. Up-side double wired system (for explanation see Chapter 10.3).
MACAddressUp2	MAC-address	MAC address of the FT NavVision® interface that's connected to the device or sensor/control. Up-side double wired system (for explanation see Chapter 10.4).
IPAddressDown	IP-address	IP address of the FT NavVision® interface that's connected to the device or sensor/control. Down-side (for explanation see Chapter 10.3).
MACAddressDown	MAC-address	MAC address of the FT NavVision® interface that's connected to the device or sensor/control. Down-side (for explanation see Chapter 10.4).
IPAddressDown2	IP-address	IP address of the FT NavVision® interface that's connected to the device or sensor/control. Down-side double wired system (for explanation see Chapter 10.3).
MACAddressDown2	MAC-address	MAC address of the FT NavVision® interface that's connected to the device or sensor/control. Down-side double wired system (for explanation see Chapter 10.4).
Connection	Text	Specify the device (see first column) to which this device is connected
Connection Port	Value	Specify the port on the device where this device is connected to
Connection Port2	Value	Specify the port on the device where this device is connected to. Double wired system
Visible	Yes/No	Non mandatory field to tell FT NavVision© if the node needs to be visible in the network topology.

Table 10-1: Devicelist Columns

Option	Devicetype	Description
Adam	Serial	Advantech 4500/5000 series
AIS	Serial	AIS Data over Nmea
Algodue	Serial	Algodue AC monitoring module
Asea	Serial	Asea Shore converters
AutoAnchor601	Serial	Chaincounter
BMV501	Serial	Victron battery monitoring modules

BMV602	Serial	Victron battery monitoring modules
BTM1	Serial	Mastervolt battery monitoring modules
Can	I7540D	CAN bus
Cat	Serial	Caterpillar CAT-Link protocol. Link via CCM
CF Smartview	Serial	Broadband
Crompton	Serial	Crompton AC monitoring module
DssKeypad	Serial	CAN-based keypad
EM4000	Serial	ELEQ AC monitoring module
EmpirBus	Serial	power supply systems
Frigomar_626C	Serial	Airconditioning
FSI_2DACM	Serial	Current measurement sensors from Falmouth Scientific Instruments
Generic	Serial	Gen-set
Gensys	Serial	GenSYS power management system (PMS) monitoring
J1708	I7540D	SAE J1708
J1939	I7540D	SAE J1939
KiloPakIguard	Serial	Kilopak I-Guard Generators
Littau Anchor	Serial	Anchoring
Lutron	Serial	Lutron Light system
MalinDraught	Serial	Draft System
Masterbus Modbus	Serial	Mastervolt charger/inverter modules through Modbus
Mastervolt	Serial	Mastervolt charger/inverter modules
Mitsubishi_DMS_II	Serial	
ModBus	Serial/IP	Modbus ASCII/RTU Serial or TCP/IP
ModBus Slave	Serial/IP	Modbus ASCII/RTU Serial or TCP/IP
MPC30	Serial	Inkjet printer
MTU	Serial	MTU MCS-5 system. Connections to be made through LOP, PIM or PCS.
MVECP	Serial	PaxMAN Engine Control Unit
Nke	Serial	NKE Navigation Instruments and Autopilots
Nmea	Serial	NMEA 183
Nmea2000	I7540D	NMEA 2000 over CAN.
PC		Server or Client PC
PPM3	Serial	Deif power management system (PMS) monitoring
Printer	Serial	Printer
Sae	I7540D	SAE
SD41	Serial	
SMS	Serial	SMS Module (Tango blackbox modem)
Sounder	Serial	Black box video sounder
SygoDraft	Serial	Sygo Draft systems
TMA4S	Serial	Tank Gauging System
Vaisala_CL31	Serial	Vaisala cloud detection sensor
Vaisala_LT31	Serial	Vaisala LT series visibility sensor
Vaisala_PTB330	Serial	Vaisala Digital Barometer
Vaisala_PW	Serial	Vaisala PW series visibility sensor
VDR	Serial	VDR output connection (NMEA 183 based)
Victron	Serial	Victron charger/inverter modules
VictronVEBus	Serial	Victron BUS

VisiplexPaging	Serial	Alarm paging system

Table 10-2: Protocol Options

Interface	Description
Camera 01, Camera 02, etc.	Define the different IP cameras on the network. Do not use the same Camera twice.
CAN 01, CAN 02, etc.	Use a separate interface-ID for each Canbus device. If you, for example, have two I7540D devices, you choose CAN 01 for the first and CAN 02 for the second
Client 01, Client 02, etc.	Clients, can be DAP's, Client PC;s and al workstations that aren't servers. Each one needs to be provided with a separate Client-ID
Local Serial	Choose this interface setting for a serial connection that is directly connected to the server.
Network Serial 01, Network Serial 02, etc.	Network Serial devices are devices like the MOXA that are used as an interface between serial to LAN. Each interface needs a distinctive interface. More ports on the same device will get the same interface
Printer	When a printer is connected
Server 01, Server 02, etc.	The main workstations will act as server. Each server gets its own interface
Settings	Use if the line contains a setting for FT NavVision©
Switch 01, Switch 02, etc.	Interface for network switches. Although the switches have multiple ports, you only use one interface for each switch.
Wago 01, Wago 02, etc.	When a Wago is connected, choose Wago as interface. Each Wago gets its own interface
WatchIO	Special connection type for WatchIO

Table 10-3: Interface Options

Type	Description
Axis 241Q	Axis IP camera interface
Carlisle Finch	Searchlight interface
GW003	
ICPdas i7540D	CANbus to serial interface
ModBus TCP/IP	Modbus over TCP/IP
ModBus TCP/IP Slave	Modbus over TCP/IP slave
Moxa UC-711X	Serial to Ethernet interface
PC	Server, DAP, panel PC, etc.
Printer	Printer
Serial TCP/IP Client	TCP/IP client over serial connection
Serial TCP/IP Server	TCP/IP server over serial connection
Serial UDP/IP Client	UDP/IP client over serial connection
Serial UDP/IP Broadcast	Typical broadcast over UDP/IP
Switch	Switch to connect different devices
Telnet	Telnet
V-Linx ESR-904	Serial to Ethernet interface
Wago	PLC
Wago 750-881	PLC type specific

Wago 750-882	PLC type specific

Table 10-4: Type Options

Device	Description
AlarmDataLoss	Gives an alarm on loss of data on the specific port. Works only when the interface have had a connection before.
DTR	When Data Terminal Ready needs to be set High
dtr	When Data Terminal Ready needs to be set Low
RTS	When Request to send needs to be set High
rts	When Request to send needs to be set Low
RTU	Sets the port to RTU
ASCII	Sets the port to ASCII
MSBFirst	Set reading of Most Significant Bit First
LSBFirst	Set reading of Least Significant Bit First
MSWFirst	Set reading of Most Significant Word First
LSWFirst	Set reading of Least Significant Word First
MaxWordCount=	Some Modbus protocols can read only an x-amount of registers at one time. While FT works with the Modbus standard of 123 registers, you need to limit the max value of words that FT is questioning. For Heinen Hopman for example it is “MaxWordCount=10”
NoHoles	Some Modbus protocols can’t handle it when there are a lot of unused registers between the different calls. With the option “NoHoles” all the registers that are not used will be ignored.

Table 10-5: Device options

10.3 IP-addresses

10.3.1 Introduction

At Free Technics© we use a specific set of IP-addresses for our connections. We use the 172.16.x.x range for the i/o side of our system and the 172.17.x.x range for the next ring. If there are more rings connected than these two we go on with 172.18.x.x etc. As you can find in the “installation and commissioning manual” we use also specific ranges for the different devices and interfaces (see Table 10-6).

Detail	IP-Address
PC I/O	172.16.x.x (172.16.24.35 for key number 2435)
PC I/O next ring	172.17.x.x (172.17.24.35 for key number 2435)
Duty Alarm Panels (DAP)	Using range x.x.1.8y Depending on the network connected, this will result in: DAP 1: 172.16.1.81 DAP 2: 172.16.1.82 DAP 3: 172.16.1.83
Serial LAN servers	Using range 172.16.1.4x (attached to I/O subnet 172.16) INT 1: 172.16.1.41 INT 2: 172.16.1.42 INT 3: 172.16.1.43
Wago	Using range 172.16.1.9x (attached to I/O subnet 172.16) Wago substation 1: 172.16.1.91 Wago substation 2: 172.16.1.92

	Wago substation 3: 172.16.1.93
CAN-Interface	Using range 172.16.1.3x (attached to I/O subnet 172.16) CAN interface 1: 172.16.1.31 CAN interface 2: 172.16.1.32 CAN interface 3: 172.16.1.33
Axis	Using range 172.16.1.24x (attached to I/O subnet 172.16) Axis cam server 1: 172.16.1.241 Axis cam server 2: 172.16.1.242 Axis cam server 3: 172.16.1.243

Table 10-6: IP Ranges

We work from the single line drawing to make it possible to get all the IP-addresses to the right line in the devicelist. Also it is wise to start with building the topology of the single line drawing in to the devicelist. This way you will get closed rings.

10.3.2 IPAddressUp- IPAddressDown

In the single line drawing you best number all the connections upfront so you minimise the mistakes. Say that the IPAddressUp is number 1 and the IPAddressDown is number 2 (try to make the Up-address to go to the i/o side of the system). The drawing will look like the following:

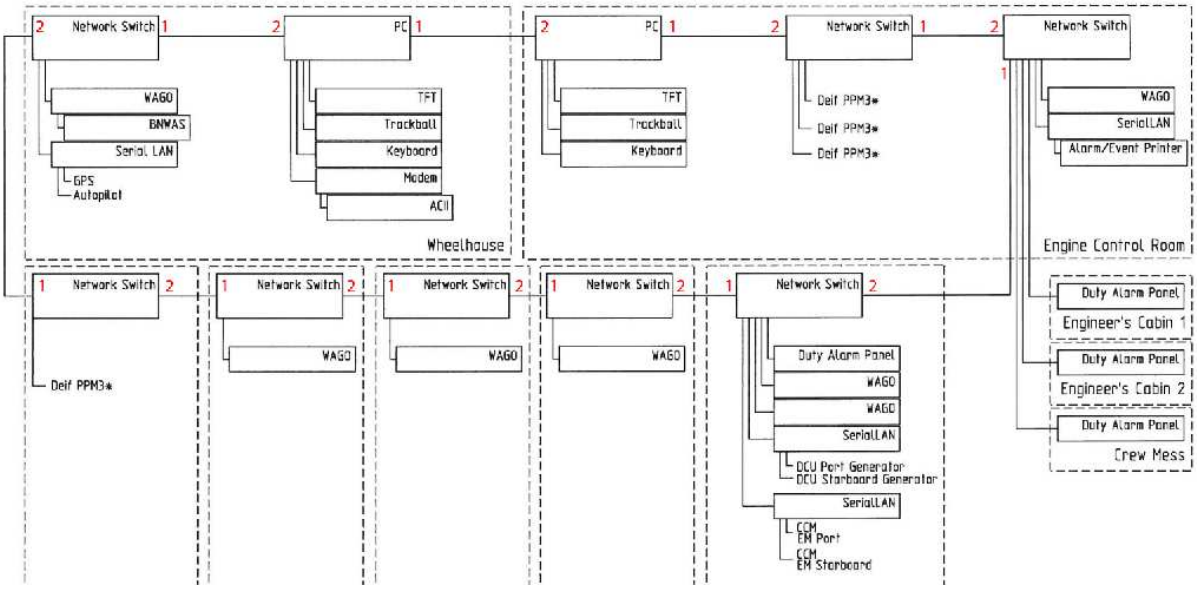


Figure 10-2: numbering the drawing

As you can see we have numbered all the devices with the numbers 1 and 2. Now number 1 is the “IPAddressUp” and number 2 is the “IPAddressDown”. So, for example. for the PC (let’s assume it has key number 3035) the number 1 side , in the sensorlist IPAddressUp, will be 172.16.30.35. the number 2 side, in the devicelist the IPAddressDown, will be 172.17.30.35. You’ll notice that de down-side is considered as another ring and will get another IP-range.

While the Switches do not have an IP-address they need not have one of the above mentioned IP addresses assigned. More on how to build that in to the devicelist in chapter 10.5.11

The interfaces such as the Wago, the SerialLan etc. will get their own IP address as well as a port connection (also see Chapter 10.5.11)

10.3.3 IPAddressUp2- IPAddressDown2

If we use a redundant system or a double wired system. The second pair of cabling will be treated the same way as described above. With this difference that the connections are new rings so they get separate IP ranges.

10.4 Mac addresses

10.4.1 Introduction

To be identified in a network it is sometimes needed that the MAC address is available to distinguish two or more of the same devices. The MAC address is a unique number that is only conjugated to one device. So if there are two or more Moxa's on a network, FT needs to separate them with their distinct MAC number. For these devices you need to fill in the MAC address in the devicelist.

10.4.2 MACAddressUp(2)- MACAddressDown(2)

In the devicelist you fill in the MAC address behind the device or interface you have the address from. Normally devices like this will be connected on a single point so you will only have to fill in the "MACAddressUp" or, in case of double wiring the "MACAddressUp2".

On the rare occasion that a device is connected to port 1 (IPAddressUp) and to port 2 (IPAddressDown) of another device you may have to use the "MACAddressDown"

10.5 How to implement this in the devicelist

10.5.1 Introduction

To implement all the devices in the devicelist we will now give an example on the basis of the single-line drawing we presented earlier. We will try to give you a method that is easy to use, yet with the least possibilities to make any mistakes. Once you get familiar with the devicelist, you can derive your own method of working. The ultimate goal of the devicelist is to make the topology connected flawlessly which can be checked in FT NavVision©.

10.5.2 The devices

As seen earlier a device name is "Identification of the device where the sensor/control or serial device is connected to. This text should be unique for each FT NavVision® device. The text is case sensitive"

So to use it later on in the sensorlist it is mandatory that you give each device a name that is unique. So use names as "GPS" or "Port Engine" or any other name as long as it is descriptive for your device.

As the example single line drawing shows we have two servers that are in the topology. For now let's call them Server 1 and Server 2. So the first devices that we put into the devicelist

are these two. Please remember wich one you call Server 1 and which Server 2 (easiest way to do is to write it down in the drawing). Now let's put them in the devicelist (see Figure 10-3).

	Device	Comment
6		
7	Server 1	
8	Server 2	
9		
10		

Figure 10-3: Filling device column 1

Next thing we find in the drawing are a lot of switches. We can number the switches or give them the location as a tag, or even both. That way we know later on about which switch we are talking. In this case we work with the descriptive name and we get the following:

	Device
6	
7	Server 1
8	Server 2
9	Switch 1 ECR
10	Switch 2 ECR
11	Switch ER
12	Switch Workshop
13	Switch AC Room
14	Switch Storage
15	Switch Em. SB
16	Switch WH
17	

Figure 10-4: Filling device column 2

Next we take the Wago's. Lets also take the descriptive name for that and we get the following:

6	Device	Comment
7	Server 1	
8	Server 2	
9	Switch 1 ECR	
10	Switch 2 ECR	
11	Switch ER	
12	Switch Workshop	
13	Switch AC Room	
14	Switch Storage	
15	Switch Em. SB	
16	Switch WH	
17	Wago WH	
18	Wago ECR	
19	Wago 1 ER	
20	Wago 2 ER	
21	Wago Workshop	
22	Wago AC Room	
23	Wago Storage	

Figure 10-5: Filling device column 3

Last items are some serial Lan interfaces and some DAP's (Duty Alarm Panels). Adding these makes the device column complete and gives the following result:

6	Device	omment
7	Server 1	
8	Server 2	
9	Switch 1 ECR	
10	Switch 2 ECR	
11	Switch ER	
12	Switch Workshop	
13	Switch AC Room	
14	Switch Storage	
15	Switch Em. SB	
16	Switch WH	
17	Wago WH	
18	Wago ECR	
19	Wago 1 ER	
20	Wago 2 ER	
21	Wago Workshop	
22	Wago AC Room	
23	Wago Storage	
24	Serial WH-1	
25	Serial WH-2	
26	Serial ECR	
27	Serial 1 ER-1	
28	Serial 2 ER-1	
29	Serial 1 ER-2	
30	Serial 2 ER-2	
31	DAP Eng. Cabin 1	
32	DAP Eng. Cabin 2	
33	DAP Enq. Crew	
34	Dap ER	

Figure 10-6: Filling device column 4

 *:Serial Lan's have multiple ports as well as some other interfaces. Make sure you put both ports (if in use) in the device column. You can give it a name like "serial 1 ER-1"wich is the first port of the first serial Lan interface in the engine room, or you can name it after the sensor or device that is connected to that port (in this case "Port Generator"). We prefer the first option because sometimes you have multiple GPS's on the system or whatever and you will get confused.*

This completes the filling of the device column. If you compare it to your drawing, you can see that all the devices in the topology are now in the devicelist. Time to move to the next column.

10.5.3 Comment

We leave this up to you. If you have something you need to remember with a certain device you can keep it here. FT NavVision© doesn't use this information.

10.5.4 Location

The location is the Identification of the substation where the sensor/control is connected to in the FT NavVision® system. You can easily get that from the drawing and put it in the Location column. In our case we will get the following:

6	Device	Comment	Location
7	Server 1		WH
8	Server 2		ECR
9	Switch 1 ECR		ECR
10	Switch 2 ECR		ECR
11	Switch ER		ER
12	Switch Workshop		WS
13	Switch AC Room		ACR
14	Switch Storage		Storage
15	Switch Em. SB		ESB
16	Switch WH		WH
17	Wago WH		WH
18	Wago ECR		ECR
19	Wago 1 ER		ER
20	Wago 2 ER		ER
21	Wago Workshop		WS
22	Wago AC Room		ACR
23	Wago Storage		Storage
24	Serial WH-1		WH
25	Serial WH-2		WH
26	Serial ECR		ECR
27	Serial 1 ER-1		ER
28	Serial 2 ER-1		ER
29	Serial 1 ER-2		ER
30	Serial 2 ER-2		ER
31	DAP Eng. Cabin 1		Cabin 1
32	DAP Eng. Cabin 2		Cabin 2
33	DAP Eng. Crew		Crew
34	Dap ER		ER

Figure 10-7: Filling location column

10.5.5 Protocol

To choose the protocol you have a lot of options. To make it easy there is a drop-down box. Just click the appropriate field and look in de drop-down menu if you can find the right protocol. (for explanation on the options see Table 10-2).

The first ones are easy. We have two server and a couple of switches and Wago's. The protocols for these are quite clear. Fill them in and you get the following:

6	Device	Comment	Location	Protocol
7	Server 1		WH	PC
8	Server 2		ECR	PC
9	Switch 1 ECR		ECR	Switch
10	Switch 2 ECR		ECR	Switch
11	Switch ER		ER	Switch
12	Switch Workshop		WS	Switch
13	Switch AC Room		ACR	Switch
14	Switch Storage		Storage	Switch
15	Switch Em. SB		ESB	Switch
16	Switch WH		WH	Switch
17	Wago WH		WH	Wago
18	Wago ECR		ECR	Wago
19	Wago 1 ER		ER	Wago
20	Wago 2 ER		ER	Wago
21	Wago Workshop		WS	Wago
22	Wago AC Room		ACR	Wago
23	Wago Storage		Storage	Wago

Figure 10-8: Filling protocol column 1

For the serial Lan's we need to know what is connected. Look at the drawing and find the right protocol for the connections you see there. For example the GPS and Autopilot are NMEA, the generators and engines are Caterpillar and the printer is a printer. Find these protocols in the drop-down menu and you'll get the following:

6	Device	Comment	Location	Protocol
7	Server 1		WH	PC
8	Server 2		ECR	PC
9	Switch 1 ECR		ECR	Switch
10	Switch 2 ECR		ECR	Switch
11	Switch ER		ER	Switch
12	Switch Workshop		WS	Switch
13	Switch AC Room		ACR	Switch
14	Switch Storage		Storage	Switch
15	Switch Em. SB		ESB	Switch
16	Switch WH		WH	Switch
17	Wago WH		WH	Wago
18	Wago ECR		ECR	Wago
19	Wago 1 ER		ER	Wago
20	Wago 2 ER		ER	Wago
21	Wago Workshop		WS	Wago
22	Wago AC Room		ACR	Wago
23	Wago Storage		Storage	Wago
24	Serial WH-1		WH	Nmea
25	Serial WH-2		WH	Nmea
26	Serial ECR		ECR	Printer
27	Serial 1 ER-1		ER	Cat
28	Serial 2 ER-1		ER	Cat
29	Serial 1 ER-2		ER	Cat
30	Serial 2 ER-2		ER	Cat

Figure 10-9: Filling protocol column 2

The DAP's are PC's so that ends the filling of the protocol column as follows:

6	Device	Comment	Location	Protocol
7	Server 1		WH	PC
8	Server 2		ECR	PC
9	Switch 1 ECR		ECR	Switch
10	Switch 2 ECR		ECR	Switch
11	Switch ER		ER	Switch
12	Switch Workshop		WS	Switch
13	Switch AC Room		ACR	Switch
14	Switch Storage		Storage	Switch
15	Switch Em. SB		ESB	Switch
16	Switch WH		WH	Switch
17	Wago WH		WH	Wago
18	Wago ECR		ECR	Wago
19	Wago 1 ER		ER	Wago
20	Wago 2 ER		ER	Wago
21	Wago Workshop		WS	Wago
22	Wago AC Room		ACR	Wago
23	Wago Storage		Storage	Wago
24	Serial WH-1		WH	Nmea
25	Serial WH-2		WH	Nmea
26	Serial ECR		ECR	Printer
27	Serial 1 ER-1		ER	Cat
28	Serial 2 ER-1		ER	Cat
29	Serial 1 ER-2		ER	Cat
30	Serial 2 ER-2		ER	Cat
31	DAP Eng. Cabin 1		Cabin 1	PC
32	DAP Eng. Cabin 2		Cabin 2	PC
33	DAP Eng. Crew		Crew	PC
34	Dap ER		ER	PC

Figure 10-10: Filling protocol column 3

10.5.6 Interface

The interface is the name of the sort of interface that is used to get the data into the system. This is used to distinguish the same sort of interfaces by a separate number.

It speaks for itself for most of the interfaces. Only notice that the PC's will be divided into Servers and Clients and for an interface that has multiple ports you need to add the same interface for each port. (for options see Table 10-3).

The result will be as follows:

6	Device	Comment	Location	Protocol	Interface
7	Server 1		WH	PC	Server 01
8	Server 2		ECR	PC	Server 02
9	Switch 1 ECR		ECR	Switch	Switch 01
10	Switch 2 ECR		ECR	Switch	Switch 02
11	Switch ER		ER	Switch	Switch 03
12	Switch Workshop		WS	Switch	Switch 04
13	Switch AC Room		ACR	Switch	Switch 05
14	Switch Storage		Storage	Switch	Switch 06
15	Switch Em. SB		ESB	Switch	Switch 07
16	Switch WH		WH	Switch	Switch 08
17	Wago WH		WH	Wago	Wago 01
18	Wago ECR		ECR	Wago	Wago 02
19	Wago 1 ER		ER	Wago	Wago 03
20	Wago 2 ER		ER	Wago	Wago 04
21	Wago Workshop		WS	Wago	Wago 05
22	Wago AC Room		ACR	Wago	Wago 06
23	Wago Storage		Storage	Wago	Wago 07
24	Serial WH-1		WH	Nmea	Network Serial 01
25	Serial WH-2		WH	Nmea	Network Serial 01
26	Serial ECR		ECR	Printer	Network Serial 02
27	Serial 1 ER-1		ER	Cat	Network Serial 03
28	Serial 2 ER-1		ER	Cat	Network Serial 03
29	Serial 1 ER-2		ER	Cat	Network Serial 04
30	Serial 2 ER-2		ER	Cat	Network Serial 04
31	DAP Eng. Cabin 1		Cabin 1	PC	Client 01
32	DAP Eng. Cabin 2		Cabin 2	PC	Client 02
33	DAP Eng. Crew		Crew	PC	Client 03
34	Dap ER		ER	PC	Client 04

Figure 10-11: Filling interface column

10.5.7 Port and Source

The port defines the port on the device that the sensor or whatever is connected. So in our case for example we have a port and a stbd engine that are both connected to the same Serial Lan. While they are separately connected one will be on port 1 and one will be on port 2. In this “Port” column you can specify this as follows:

27	Serial 1 ER-1		ER	Cat	Network Serial 03	1	1
28	Serial 2 ER-1		ER	Cat	Network Serial 03	2	1

Figure 10-12: Port and Source 1

As you can see, the first port on the Serial Lan gets number 1 and the second port gets number 2. In this case the “source” will stay at number 1.

