



# NAVIPAC & NAVISCAN SHARE SERIAL INTERFACES

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# 1 Introduction

**NaviPac** allows the operator to share an input (serial device) with another program such as **NaviScan** to ease the system configuration.

# 2 Data protocol

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**NaviPac** offers a feature to share COM ports with **NaviScan** (or another external receiver). This is done by sending the time tagged (made by **NaviPac**) out on UDP/IP network using the **ATTU** (TimeBox) data format:

```
char
             Ident[4];
                           // Packet starter: always EIVA
INT32
             Length;
                            // Length of packet - remaining of entire packet
ТМТ 32
             VersAndDomain; // First 16 bit version number (1)
                           // Last 16 bit domain id - unique time box number
INT32
             InsId;
                            // Id of instrument - version 1 COM port number
TIMEVAL
             time stamp; // Timestamp of reception of telegram (first bit)
}
             data [length-16];
char
                             // The raw telegram - not really a part of
                             // structure - but follows right after the header
```

The data is kept in 4 bytes structures to avoid any discussions on special alignments. Where TIMEVAL is found in the general <code>sys/time.h</code> header file.

#### In Windows it's defined as:

```
struct timeval {
    long tv_sec; /* seconds */
    long tv_usec; /* and microseconds */
};
```

#### And in UNIX/Linux:

```
struct timeval {
    time_t tv_sec // seconds
    suseconds_t tv_usec // Microseconds
};
```

The reason for selecting this protocol is

- The data is delivered with timetag as per NaviPac and thus delivered in a consistent way.
- Several programs use the ATTU (TimeBox) protocol and can use this directly.



# 3 Setup in NaviPac

You must enable the functionality in NaviPac via the Project Settings menu:

Project Settings					
NaviPac	NaviScan				
Warm Start	4				
GPS	Enable port sharing				
Filters	Destination 127.0.0.1				
UW and Remote Navigation	Port ID 16012				
Advanced	Object limited to CSEM-Fish		•		
Survey Parameters	Local loop-back				
Rig/Barge Move or TMS					
Telemetry Multiplexer 1					
Telemetry Multiplexer 2					
Telemetry Multiplexer 3					
Event Settings	Object limited to Select the data source for the delivery.				
NaviScan None: All data input of the relevant type is transmitted					
	Object: Only relevant data for the selected object is transmitted.				
	ОК	Cance	el		



#### • Enable port sharing

Must **NaviPac** export data from data inputs to **NaviScan** - and thus enable port sharing between the two programs without losing time tagging accuracy. Is only applicable for serial (COM) inputs and UDP inputs of:

- GPS
- Gyro
- Motion Sensor
- DVL
- Bathy
- Pipe tracker

Sharing can be used on same pc or on remote pc(s).

#### • Destination

Type the destination address of the receiver computer, eg



10.10.1.33 For specific pc receiving the data.

10.10.1.255 For broadcast to multiple receivers on same subnet.

127.0.0.1 For local pc only.

• Port ID

The data will be sent out as UDP/IP messages using the ATTU format. Each serial port will send its own UDP port defined by the original port number plus this add-on. If you eg enter 10000 then COM1 will be sent on UDP 10001 etc.

#### • Object limited to <Object/vessel>

Select the data source for the delivery.

- None: All data input of the relevant type is transmitted
- Object: Only relevant data for selected object is transmitted, eg ROV.

The changes in setup will not be available until next restart of navigation.

### 4 Setup in NaviScan

The drivers can be read into NaviScan by using the ATTU interface:

📝 NaviScan.BIN - NaviScan Config — 🗆 🗙								
File Equipment View Options Tools	Help							
	*							
🖃 🗖 NaviScan.bin	Sensor & help	NMEA Gyro						
🔤 🖥 System Parameters	Name	Name NMEA Gyro						
🗄 🖆 Geodesy	Disabled							
🖕 🖻 Gyro	Port setup	ATTU 8888 127.0.0.1						
MMEA Gyro	Latency	0 ms						
⊟ <sup></sup> Dopplerlog	gyroC_O	0 °						
BDI DVL PD6 (Ascii)	useGyroSpeed							
□ · □ · □ · □ · □ · □ · □ · □ · □ · □ ·	GPS Data	HDT						
Pos from NaviPac								
Motion								
TSS DMS-xx RPH								
Bathy								
ia Sidescan								
SeaBat 81xx Sidescan	Enter ip addr of the source sending data, or localhost if sent from local pc, or for multicast set the multicast addr. For UDP/ATTU the ip addr is used as filter, only passing data from							
E- Runline Control	that ip, you can use	ip addr 0.0.0.0 if you want to disable the	e UDP filter	and get da	ta from			
HDP4060 remote line control	testing, ignores the	ne port. NOTICE: the Connect button in ip address filter and displays data from a ddr filter is used online						
For Help, press F1			1	NUM				

Figure 2 NaviScan.BIN – NaviScan Config



The trick is to know the mapping between **NaviPac** drivers and the **NaviScan** drivers, so you select the correct driver both places.

### 5 Automatic import

#### NaviPac stores a file under C:\EIVA\NaviPac\Db called NP2NS.INI.

This file gives a full listing of the outputs from NaviPac (shared ports plus defined outputs):

```
[NaviScan]
m enablePortSharing=1
m interpretedNpDataFromObj=-1
NPTCP=192.168.2.13
m portAddition=16000
m ioNaviScan=127.0.0.1
m portShareData=0
[GPS]
INS001=44,GPS1 (NMEA) From NaviPac,21000,0.000,0.000,0.000
no obj=1
[GYRO]
INS001=133,HMR3000 Gyro From NaviPac,16016,0.000,0.000,0.000, 0.000, 0.0000
no obj=1
[MOTION]
INS001=227, MDL From NaviPac, 16052, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.0000
no obj=1
[ACQ]
no obj