Normally the Port and Source will be “1”

This will result in the following list:

6	Device	Comment	Location	Protocol	Interface	Port	Source
7	Server 1		WH	PC	Server 01	1	1
8	Server 2		ECR	PC	Server 02	1	1
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1
11	Switch ER		ER	Switch	Switch 03	1	1
12	Switch Workshop		WS	Switch	Switch 04	1	1
13	Switch AC Room		ACR	Switch	Switch 05	1	1
14	Switch Storage		Storage	Switch	Switch 06	1	1
15	Switch Em. SB		ESB	Switch	Switch 07	1	1
16	Switch WH		WH	Switch	Switch 08	1	1
17	Wago WH		WH	Wago	Wago 01	1	1
18	Wago ECR		ECR	Wago	Wago 02	1	1
19	Wago 1 ER		ER	Wago	Wago 03	1	1
20	Wago 2 ER		ER	Wago	Wago 04	1	1
21	Wago Workshop		WS	Wago	Wago 05	1	1
22	Wago AC Room		ACR	Wago	Wago 06	1	1
23	Wago Storage		Storage	Wago	Wago 07	1	1
24	Serial WH-1		WH	Nmea	Network Serial 01	1	1
25	Serial WH-2		WH	Nmea	Network Serial 01	2	1
26	Serial ECR		ECR	Printer	Network Serial 02	1	1
27	Serial 1 ER-1		ER	Cat	Network Serial 03	1	1
28	Serial 2 ER-1		ER	Cat	Network Serial 03	2	1
29	Serial 1 ER-2		ER	Cat	Network Serial 04	1	1
30	Serial 2 ER-2		ER	Cat	Network Serial 04	2	1
31	DAP Eng. Cabin 1		Cabin 1	PC	Client 01	1	1
32	DAP Eng. Cabin 2		Cabin 2	PC	Client 02	1	1
33	DAP Eng. Crew		Crew	PC	Client 03	1	1
34	Dap ER		ER	PC	Client 04	1	1

Figure 10-13 Port and Source 2

: The source can be as high as 256. When, for instance, you have Modbus/TCP connected through a serial Lan it is possible that there are multiple devices connected through the same bus. The ID's of these devices can also be put in the "source" column.

10.5.8 Type

defines the type of module used to read/control the I/O. (for options see Table 10-4). As you can tell from the options table it is mostly used when the i/o source is connected to the FT system through some type of interface. This can be Serial Lan, TCP/IP (Modbus or Serial) and a few more options.

Keep in mind that this is part of the interface-side in the sensorlist/devicelist. If the interface needs some extra specification, you will put it here. Most of the fields will be head on what it says but as you may have noticed earlier the Network Serial interface will need some

additional information. This is directly shown when you choose Network Serial, the fields “type, speed, datalink and hardware” will change color (see Figure 10-14).

Wago 05	1	1				
Wago 06	1	1				
Wago 07	1	1				
Network Serial 01	1	1				
Network Serial 01	2	1				
Network Serial 02	1	1				
Network Serial 03	1	1				
Network Serial 03	2	1				
Network Serial 04	1	1				
Network Serial 04	2	1				

Figure 10-14: Network Serial colors

In our example, while we do not have any special interfaces, it is quite obvious what to choose. Only some extra information will be needed for the Network Serial. The rest will look like the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type
7	Server 1		WH	PC	Server 01	1	1	PC
8	Server 2		ECR	PC	Server 02	1	1	PC
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch
11	Switch ER		ER	Switch	Switch 03	1	1	Switch
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch
16	Switch WH		WH	Switch	Switch 08	1	1	Switch
17	Wago WH		WH	Wago	Wago 01	1	1	Wago
18	Wago ECR		ECR	Wago	Wago 02	1	1	Wago
19	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago
20	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago
21	Wago Workshop		WS	Wago	Wago 05	1	1	Wago
22	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago
23	Wago Storage		Storage	Wago	Wago 07	1	1	Wago
24	Serial WH-1		WH	Nmea	Network Serial 01	1	1	
25	Serial WH-2		WH	Nmea	Network Serial 01	2	1	
26	Serial ECR		ECR	Printer	Network Serial 02	1	1	
27	Serial 1 ER-1		ER	Cat	Network Serial 03	1	1	
28	Serial 2 ER-1		ER	Cat	Network Serial 03	2	1	
29	Serial 1 ER-2		ER	Cat	Network Serial 04	1	1	
30	Serial 2 ER-2		ER	Cat	Network Serial 04	2	1	
31	DAP Eng. Cabin 1		Cabin 1	PC	Client 01	1	1	PC
32	DAP Eng. Cabin 2		Cabin 2	PC	Client 02	1	1	PC
33	DAP Eng. Crew		Crew	PC	Client 03	1	1	PC
34	Dap ER		ER	PC	Client 04	1	1	PC

Figure 10-15: Filling Type column 1

For the Network Serial you will have to look at the Interface in the same way you do as in the rest of the “Type” column. Only in this case it will probably be a serial to Ethernet interface that will go here. You can’t get that directly from the single line drawing, so you need to find out up front. In this example all the network serial interfaces are Moxa’s so we will fill that in. This results the Type column as follows:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type
7	Server 1		WH	PC	Server 01	1	1	PC
8	Server 2		ECR	PC	Server 02	1	1	PC
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch
11	Switch ER		ER	Switch	Switch 03	1	1	Switch
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch
16	Switch WH		WH	Switch	Switch 08	1	1	Switch
17	Wago WH		WH	Wago	Wago 01	1	1	Wago
18	Wago ECR		ECR	Wago	Wago 02	1	1	Wago
19	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago
20	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago
21	Wago Workshop		WS	Wago	Wago 05	1	1	Wago
22	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago
23	Wago Storage		Storage	Wago	Wago 07	1	1	Wago
24	Serial WH-1		WH	Nmea	Network Serial 01	1	1	Moxa UC-711X
25	Serial WH-2		WH	Nmea	Network Serial 01	2	1	Moxa UC-711X
26	Serial ECR		ECR	Printer	Network Serial 02	1	1	Moxa UC-711X
27	Serial 1 ER-1		ER	Cat	Network Serial 03	1	1	Moxa UC-711X
28	Serial 2 ER-1		ER	Cat	Network Serial 03	2	1	Moxa UC-711X
29	Serial 1 ER-2		ER	Cat	Network Serial 04	1	1	Moxa UC-711X
30	Serial 2 ER-2		ER	Cat	Network Serial 04	2	1	Moxa UC-711X
31	DAP Eng. Cabin 1		Cabin 1	PC	Client 01	1	1	PC
32	DAP Eng. Cabin 2		Cabin 2	PC	Client 02	1	1	PC
33	DAP Eng. Crew		Crew	PC	Client 03	1	1	PC
34	Dap ER		ER	PC	Client 04	1	1	PC

Figure 10-16: Filling type column 2

10.5.9 Speed, Datalink and Hardware

The speed, datalink and hardware are figures that you will find in the manuals of the attached sensors, engines, i/o or whatever. If a GPS is connected to the Serial interface, you probably Will find a paragraph describing that it is NMEA, at a speed (baudrate) of 4800. None parity, eight data bits and 1 stop bit and that the serial connection is RS232. (see FT Port Connections and Protocols manual for more information)

This is the data that you need for these columns. FT NavVision© will set the ports on the devices, accordingly to what you put here. Make sure that you have the data ready before starting to build the devicelist.

On the basis of our example drawing we know the following:

- GPS 9600 None 8 1 RS232
- Autopilot 115200 None 8 1 RS232

- Printer 9600 None 8 1 RS232
- Generator 115200 None 8 1 RS485
- Engines 115200 None 8 1 RS485

So with this we can finish these columns and we get the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware
7	Server 1		WH	PC	Server 01	1	1	PC			
8	Server 2		ECR	PC	Server 02	1	1	PC			
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch			
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch			
11	Switch ER		ER	Switch	Switch 03	1	1	Switch			
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch			
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch			
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch			
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch			
16	Switch WH		WH	Switch	Switch 08	1	1	Switch			
17	Wago WH		WH	Wago	Wago 01	1	1	Wago			
18	Wago ECR		ECR	Wago	Wago 02	1	1	Wago			
19	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago			
20	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago			
21	Wago Workshop		WS	Wago	Wago 05	1	1	Wago			
22	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago			
23	Wago Storage		Storage	Wago	Wago 07	1	1	Wago			
24	Serial WH-1		WH	Nmea	Network Serial 01	1	1	Moxa UC-711X	9600	N,8,1	RS232
25	Serial WH-2		WH	Nmea	Network Serial 01	2	1	Moxa UC-711X	115200	N,8,1	RS232
26	Serial ECR		ECR	Printer	Network Serial 02	1	1	Moxa UC-711X	9600	N,8,1	RS232
27	Serial 1 ER-1		ER	Cat	Network Serial 03	1	1	Moxa UC-711X	115200	N,8,1	RS485
28	Serial 2 ER-1		ER	Cat	Network Serial 03	2	1	Moxa UC-711X	115200	N,8,1	RS485
29	Serial 1 ER-2		ER	Cat	Network Serial 04	1	1	Moxa UC-711X	115200	N,8,1	RS485
30	Serial 2 ER-2		ER	Cat	Network Serial 04	2	1	Moxa UC-711X	115200	N,8,1	RS485
31	DAP Eng. Cabin 1		Cabin 1	PC	Client 01	1	1	PC			
32	DAP Eng. Cabin 2		Cabin 2	PC	Client 02	1	1	PC			
33	DAP Eng. Crew		Crew	PC	Client 03	1	1	PC			
34	Dap ER		ER	PC	Client 04	1	1	PC			

Figure 10-17: speed, datalink and hardware

10.5.10 Options

Some devices need some special attention. Mostly because they have another interpretation on protocols, or just that their interpretation deviates from the one that Free Technics uses. To make it easier we have made a separate column where we can put those differences. (for options see Table 10-5). You can use more options on one device. Just put them in the same cell “comma separated”.

10.5.11 IP addresses and MAC addresses

As described earlier in Chapters 10.3 and 10.4, we now need to put in the diverse IP addresses and MAC addresses to let the system know how everything is connected. This is essential because the system needs to know where to transfer requests and to make sure that the system is connected the right way. Also the alarms on lost connections depends on these figures.

Let’s look back at the single line drawing that we made (see Figure 10-1). We already gave the Up-link the number 1 and the Down-link the number 2. These are two separate rings an so they will get a separate IP-range. For the Up-link we start with 172.16.x.x.

Based on our drawing we state that the WH-pc has the key 2637 and the ECR-pc has the key 2636. In this case we can fill in the x.x with the key number. While we always start in the

direction of the i/o we will start at the ECR-pc. The ECR-pc port 1 (Up-link) will get the IP address from the first IP range ending with the key number. In this case that will be 172.16.26.36. This address we put in the IPAddressUp behind the Server 2 (see Figure 10-18).

	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	AddressU
7	Server 1		WH	PC	Server 01	1	1	PC					
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36

Figure 10-18: Addresses and connection 1

From port 1 at the ECR pc we come at a switch in the ECR. As we use the single line drawing as our reference, it is easier that we fill in the devicelist as we follow the main lead of this drawing instead of filling the IP addresses one by one following the order in the devicelist. This will also give you a good indication on any mistakes that you might have made in the devicelist.

So the next column we now will look at is the “connection” column. Here you need to put the device that the server 2 is connected to. In this case that will be the “Switch 1 ECR” as we named that switch in the “device” column (see Figure 10-19).

	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	PAddressU	MACAddres	PAddressU	MACAddres	PAddressD	MACAddres	PAddressD	MACAddres	Connection
7	Server 1		WH	PC	Server 01	1	1	PC													
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36								Switch 1 ECR

Figure 10-19: Addresses and connection 2

As we connect from the Up-link from one device to the Down-link of the other device, we now that we connect Server 2 Port 1 to the Switch 1 ECR Port 2. So in column “ConnectionPort” We type “2” (see Figure 10-20).

	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	PAddressU	MACAddres	PAddressU	MACAddres	PAddressD	MACAddres	PAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC														
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36								Switch 1 ECR	2

Figure 10-20: Addresses and connection 3

As we mentioned, we will follow the single line drawing. So the next row that we will process is the row of the “Switch 1 ECR”. A switch doesn’t have an IP address nor a MAC address is needed. This only leaves us to fill in where a switch is connected at. Following the drawing we see that the “Switch 1 ECR” is connected to the “Switch 2 ECR”. So in this case we need to fill in that it is connected to “Switch 2 ECR” at Port 2 (the Down-link of that switch). This way we come to the following:

	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC														
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36								Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2

Figure 10-21: Addresses and connection 4

As you can see in the single line drawing, the main ring is connected through a bunch of switches until you come to the WH server. So the rest of the rows are quite the same. After filling in all the switches you will get to the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC														
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36								Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2

Figure 10-22: Addresses and connection 5

From the last switch we come to the WH Server or as in the devicelist “Server 1”. This is the tricky part. As you find in the single line drawing, that switch is connected to Port 2 of the Server. As we mentioned earlier, the Up- and Down-link are two separate rings. These rings need to go round all the way. So the Port 2 of the WH server has to be in the same IP-range. With the key number of the WH sever being 2637 the IP address of that port will have to be 172.16.26.37. Now while this is Port 2 on the WH server (the Down-link) you will have to put that IP address in the “IPAddressDown” column. See the following figure:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC							172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36								Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2

Figure 10-23: Addresses and connection 6

So now the ring is completed. You can use the devicelist to check if the lines are correct.

Next thing we do is close the ring in the opposite direction. This will be the next IP-range, so 172.17.x.x.

Starting again with the Server 2 the ECR server We are going to address the Down-link port or Port 2 of that server. While it has the key 2636 the IP address for that will be 172.17.26.36 and has to be filled in at the “IPAddressDown” column at the Server 2 row. See following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC							172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2

Figure 10-24: Addresses and connection 7

Concluding that it is connected to Port 1 on the WH server (Server 1) we can now say that the IP address in the “IPAddressUp” column at the Server 1 row must be 172.17.26.37. See following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2

Figure 10-25: Addresses and connection 8

Now the circle is really connected properly and FT NavVision© can calculate all the connections etc.

10.5.11.1 Other devices

The other devices such as Wago, Network Serial and Clients will not have a Down-link (unless they are in a double-wired systems which goes beyond the scope of this manual), but they do need an IP address, a connection port and sometimes a MAC address.

Let's start at the Wago. As we saw in Table 10-6 the Wago use the IP range x.x.1.9y. While the connection lies in the 172.16.x.x range the first Wago will get the address 172.16.1.91, the second Wago will get the address 172.16.1.92 etc. Resulting for our example in the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91									
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92									
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93									
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94									
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95									
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96									
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97									

Figure 10-26: Wago Addresses 1

Wago does need a MAC address but is doesn't have a Down-link. The MAC address can be found on the Wago PLC itself and will probably lie in the range of 0030DE. Fill in the MAC address in the appropriate row. Also we do need to fill in where they are connected at. For that we again use the single line drawing. As we started earlier at the ECR server we now start again in the ECR and go clockwise to find all the Wago's. There is one Wago in the ECR (that is why it gets the address 172.16.1.91) and it is connected at the "Switch 2 ECR". The first free port at the switch is port 3. This results in the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91								Switch 2 ECR	3
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92									
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93									
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94									
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95									
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96									
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97									

Figure 10-27: Wago Addresses 2

 : *FT NavVision© calculates all the port 1 connections itself. So it is not possible that you find a "1" in the "ConnectionPort" column.*

You can follow this for all the Wago's. If, like in this example, there are two Wago's on one switch, than you need to give them separate connection ports. In this case the firs adjacent free ports will be port 3 and port 4.

 : *The ports you assign in the devicelist, must be connected exactly the same in the installation. Because FT NavVision© works with multicast, it would be impossible to troubleshoot the system if you mix up the ports.*

The devicelist will be like the next figure after filling in the information (including the MAC addresses) for the Wago's:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91			0030DE0623A7					Switch 2 ECR	3
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92			0030DE0623A4					Switch ER	3
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93			0030DE0623A2					Switch ER	4
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94			0030DE0623A6					Switch Workshop	3
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95			0030DE0623A9					Switch AC Room	3
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96			0030DE0623A0					Switch Storage	3
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97			0030DE0623A1					Switch WH	3

Figure 10-28: Wago Addresses 3

The Network Serial connections need some special attention. Network Serial Connections can be a variety of interfaces with different approaches in the devicelist. In our example we have Moxa's as interface. These Moxa's have an Up-link and you need to specify the MAC address. Also you must specify the connection and the connection port.

According to Table 10-6 the Moxa falls in the range of x.x.1.4y. so in this case, starting again in the ECR the first Moxa (Serial Network 01) will get the address 172.16.1.41 (as it exists in the 172.16.x.x. range.

 : *if you use multiple ports on a Serial Network interface, make sure that you give the same IP address and MAC address to these ports as they are on the same interface.*

The MAC address range of a Moxa will probably be within the 0090E8 range. You'll find it on the backside of the interface. Put it in the appropriate row.

The first Moxa we find in the ECR with the printer connected to it. This will get the address 172.16.1.41. While only one port is in use, we only need to fill in one row. See the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91			0030DE0623A7					Switch 2 ECR	3
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92			0030DE0623A4					Switch ER	3
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93			0030DE0623A2					Switch ER	4
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94			0030DE0623A6					Switch Workshop	3
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95			0030DE0623A9					Switch AC Room	3
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96			0030DE0623A0					Switch Storage	3
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97			0030DE0623A1					Switch WH	3
24	Serial ECR		ECR	Printer	Network Serial 01	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.41			0090E82EBDCC						

Figure 10-29: Network Serial addresses 1

Now we can do that for the rest of the Network Serial connections. Be sure that you fill in the same addresses at multiple port connections.

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91			0030DE0623A7					Switch 2 ECR	3
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92			0030DE0623A4					Switch ER	3
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93			0030DE0623A2					Switch ER	4
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94			0030DE0623A6					Switch Workshop	3
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95			0030DE0623A9					Switch AC Room	3
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96			0030DE0623A0					Switch Storage	3
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97			0030DE0623A1					Switch WH	3
24	Serial ECR		ECR	Printer	Network Serial 01	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.41			0090E82EBDCC						
25	Serial 1 ER-1		ER	Cat	Network Serial 02	1	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.42			0090E82EBDB2						
26	Serial 2 ER-1		ER	Cat	Network Serial 02	2	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.42			0090E82EBDB2						
27	Serial 1 ER-2		ER	Cat	Network Serial 03	1	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.43			0090E82EBD09						
28	Serial 2 ER-2		ER	Cat	Network Serial 03	2	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.43			0090E82EBD09						
29	Serial WH-1		WH	Nmea	Network Serial 04	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.44			0090E82EBDC1						
30	Serial WH-2		WH	Nmea	Network Serial 04	2	1	Moxa UC-711X	115200	N,8,1	RS232		172.16.1.44			0090E82EBDC1						

Figure 10-30: Network Serial addresses 2

Finally assign the Connection and ConnectionPort Wher the ConnectionPort will be the first free port on the switch and you will get the following:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddres	IPAddressU	MACAddres	IPAddressD	MACAddres	IPAddressD	MACAddres	Connection	Connection
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91			0030DE0623A7					Switch 2 ECR	3
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92			0030DE0623A4					Switch ER	3
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93			0030DE0623A2					Switch ER	4
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94			0030DE0623A6					Switch Workshop	3
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95			0030DE0623A9					Switch AC Room	3
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96			0030DE0623A0					Switch Storage	3
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97			0030DE0623A1					Switch WH	3
24	Serial ECR		ECR	Printer	Network Serial 01	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.41			0090E82EBDCC					Switch 2 ECR	4
25	Serial 1 ER-1		ER	Cat	Network Serial 02	1	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.42			0090E82EBDB2					Switch ER	5
26	Serial 2 ER-1		ER	Cat	Network Serial 02	2	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.42			0090E82EBDB2					Switch ER	5
27	Serial 1 ER-2		ER	Cat	Network Serial 03	1	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.43			0090E82EBD09					Switch ER	6
28	Serial 2 ER-2		ER	Cat	Network Serial 03	2	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.43			0090E82EBD09					Switch ER	6
29	Serial WH-1		WH	Nmea	Network Serial 04	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.44			0090E82EBDC1					Switch WH	4
30	Serial WH-2		WH	Nmea	Network Serial 04	2	1	Moxa UC-711X	115200	N,8,1	RS232		172.16.1.44			0090E82EBDC1					Switch WH	4

Figure 10-31: Network Serial addresses 3

: other Network Serial interfaces can be: ICPdas i7540D, Modbus TCP/IP, Serial TCP/IP and a few others. They mainly work the same way in the devicelist, with the exception that you don't need a MAC address for TCP/IP.

Finally we have a few clients in the single line drawing. These are the so called DAP's (Duty Alarm Panels). As we know from Table 10-6 the IP range for DAP's lies within the x.x.1.8y range Where the first one will be x.x.1.81 and so on. While these DAP's are also in the 172.16.x.x. range, the first DAP will get the address 172.16.1.81.

Also the MAC address is necessary so we put that in the devicelist (DAP's are in the 00506C range) and also the Connection and ConnectionPort has to be put in. We will finish the devicelist like this:

6	Device	Comment	Location	Protocol	Interface	Port	Source	Type	Speed	Datalink	Hardware	Options	IPAddressU	MACAddress	IPAddressU	MACAddress	IPAddressD	MACAddress	IPAddressD	MACAddress	Connection	ConnectionP
7	Server 1		WH	PC	Server 01	1	1	PC					172.17.26.37		172.16.26.37							
8	Server 2		ECR	PC	Server 02	1	1	PC					172.16.26.36		172.17.26.36						Switch 1 ECR	2
9	Switch 1 ECR		ECR	Switch	Switch 01	1	1	Switch													Switch 2 ECR	2
10	Switch 2 ECR		ECR	Switch	Switch 02	1	1	Switch													Switch ER	2
11	Switch ER		ER	Switch	Switch 03	1	1	Switch													Switch Workshop	2
12	Switch Workshop		WS	Switch	Switch 04	1	1	Switch													Switch AC Room	2
13	Switch AC Room		ACR	Switch	Switch 05	1	1	Switch													Switch Storage	2
14	Switch Storage		Storage	Switch	Switch 06	1	1	Switch													Switch Em. SB	2
15	Switch Em. SB		ESB	Switch	Switch 07	1	1	Switch													Switch WH	2
16	Switch WH		WH	Switch	Switch 08	1	1	Switch													Server 1	2
17	Wago ECR		ECR	Wago	Wago 02	1	1	Wago					172.16.1.91			0030DE0623A7					Switch 2 ECR	3
18	Wago 1 ER		ER	Wago	Wago 03	1	1	Wago					172.16.1.92			0030DE0623A4					Switch ER	3
19	Wago 2 ER		ER	Wago	Wago 04	1	1	Wago					172.16.1.93			0030DE0623A2					Switch ER	4
20	Wago Workshop		WS	Wago	Wago 05	1	1	Wago					172.16.1.94			0030DE0623A6					Switch Workshop	3
21	Wago AC Room		ACR	Wago	Wago 06	1	1	Wago					172.16.1.95			0030DE0623A9					Switch AC Room	3
22	Wago Storage		Storage	Wago	Wago 07	1	1	Wago					172.16.1.96			0030DE0623A0					Switch Storage	3
23	Wago WH		WH	Wago	Wago 01	1	1	Wago					172.16.1.97			0030DE0623A1					Switch WH	3
24	Serial ECR		ECR	Printer	Network Serial 01	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.41			0090E82EBDCC					Switch 2 ECR	4
25	Serial 1 ER-1		ER	Cat	Network Serial 02	1	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.42			0090E82EBDB2					Switch ER	5
26	Serial 2 ER-1		ER	Cat	Network Serial 02	2	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.42			0090E82EBDB2					Switch ER	5
27	Serial 1 ER-2		ER	Cat	Network Serial 03	1	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.43			0090E82EBD09					Switch ER	6
28	Serial 2 ER-2		ER	Cat	Network Serial 03	2	1	Moxa UC-711X	115200	N,8,1	RS485		172.16.1.43			0090E82EBD09					Switch ER	6
29	Serial WH-1		WH	Nmea	Network Serial 04	1	1	Moxa UC-711X	9600	N,8,1	RS232		172.16.1.44			0090E82EBDC1					Switch WH	4
30	Serial WH-2		WH	Nmea	Network Serial 04	2	1	Moxa UC-711X	115200	N,8,1	RS232		172.16.1.44			0090E82EBDC1					Switch WH	4
31	DAP Eng. Cabin 1		Cabin 1	PC	Client 01	1	1	PC					172.16.1.81			00506C03E612					Switch 2 ECR	5
32	DAP Eng. Cabin 2		Cabin 2	PC	Client 02	1	1	PC					172.16.1.82			00506C03E60F					Switch 2 ECR	6
33	DAP Eng. Crew		Crew	PC	Client 03	1	1	PC					172.16.1.83			00506C03E610					Switch 2 ECR	7
34	Dap ER		ER	PC	Client 04	1	1	PC					172.16.1.84			00506C03E5E8					Switch ER	7

Figure 10-32: Client addresses

Now the Devicelist is ready you can import it into FT NavVision© to check if it works. We refer to Chapter 12 for further information.

: We didn't describe all the possibilities that you can change in the Devicelist, merely the basic ones. Other interfaces or devices can roughly be treated as we described above. If you do find something not working or don't know how to implement that, please contact Free Technics.

11. Sensorlist

11.1 Introduction

In the devicelist we started to list all the devices with their respective interfaces and ports. The sensorlist (tab sensorlist) will break this up even further. It will go from device through I/O to the field that is attached.

Every single I/O that comes in to the system will have its own line here in the sensorlist. This is done to control all the incoming data as accurate as possible. Every I/O gets its own Field-ID which will be kept in the database of FT NavVision©. Once the program knows that a certain I/O belongs to a specific field, you can add possibilities to that field to control the I/O. Just as example, you can add min/max values, alarm values, unit types, offsets, inhibits and much more. You can even use the specific I/O in PLC programs, Whether internal or external.

With the devices already assigned in the devicelist, you can start out filling the columns in the sensorlist. Be aware that you need all the information on the I/O's upfront. So for I/O's on Wago you need to know the sort and type of I/O, but also for protocols such as Modbus, Canbus and other types you will need the right details. Without these details it is almost impossible to make a good sensorlist

11.2 Columns

The sensorlist is also divided in to columns. Some columns are free for your own information, but the colored ones are mainly mandatory. Same as in the devicelist you can find the columns in the sensorlist are labeled in the first row. The fields underneath can be filled with free text or have a drop-down menu where you can choose a tag. These tags are mandatory and the sensorlist won't except tags that are not in the list for these columns.

The following columns are in the sensorlist:

Column	Type	Description
Import Result	Text	For troubleshooting purposes. See Chapter 12.3
ID	Text	A unique ID for the I-O provided by the shipyard or installation company
CableLabel	Text	The cable label as labeled in the real installation. Mostly provided by the installation company
GroupLabel	Text	Group labels are for dividing I/O into dedicated groups, like Bilge, Fire, Engines etc.
Item	Text	The description of the Data Field. Default item text belonging to the Data Field is preferred. The name of the I/O as you want it to appear in the Alarm List.
SensorType	Select	SensorType defines which subfield or action of the Data

	(Text)	Field is set by this value. By default it's [Standard]. Standard means it's not defining a subfield or action, but the value of the Data Field itself. (For more options see Table 11-2 and Table 11-3).
Connection	Select (NO,NC)	Connection defines the type of connection for digital in- and outputs. Connection is NO by default. If an in- or output is normally closed it's NC.
Device	Select	Identification of the device where the sensor/control or serial device is connected to. This text should be unique for each FT NavVision® device. The text is case sensitive This comes from the devicelist
Location	Text	Identification of the substation where the sensor/control is connected to in the FT NavVision® system. Every substation should have a unique text. The text is case sensitive
Interface	Select (text)	Select the type of interface that the data is coming in. For Wago this is divided in the slice's type-number. For Modbus, Canbus and other protocols it is Serial (Digital/Analog) in or out.
Module	Value (Index)	Module index where the sensor/control data can be found. For CAN bus it is the parameter group number (PGN), for Modbus it is the Modbus mapping and for WAGO it is the slice number. Module 1 for WAGO is the first slice after the 750-626 module.
Pin	Value (Index)	The I/O index on the module for WAGO and the bit offset in the message for serial protocols. (NOTE: The pin index is 1 based)
Type	Select	defines the type of module used to read/control the I/O. This is mainly used for WAGO. It can be between 750-400 and 750-612. For Modbus here goes the function code.
Min	Value	Minimum instrument value
Max	Value	Maximum instrument value
DefaultUnit	Select	The default unit used to present this Data Field. (For options see Table 11-4)
Manufacturer	Optional	Manufacturer
Supplier	Optional	Supplier
Comment	Optional	Comment
Revision	Optional	Revision
Field	Select (FTSelect)	The ID of the Field. References to this ID can be found in the file "fieldlist.txt" that is in the root folder of the FT NavVision® software installation after the first time FT NavVision® has been started.
Label	Text	The short description of the Data Field when shown in an instrument. Default label text belonging to the Data Field is preferred. The name of the I/O as you want it to appear in an instrument, a value, a button, etc.
Rate	Value (Hz)	Rate describes the number of samples per second of a sensor/control. This is defined by the protocol. Leave empty.
Index	Value	Index defines when this Data Field Definition [DFD] is

	(Index)	valid. The Index column can only be used in combination with a Data Field Definition [DFD] that has the SensorType set to Index and is in the same message as this DFD. Default is empty.
DataType	Select (Unsigned, Signed, Bool, Enum, Float)	DataType is used to define the type of value on serial protocols. For analogue values it's Float, Signed or Unsigned. For digital values it's Bool. For enumerations this is Enum. See Enum column.
Enum	Value (Index)	Enum is the index value where the received value should compare to, to switch the Data Field on. If the value is not equal to the Enum index the Data Field is switched off.
Count	Value (Count)	Count is the number of bits starting from the pin index. For a digital value it's typically 1 with a pin index between 1 and 16 and for analog values it's for example for Mod bus typically 16 with pin index 1.
Multiplier	Value	Multiplier defines the factor between the sensor/control value and the real value. For inputs/read: *value = sensor value * multiplier + offset* For outputs/write: *sensor value = (value – offset) / multiplier*
Offset	Value	Offset defines the offset between the sensor/control value and the real value. See Multiplier column.
Unit	Select	The Unit in which the sensor/control value is received or send. (See Table 11-4)
GroupLocal	Text	Local language text (see 11.3.29) and: chapter 11.1.14 Software installation and commissioning manual 1.9
ItemLocal	Text	Local language text (see 11.3.29) and: chapter 11.1.14 Software installation and commissioning manual 1.9
LabelLocal	Text	Local language text (see 11.3.29) and: chapter 11.1.14 Software installation and commissioning manual 1.9
Filter	Value (Seconds)	The filter used in the instruments for this Data Field to eliminate short spikes in measurements. Default is 1 second. Maximum is 10 seconds
SetpointMin	Optional	SetpointMin
SetpointMax	Optional	SetpointMin
SetpointMinDelay	Optional	SetpointMinDelay
SetpointMaxDelay	Optional	SetpointMaxDelay
SwitchTime	Optional	SwitchTime
PulseTime	Optional	PulseTime
ExternalRight	Optional	Read, Write or Read/Write rights
Decimals	Optional	Set number of decimals in values. See also chapter 11.2.2.3 Software installation and commissioning manual 1.9
AlarmSMS	Obsolete	Set if an SMS will be sent at alarm
AlarmWAV	Filename	The filename of the sound that will be played over the sound card when this Data Field is in alarm. Default is "alarm.wav". Files can be found in the "sound" sub

		folder of the FT NavVision® software installation
WarningLow	Value (in “Unit”)	The threshold for the low alarm. Empty is off
WarningHigh	Value (in “Unit”)	The threshold for the high alarm. Empty is off
WarningDelay	Value (Seconds)	The delay for the low and high alarms
WarningGroup	Select	The ID of the alarm group that the low and high alarms are assigned to. References to this ID can be found in the file “fieldlist.txt”
WarningAction	Text	The action an operator should take when a low or high alarm occurs.
CriticalLow	Value (in “Unit”)	The threshold for the too low alarm. Empty is off
CriticalHigh	Value (in “Unit”)	The threshold for the too high alarm. Empty is off
CriticalDelay	Value (Seconds)	The delay for the too low and too high alarms
CriticalGroup	Select	The ID of the alarm group that the too low and too high alarms are assigned to. References to this ID can be found in the file “fieldlist.txt”
CriticalAction	Text	The action an operator should take when a too low or too high alarm occurs.
InhibitAll	Value (“” or “Y”)	Inhibit all alarms for a specific field. This will show in the alarmlist. Empty is off.
InhibitLevels	Value (“” or “Y”)	Inhibit all Level alarms for a specific field. This will show in the alarmlist. Empty is off.
InhibitTimeout	Value (“” or “Y”)	Inhibit all Timeout alarms for a specific field. This will show in the alarmlist. Empty is off.
InhibitNotReady	Value (“” or “Y”)	Inhibit all NotReady alarms for a specific field. This will show in the alarmlist. Empty is off.
InhibitDefect	Value (“” or “Y”)	Inhibit all Defect alarms for a specific field. This will show in the alarmlist. Empty is off.
InhibitField1	Select (FTSelect)	Field That this I/O should be inhibited or not inhibited to. Se definition “Field”.
InhibitType1	Value (Higher, Lower)	Inhibits the field depending on if the type is Higher or Lower.
InhibitValue1	Value	Value when to inhibit. (i.e. Inhibit when RPM is Lower than 500). So choose 500 here.
InhibitLogic	Value (AND, OR)	Logic for second inhibit field. Choose between different possibilities.
InhibitField2	Select (FTSelect)	Field That this I/O should be inhibited or not inhibited to. Se definition “Field”.
InhibitType2	Value (Higher, Lower)	Inhibits the field depending on if the type is Higher or Lower.
InhibitValue2	Value	Value when to inhibit. (i.e. Inhibit when RPM is Lower than 500). So choose 500 here.

InhibitBeforeDelay	Value (seconds)	Delay before inhibit kicks in
InhibitAfterDelay	Value (seconds)	Delay after inhibit stops
Weight	Optional	Weight
CableLength	Optional	CableLength
Connector	Optional	Connector
Supply	Optional	Supply
Consumption	Optional	Consumption

Table 11-1: Sensorlist columns

Sensor types can be used for in- and outputs (read/write). The interpretation of the read values and written values differs a bit, so they are described separately

SensorType (Mode: Read)		
Option	Sensor	Description
Standard	Value	Sensor value represents the state of the Data Field itself (Default)
Set	On	Request to turn on
	Off	No action
Reset	On	Request to turn off
	Off	No action
Pending	On	Processing a request.
	Off	No action
Auto	On	Switched by an automatic control sequence
	Off	Controlled by an operator
Manual	On	Controlled by an operator
	Off	Switched by an automatic control sequence
Low Speed	On	Running at low speed
	Off	Off, when not in “High Speed”. Otherwise no action
High Speed	On	Running at high speed
	Off	Off, when not in “Low Speed”. Otherwise no action
Closed	On	Switched off
	Off	Processing a request, when not “Open”
Open	On	Switched on
	Off	Processing a request, when not “Closed”
Ready	On	Ready for use
	Off	Not ready for use
Remote	On	Remote control. Controlled by AMCS
	Off	Local control. Not controlled by AMCS
Ack	On	Acknowledgement of alarm on the assigned field
	Off	No action
Request	On	Request to turn on
	Off	Request to turn off
Push	On	Request to turn on, when off. Request to turn off, when on.
	Off	No action
Too Low	On	Value is too low
	Off	Value is not too low

Low	On	Value is low
	Off	Value is not low
High	On	Value is high
	Off	Value is not high
Too High	On	Value is too high
	Off	Value is not too high
Failure	On	Defect
	Off	Not defect
Precision	On	High precision frequency counter in 0.01 Hz accuracy up to 10kHz
	Off	Low precision frequency counter in 1 Hz accuracy up to 100kHz
Counter	Value	The changes in this counter value will be added to the field
Sign	On	The value read by “Standard” is negative
	Off	The value read by “Standard” is positive
Index	Value	Value is the index of a serial message. See “Index” description
Pulse	On	Field’s value is counted 1 up
	Off	No action
Pulse 1/2	Value	Used in combination with “Pulse 2/2” to detect movement with two proximity switches.
Pulse 2/2	Value	
Pulse 1/3	Value	Used in combination with “Pulse 2/3” and “Pulse 3/3” to detect movement with three proximity switches.
Pulse 2/3	Value	
Pulse 3/3	Value	

Table 11-2: Sensor Type mode Read

SensorType (Mode: Write)		
Option	Sensor	Description
Standard	Value	Requested state of the Data Field itself (Default)
Set	On	Request to turn on
	Off	No action
Reset	On	Request to turn off
	Off	No action
Pending	On	Processing a request.
	Off	No action
Auto	On	Request to turn automatic control sequence on
	Off	Request to turn automatic control sequence off
Low Speed	On	Request to run at low speed
	Off	Request to turn off, when not in “High Speed”. Otherwise no action
High Speed	On	Request to run at high speed
	Off	Request to turn off, when not in “Low Speed”. Otherwise no action
Impulse	On	Request to turn on, when off. Request to turn off, when on.
	Off	No action
Status	Value	Output value represents the state of the field/ device itself (No control)
Ready	On	Ready for use
	Off	Not ready for use
Remote	On	Remote control. Controlled by AMCS

	Off	Local control. Not controlled by AMCS
Too Low	On	Value is too low
	Off	Value is not too low
Low	On	Value is low
	Off	Value is not low
High	On	Value is high
	Off	Value is not high
Too High	On	Value is too high
	Off	Value is not too high
Failure	On	Defect
	Off	Not defect

Table 11-3: Sensor Type mode Write

Unit Type	Select	Description
Alarm	Alm	Alarm
Ampere Hour	Ah	Ampere hour
Angle	°	Angle
Angular Acceleration	°/s^2	Degrees per square second
Angular Speed	°/sec	Degrees per second
	°/min	Degrees per minute
Content	%	Percentage
	G	Gallon [US]
	M3	Cubic meter
	L	Liter
	Guk	Gallon [UK]
Consumption per Distance	l/nm	Liter per nautical mile
	l/km	Liter per kilometer
	G/nm	Gallon [US] per nautical mile
	l/m	Liter per meter
Consumption per Time	G/H	G/H
	G/M	G/M
	Guk/M	Guk/M
	Guk/H	Guk/H
	l/m	l/m
	G/S	G/S
	Guk/S	Guk/S
	l/h	l/h
	L/S	L/S
Counter	x	Count
Course	°	Course
Current	mA	MilliAmpere
	kA	Kilo Ampere
	A	Ampere
Dampening	D	Dampening
DistanceContent	nm/G	nm/G
	nm/l	nm/l
	km/l	km/l
	m/l	m/l
Force	Pdl	Poundal
	Lbf	Lbf
	N	Newton
	Kgf	kg

ForceLength	Kgm	Kgm
	Lbf-ft	Lbf-ft
	kips	Kips
	Nm	Nm
Frequency	Hz	Hertz
FuelEconomyGaseous	nm/kg	nm/kg
	m/g	m/g
	km/kg	Km/Kg
FuelEconomyPower	kWh/l	kWh/L
	kWh/Guk	kWh/Guk
	kWh/G	kWh/G
Length	km	Km
	mi	mi
	cm	cm
	nm	NM
	ft	Feet
	fm	Fathom
	mm	mm
	m	M
	in	Inch
Luminance	cd m-2	cd m-2
Magnetic	°	Magnetic
MassSpeed	g/s	g/s
	t/s	t/s
	kg/h	Kg/H
Name		
Number		
	okta	Okta
Percentage	%	Percentage
Position	°	Degrees
Pressure	psi	Psi
	Pa	Pascal
	kPa	kPa
	mbar	mBar
	hPa	hPa
	Hg	Hg
	bar	Bar
Resistance	ohm	Ohm
	mOhm	MilliOhm
	kOhm	KiloOhm
RPM	rpm	RPM
RPMAccelaration	rpm/s	RPM/s
Speed	km/h	Km/H
	m/min	M/Min
	m/s	M/S
	ft/min	Feet/Min
	kn	Knots
	B	Beaufort
	mph	Miles per hour
SpeedAcceleration	g	g-force
	m/s2	M/S2
Status	Open	Open
	On	OnOff

Switch	Take Over	Take Over
	S	Switch Off
	Alarm Group	Alarm Group
	General Alarm	General Alarm
	Alarm Deadman Group	Alarm Deadman Group
	P	Push
	S	Switch
	PS	Popup Switch
Temperature	K	Kelvin
	°C	Celsius
	°F	°F
Time	Mn	Month
	H	Hour
	D	Day
	DTL	Date & Time Left
	D	Date
	ms	mSec
	us	uSec
	Wk	Week
	M	Min
	T	Time
	DT	Date & Time
	S	Sec
	Yr	Year
True	°	True
Voltage	mV	MilliVolt
	kV	KiloVolt
	V	Volt
VoltAmpere	VA	VA
	kVA	kVA
VoltAmpereHour	kVAh	kVAh
	VAh	VAh
	MVAh	MVAh
Watt	MW	MegaWatt
	W	Watt
	kW	kW
WattHour	Wh	WattHour
	MWh	MegaWattHour
	kWh	kWh
Weight	lbs	Lbs
	kg	kg
	g	Gram
	t	Ton

Table 11-4: Unit Type

11.3 Implementation in the sensorlist

11.3.1 Introduction

As the sensorlist is way bigger and more complex than the devicelist, we will not fill in all the columns and fields. We will give some excerpts from what you can expect at the different devices and the different columns. On the basis of the single line drawing we used for the explanation of the devicelist, we will give as many examples as possible. After this explanation, you should be capable to work out the rest of the sensorlist.

 *: Once you have imported the sensorlist into FT NavVision©, most of the fields will be automatically added. This will be done by FT NavVision© on standard basis. This will not always be right, so you need to check that. We will come back at that in a separate Chapter*

11.3.2 Import Result

The import result is a checklist. When you have imported the sensorlist, FT NavVision© will generate a few files at which we will come back later. One of these files is the sensorlist_generated. In this file you will see in the first column the import result. For more information we refer you to Chapter 12.5.

11.3.3 ID, CableLabel, GroupLabel

These columns are optional. They are not needed for the proper functioning of the program. However it could come in handy when you fill up some of those fields.

The ID column you can use for your own reference. Maybe you use some kind of numbering that is different from the one you get from the shipyard.

Many installation companies use cable labels (numbers) for the connections of the wires at the terminals and/or at the sensor/control. If you fill in these Cable labels in this column, you will have a reference in the sensorlist which is searchable. You also get a reference in FT NavVision© where the Cablelabel is shown in the Wago screen.

In the GroupLabel column you can separate different (alarm)groups and their I/O. This makes it quite easy to search specific I/O or just select a whole group that you need to adjust.

Next figure will show a small example:

Import Result	ID	CableLabel	GroupLabel
	B1	BP234G	Bilges
	B2	BP235G	Bilges
	B3	BP236G	Bilges
	PSME23	EMPVT3	Propulsion
	PSME54	EMPVT9	Propulsion
	SBME23	EMPVT7	Propulsion
	SBME54	EMPVT13	Propulsion
	FF01	17269F	Fire Fighting
	FF02	17270F	Fire Fighting
	Door ER	DH3456	Doors and Hatches
	Door WH	DH2376	Doors and Hatches

Figure 11-1: ID, CableLabel, GroupLabel Example

11.3.4 Item

The Item is somewhat different and needs some attention. In consultation with the installer or even with the shipyard, you need to come up with a descriptive name for each field (I/O, sensor, control). As this is the name that comes up in the logbook and the alarmlist, you need to be clear about what it is.

Sometimes people come up with texts like “Preferential Trip & Em. Stop System Power Failure”. As you can see it is quite long and also very confusing. It can mean a lot of things. Maybe this one would be easier to understand if you called it “PMS Power Failure”. It is certainly more descriptive and short and concise.

In other cases, the crew can be very familiar with certain names. The example “N.16 Fr 20-21 Bilge Level High Alarm” may seem confusing, but the crew knows exactly what it means cause they have been working with this name for years.

Remember however that the text is free to choose, but it will appear in alarm lists and the logbook. So keep it as simple as possible.

11.3.4.1 Conjunction with SensorType

You also need to understand the conjunction with the “Item” column and the “SensorType” column. As explained in Chapter 11.3.5 SensorType defines which subfield or action of the Data Field is set by the value in that column. So if it is not “standard” you better check the “Item” text again.

For example: A sensortype can be “High Alarm” or “Running” or even just “Alarm”. This means that you trigger an extra action with the sensortype field. Now let’s say that you have the sensortype defined as Alarm. When you put “Bilge ER Alarm” as text in the “Item” field you get it double. With an alarm you now will get “Ext: Bilge ER Alarm Alarm” in your alarm screen. Easy to understand that if you use the sensortype “Alarm” you leave the word Alarm out of the Item-text. This is valid for all the conjunctions between these two columns.

Import Result	ID	CableLabel	GroupLabel	Item	SensorType
	B1	BP234G	Bilges	Fore Peak Bilge	Alarm
	B2	BP235G	Bilges	ER Bilge	Alarm
	B3	BP236G	Bilges	Aft. Crew Bilge	Alarm
	PSME23	EMPVT3	Propulsion	ME Port Oil	High
	PSME54	EMPVT9	Propulsion	ME Port Coolant	Low Level
	SBME23	EMPVT7	Propulsion	ME STBD Oil	High
	SBME54	EMPVT13	Propulsion	ME STBD Coolant	Low Level
	FF01	17269F	Fire Fighting	Main FiFi Pump	Running
	FF02	17270F	Fire Fighting	Em. FiFi Pump	Running
	Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard
	Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard

Figure 11-2: Item example

11.3.5 SensorType

SensorType defines which subfield or action of the Data Field is set by this value. By default it's "Standard". Standard means it's not defining a subfield or action, but the value of the Data Field itself. (For more options see Table 11-2 and Table 11-3).

With "standard" as option in the sensortype column FT NavVision© will only act upon the field itself. So if the field is an alarmfield FT NavVision© will give an alarm when that field gets triggered. This goes for all the different type of fields. So if for example it is a Pressure field (analog value) FT NavVision© will show the pressure value. If you don't fill in anything in the sensortype column, it will automatically be "Standard".

If no extra action is necessary on a field you probably won't use the sensortype column. This comes in play when you want something extra. An analog field that needs a "high" alarm. An output that needs a "Set" request and so on. Before we elaborate on this we need to explain something about the "Fields" within FT NavVision©.

11.3.5.1 Fields

FT NavVision© works with a database with all kind of ID's in it. These ID's are represented by fields that are divided into sup-parts. Every action in FT NavVision© revolves around this database of field-id's. You can use one field over and over again cause the main value is set in the database.

Once you connect a sensor or control to a field you can do almost everything you like. For example if you want to control a pump with a hardwired button, you can connect that pump in FT NavVision© to let's say the field "Pump1". Through a Wago PLC you now get to control that pump. On a Wago Digital Input, you connect the field "Pump1" and you hardwire a button to the same Slice. Now if you push the button the Wago input will get high. If you put the same field "Pump1" to an output on the Wago. This output will get active as soon as the input gets active. While this is an output, you can hardwire it to the actual Pump1. So than when you push the button the pump will start to run.

These fields you can find in the “fieldlist.txt”. Once that FT NavVision© is started for the first time, you will find it in the root folder. You can open and control this .txt-file best with Excel. For people not familiar with Excel there is a small explanation in Chapter 9.2.

As there is a lot of intelligence in the fields already it is good to understand the interaction between the field and the sensortype. You can mess things up when you use this wrong.

11.3.5.2 Back to SensorType

So, as mentioned earlier, there is a conjunction between the “Item” and the “SensorType” and now also between the “Field” and the “SensorType”. We use the same example as in Chapter 11.3.4.1 to show how it all fits together.

As we mentioned in that chapter, you need to pay attention to the name you use in the Item-column so you do not get confusing or double values. Same goes for the fields and the sensortype. If you choose a field that is already an alarm-field this means that, when the value gets high, the field will give an alarm. So it is not necessary to put an extra alarm in the sensortype column. This is not only double but also can confuse the system or the user. On the other hand, if you use a field that holds Level information, you might want to trigger an alarm when you get to a certain level. This is possible by putting “High Level” in the SensorType column. You see there is quite some interaction between those different columns.

You need to practice a lot with the sensorlist to learn how to work with it. For now we will give an example on how it is not supposed to be concerning “Item” “SensorType” and “Field”.

ID	CableLabel	GroupLabel	Item	SensorType	Revision	Field
		Propulsion	PS engine General Alarm	Alarm		AlarmEngineGeneralAlarmPro1

Figure 11-3: Double fault

As you can see we have an alarmfield in the field column, a sensortype that triggers an alarm and the name in the Item column that will make it double. Easiest in this case is: keep the alarmfield in the Field column, put Sensortype to “Standard” and take “Alarm” out of the Item column name.

11.3.6 Connection

Connection defines the type of connection for digital in- and outputs. Connection is NO by default. If an in- or output is normally closed it’s NC. If you have problems with switches that go the wrong way around or there is an alarm where the sensor itself is not in alarm, this is the first place to look.

11.3.7 Device

Identification of the device where the sensor/control or serial device is connected to. This text should be unique for each FT NavVision® device. The text is case sensitive.

This device is already been set in the devicelist. See chapter 10.5.2 to see how you've done that. Now all the I/O that you put into the sensorlist must be connected to the right device, so FT NavVision© knows where to look for it and how to process it.

When you click on a field you can see there is a drop-down menu. In the menu you will find all the previous assigned devices. All you have to do now is choose the right device.

As we look at the single line drawing and we take the example we had earlier we can tell that the Fore Peak Bilge is connected to the Wago AC Room and the ER Bilge is connected to the Wago 2 ER.

The Port Engine is connected to the second port at the second SerialLan in the ER so you choose Serial 2 ER-2 as device. It will look a bit like the following figure:

ID	CableLabel	GroupLabel	Item	SensorType	Connection	Device
B1	BP234G	Bilges	Fore Peak Bilge	Alarm		Wago AC Room
B2	BP235G	Bilges	ER Bilge	Alarm		Wago 2 ER
B3	BP236G	Bilges	Aft. Crew Bilge	Alarm		Wago Workshop
PSME23	EMPVT3	Propulsion	ME Port Oil	High		Serial 2 ER-2
PSME54	EMPVT9	Propulsion	ME Port Coolant	Low Level		Serial 2 ER-2
SBME23	EMPVT7	Propulsion	ME STBD Oil	High		Serial 2 ER-1
SBME54	EMPVT13	Propulsion	ME STBD Coolant	Low Level		Serial 2 ER-1
FF01	17269F	Fire Fighting	Main FiFi Pump	Running		Wago Workshop
FF02	17270F	Fire Fighting	Em. FiFi Pump	Running		Wago Workshop
Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard		Wago 1 ER
Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard		Wago WH

Figure 11-4: Sensorlist device column

Of course, while you probably will start filling all the I/O's from one device at the time, you will get a long row with only Wago WH and then for example Wago Workshop. You will see that once you start working with it.

In the example we only have serial and Wago connections, but it can be anything that you filled in as a device. It is probably best to start to fill the list with the Wago devices as these are mostly already assigned. Later on you take the serial connections with for example Modbus or CANbus on it.

11.3.8 Location

For location you can use the same field as in the devicelist. It is optional, but also usable for sorting the list and/or localizing sensors or I/O's.

11.3.9 Interface

Here you define what kind of interface is used to connect the sensor/control to FT NavVision©. For Wago this is divided in the slice's type-number. For Modbus, Canbus and other protocols it is Serial (Digital/Analog) in or out.

If you have the Wago drawings available, it is easy to choose the right module for that. If you have trouble finding it, you can always fall back to the documentation of Wago. For the

protocols you just need to look if it is a digital or analog value and if it is an input or an output. More on these serial interfaces we discuss later.

To give you an idea, we go back to our example. The bilges in the example will be most likely digital inputs. As Wago works standard with 24V it will be a Dig in (24V) you have to choose there. This goes also for the fire pumps and the doors. Probably normal switches so an input of 24V for High or Low (On or Off).
The engine however is somewhat different. As we can see in the SensorType field it is just a digital input where On is High or On is Low Level. However, this is the SensorType Field. This field will give FT NavVision© a reason to calculate an alarm on an analog value. So don't be misled. This will be an analog field coming in (Oil is a pressure field and Low Level is a level field). So you will have to connect it to an analog interface module on the Wago. This can be 4-20mA, 0-10V or a lot of other sorts. Let's say the oil pressure field is a 4-20mA signal and the level field is a 0-10V signal. We will come to the following:

ID	CableLabel	GroupLabel	Item	SensorType	Connection	Device	Location	Interface
B1	BP234G	Bilges	Fore Peak Bilge	Alarm		Wago AC Room		Dig in(24V)
B2	BP235G	Bilges	ER Bilge	Alarm		Wago 2 ER		Dig in(24V)
B3	BP236G	Bilges	Aft. Crew Bilge	Alarm		Wago Workshop		Dig in(24V)
PSME23	EMPVT3	Propulsion	ME Port Oil	High		Serial 2 ER-2		mA in(4 - 20)
PSME54	EMPVT9	Propulsion	ME Port Coolant	Low Level		Serial 2 ER-2		V in(0 - 10)
SBME23	EMPVT7	Propulsion	ME STBD Oil	High		Serial 2 ER-1		mA in(4 - 20)
SBME54	EMPVT13	Propulsion	ME STBD Coolant	Low Level		Serial 2 ER-1		V in(0 - 10)
FF01	17269F	Fire Fighting	Main FiFi Pump	Running		Wago Workshop		Dig in(24V)
FF02	17270F	Fire Fighting	Em. FiFi Pump	Running		Wago Workshop		Dig in(24V)
Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard		Wago 1 ER		Dig in(24V)
Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard		Wago WH		Dig in(24V)

Figure 11-5: Sensorlist Interface column

11.3.10 Module

For Wago you start counting the slices after the 750-626 module. Starting with 1 and so on. If you do not filter the sensorlist, than it will be hard to look if the numbers are alright. But as we will explain that in a later stadium we now just have to watch carefully. As example we show you the next figure:

ID	CableLabel	GroupLabel	Item	SensorType	Connection	Device	Location	Interface	Module
B1	BP234G	Bilges	Fore Peak Bilge	Alarm		Wago AC Room		Dig in(24V)	1
B2	BP235G	Bilges	ER Bilge	Alarm		Wago 2 ER		Dig in(24V)	1
B3	BP236G	Bilges	Aft. Crew Bilge	Alarm		Wago Workshop		Dig in(24V)	1
PSME23	EMPVT3	Propulsion	ME Port Oil	High		Serial 2 ER-2		mA in(4 - 20)	2
PSME54	EMPVT9	Propulsion	ME Port Coolant	Low Level		Serial 2 ER-2		V in(0 - 10)	3
SBME23	EMPVT7	Propulsion	ME STBD Oil	High		Serial 2 ER-1		mA in(4 - 20)	2
SBME54	EMPVT13	Propulsion	ME STBD Coolant	Low Level		Serial 2 ER-1		V in(0 - 10)	3
FF01	17269F	Fire Fighting	Main FiFi Pump	Running		Wago Workshop		Dig in(24V)	1
FF02	17270F	Fire Fighting	Em. FiFi Pump	Running		Wago Workshop		Dig in(24V)	1
Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard		Wago 1 ER		Dig in(24V)	1
Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard		Wago WH		Dig in(24V)	1

Figure 11-6: Sensorlist Module column 1

This may look a bit odd, but realize that we put the Dig in (24V) on a module with 8 contacts (Pin). So the first 8 DI you find are on the first module. Same goes for the mA in (4-20). These modules have 4 contacts. It will become more clear in the next paragraph.

For CANbus in this column you put the PGN or Parameter Group Number as index for the I/O. With Modbus you take the Modbus mapping as starting-point. The register of the Modbus mapping you put here. See following example:

`CANbus`	Serial in(Digital)	65280
`Modbus`	Serial in(Analog)	502

Figure 11-7: Sensorlist Module column 2

11.3.11 Pin

The I/O index on the module for WAGO and the bit offset in the message for serial protocols. (NOTE: The pin index is 1 based).

11.3.11.1 Wago

So if you look at a Wago slice you will see openings for the wires to be attached. It needs some attention because Wago has a different numbering than FT NavVision© and this can be confusing. First let's look at the numbering Wago uses:

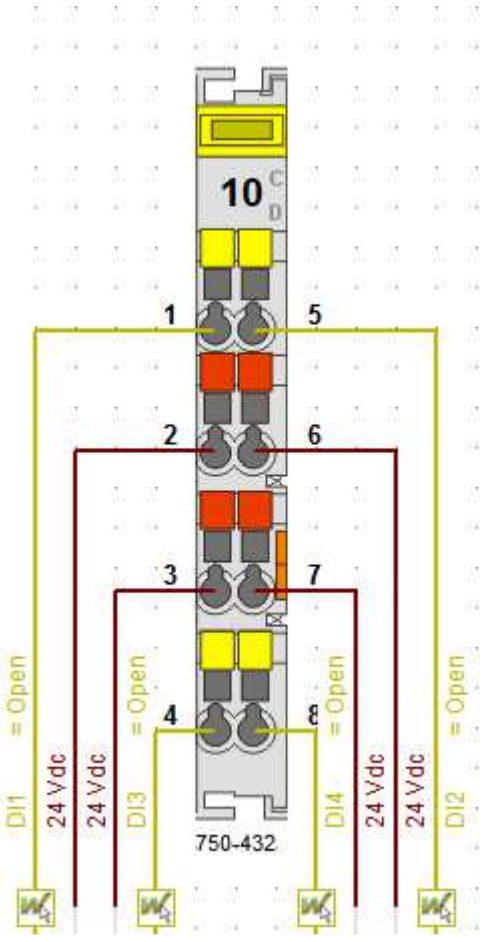


Figure 11-8: Wago Numbering 1

As you can see Wago numbers the pins vertically so left side 1-4 and right side 5-8.

FT NavVision© has to number different because of program issues. We number the Wago horizontally. So 1=1, 5=2 and so on. You have to keep that in mind to work properly with the sensorlist. The FT NavVision© numbering will look as follows:

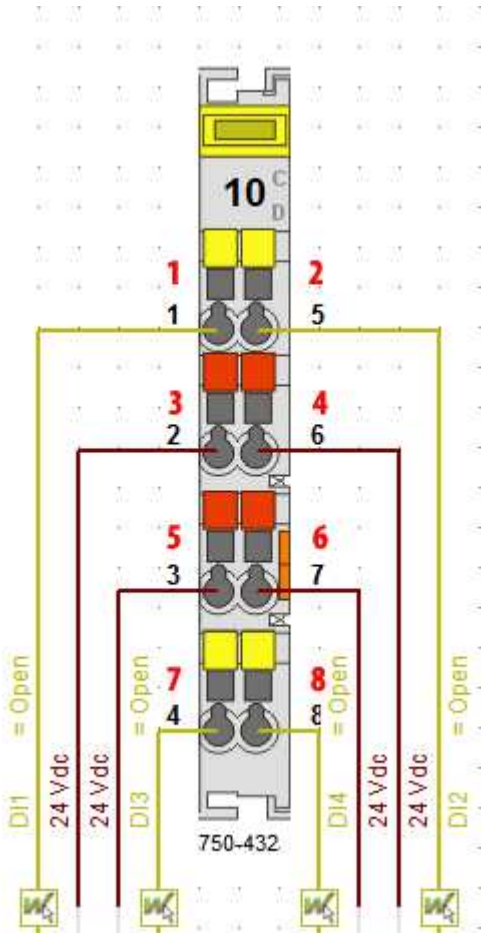


Figure 11-9: Wago Numbering 2

So when you number it this way in the sensorlist, it will mainly look like the following figure:

Interface	Module	Pin
Dig in(24V)	1	1
Dig in(24V)	1	2
Dig in(24V)	1	3
mA in(4 - 20)	2	1
V in(0 - 10)	3	1
mA in(4 - 20)	2	2
V in(0 - 10)	3	2
Dig in(24V)	1	4
Dig in(24V)	1	5
Dig in(24V)	1	6
Dig in(24V)	1	7

Figure 11-10: Pin column 1

Or, when you already sorted the sensorlist, it will make it even clearer. See the following figure:

Interface	Module	Pin
Dig in(24V)	1	1
Dig in(24V)	1	2
Dig in(24V)	1	3
Dig in(24V)	1	4
Dig in(24V)	1	5
Dig in(24V)	1	6
Dig in(24V)	1	7
mA in(4 - 20)	2	1
mA in(4 - 20)	2	2
V in(0 - 10)	3	1
V in(0 - 10)	3	2

Figure 11-11: pin column 2

Of course I can't show you the example from where we started off. While all the connections where on different Wago's there, we should than have divided all the modules over the different Wago stations. Therefore, before you begin numbering the modules and pins, you need to have all the Wago connections in the sensorlist. Then you can filter the sensorlist first (as explained in Chapter 11.4) and then do the modules and pins.

11.3.11.2 Serial Protocols

For Serial protocols the pin number defines the bit-offset. So if you need to connect to a serial protocol at bit level, this column is where you assign this. Note that the "pin index" is 1 based. So if you need bit 3 for PGN 65280 you have to put 4 in the column. See next figure:

`CANbus`	Serial in(Digital)	65280	4
`Modbus`	Serial in(Analog)	502	7

Figure 11-12: Pin column 3

11.3.12 Type

11.3.12.1 Wago

For Wago you fill in here the module number. You can find the module number on the Wago slice itself, on the drawings or look it up in the Wago documentation. See following figure:

Interface	Module	Pin	Type
Dig in(24V)	1	1	750-432
Dig in(24V)	1	2	750-432
Dig in(24V)	1	3	750-432
Dig in(24V)	1	4	750-432
Dig in(24V)	1	5	750-432
Dig in(24V)	1	6	750-432
Dig in(24V)	1	7	750-432
mA in(4 - 20)	2	1	750-454
mA in(4 - 20)	2	2	750-454
V in(0 - 10)	3	1	750-459
V in(0 - 10)	3	2	450-459

Figure 11-13: Type column 1

11.3.12.2 Serial Protocols

For CANbus we do not use this column. For Modbus we use this column to define the function code of the Modbus register. So for example if you read actual values in Modbus, this will be Modbus function 04. Type a 4 in the “Type” column. See following figure:

`CANbus`	Serial in(Digital)	65280	4	
`Modbus`	Serial in(Analog)	502	7	4

Figure 11-14: Type column 2

11.3.13 Min-Max

The columns Min and Max show the range of the data field. This will come back in instruments and value-bars. If you choose them wrong then you get values that go beyond the range of an instrument. Once you see this, you know that you need to change the values. If you get the right data from the shipyard you can fill it in in these fields. For digital data it is Min=0 and Max=1. It is not necessary to fill in the Min- Max-values for digital values. FT NavVision© will do this for you. You can also change these values at a later time.

11.3.14 DefaultUnit

The defaultUnit is used to set the unit to present this Data Field in. This can also be changed in the instrument or mimic itself, but for big amounts of data it is easier to use the sensorlist. If you do not choose anything FT NavVision© will fill it in for you. For options see the next figure:

Alarm	High Alarm	Low Alarm	Ampere-Hour
Radians	Degrees	Grads	°/sec²
rad/sec	°/sec	°/min	Normal
Normal	Mirror	Liter	Gallon
GallonUK	Cubic Meter	Percentage	L/km
G/Nm	L/min	L/Nm	G/S
l/h	G/H	Guk/H	G/min
L/S	Guk/min	l/m	Guk/S
Count	Degrees	Grads	Radians
Kilo Ampere	MilliAmpere	Ampere	Dampening
kg/m³	kg/L	lb/gal	nm/G

nm/l	m/l	km/l	Poundal
Newton	Lbf	Kgf	Kips
Newton Meter	Kgm	Lbf-ft	Hertz
m/g	nm/kg	Km/Kg	kWh/L
kWh/Guk	kWh/G	Fathom	Nautical Mile
Feet	mi	cm	Km
mm	Inch	M	cd/m²
Kg/H	g/s	t/s	Name
Okta	Mask	Number	Percentage
Degrees	Bar	mBar	kPa
Hg	hPa	MPa	Psi
Pascal	MilliOhm	Ohm	KiloOhm
RPM	Hertz	RPM/s	Km/H
Knots	M/Min	M/S	Beaufort
Miles per hour	Feet/Min	g-force	m/s²
OnOff	Open	Alarm Group	General Alarm
Switch Off	Alarm Deadman Group	Switch	Take Over
Push	Popup Switch	Kelvin	Fahrenheit
Celsius	Date	Day	Date & Time
Month	Date & Time Left	Time	Sec
Week	Hour	Year	Min
mSec	uSec	MilliVolt	KiloVolt
Volt	Volt Ampere	kVA	Volt Ampere Hour
kVAh	MVAh	Watt	MegaWatt
KiloWatt	MegaWattHour	WattHour	kWh
Ton	kg	Lbs	Gram

Table 11-5: (Default) Unit options

For our example it will be the following:

Interface	Module	Pin	Type	Min	Max	DefaultUnit
Dig in(24V)	1	1	750-432	0	1	Alarm
Dig in(24V)	1	2	750-432	0	1	Alarm
Dig in(24V)	1	3	750-432	0	1	Alarm
Dig in(24V)	1	4	750-432	0	1	Alarm
Dig in(24V)	1	5	750-432	0	1	Alarm
Dig in(24V)	1	6	750-432	0	1	Alarm
Dig in(24V)	1	7	750-432	0	1	Alarm
mA in(4 - 20)	2	1	750-454	0	10	Bar
mA in(4 - 20)	2	2	750-454	0	10	Bar
V in(0 - 10)	3	1	750-459	0	800	Liter
V in(0 - 10)	3	2	450-459	0	1000	Liter

Figure 11-15: Default Unit column

11.3.15 Manufacturer

This is an optional field for your own convenience

11.3.16 Supplier
This is an optional field for your own convenience

11.3.17 Comment
This is an optional field for your own convenience

11.3.18 Revision
This is an optional field where you can give a revision number. Easy if you need to see when something has been changed or what has been changed after a certain revision.

11.3.19 Field
This is one of the most important columns within the sensorlist. This is the place where you assign a dedicated field from the database of FT NavVision©. This field will be inextricably linked to that I/O, sensor or control. All the in- and outputs and all the calculations, as well as connection to instruments and mimics, will be represented with that field. Also the alarmgroup and behavior will be defined by what you choose here.

You can understand that it is utmost important that this field is chosen properly and a field is only used for one particular sensor/control. These field-column is also the one that will consume most of the time in building the sensorlist.

As mentioned before these fields can be found in the file “fieldlist.txt” in the root of NavVision after the first start of FT NavVision©. Also FTSelect is suitable for checking the right fields.

11.3.19.1 How to work with fieldlist.txt
To find all the right fields you first have to open “fieldlist.txt” the right way. You need to know that, to work with the .txt-file you need to open it in Excel. To do so, right-click on the .txt file and choose “open with” and go for Excel (see Figure 11-16)

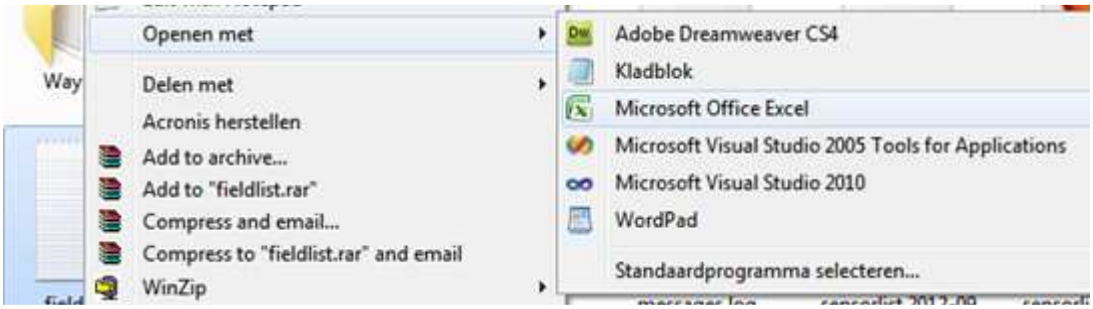


Figure 11-16: open with Excel

Now the program will open as an Excel sheet, with all the opportunities. There are two things you must do first (this is basic Excel knowledge).

Click in the upper left corner of the sheet (see Figure 11-17) to select all fields. Put your mouse between row “A” and row “B” (see Figure 11-18)and doubleclick. The fields now will be all on the right width.

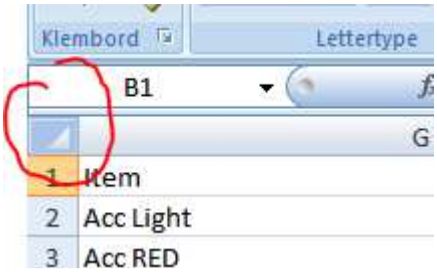


Figure 11-17: Excel 1

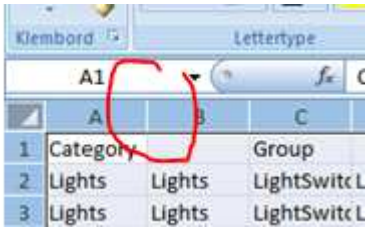


Figure 11-18: Excel 2

Now select the first row by clicking with you mouse on the number “1” in front of the row. Goto Start>sort and filter and then filter (see Figure 11-19). Click it

Figure 11-19: Excel 3

The first row with the index names has now drop down menus and you can choose what to filter. For our example we need Bilges. Goto the index name “Category” click on the dropdown menu, deselect the “select all” checkmark and then select the “bilges” checkmark (see Figure 11-20). You now have only all the bilges-fields available.

You can narrow it down by going to the index name “Group” and make another selection (see Figure 11-21). In our case it is AlarmBilge

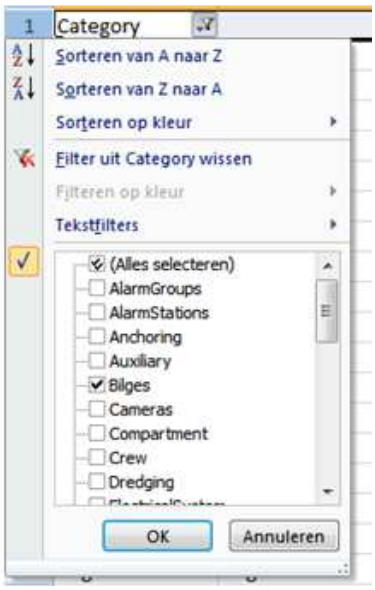


Figure 11-20 : Excel 4

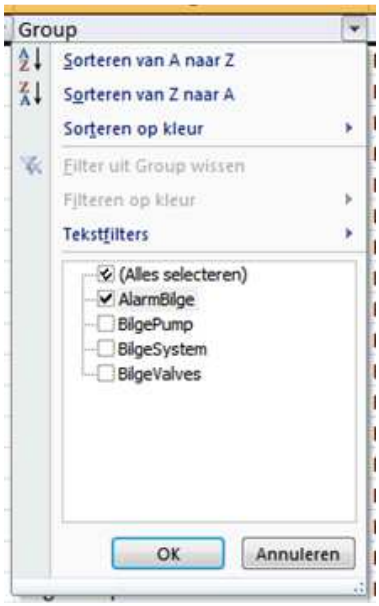


Figure 11-21: Excel 5

Now we've done this we have only the Bilge alarmfields available. You can figure out yourself how you can further narrow it down, or use it for other fields.

11.3.19.2 How to work with FTSelect

In the bin-folder of FT NavVision© you will find the program "FTSelect". Open it and you will get the following window:

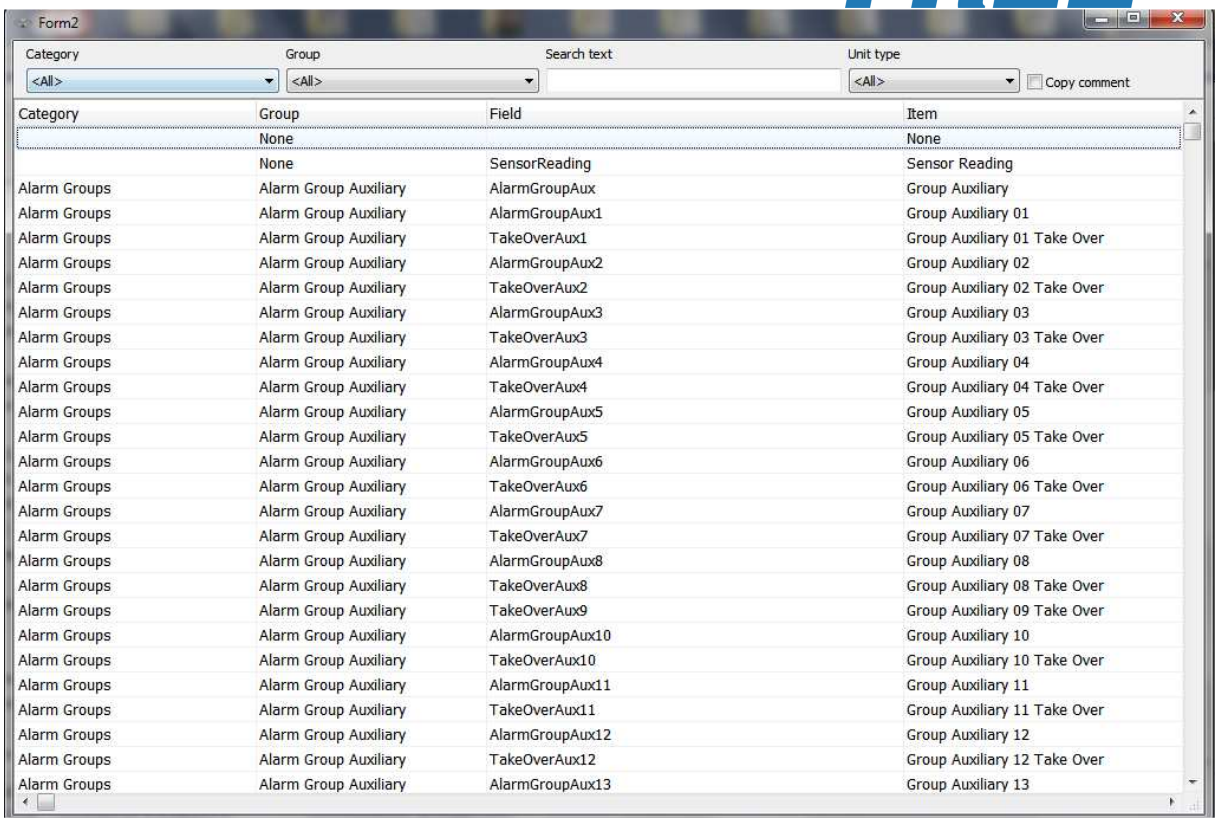


Figure 11-22: FTSelect

You can search for a specific text, or just choose a category and a group to get to the right field. You can even filter on “Unit Type”.

Say you look for the bilge alarm, you can fill in the fields as follows:

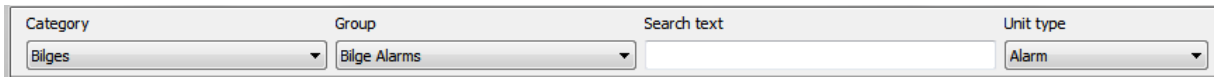
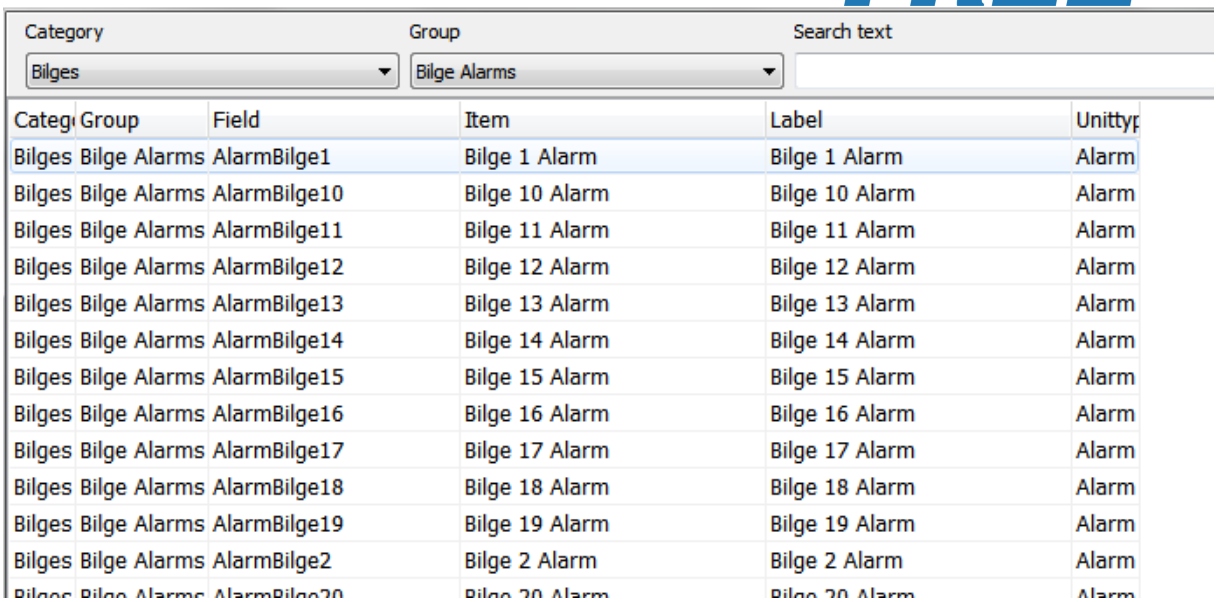


Figure 11-23: filtering in FTSelect

You now get all the bilge alarms available as seen in the following figure:



Category: Bilges | Group: Bilge Alarms | Search text:

Categ	Group	Field	Item	Label	Unittyp
Bilges	Bilge Alarms	AlarmBilge1	Bilge 1 Alarm	Bilge 1 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge10	Bilge 10 Alarm	Bilge 10 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge11	Bilge 11 Alarm	Bilge 11 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge12	Bilge 12 Alarm	Bilge 12 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge13	Bilge 13 Alarm	Bilge 13 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge14	Bilge 14 Alarm	Bilge 14 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge15	Bilge 15 Alarm	Bilge 15 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge16	Bilge 16 Alarm	Bilge 16 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge17	Bilge 17 Alarm	Bilge 17 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge18	Bilge 18 Alarm	Bilge 18 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge19	Bilge 19 Alarm	Bilge 19 Alarm	Alarm
Bilges	Bilge Alarms	AlarmBilge2	Bilge 2 Alarm	Bilge 2 Alarm	Alarm

Figure 11-24: Filtered FTSelect

Now you just select the right line that you need and highlight it by clicking on the light. FTSelect will automatically copy the field to the clipboard and you can paste it again in the sensorlist.

11.3.19.3 Back to the Field column

So now we have narrowed it down to the right fields, it is time to give all our I/O a separate field tag. In the adjusted fieldlist.txt we now see all the alarms for bilges available. We need three bilge alarms, so we need three distinctive bilge alarm fields.

In the previous mentioned excel list, goto the column “Field”. As we are just starting, all the fields are still available. So we can choose the first three Bilge Alarm Fields. Select these three fields and copy them (CTRL-C). Go back to your sensorlist and past them into the field column behind the three bilge items. See the following figure.

ID	CableLabel	GroupLabel	Item	SensorType	Pin	Type	Min	Max	DefaultUnit	Manufacturer	Supplier	Comment	Revision	Field
B1	BP234G	Bilges	Fore Peak Bilge	Alarm	1	750-432	0	1	Alarm					AlarmBilge
B2	BP235G	Bilges	ER Bilge	Alarm	2	750-432	0	1	Alarm					AlarmBilge1
B3	BP236G	Bilges	Aft. Crew Bilge	Alarm	3	750-432	0	1	Alarm					AlarmBilge2
FF01	17269F	Fire Fighting	Main FiFi Pump	Running	4	750-432	0	1	Alarm					

Figure 11-25: Field column 1

You can follow this for all the other fields and you will get the following:

ID	CableLabel	GroupLabel	Item	SensorType	Pin	Type	Min	Max	DefaultUnit	Manufacturer	Supplier	Comment	Revision	Field
B1	BP234G	Bilges	Fore Peak Bilge	Alarm	1	750-432	0	1	Alarm					AlarmBilge
B2	BP235G	Bilges	ER Bilge	Alarm	2	750-432	0	1	Alarm					AlarmBilge1
B3	BP236G	Bilges	Aft. Crew Bilge	Alarm	3	750-432	0	1	Alarm					AlarmBilge2
FF01	17269F	Fire Fighting	Main FiFi Pump	Running	4	750-432	0	1	Alarm					AlarmFire1
FF02	17270F	Fire Fighting	Em. FiFi Pump	Running	5	750-432	0	1	Alarm					AlarmFire2
Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard	6	750-432	0	1	Alarm					DoorOpen1
Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard	7	750-432	0	1	Alarm					DoorOpen2
PSME23	EMPVT3	Propulsion	ME Port Oil	High	1	750-454	0	10	Bar					EngineOilPressure1
SBME23	EMPVT7	Propulsion	ME STBD Oil	High	2	750-454	0	10	Bar					EngineOilPressure2
PSME54	EMPVT9	Propulsion	ME Port Coolant	Low Level	1	750-459	0	120	Liter					EngineCoolantLevel1
SBME54	EMPVT13	Propulsion	ME STBD Coolant	Low Level	2	450-459	0	120	Liter					EngineCoolantLevel1

Figure 11-26: Field column 2

: with bigger projects it is easy to get mistaken. Easiest way to prevent this is that you color the fields u have used in the fieldlist.txt yellow. That way you will know which ones are used and which are free. Later on we show you that FT NavVision© has a way to trace the faults. See chapter 12.5

11.3.20 Label

The Label column exists of the short description of the Data Field when shown in an instrument. Default label text belonging to the Data Field is preferred.

So the easiest way is to copy the “Item” column and just past it into the “Label” column. This way you have a one-on-one connection. Off course this is the text that you find as a label in instruments etc. When the text is too big, it won’t fit in the instrument or just looks sloppy. So if this is the case, just alter the name here to a short description. “Emergency Generator Power Failure” can be changed into “Em. Gen. Power Fail.” And if the default unit is available in an instrument, you can even leave types as “Pressure”, “Voltage”, etc. out of it, cause they will see that it is a “Bar” value or a “V” value. So “Main Engine Lub Oil Pressure” can be set as “ME Oil”

11.3.21 Rate

Rate describes the number of samples per second of a sensor/control. This is defined by the protocol. Leave empty.

11.3.22 Index

Index defines when this Data Field Definition [DFD] is valid. The Index column can only be used in combination with a Data Field Definition [DFD] that has the SensorType set to Index and is in the same message as this DFD. Default is empty.

11.3.23 Datatype

DataType is used to define the type of value on serial protocols. For analogue values it’s Float, Signed or Unsigned. For digital values it’s Bool. For enumerations this is Enum. See Enum column.

11.3.24 Enum
Enum is the index value where the received value should compare to, to switch the Data Field on. If the value is not equal to the Enum index the Data Field is switched off.

11.3.25 Count
Count is the number of bits starting from the pin index. For a digital value it's typically 1 with a pin index between 1 and 16 and for analog values it's for example for Mod bus typically 16 with pin index 1. Canbus has almost always a count of "2".

11.3.26 Multiplier
Multiplier defines the factor between the sensor/control value and the real value.
For inputs/read:
*value = sensor value * multiplier + offset*
For outputs/write:
sensor value = (value – offset) / multiplier
For example: if the temperature is send in from a sensor in whole numbers (210 for 21 degrees) you can put in a multiplier of 0.1. So when the sensor sends 210, it goes through the multiplier and FT NavVision© makes it 210*0.1=21

11.3.27 Offset
Offset defines the offset between the sensor/control value and the real value. See Multiplier column.

11.3.28 Unit
The Unit in which the sensor/control value is received or send. Directly from the sensor control. This field differs from the DefaultUnit by the fact that FT NavVision© has no influence on this one. For options see Table 11-5.

11.3.29 GroupLocal, ItemLocal and LabelLocal
To use a local language in FT NavVision© it is possible to set local fields. In chapter 11.1.14 Software installation and commissioning manual 1.9, you can find how you can set the local language for an operator.

As you will set the English language in the columns Group, Item and Label, you can set the local language in these columns. For example you can set all these items in the Chinese language. Now by choosing the local setting for an operator in FT NavVision©, this operator will get FT NavVision© to show his preferred language

11.3.30 Decimals
As described in chapter 11.2.2.4 Software installation and commissioning manual 1.9, you can set the number of decimals that you want FT NavVision© to show in values. To change it quickly for a lot of values, you can use this column. Empty is standard FT NavVision© settings. Other choices are 1,2,3,4,5,6,7 or 8

11.3.31 Other columns

The rest of the columns in the sensorlist are optional, because FT NavVision© will fill them in for you. These fields will only be used for specific needs. If you want to know what you can do with these columns, it is enough to look in the Sensorlist Table (see Table 11-1).

11.4 Filter sensorlist

Once you start filling the sensorlist it is good habit that before you fill in the columns module and pin, you filter the sensorlist. This is also common Excel knowledge, but for your convenience we will give a short explanation here.

Let's say you have filled in a few I/O that you got from a list and you just start to fill in in no particular order. Than it is impossible to address the right module and pin as the list will be extremely long and changes on mistakes will be huge. So before you start with the module and pin columns you will have to filter the sheet.

The columns that you did fill in contain the device-column and the interface-column. With these two you can filter the sheet for a first result.

What you need to filter first is that all the devices are grouped and the interfaces are grouped together. To do this you go to Start>Sort and Filter>Custom sort. You will get a menu like in the folloing figure:

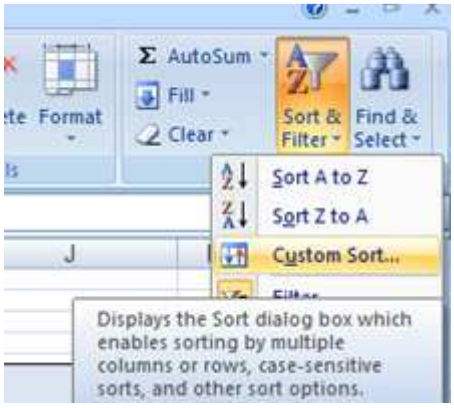


Figure 11-27: Custom sort

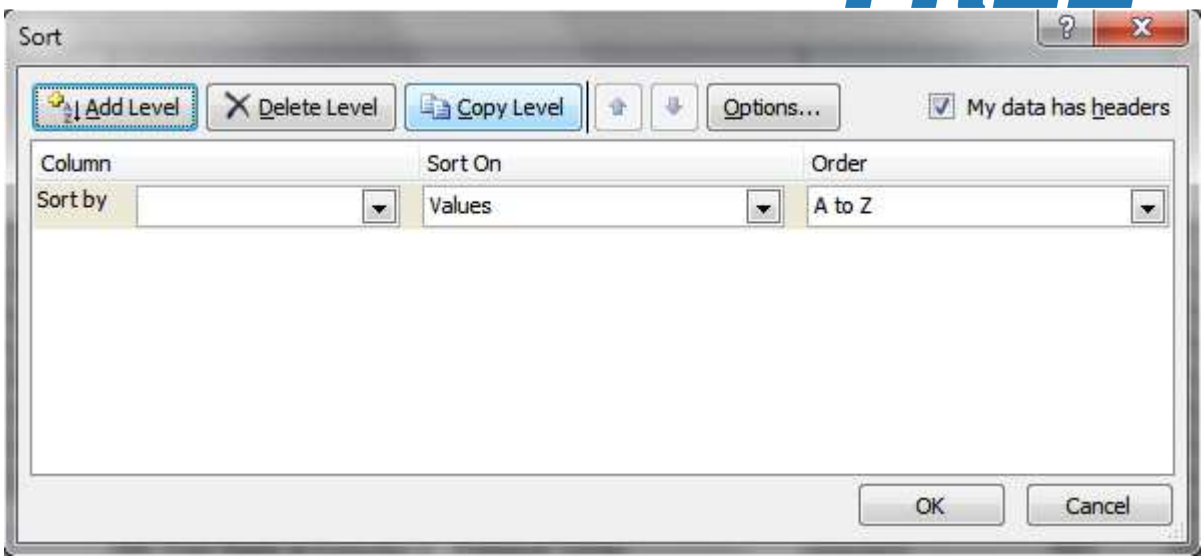


Figure 11-28: Custom sort window

In this window you can add as many levels as you want to filter out the sheet. We need only two for now, “Device” and “Interface” as you see in the next figure:

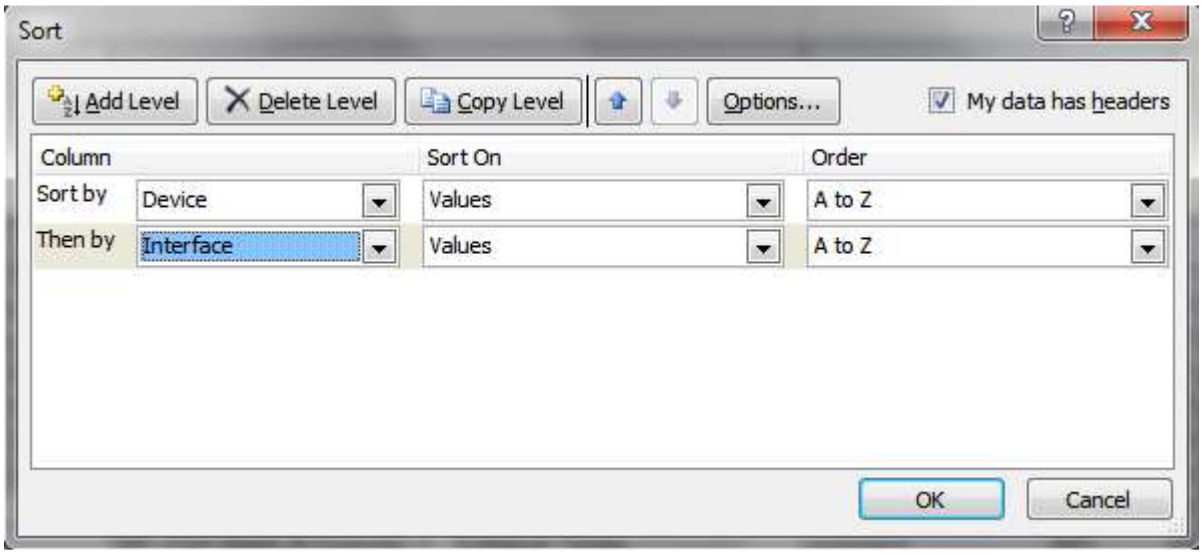


Figure 11-29: Sorting device and interface

Sorting it this way gives you the devices ordered at the right Wago PLC and you get all the same slices together. This is the first step of filtering that is pretty easy and it gives the following example:

ID	CableLabel	GroupLabel	Item	SensorType	Connection	Device	Location	Interface	Module	f	Type
	SYS01	System	Station Engine Room Alarm Buzzer	Standard	NO	PLC ECR	ECR	Dig out(24V)			750-504
	SYS02	System	Group General Engineer	Standard	NO	PLC ECR	ECR	Dig out(24V)			750-504
		ER Signalling system	Signalling system rotating lamp	Standard	NO	PLC ECR	ECR	Dig out(24V)			750-504
		ER Signalling system	Signalling system horn	Standard	NO	PLC ECR	ECR	Dig out(24V)			750-504
	AC008	ELECTRICAL SYSTEMS	Diesel Generator 3 LO Pressure Low	Low	NO	PLC ECR	ECR	Dig out(pot free)			750-517
	AC009	ELECTRICAL SYSTEMS	Diesel Generator 3 CW Temperature High	High	NO	PLC ECR	ECR	Dig out(pot free)			750-517
	TA007	TANK LEVELS	1-Port Fuel Tank Level	standard	NO	PLC ECR	ECR	mA in(4 - 20)			750-454
	TA008	TANK LEVELS	1-Stbd Fuel Tank Level	standard	NO	PLC ECR	ECR	mA in(4 - 20)			750-454
	ES004	ELECTRICAL SYSTEMS	Alarm Monitoring System Battery Voltage	standard	NO	PLC ECR	ECR	V in(0 - 30)			750-483
	BL001	BILGE SYSTEM & ALARMS	Engine Room Aft Bilge Alarm	Alarm	NC	PLC ER1	ER	Dig in(24V)			750-432
	BL002	BILGE SYSTEM & ALARMS	Engine Room Fwd Bilge Alarm	Alarm	NC	PLC ER1	ER	Dig in(24V)			750-432
	PC011	PUMP	Fire Pump	Standard	NO	PLC ER1	ER	Dig out(pot free)			750-517
	EX101	ENGINE - PORT	ME Port Bank A Cylinder 1 Exhaust Temp.	standard	NO	PLC ER1	ER	Thermo in(K)			750-469
	EX102	ENGINE - PORT	ME Port Bank A Cylinder 2 Exhaust Temp.	standard	NO	PLC ER1	ER	Thermo in(K)			750-469
	ES001	ELECTRICAL SYSTEMS	Diesel Generator 1 Battery Voltage	standard	NO	PLC ER1	ER	V in(0 - 30)			750-483
	ES002	ELECTRICAL SYSTEMS	Diesel Generator 2 Battery Voltage	standard	NO	PLC ER1	ER	V in(0 - 30)			750-483
	ES003	ELECTRICAL SYSTEMS	Diesel Generator 3 Battery Voltage	standard	NO	PLC ER1	ER	V in(0 - 30)			750-483
		System	Alarm Fuse1 ER2	Alarm	NO	PLC ER2	ER	Dig in(24V)			750-610
	MI016	MISC.ENGINEERING	Domestic Compressed Air Pressure Low Alarm	standard	NO	PLC ER2	ER	mA in(4 - 20)			750-454
	ME119	ENGINE - PORT	ME Port Raw Water In Temperature	standard	NO	PLC ER2	ER	Ohm in(Pt100)			750-461
	ME120	ENGINE - PORT	ME Port Raw Water Out Temperature	standard	NO	PLC ER2	ER	Ohm in(Pt100)			750-461
	ME140	ENGINE - PORT	ME Port RPM	Standard	NO	PLC ER2	ER	Puls(0 - 100kHz)			750-404-00
	ME240	ENGINE - STBD	ME Stbd RPM	Standard	NO	PLC ER2	ER	Puls(0 - 100kHz)			750-404-00
	MI034	AUXILIARY SYSTEMS	Bow Thruster 24V DC Control Voltage Failure	Alarm	NC	PLC Fwd	FWD	Dig in(24V)			750-432
		System	Alarm Fuse FWD	Alarm	NO	PLC Fwd	FWD	Dig in(24V)			750-610
	TA026	TANK LEVELS	3-Port Fuel Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)			750-454
	TA027	TANK LEVELS	3-Stbd Fuel Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)			750-454
	PC022	PUMP	Em. Fire Pump	Running	NC	PLC Lazarette	LAZZERETTE	Dig in(24V)			750-432
		System	Alarm Fuse Lazarette	Alarm	NO	PLC Lazarette	LAZZERETTE	Dig in(24V)			750-610

Figure 11-30: Sorted sensorlist

As you can see we have all the devices put together and within these devices we have all the interfaces put together. Due to the running sequence Wago follows, we need to make some final adjustments by hand. There is a certain sequence that we have to build up the Wago PLC's in. For more information we refer to Wago. For now we can say that we start the construction of Wago in the following (global) order:

First DI-modules
Than DO-modules
Than AI-modules
Than AO-modules

This is a global distribution, cause it sometimes needs some additional action. For now this is enough to understand.

As you look at Figure 11-30 you can see in the column "Interface" that it worked out pretty well. The only thing in this example that is not right are the modules at line 28 and 29. This is need to know knowledge. These modules don't work in that position and has to be places before the 750-454 module at line 25.

To do so select the two lines (28 and 29) and cut them.

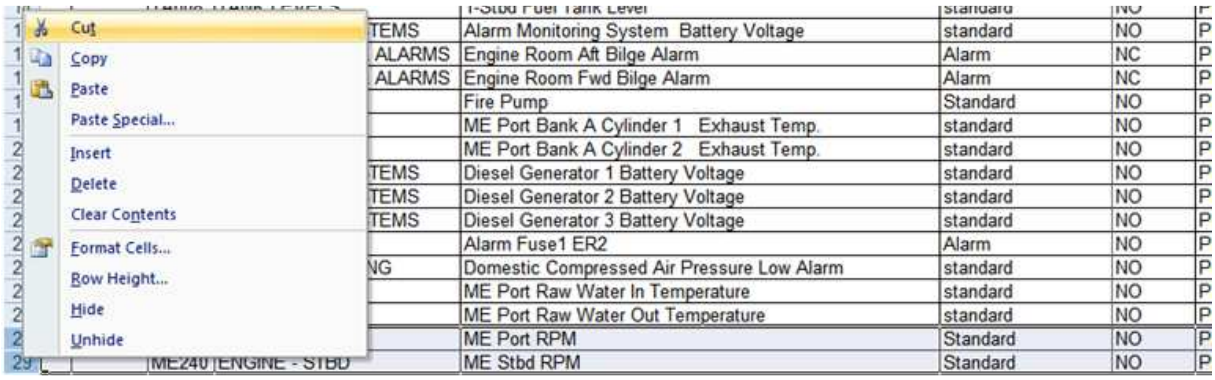


Figure 11-31: Cut and paste 1

Once you've done that you go to the line that you need to insert them and right-click on the number of the row underneath that line. Choose Insert Cut Cells. See following figure"

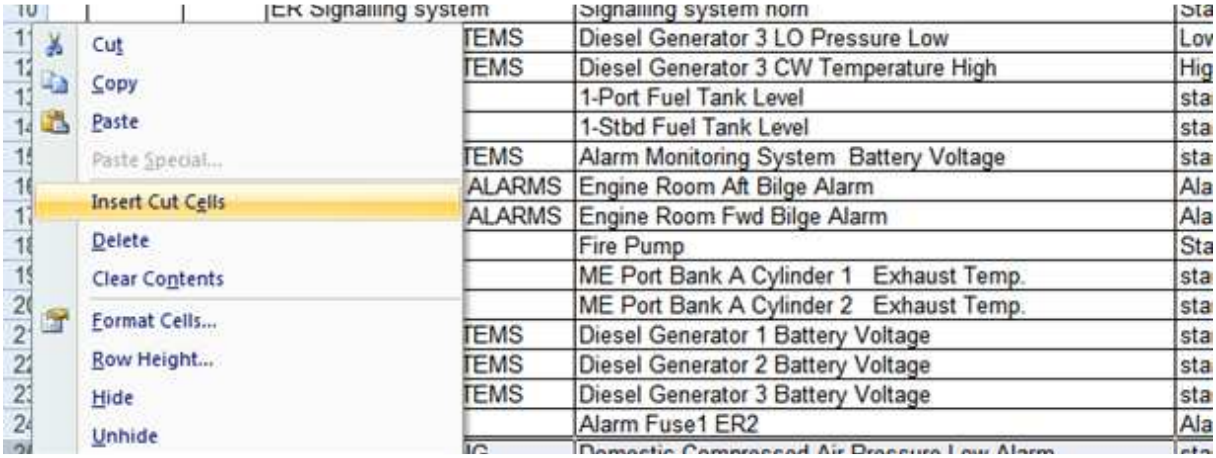


Figure 11-32: Cut and paste 2

Now you have everything in the right order and you can start numbering the Modules and Pins.

:You need to have good to excellent knowledge about Wago and Microsoft Excel. We recommend that you get some additional training on this as well.

11.5 Special issues

There are several special issues that you can put in the sensorlist. Changes you make in FT NavVision© itself will get lost as soon as you import a new sensorlist. To prevent this loss it necessary that you put all the changes you make in FT NavVision© are directly put into the sensorlist. In the hectics of a commissioning it will not always be possible to do that directly, for adjusting the sensorlist at a later time we refer you to Chapter 12.

However we do like to give an example of things you need to change by hand in the sensorlist. For this we assume that you have more than basic knowledge of working with FT NavVision©.

So let's say that you have a ship with a lot of duty-stations. At some point the crew will ask you to change the names in the alarm/duty mimic, so they can see who is on duty or who they are calling through the FT NavVision© call function.

Given the next example (see Figure 11-33 and Figure 11-34) we have changed the names of a few files to match the names as the crew would like to see it. As you will know these names are changed in Fieldsettings>Comment>Crew>CrewAlarms within FT NavVision©. If you do not put this in the sensorlist, each time you import a new sensorlist these names will be changed. This is not desirable, so you need to put these changes into the sensorlist.

If you put this in to the sensorlist, the easiest way to do this is on top of the list. Add some extra rows and start filling the information there. You have to understand that it is FT NavVision© based so the device is FT NavVision© NavVision. SensorType is Standard,

Connection is NO and in the “Item” column you fill in the name that you want to show in the alarm mimic of FT NavVision© (see Figure 11-35).

Figure 11-33: Duty names

Figure 11-34: Call names

Item	SensorType	Connection	Device
Chief Eng.	Standard	NO	FT NavVision
2nd Eng.	Standard	NO	FT NavVision
1st Off.	Standard	NO	FT NavVision
2nd Off.	Standard	NO	FT NavVision
Stewardes	Standard	NO	FT NavVision
Captain	Standard	NO	FT NavVision
Chief Eng.	Standard	NO	FT NavVision
2nd Eng.	Standard	NO	FT NavVision
1st Off.	Standard	NO	FT NavVision
2nd Off.	Standard	NO	FT NavVision
Stewardes	Standard	NO	FT NavVision
Captain	Standard	NO	FT NavVision

Figure 11-35: Special issues 1

At the “field” column you assign the right fields (which you will find in the fieldlist.txt see Chapter 11.3.19.10). In the “Label” column you once again fill in the names as you described them in the “Item” column (see).

Item	SensorType	Comm	Revis	Field	Label
Chief Eng.	Standard			EngineerCall	Chief Eng.
2nd Eng.	Standard			EngineerCall1	2nd Eng.
1st Off.	Standard			EngineerCall2	1st Off.
2nd Off.	Standard			EngineerCall3	2nd Off.
Stewardes	Standard			EngineerCall5	Stewardes
Captain	Standard			EngineerCall6	Captain
Chief Eng.	Standard			EngineerDutyStatus	Chief Eng.
2nd Eng.	Standard			EngineerDutyStatus1	2nd Eng.
1st Off.	Standard			EngineerDutyStatus2	1st Off.
2nd Off.	Standard			EngineerDutyStatus3	2nd Off.
Stewardes	Standard			EngineerDutyStatus5	Stewardes
Captain	Standard			EngineerDutyStatus6	Captain

Figure 11-36: Special issues 2

That is all. FT NavVision© will take care of the rest. Now if you import the sensorlist again, you will keep the names you gave to the Crew Alarms.

12. Importing in FT NavVision

12.1 Introduction

Once you are finished with (a part) of the sensorlist, you will at some point need to implement it in FT NavVision©. This is done by importing the sensorlist into FT NavVision©.

In Chapter 9.4 you can see how that is done. Once you have the sensorlist.xls file ready you will put it in the root folder of the NavVision installation. We will go over these steps in the next chapters.

12.2 How to import

Make sure that FT NavVision© is closed and you are in the file explorer. You will have to be in the root folder. Here you will paste the sensorlist.xls file that you just created (see Figure 12-1).

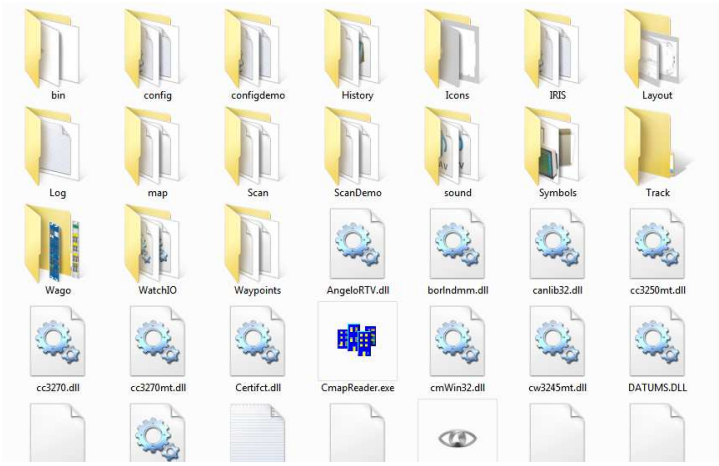


Figure 12-1: Root folder

Once you have done this, you can start FT NavVision© again. During the startup you will be asked if you want to import the devicelist and/or the sensorlist (this is referring to the 2 tabs in the sensorlist.xls. You answer yes to both the questions (see Figure 12-2 and Figure 12-3) and FT NavVision© will continue the startup. At this time the sensorlist will overwrite the existing configuration.

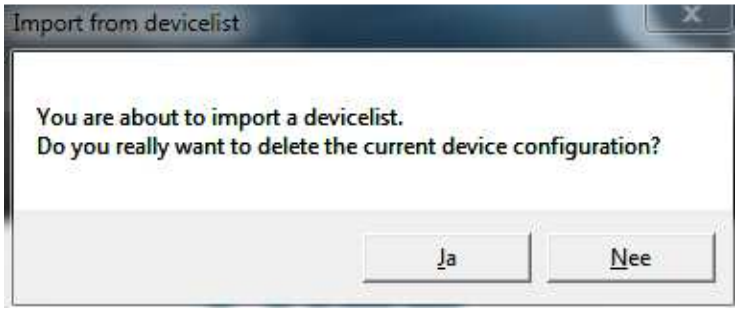


Figure 12-2: Import devicelist

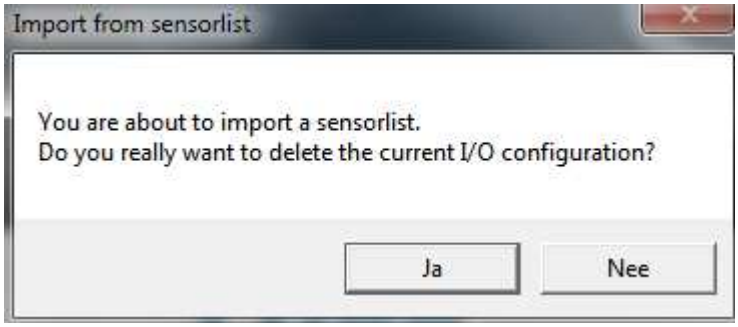


Figure 12-3: Import sensorlist

Everything you have put into the sensorlist will now be in the configuration of FT NavVision©. This cannot easily be undone, so be very careful if you import. There is a possibility to preserve the old system. Therefor it is necessary that you back up the complete “config” folder. If than anything goes wrong, you can paste the old config folder back.

: it is always wise to keep a backup of the last working system on for back up sake. Always make a backup of, at least, the “config” folder.

Make sure when importing a sensorlist (or even just working on the system) you work on one workstation only (close down all other stations). This way you prevent other workstations from interfering with your setup through the sync-function in FT NavVision©.

12.3 Check the import

There is not a simple way to check if the import has been successful. The import function has been tested thoroughly by FT NavVision© so the basic import function will work. It is wise to check the import anyway.

As you are probably the one that changed the sensorlist you will now which items has been changed, so you can check these items in FT NavVision©. Also check if the connections are still allright in network>system layout (see) and if the Wago’s are still in place and connected right, etc. For more information on how to check these items we refer to the “Installation and commissioning manual”.

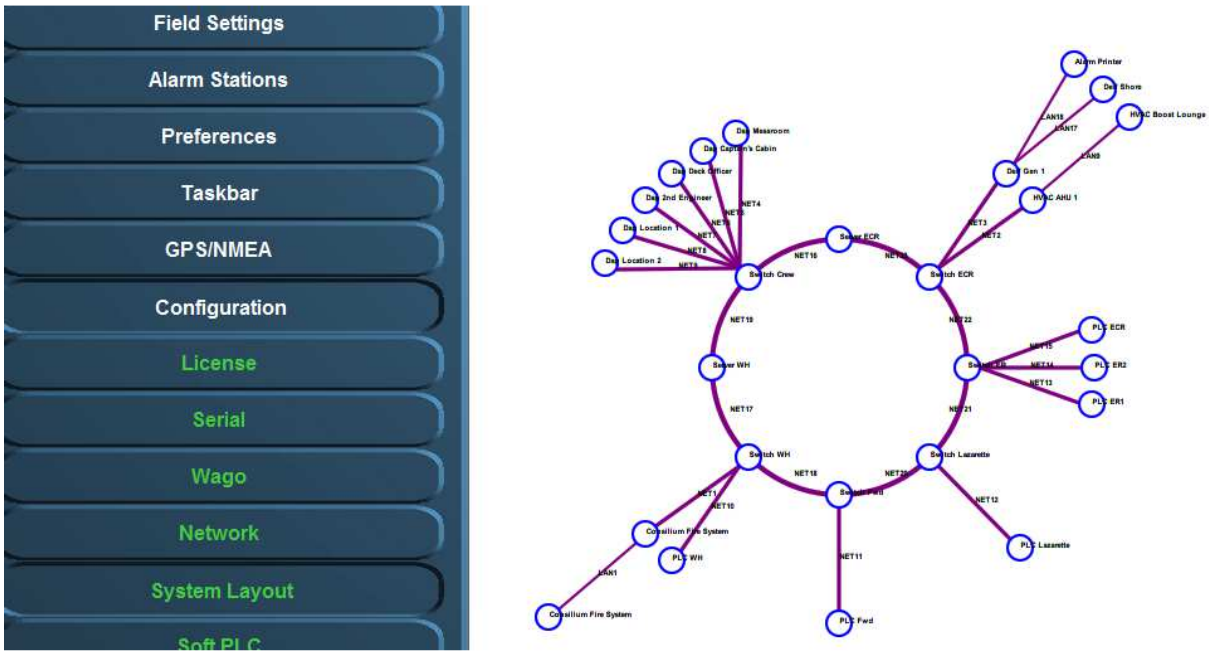


Figure 12-4: Checking system layout

12.4 Devicelist generated

Once you have made an import the system will make a “devicelist_generated”. In this file you will find all the changes, faults, etc. that the system found. These are changes that are the differences between your devicelist import and the existing configuration. Also if you have made a mistake in the devicelist, it will be noted here so you can check whether you have to change something. The devicelist_generated will look like the following figure:

: Open the devicelist_generated (or the other generated files which are all HTML-files) with right-click>open with> excel program.

Import Result	Id	Device	Comment	Location	Protocol	Interface	Port	Source	Server	Type	Speed	Datalink	Hardware	Options	IPAddressUp	MACAddressUp	IPAddressUp2	MACAddress
		FT NavVision			PC	Settings	1	1		PC	9600	N,8,1	RS232					
		Serial ECR		ECR	Printer	Network Serial 01	1	1		Moxa UC-711X	9600	N,8,1	RS232	DTR,RTS	172.16.1.41			0090E82EBDC
		Network Serial 1, Port 2			PC	Network Serial 01	2	1		Moxa UC-711X	9600	N,8,1	RS232	DTR,RTS	172.16.1.41			
		Serial 1 ER-1		ER	Cat	Network Serial 02	1	1		Moxa UC-711X	115200	N,8,1	RS485	DTR,RTS	172.16.1.42			0090E82EBDE
		Serial 2 ER-1		ER	Cat	Network Serial 02	2	1		Moxa UC-711X	115200	N,8,1	RS485	DTR,RTS	172.16.1.42			0090E82EBDE
		Serial 1 ER-2		ER	Cat	Network Serial 03	1	1		Moxa UC-711X	115200	N,8,1	RS485	DTR,RTS	172.16.1.43			0090E82EBD0
		Serial 2 ER-2		ER	Cat	Network Serial 03	2	1		Moxa UC-711X	115200	N,8,1	RS485	DTR,RTS	172.16.1.43			0090E82EBD0
		Serial WH-1		WH	Nmea	Network Serial 04	1	1		Moxa UC-711X	9600	N,8,1	RS232	DTR,RTS	172.16.1.44			0090E82EBDC
		Serial WH-2		WH	Nmea	Network Serial 04	2	1		Moxa UC-711X	115200	N,8,1	RS232	DTR,RTS	172.16.1.44			0090E82EBDC
		DAP Eng. Cabin 1		Cabin 1	PC	Client 01	1	1		PC	9600	N,8,1	RS232		172.16.1.81			00506C03E61
		DAP Eng. Cabin 2		Cabin 2	PC	Client 02	1	1		PC	9600	N,8,1	RS232		172.16.1.82			00506C03E60
		DAP Eng. Crew		Crew	PC	Client 03	1	1		PC	9600	N,8,1	RS232		172.16.1.83			00506C03E61
		Dap ER		ER	PC	Client 04	1	1		PC	9600	N,8,1	RS232		172.16.1.84			00506C03E5E
		Server 1		WH	PC	Server 01	1	1		PC	9600	N,8,1	RS232		172.17.26.37		172.16.26.37	
		Server 2		ECR	PC	Server 02	1	1		PC	9600	N,8,1	RS232		172.16.26.36		172.17.26.36	
		Wago WH		WH	Wago	Wago 01	1	1		Wago	9600	N,8,1	RS232		172.16.1.97			0030DE0623A
		Wago ECR		ECR	Wago	Wago 02	1	1		Wago	9600	N,8,1	RS232		172.16.1.91			0030DE0623A
		Wago 1 ER		ER	Wago	Wago 03	1	1		Wago	9600	N,8,1	RS232		172.16.1.92			0030DE0623A
		Wago 2 ER		ER	Wago	Wago 04	1	1		Wago	9600	N,8,1	RS232		172.16.1.93			0030DE0623A
		Wago Workshop		WS	Wago	Wago 05	1	1		Wago	9600	N,8,1	RS232		172.16.1.94			0030DE0623A
		Wago AC Room		ACR	Wago	Wago 06	1	1		Wago	9600	N,8,1	RS232		172.16.1.95			0030DE0623A
		Wago Storage		Storage	Wago	Wago 07	1	1		Wago	9600	N,8,1	RS232		172.16.1.96			0030DE0623A
		Switch 1 ECR		ECR	Switch	Switch 01	1	1		Switch	9600	N,8,1	RS232					
		Switch 2 ECR		ECR	Switch	Switch 02	1	1		Switch	9600	N,8,1	RS232					
		Switch ER		ER	Switch	Switch 03	1	1		Switch	9600	N,8,1	RS232					
		Switch Workshop		WS	Switch	Switch 04	1	1		Switch	9600	N,8,1	RS232					
		Switch AC Room		ACR	Switch	Switch 05	1	1		Switch	9600	N,8,1	RS232					
		Switch Storage		Storage	Switch	Switch 06	1	1		Switch	9600	N,8,1	RS232					
		Switch Em. SB		ESB	Switch	Switch 07	1	1		Switch	9600	N,8,1	RS232					
		Switch WH		WH	Switch	Switch 08	1	1		Switch	9600	N,8,1	RS232					

Figure 12-5: devicelist_generated good

This is of course when the devicelist was good in the first place. This is the kind of devicelist_generated that you want to get back, because then you know you did well. When you have made a mistake you will find a comment (with a color) in the first column import result”. You can have something like the following figure:

Field	Description
Comment	Comment that something is different in the field
Changed	Notice that something has changed
Failed	Critical failure somewhere in the field
Missing	Field tag is missing
New	Field is added since last import

Figure 12-6: Fault codes

The “comments” are merely there to make you aware that there is a small problem. Just check the line if there is an inconsistency in words or something. Sometimes it doesn’t even matter that there is a comment while you can deliberately made a difference in something. It doesn’t really affect he program.

The “changed” is there to warn you that there is something altered between the original configuration and the import. It can be two ways. Maybe FT NavVision© changed something because the program noticed that you made a mistake. Maybe you mixed up a protocol or whatever. The fault in the row behind the import result will also be colored yellow. Sometimes

there is something changed that differs between the original configuration and what you imported with the sensorlist.

12.5 Sensorlist generated

The sensorlist has the same import result column. It also has the same fault codes as the devicelist. The only extra field that the sensorlist_generated has is the import result “New” in a green cell. This means that with the import of the sensorlist, you introduced a new i/o or control or that you changed something in the FT NavVision© program itself which is much more likely. In Chapter 13 we will explain that these fields are of much importance to keep the sensorlist up to date. For now you must know what you are looking at when you open up the sensorlist_generated or the devicelist_generated. The sensorlist_generated is mostly much bigger than the devicelist_generated, so you can imagine that it will be a lot of work to keep the sensorlist up to date. See the next figure for a small excerpt of a devicelist_generated:

27	Changed				Deadman Timer Bridge	Standard	NO	FT NavVision		Serial in(Analog)	28447	1	0		-10	12	Min
28	Changed				Fuel Tank 1 Volume	Standard	NO	FT NavVision		Serial in(Analog)	39652	1	0		0	25987	Liter
29	Changed				Fuel Tank 1 Ullage	Standard	NO	FT NavVision		Serial in(Analog)	39720	1	0		0	25987	Liter
30	Comment				PLC fail: SoftPLC1	Standard	NO	FT NavVision		Serial in(Analog)	42867	1	0		0	1	Alarm
31	Comment				PLC stop: SoftPLC1	Standard	NO	FT NavVision		Serial in(Analog)	42918	1	0		0	1	Alarm
32	Changed	SBME23	EMPVT7	Propulsion	ME STBD Oil	High	NO	Serial 2 ER-1		mA in(4 - 20)	2	2	0	750-454	0	1	Alarm
33	Changed	SBME54	EMPVT13	Propulsion	ME Port Coolant	Low Level	NO	Serial 2 ER-1		V in(0 - 10)	3	2	0	450-459	0	800	Liter
34	Changed	PSME23	EMPVT3	Propulsion	ME Port Oil	High	NO	Serial 2 ER-2		mA in(4 - 20)	2	1	0	750-454	0	1	Alarm
35		PSME54	EMPVT9	Propulsion	ME Port Coolant	Low Level	NO	Serial 2 ER-2		V in(0 - 10)	3	1	0	750-459	0	800	Liter
36						Standard	NO	Wago WH		Dig in(24V)	1	1	0	750-432			
37	Fail	Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard	NO	Wago WH		Dig in(24V)	1	7	0	750-432	0	1	Switch
38						Standard	NO	Wago 1 ER		Dig in(24V)	1	1	0	750-432			
39	Fail	Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard	NO	Wago 1 ER		Dig in(24V)	1	6	0	750-432	0	1	Switch
40		B2	BP235G	Bilges	ER Bilge	Alarm	NO	Wago 2 ER		Dig in(24V)	1	2	0	750-432	0	1	Alarm
41		B3	BP236G	Bilges	Aft. Crew Bilge	Alarm	NO	Wago Workshop		Dig in(24V)	1	3	0	750-432	0	1	Alarm
42	Changed	FF01	17269F	Fire Fighting	Main FiFi Pump	Running	NO	Wago Workshop		Dig in(24V)	1	4	0	750-432	0	1	Switch
43	Changed	FF02	17270F	Fire Fighting	Em. FiFi Pump	Running	NO	Wago Workshop		Dig in(24V)	1	5	0	750-432	0	1	Switch
44		B1	BP234G	Bilges	Fore Peak Bilge	Alarm	NO	Wago AC Room		Dig in(24V)	1	1	0	750-432	0	1	Alarm

Figure 12-7: sensorlist_generated

12.6 Sensorlist generated diff

The sensorlist_generated_diff is a help file that shows all the comments, fail and changes together with the corresponding original line (see). This is ideal if you are troubleshooting the sensorlist. There you can see what is changed and the line underneath will tell you how it was original. In the next Chapter we will show you how you can make use of this file to keep the sensorlist up to date. There is no need to use it, but some people find it easier to work with. Others just use the sensorlist_generated. It is up to you what you will use.

Comment				LAN: Serial ECR -> Switch 2 ECR
Reference				Network cable 1 broken Alarm

Figure 12-8: Diff example 1

This is a typical example of a “comment”. You can see that FT NavVision© noticed that the name is changed. In the reference line you can see what it used to be. While this is probably the way you want it to be changed, you can ignore this comment.

Changed				Deadman Timer Bridge	Standard	NO	FT NavVision		Serial in(Analog)	28447	1	0		-10	12
Reference				Deadman Timer Bridge	Standard	NO	FT NavVision		Serial in(Analog)	28447	1	0		-10	30

Figure 12-9: Diff example 2

Here you see a row that shows a changed state. In this case it is about the deadman timer bridge. Somehow in the program, somebody filled in 30 as the max amount of minutes. Later, probably after a new import, somebody changed it to 12 minutes. FT NavVision© notices this change and point it out for you here. If you feel it is alright you can leave it. You will, however, have to change it in the original sensorlist, or it will come back at the next import.

Fail	Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard	NO	Wago WH		Dig in(24V)	1	7	0	750-432	0	1	Switch
Reference	Door WH	DH2376	Doors and Hatches	WH Port Door Open	Standard		Wago WH		Dig in(24V)	1	7		750-432	0	1	Alarm
Fail	Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard	NO	Wago 1 ER		Dig in(24V)	1	6	0	750-432	0	1	Switch
Reference	Door ER	DH3456	Doors and Hatches	ER Main Door Open	Standard		Wago 1 ER		Dig in(24V)	1	6		750-432	0	1	Alarm

Figure 12-10: Diff example 3

This concerns a real fault. FT NavVision© will look at the “field” column and see that the Field is not an alarm field, but a switch field. It will notice you that there is a fault and you have to change something in the sensorlist. Either you change the “DefaultField” into switch instead of alarm, or you need to change the “field” into an alarmfield. Either way you will have to adjust the sensorlist.

12.6.1 Making an export

When you import a sensorlist FT NavVision© automatically generates the “_generated”fields. There can be a time that you need to have one of these generated files without an import upfront. This can be done by stating FT NavVision© with the extension “EXPORT”.

Find the file “NavVision.exe” in the folder NavVision/bin/ and right click on it. Choose create a shortcut. Right click on that shortcut and choose “properties”. In the target window type EXPORT in capitals at the end of the line (see).

Choose OK and start FT NavVision© up by doubleclick on the shortcut. When FT NavVision© has started you can close it directly. FT NavVision© will have generated the files. Now you can go further as planned.

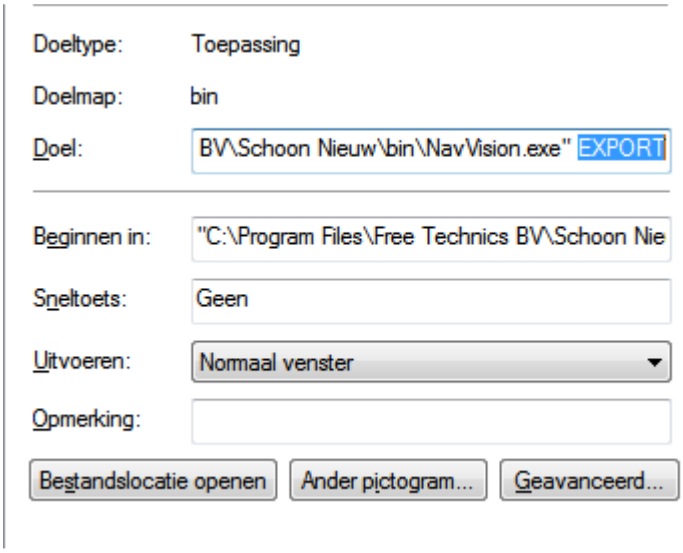


Figure 12-11: Export shortcut

13. Keeping up to date

13.1 Introduction

Now you have seen what the sensorlist is capable of, you might have guessed that the sensorlist is the spill of the system. From the first build, up to changing large amount of data, the sensorlist is the tool for working with FT NavVision©.

It is very important that you keep the sensorlist up to date during commissioning. The best way to do this is probably have the sensorlist open at your laptop and change immediately everything that you change in FT NavVision© on board. We know that it is sometimes very hectic and you don't have the time to do this directly. In that case it's best that you change it right after you finished your days' work. This way you can use the sensorlist the next day again.

We will explain here the different methods of keeping the sensorlist up to date.

13.2 Direct changing

So this is the one that you keep the latest sensorlist open at your laptop, next to the workstation that you are working on. When you alter something directly on the workstation, you can immediately change that in the sensorlist.

I already gave an example in Chapter 11.5 with the crew names. But now lets say that you are working on the workstation and you find out that the serialnetwork on moxa 1 port 1 has a different baudrate. The seriallan is the 1st one in the ER en you have to change port 1 to a baudrate of 38400 instead of 115200. In FT NavVision© you change this on the workstation and the connection seems to be good.

Next time you import the sensorlist, you might wonder why the port isn't working anymore. This is why you need to change it in the sensorlist in the tab "devicelist" to make sure next time the import will be in order. So go to your laptop, click on the devicelist tab and change the baudrate accordingly (see Figure 13-1 and Figure 13-2).

Serial 1 ER-1		ER	Cat	Network Serial 02	1	1	Moxa UC-711X	115200	N,8,1	RS485
Serial 2 ER-1		ER	Cat	Network Serial 02	2	1	Moxa UC-711X	115200	N,8,1	RS485
Serial 1 ER-2		ER	Cat	Network Serial 03	1	1	Moxa UC-711X	115200	N,8,1	RS485
Serial 2 ER-2		ER	Cat	Network Serial 03	2	1	Moxa UC-711X	115200	N,8,1	RS485

Figure 13-1: changing baudrate old

Serial 1 ER-1		ER	Cat	Network Serial 02	1	1	Moxa UC-711X	38400	N,8,1	RS485
Serial 2 ER-1		ER	Cat	Network Serial 02	2	1	Moxa UC-711X	115200	N,8,1	RS485
Serial 1 ER-2		ER	Cat	Network Serial 03	1	1	Moxa UC-711X	115200	N,8,1	RS485
Serial 2 ER-2		ER	Cat	Network Serial 03	2	1	Moxa UC-711X	115200	N,8,1	RS485

Figure 13-2: Changing baudrate new

Same goes for the changes in the sensorlist. Again you're working on the workstation and you notice that you have to change a connection at the Wago. It seems that the connections on the Wago Workshop are switched. The sensor on pin 3 is on pin 5 and the sensor on pin 5 is on pin 3. Of course you can change the wires on the Wago itself but for argument sake we say that you change the fieldnames in the Wago-section of the workstation.

Again you need to change this in the sensorlist or it will get back to the old state as you import the sensorlist again. The original lines you will find in the next figure:

B3	BP236G	Bilges	Aft. Crew Bilge	Alarm		Wago Workshop		Dig in(24V)	1	3
FF01	17269F	Fire Fighting	Main FiFi Pump	Running		Wago Workshop		Dig in(24V)	1	4
FF02	17270F	Fire Fighting	Em. FiFi Pump	Running		Wago Workshop		Dig in(24V)	1	5

Figure 13-3: Changing Wago original

Now you can switch the whole line with names, fields and everything (see Figure 13-4). Realize that you still need to change the pin-number, or nothing will change. For readability this will be the best option and also if you have to change a lot of pin numbers this is more synoptic. There will be an example later.

FF02	17270F	Fire Fighting	Em. FiFi Pump	Running		Wago Workshop		Dig in(24V)	1	3
FF01	17269F	Fire Fighting	Main FiFi Pump	Running		Wago Workshop		Dig in(24V)	1	4
B3	BP236G	Bilges	Aft. Crew Bilge	Alarm		Wago Workshop		Dig in(24V)	1	5

Figure 13-4: Changing Wago lines

If it is about small amounts of changes it is easier to just change the pin-number. FT NavVision© doesn't mind and will put it in the right order into the system. See next figure:

B3	BP236G	Bilges	Aft. Crew Bilge	Alarm		Wago Workshop		Dig in(24V)	1	5
FF01	17269F	Fire Fighting	Main FiFi Pump	Running		Wago Workshop		Dig in(24V)	1	4
FF02	17270F	Fire Fighting	Em. FiFi Pump	Running		Wago Workshop		Dig in(24V)	1	3

Figure 13-5: Changing Wago numbers

13.2.1 insert

When you need to insert a new connection into the Wago (an extra sensor for example), it could be very easy to do as you can read in the "Installation and commissioning manual". Just choose a free pin in FT NavVision© Tools>Configuration>Wago. However, don't forget to put that also in the sensorlist or you will lose that connection again after importing.

Same goes for extra devices in the "devicelist" tab. Just remember: importing a sensorlist will overwrite every change you have made on the system.

13.3 Bigger changes

One of the bigger changes that can take place is that you have to change the order of the Wago slices or you will have to add a Wago slice somewhere. This will mess up the whole configuration. Without using the sensorlist this is almost impossible to do.

Let's pretend you have the following configuration:

CableLabel	GroupLabel	Item	SensorType	Connection	Device	Location	Interface	Module		Type
	System	Alarm Fuse FWD	Alarm	NO	PLC Fwd	FWD	Dig in(24V)	1	1	750-610
MI034	AUXILIARY SYSTEMS	Bow Thruster 24V DC Control Voltage Failure	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	2	1	750-432
MI035	AUXILIARY SYSTEMS	Bow Thruster Cut-out Overcurrent Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	2	2	750-432
MI036	AUXILIARY SYSTEMS	Bow thruster Motor Oil Deficiency	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	2	3	750-432
MI037	MISC.ENGINEERING	Fridge Low Temperature Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	1	750-432
MI038	MISC.ENGINEERING	Freezer Low Temperature Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	2	750-432
DH016	DOOR & HATCH	Fore Peak Watertight Hatch Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	3	750-432
DH017	DOOR & HATCH	FWD A/C Room Watertight Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	4	750-432
DH018	DOOR & HATCH	Center Crew Watertight Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	1	750-432
DH019	DOOR & HATCH	Staff Mess Room Watertight Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	2	750-432
BL011	BILGE SYSTEM & ALARMS	Fore Peak Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	3	750-432
BL012	BILGE SYSTEM & ALARMS	Fwd Crew - Aft Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	4	750-432
BL013	BILGE SYSTEM & ALARMS	Fwd Crew - Fwd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	1	750-432
BL014	BILGE SYSTEM & ALARMS	Aft Crew - Fwd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	2	750-432
BL015	BILGE SYSTEM & ALARMS	Bow Thruster Motor Compartment Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	3	750-432
BL016	BILGE SYSTEM & ALARMS	Galley - Aft Crew - Aft Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	4	750-432
BL019	BILGE SYSTEM & ALARMS	Laundry Aft Center Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	6	3	750-432
BL020	BILGE SYSTEM & ALARMS	Laundry Void Space Aft Port Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	6	4	750-432
BL021	BILGE SYSTEM & ALARMS	Laundry Void Space Aft Stbd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	1	750-432
BL022	BILGE SYSTEM & ALARMS	N.18 Fr 53-54 Bilge Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	2	750-432
BL023	BILGE SYSTEM & ALARMS	N.19 Fr 58-59 Bilge Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	3	750-432
BL024	BILGE SYSTEM & ALARMS	Centre Guest Aft Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	4	750-432
BL025	BILGE SYSTEM & ALARMS	Centre Guest Fwd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	8	1	750-432
DH020	DOOR & HATCH	Fore Peak Entrance Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	8	2	750-432
TA015	TANK LEVELS	Washing Machine Drain Tank Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	8	3	750-432
TA016	TANK LEVELS	2-Port Fuel Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	9	1	750-454
TA017	TANK LEVELS	2-Stbd Fuel Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	9	2	750-454
TA018	TANK LEVELS	14-Port FW Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	10	1	750-454
TA019	TANK LEVELS	14-Stbd FW Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	10	2	750-454
TA020	TANK LEVELS	8-Port Grey/Black Water Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	11	1	750-454
TA021	TANK LEVELS	8-Stbd Grey/Black Water Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	11	2	750-454

Figure 13-6: Inserting a Wago slice 1

Now you need to put an extra slice (DI) 750-432 after the 3rd slice in the Wago. If you do that FT NavVision© will see that as a slice without a number and all the fields after slice 3 will go back one slice. You can imagine that is not what we want.

Now let's do this with the sensorlist. You insert an empty row after the 3rd slice (see Figure 13-7). Now this will be the 4th slice so at the module column you say it is number 4 and you fill in all the other appropriate fields (see Figure 13-8).

ID	CableLabel	GroupLabel	Item	SensorType	Connection	Device	Location	Interface	Module		Type
		System	Alarm Fuse FWD	Alarm	NO	PLC Fwd	FWD	Dig in(24V)	1	1	750-610
	MI034	AUXILIARY SYSTEMS	Bow Thruster 24V DC Control Voltage Failure	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	2	1	750-432
	MI035	AUXILIARY SYSTEMS	Bow Thruster Cut-out Overcurrent Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	2	2	750-432
	MI036	AUXILIARY SYSTEMS	Bow thruster Motor Oil Deficiency	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	2	3	750-432
	MI037	MISC.ENGINEERING	Fridge Low Temperature Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	1	750-432
	MI038	MISC.ENGINEERING	Freezer Low Temperature Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	2	750-432
	DH016	DOOR & HATCH	Fore Peak Watertight Hatch Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	3	750-432
	DH017	DOOR & HATCH	FWD A/C Room Watertight Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	3	4	750-432
	DH018	DOOR & HATCH	Center Crew Watertight Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	1	750-432
	DH019	DOOR & HATCH	Staff Mess Room Watertight Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	2	750-432
	BL011	BILGE SYSTEM & ALARMS	Fore Peak Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	3	750-432
	BL012	BILGE SYSTEM & ALARMS	Fwd Crew - Aft Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	4	4	750-432
	BL013	BILGE SYSTEM & ALARMS	Fwd Crew - Fwd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	1	750-432
	BL014	BILGE SYSTEM & ALARMS	Aft Crew - Fwd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	2	750-432
	BL015	BILGE SYSTEM & ALARMS	Bow Thruster Motor Compartment Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	3	750-432
	BL016	BILGE SYSTEM & ALARMS	Galley - Aft Crew - Aft Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	5	4	750-432
	BL019	BILGE SYSTEM & ALARMS	Laundry Aft Center Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	6	3	750-432
	BL020	BILGE SYSTEM & ALARMS	Laundry Void Space Aft Port Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	6	4	750-432
	BL021	BILGE SYSTEM & ALARMS	Laundry Void Space Aft Stbd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	1	750-432
	BL022	BILGE SYSTEM & ALARMS	N.18 Fr 53-54 Bilge Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	2	750-432
	BL023	BILGE SYSTEM & ALARMS	N.19 Fr 58-59 Bilge Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	3	750-432
	BL024	BILGE SYSTEM & ALARMS	Centre Guest Aft Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	7	4	750-432
	BL025	BILGE SYSTEM & ALARMS	Centre Guest Fwd Bilge Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	8	1	750-432
	DH020	DOOR & HATCH	Fore Peak Entrance Door Open Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	8	2	750-432
	TA015	TANK LEVELS	Washing Machine Drain Tank Level High Alarm	Alarm	NC	PLC Fwd	FWD	Dig in(24V)	8	3	750-432
	TA016	TANK LEVELS	2-Port Fuel Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	9	1	750-454
	TA017	TANK LEVELS	2-Stbd Fuel Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	9	2	750-454
	TA018	TANK LEVELS	14-Port FW Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	10	1	750-454
	TA019	TANK LEVELS	14-Stbd FW Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	10	2	750-454
	TA020	TANK LEVELS	8-Port Grey/Black Water Tank Level	Standard	NO	PLC Fwd	FWD	mA in(4 - 20)	11	1	750-454

Figure 13-7: Inserting a Wago slice 2

ID	CableLabel	GroupLabel	Item	SensorType	Device	Location	Interface	Module	I	Type
		System	Alarm Fuse FWD	Alarm	PLC Fwd	FWD	Dig in(24V)	1	1	750-610
	MI034	AUXILIARY SYSTEMS	Bow Thruster 24V DC Control Voltage Failure	Alarm	PLC Fwd	FWD	Dig in(24V)	2	1	750-432
	MI035	AUXILIARY SYSTEMS	Bow Thruster Cut-out Overcurrent Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	2	2	750-432
	MI036	AUXILIARY SYSTEMS	Bow thruster Motor Oil Deficiency	Alarm	PLC Fwd	FWD	Dig in(24V)	2	3	750-432
	MI037	MISC.ENGINEERING	Fridge Low Temperature Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	3	1	750-432
	MI038	MISC.ENGINEERING	Freezer Low Temperature Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	3	2	750-432
	DH016	DOOR & HATCH	Fore Peak Watertight Hatch Open Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	3	3	750-432
	DH017	DOOR & HATCH	FWD A/C Room Watertight Door Open Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	3	4	750-432
		DOOR & HATCH	Extra door	Alarm	PLC Fwd	FWD	Dig in(24V)	4	1	750-432
	DH018	DOOR & HATCH	Center Crew Watertight Door Open Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	4	1	750-432
	DH019	DOOR & HATCH	Staff Mess Room Watertight Door Open Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	4	2	750-432
	BL011	BILGE SYSTEM & ALARMS	Fore Peak Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	4	3	750-432
	BL012	BILGE SYSTEM & ALARMS	Fwd Crew - Aft Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	4	4	750-432
	BL013	BILGE SYSTEM & ALARMS	Fwd Crew - Fwd Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	5	1	750-432
	BL014	BILGE SYSTEM & ALARMS	Aft Crew - Fwd Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	5	2	750-432
	BL015	BILGE SYSTEM & ALARMS	Bow Thruster Motor Compartment Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	5	3	750-432
	BL016	BILGE SYSTEM & ALARMS	Galley - Aft Crew - Aft Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	5	4	750-432
	BL019	BILGE SYSTEM & ALARMS	Laundry Aft Center Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	6	3	750-432
	BL020	BILGE SYSTEM & ALARMS	Laundry Void Space Aft Port Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	6	4	750-432
	BL021	BILGE SYSTEM & ALARMS	Laundry Void Space Aft Stbd Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	7	1	750-432
	BL022	BILGE SYSTEM & ALARMS	N.18 Fr 53-54 Bilge Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	7	2	750-432
	BL023	BILGE SYSTEM & ALARMS	N.19 Fr 58-59 Bilge Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	7	3	750-432
	BL024	BILGE SYSTEM & ALARMS	Centre Guest Aft Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	7	4	750-432
	BL025	BILGE SYSTEM & ALARMS	Centre Guest Fwd Bilge Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	8	1	750-432
	DH020	DOOR & HATCH	Fore Peak Entrance Door Open Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	8	2	750-432
	TA015	TANK LEVELS	Washing Machine Drain Tank Level High Alarm	Alarm	PLC Fwd	FWD	Dig in(24V)	8	3	750-432
	TA016	TANK LEVELS	2-Port Fuel Tank Level	Standard	PLC Fwd	FWD	mA in(4 - 20)	9	1	750-454
	TA017	TANK LEVELS	2-Stbd Fuel Tank Level	Standard	PLC Fwd	FWD	mA in(4 - 20)	9	2	750-454
	TA018	TANK LEVELS	14-Port FW Tank Level	Standard	PLC Fwd	FWD	mA in(4 - 20)	10	1	750-454
	TA019	TANK LEVELS	14-Stbd FW Tank Level	Standard	PLC Fwd	FWD	mA in(4 - 20)	10	2	750-454
	TA020	TANK LEVELS	8-Port Grey/Black Water Tank Level	Standard	PLC Fwd	FWD	mA in(4 - 20)	11	1	750-454

Figure 13-8: Inserting a Wago slice 3

Now you will have two Wago slices with number 4 so you will need to increase the rest of the module numbers on that Wago. Of course you can do this by hand, but Excel is very helpful in this. Just find a cell with number 1 in it (cause we need to increase the modules by 1) an click CTRL-C to copy the number. Now select all the select all the cells in the module-column that need to be adjusted and right-click. Select “Paste Special” (see Figure 13-9).

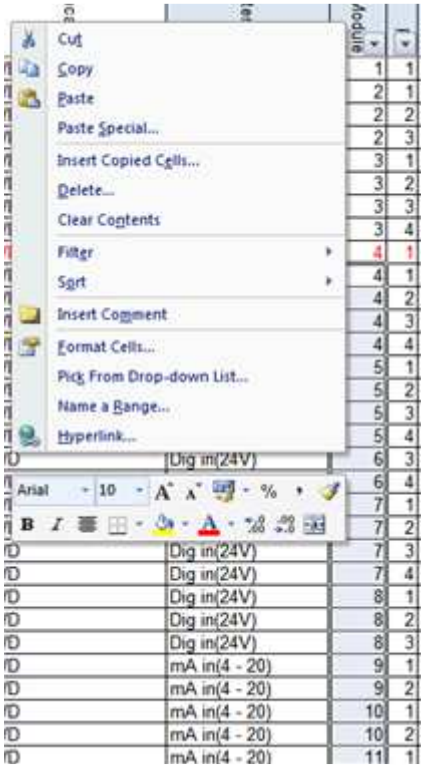


Figure 13-9: Excel trick 1

In the next window choose “Add” and then click OK (see Figure 13-10). You will see that all the module numbers has increased by 1.

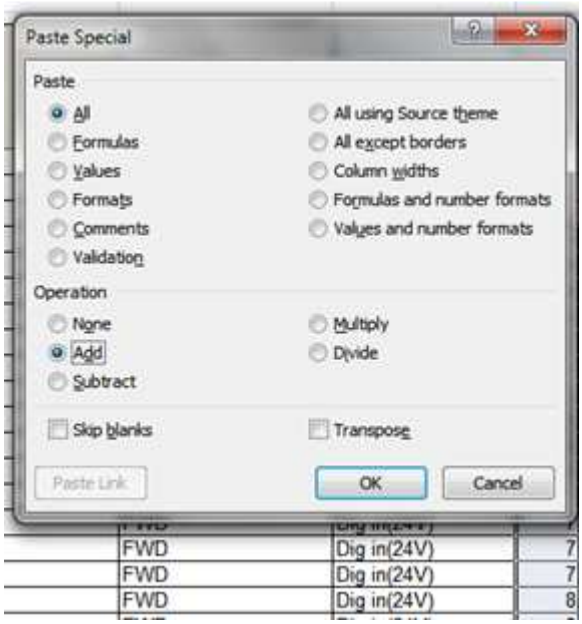


Figure 13-10: Excel trick 2

Now you can easily import the sensorlist (after you inserted the new Wago slice) and it will set everything in its right place.

13.4 Keep the sensorlist up to date afterwards

13.4.1 Introduction

Most likely you will find yourself occupied with work or you will get on board and the crew has made a lot of changes. In both cases it is impossible to use the sensorlist because it probably makes more problems than that it serves you. In that case you need to clean up the sensorlist first. After the clean-up you can use the sensorlist again.

To clean up the sensorlist you need to follow the instructions below. This is, for now, the best way to do this. The bigger the sensorlist is and the more changes, the more time-consuming it will be. But in the end you will only benefit.

13.4.2 What do you need

You need a complete clean installation of the latest FT NavVision© on your pc/laptop. Keep this one clean and copy your key file (the *.key.ini) into the folder NavVision/config/network.

If you start at a new project, or wish to make a new beginning, make a new folder and name it after your project. Copy al the files from the clean FT NavVision© folder into your new folder. You will get the following folder:

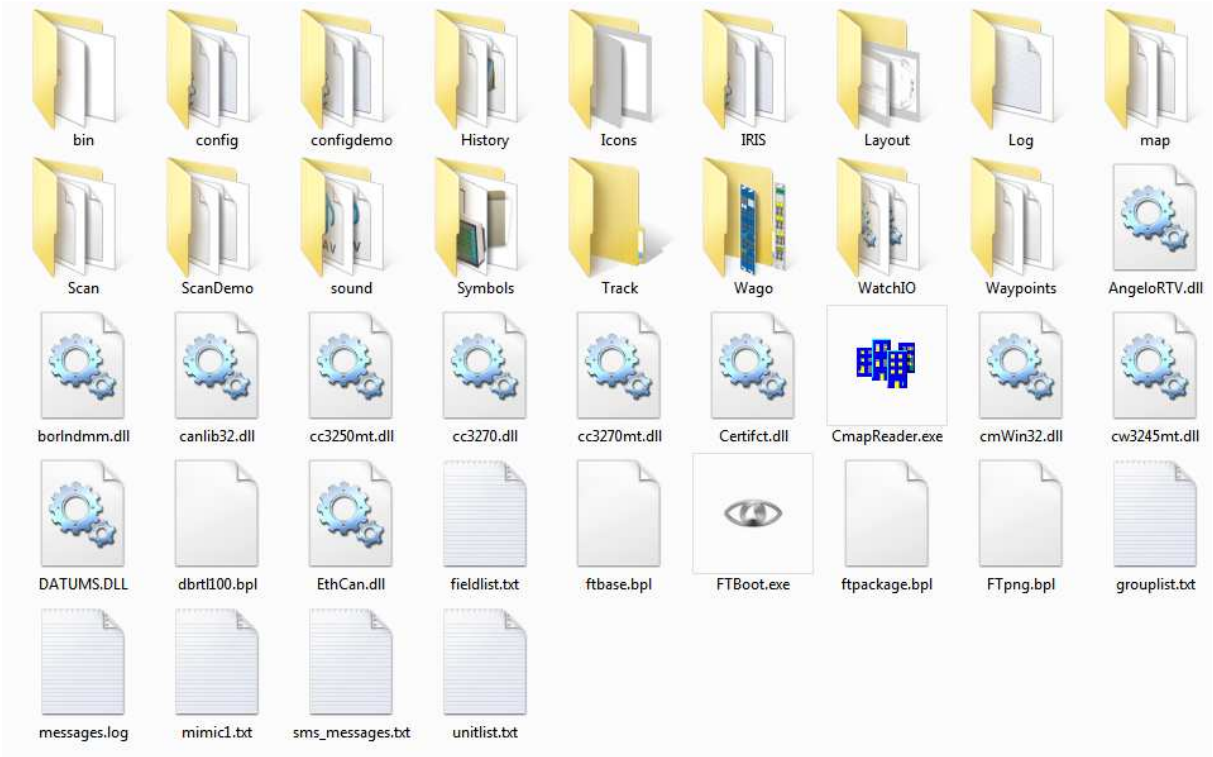


Figure 13-11: clean FT NavVision© folder

Also you need the config-folder from the installation on board (better back-up the whole FT NavVision© folder). You can do this at the end of the day, when you have finished working on the system, or at a ship that you arrive at for commissioning.

13.4.3 Cleaning up after a day on board

After you have been on board all day we assume that you have made a backup of the system. Now you do have an existing sensorlist, but we need to find out the changes. Here are the steps you need to take.

13.4.3.1 Copy devicelist.dat and sensorlist.dat

In the backup you took with you from aboard you find two files in the folder NavVision/config/network. These files are:

- Devicelist.dat
- Sensorlist.dat

Now copy these files and paste then in the folder NavVision/config/network of the folder you made on your pc/laptop as in Figure 13-11. This folder now contains the configuration on board as it was when you left. Don't start up yet.

13.4.3.2 The old sensorlist

You also have the old sensorlist.xls that you had before you went on board. If you do not already have the file as described, but only the raw sensorlist, we refer you to Chapter 9.4 to see how to save a sensorlist for import.

Copy this sensorlist.xls in to the root of your project folder. It will now look as follows:

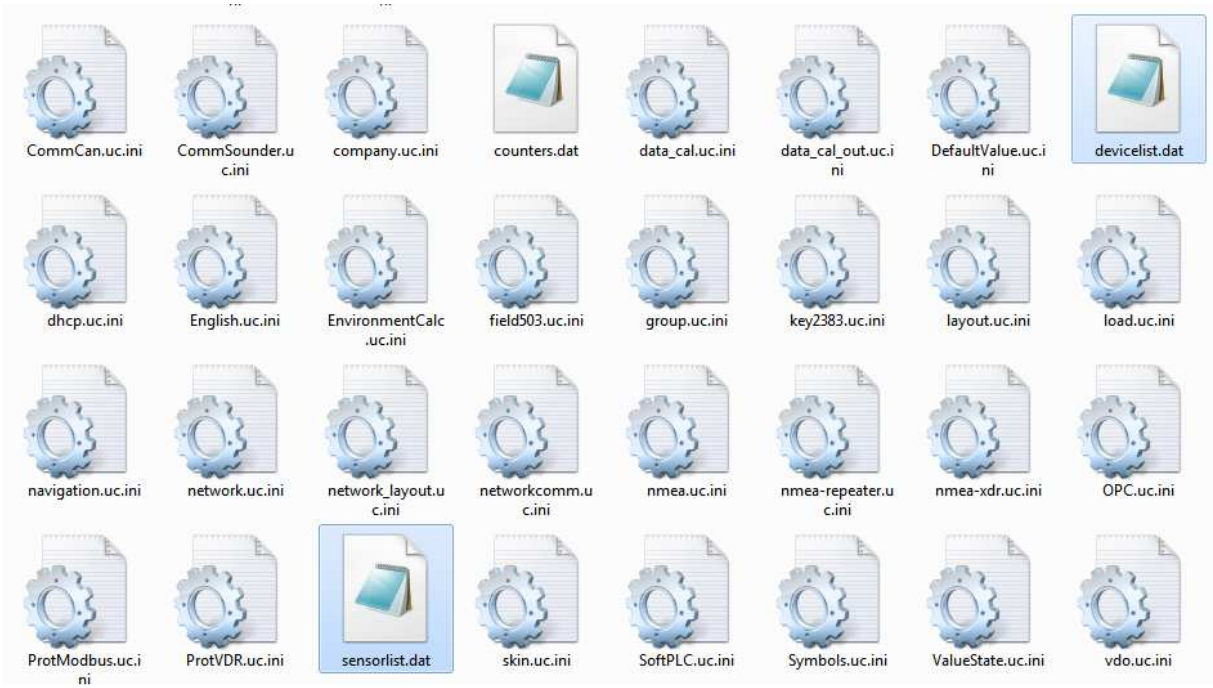


Figure 13-12: Devicelist.dat and sensorlist.dat in network folder

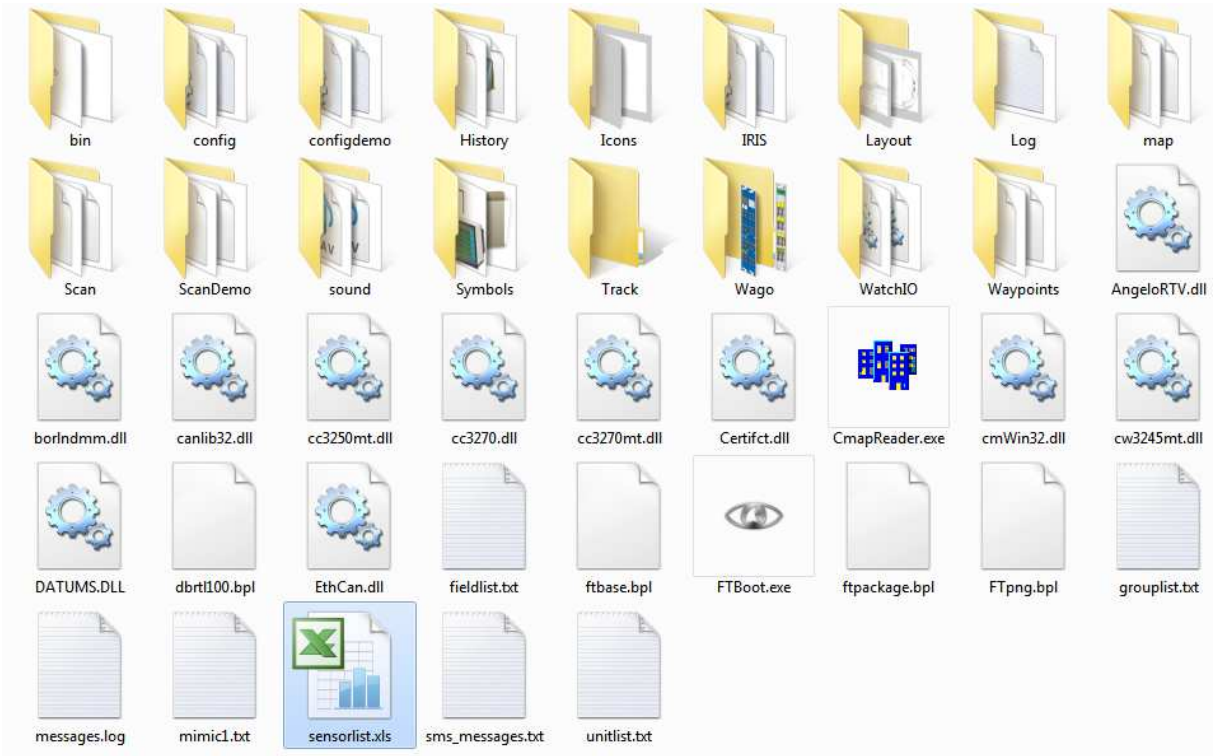


Figure 13-13: sensorlist.xls in root of project folder

13.4.3.3 Startup your project folder

Now you must start up the FT NavVision© that is in your project folder. To do so, go to the folder NavVision/bin and double-click the NavVision.exe. This way you know that you start the right version.

During startup FT NavVision© will ask you if you want to import the devicelist and after that the sensorlist. Answer both questions with “Yes”. FT NavVision© will start up completely.

After it started up you can shut it down immediately. FT NavVision© will now generate de devices you need. These are:

- devicelist_generated.html
- sensorlist_generated.html
- sensorlift_generated_diff.html

These files can be found in the root of your projectfolder which now looks like the following:

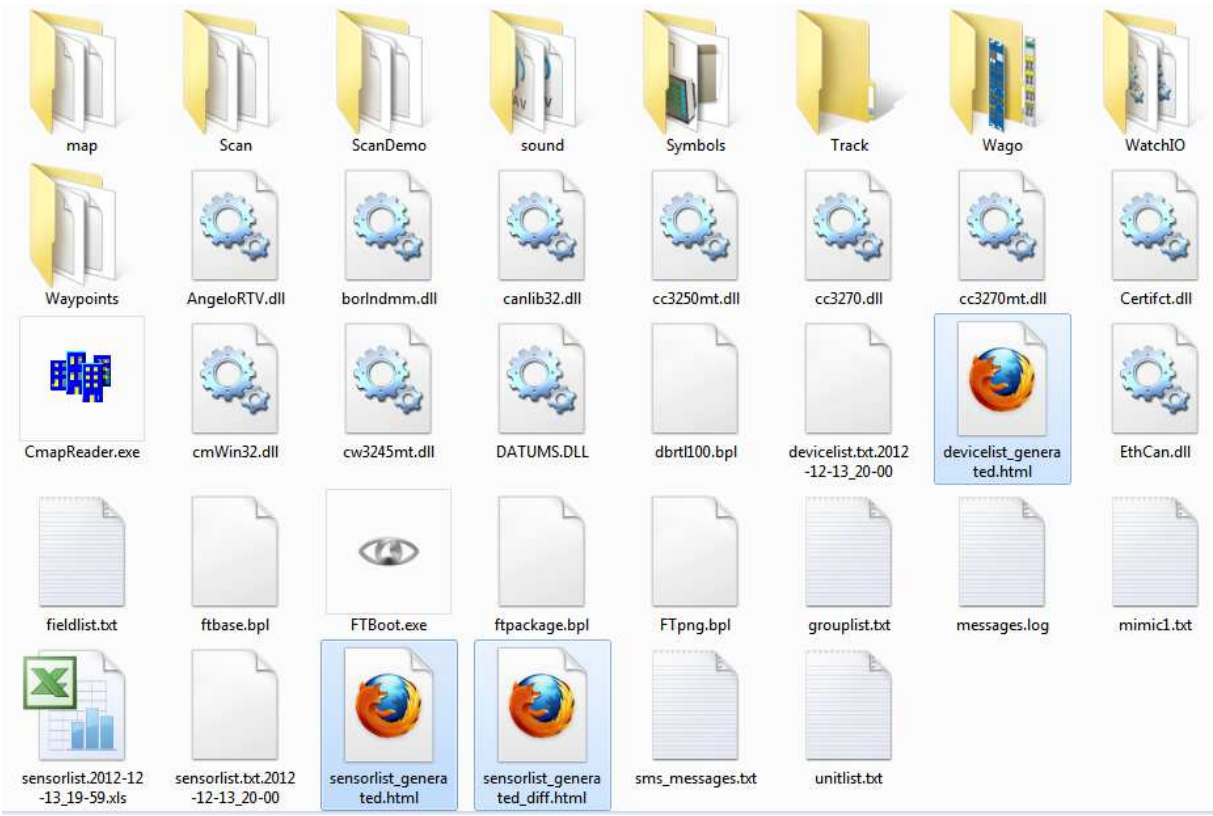


Figure 13-14: root folder after import sensorlist

13.4.3.4 Inspecting the generated files

What goes for the sensorlist_generated will also count for the other generated files, so we will only discuss this file here.

Open up the sensorlist_generated.html (right-click, open with, Microsoft Office Excel). You will now have the sensorlist but also the column ImportResult filled in. If the field is blank than nothing has changed. Just pay attention to the fields that are colored and have a result in it.

This results can be:

Field	Description
Comment	Comment that something is different in the field
Changed	Notice that something has changed

Failed	Critical failure somewhere in the field
Missing	Field tag is missing
New	Field is added since last import

Table 13-1: Import Result fields

This results will almost always be explained by the same color in the row that triggered the code.

Also you can open the sensorlist_generated_diff.html to see a reference to the same row (the old value that was there before you imported the sensorlist).

13.4.3.5 Comment

Comment usually indicates a minor problem or no problem at all, but you will need to check them. A simple example is that you see the following line:

44	Comment			Nav. Lights	bulb nav light SB 1

Figure 13-15: Comment example 1

If you look further down the row you will see that the problem is the text “bulb nav light SB 1” as you see in the next figure:

Navigation Lights	AftNavLightsSB	bulb nav light SB 1

Figure 13-16: Comment example 2

The fact is that “comment” usually indicates that the text is already in use somewhere in the sensorlist. Also it is possible that the field, in this case “AftNavLightSB” is already in use. Use the search function of Excel to find the text throughout the sensorlist.

In this case we will find that the text and the field is also used in line 71 as showed in the next figure:

71				Nav. Lights	bulb nav light SB 1

Figure 13-17: Comment example 3

You always have to check closely, but in this case it is fairly easy. Line 44 is the status connection as you will find in the SensorType column and it is connected to a DI-module. Line 71 is Standard connection and is connected to a DO-module. As you know how FT NavVision© works this is no problem. With line 71 you can switch the line on and if the light is on it will give a status back on line 44.

Now you now it is no problem and you can leave the row as is.

 *: although it is only a comment, do check all fields for abnormalities. If you are sure it is ok, mark it in the sensorlist.*

13.4.3.6 Changed

Changed indicates that there is a bigger problem. It is a warning. It can be that a value has changed in the min/max settings, or an Item-name is changed or even the interface is changed. Eventually something can be changed in either column.

For your convenience FT NavVision© will show the changed cell in yellow as well. So it is easy to look up. It can even be in multiple cells, so have a good look. See the next figures as example:

11	Changed			MTU PS	P-Oil Filter Difference	High	NO	MTU PS	ER	Serial in(Analog)
12	Changed			MTU PS	T-Coolant (ECU)	High	NO	MTU PS	ER	Serial in(Analog)

Figure 13-18: Changed example 1

151	Changed			Battery	shunt service battery	Standard	NO	Wago ER	ER	Thermo in(K)
152				Battery	voltage service battery	Standard	NO	Wago ER	ER	V in(0 - 30)

Figure 13-19: Changed example 2

As you can see there is a yellow colored field that will give you the changed value. In these examples it changed the interface. If you are not sure why it is changed or what was there before, you open up the sensorlist_generated_diff.html to see the reference. If we take the second figure as example and we look that up in the sensorlist_generated_diff.html, we'll see the following:

Changed			Battery	shunt service battery	Standard	NO	Wago ER	ER	Thermo in(K)	25	1	0 750-469
Reference			Battery	shunt service battery			Wago ER	ER	mV in(-125 - 125)	25	1	750-469

Figure 13-20: Changed example 3

Now you can check that in FT NavVision© it was defined as mV in(-125-125). As FT NavVision© knows that a Wago 750-469 slice is a Thermo in (K) slice it changed that interface to the right one.

Now that you know that it was changed because of the right reason, you also will have to change it in your sensorlist to keep that up to date.

: make sure that you check all the changed fields and adjust them accordingly in your sensorlist. It is not possible with a changed field that you leave one unchanged. They all need to be altered in your basic sensorlist.

13.4.3.7 Failed

Failed is a critical warning. There is something really wrong in that specific line. It can be anything, from missing information to double sensors. You will have to check the line very carefully. Sometimes it will show a red colored cell to show you what is wrong, but other times you will have to dig deeper to find the problem.

Failed always needs to be rectified in your original sensorlist. Here a simple example:

Changed			Generator	Generator Oil Press	Low	NO	Onan		Serial in(Analog)	65263	101
Fail			Generator	Generator Oil Press	Low	NO	Onan		Serial in(Digital)	65263	101

Figure 13-21: Failed example 1

This is a sensor on a bus-protocol. As you can tell it was put twice in the sensorlist. Bus-protocols can hang on such information, so it is wise, in this case that you remove the Failed line from your original sensorlist.

13.4.3.8 Missing

Missing is an easy one. In this row the field tag is missing. You can go straight to the Field-column and you will find it is empty. See next figure:

108	Missing	Engines	Engine 1		T-Coolw	20	0

Figure 13-22: Missing example 1

Find the right field as described in Chapter 11.3.19.1 and put that in the original sensorlist.

13.4.3.9 New

Everything that was changed on board and that wasn't already in the sensorlist will become visible as new. This could be a new sensor on a Wago, but also a complete new device or interface with, for example a bus-protocol.

The next example is when a new device or interface is connected. You will see the following:

379	New				Generator 1 Remote Start/Stop	Request	NO			Serial out(Digital)	1	1
380	New				Generator 1 Remote Stop	Request	NO			Serial out(Digital)	4	1
381	New				Generator Semi-Auto Mode 1	Request	NO			Serial out(Digital)	29	1
382	New				Generator Auto Mode 1	Request	NO			Serial out(Digital)	30	1
383	New				Generator 1 AC First Standby	Request	NO			Serial out(Digital)	39	1
384	New				Generator 1 AC L1-L2 Voltage	Standard	NO			Serial in(Analog)	502	1
385	New				Generator 1 AC L2-L3 Voltage	Standard	NO			Serial in(Analog)	503	1
386	New				Generator 1 AC L3-L1 Voltage	Standard	NO			Serial in(Analog)	504	1
387	New				Generator 1 AC L1-N Voltage	Standard	NO			Serial in(Analog)	505	1
388	New				Generator 1 AC L2-N Voltage	Standard	NO			Serial in(Analog)	506	1
389	New				Generator 1 AC L3-N Voltage	Standard	NO			Serial in(Analog)	507	1
390	New				Generator 1 AC L1 Frequency	Standard	NO			Serial in(Analog)	508	1
391	New				Generator 1 AC L2 Frequency	Standard	NO			Serial in(Analog)	509	1
392	New				Generator 1 AC L3 Frequency	Standard	NO			Serial in(Analog)	510	1
393	New				Generator 1 AC L1-L2 Phase Angle	Standard	NO			Serial in(Analog)	511	1
394	New				Generator 1 AC L2-L3 Phase Angle	Standard	NO			Serial in(Analog)	512	1
395	New				Generator 1 AC L3-L1 Phase Angle	Standard	NO			Serial in(Analog)	513	1
396	New				Generator 1 AC L1 Current	Standard	NO			Serial in(Analog)	514	1
397	New				Generator 1 AC L2 Current	Standard	NO			Serial in(Analog)	515	1
398	New				Generator 1 AC L3 Current	Standard	NO			Serial in(Analog)	516	1
399	New				Generator 1 AC L1 Power	Standard	NO			Serial in(Analog)	517	1
400	New				Generator 1 AC L2 Power	Standard	NO			Serial in(Analog)	518	1
401	New				Generator 1 AC L3 Power	Standard	NO			Serial in(Analog)	519	1
402	New				Generator 1 AC Power	Standard	NO			Serial in(Analog)	520	1
403	New				Generator 1 AC L1 Reactive Power	Standard	NO			Serial in(Analog)	521	1
404	New				Generator 1 AC L2 Reactive Power	Standard	NO			Serial in(Analog)	522	1
405	New				Generator 1 AC L3 Reactive Power	Standard	NO			Serial in(Analog)	523	1

Figure 13-23: New example 1

You can understand that you have to copy all these lines and paste them into the original sensorlist or they will get lost with a new import.

13.4.3.10 Keep importing

After you checked and replaced all the import results into the original sensorlist, you once again convert it to a sensorlist for import as described in Chapter 9.4 and put it in the root folder of your project folder.

Start FT NavVision© again and import the devicelist and sensorlist. Close FT NavVision© and open the new sensorlist_generated.html.

If you did well there are no more import results except maybe for a few comments that you left there. If not you will have to repeat this process over and over again until there are no more import results and the sensorlist_generated_diff.html is empty.

Once you have reached that point you are finished and your original sensorlist is up to date again.

 *: if you arrive on a ship after a long time and the crew has changed a lot, you can follow the same procedures. Just make a backup (or let them send one upfront) and go through all these steps. That way you can start directly with a good and working sensorlist.*

14. Special notes

14.1 Introduction

In this chapter we will discuss some special issues or things that are easy to know. It will just be a collection of extra knowledge randomly addressed and will be changed over time.

14.2 PLC

When a PLC program is written and put into the Wago PLC itself it is necessary, especially for the outputs, that FT NavVision© doesn't have field tags attached. To prevent the PLC program as well as FT NavVision© to address the output on the Wago, you do the following:

The rows in the sensorlist that hold the outputs that already are in use by the Wago PLC program, will need to be adjusted. First you add a ",PLC" after the module number in the column "Type" See the next figure:

Type
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC
750-517,PLC

Figure 14-1: PLC added

This way FT NavVision© knows that the slice is in use by the Wago itself, but will show up in the Wago overview in FT NavVision© see the next figure:

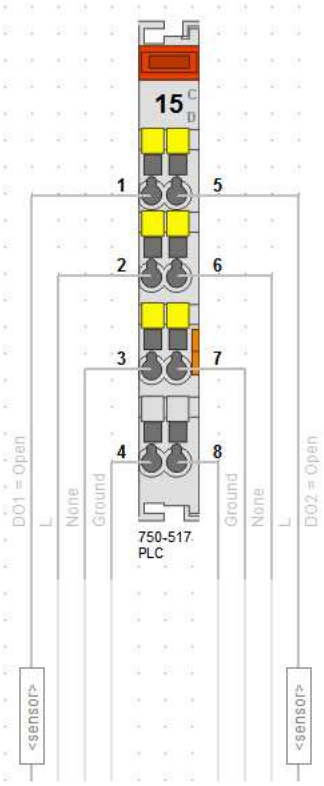


Figure 14-2: Wago overview PLC

: Leave the field column empty or it will interfere with the Wago PLC program.

14.3 Search

When you check the “sensorlist_generated” you will often find comments. Most of the time it will be that you used the same field-ID in different rows. When you find a comment, go to the column “Type” and copy the field-ID. Press CTRL-F and you get a window where you can search. Paste the copied field-ID and select “Find all”. Now you can scroll through the fields to see if you have used the same Field-ID on multiple rows. If you find it, repair the problem and it will be fixed.

14.4 Setting NMEA in the sensorlist

Since revision 3616 it is also possible to set the NMEA interfaces directly in the sensorlist. This needs an extra explanation cause it works a slightly bit different.

We will focus on the columns that are important. The other columns will all practically work the same as described earlier.

As example we will take a Voith NMEA interface. As you can see in the following figure, the standard columns will be the same as you already learned.

GroupLabel	Item	SensorType	Connection	Device	Location	Interface	Module	Pin	I/O Count	Type
PS Voith	PS Voith Control Fault Gateway	Standard	NO	NMEA1		Serial in(Analog)	4	1		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Speed	Low	NO	NMEA1		Serial in(Analog)	4	2		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Control Oil Filter	Standard	NO	NMEA1		Serial in(Analog)	4	3		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Lube Oil Filter	Standard	NO	NMEA1		Serial in(Analog)	4	4		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Control Oil Level	Low	NO	NMEA1		Serial in(Analog)	4	5		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Lube Oil Level	Low	NO	NMEA1		Serial in(Analog)	4	6		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Elevated Oil Level	Low	NO	NMEA1		Serial in(Analog)	4	7		$VSP_ALSYS,01,01,01,#,DOs
PS Voith	PS Voith Control Oil Pressure	Standard	NO	NMEA1		Serial in(Analog)	4	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
PS Voith	PS Voith Lube Oil Pressure	Standard	NO	NMEA1		Serial in(Analog)	6	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
PS Voith	PS Voith Low Lube Oil Pressure	Standard	NO	NMEA1		Serial in(Analog)	8	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
PS Voith	PS Voith Control Oil Temperature	Standard	NO	NMEA1		Serial in(Analog)	10	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
PS Voith	PS Voith Lube Oil Temperature	Standard	NO	NMEA1		Serial in(Analog)	12	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
SB Voith	SB Voith Control Fault Gateway	Standard	NO	NMEA2		Serial in(Analog)	4	1		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Speed	Low	NO	NMEA2		Serial in(Analog)	4	2		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Control Oil Filter	Standard	NO	NMEA2		Serial in(Analog)	4	3		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Lube Oil Filter	Standard	NO	NMEA2		Serial in(Analog)	4	4		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Control Oil Level	Low	NO	NMEA2		Serial in(Analog)	4	5		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Lube Oil Level	Low	NO	NMEA2		Serial in(Analog)	4	6		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Elevated Oil Level	Low	NO	NMEA2		Serial in(Analog)	4	7		$VSP_ALSYS,01,01,01,#,DOs
SB Voith	SB Voith Control Oil Pressure	Standard	NO	NMEA2		Serial in(Analog)	4	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
SB Voith	SB Voith Lube Oil Pressure	Standard	NO	NMEA2		Serial in(Analog)	6	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
SB Voith	SB Voith Low Lube Oil Pressure	Standard	NO	NMEA2		Serial in(Analog)	8	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
SB Voith	SB Voith Control Oil Temperature	Standard	NO	NMEA2		Serial in(Analog)	10	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
SB Voith	SB Voith Lube Oil Temperature	Standard	NO	NMEA2		Serial in(Analog)	12	1		$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C

Figure 14-3: NMEA sensorlist example

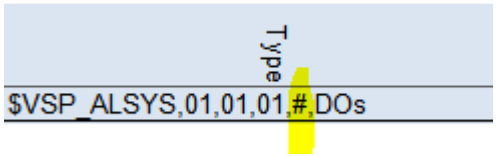
Grouplabel, Item, Sensor Type, Connection and Device are the same as described earlier. The alternative columns we’ll describe here.

14.4.1 Interface

With NMEA you can choose between Serial in(Analog) and Serial out(Analog), depending if you want to receive or send.

14.4.2 Module

As you will see in the column “type” you set the standard NMEA sentence there. All values are defined between comma’s in that sentence. To let FT NavVision© know which value you are looking at, you will set the comma after which the value is available in the NMEA sentence. So if you need the value after the 4th comma in the NMEA sentence, you will put a 4 here.



Type
$VSP_ALSYS,01,01,01,#,DOs

Figure 14-4: NMEA example 1

:the “#” sign is just to make it more visible and is not mandatory. You can leave the string without these.

14.4.3 Pin

To see which character behind the specific comma you need, under Pin you define the character number. In our example we have on that spot the digital values for the VOITH. So there are 7 zero’s or ones there, each representing one digital input. In our example we define all these values in the first seven rows.

Interface	Module	Pin	I/O Count	Type
Serial in(Analog)	4	1		$VSP_ALSYS,01,01,01,#,DOs
Serial in(Analog)	4	2		$VSP_ALSYS,01,01,01,#,DOs
Serial in(Analog)	4	3		$VSP_ALSYS,01,01,01,#,DOs
Serial in(Analog)	4	4		$VSP_ALSYS,01,01,01,#,DOs
Serial in(Analog)	4	5		$VSP_ALSYS,01,01,01,#,DOs
Serial in(Analog)	4	6		$VSP_ALSYS,01,01,01,#,DOs
Serial in(Analog)	4	7		$VSP_ALSYS,01,01,01,#,DOs

Figure 14-5: NMEA example 2

:Make sure that the count column is set to “1” cause you only want to read one character at the time.

14.4.4 Type

The Type column is the specific NMEA sentence that you are expecting. Lets analyse a sentence.

$VSP_ALSYS	= talker ID and Sentence Identifier
,01	= digital value
,03	= analog value
,#	= wildcard

Or another example:

```
$GPRMC,220516,A,5133.82,N,00042.24,W,173.8,231.8,130694,004.2,W*70
```

$GPRMC	= talker ID and Sentence Identifier
,220516	= time stamp
,A	= valid or ”V” invalid

Etc.

If you know the characters that are needed, you can fill it in.

```
$VSP_ALSYS,01,01,03,#,P,#,P,#,P,#,C,#,C
```

The “P” and “C” represent Pressure and Celcius.

 *:make sure that if you have an analog value, you set the Count column to the right amount of characters to read.*

14.4.5 Count

At the count column you specify how many characters you will read at maximum on that specific location. So for digital values that will be 1. For analog values you will have to look at the original NMEA sentence. It can be that you need to read 4 characters max or 6. Whatever max number of characters you find for that field, you will define her at “count”.

Free Technics

Technical & customer support
The Netherlands

Free Technics B.V.
Eikenlaan 259J
2404 BP, Alphen aan den Rijn
The Netherlands

Telephone: +31 172418 890
Fax: +31 172418 899
www.freetechnics.eu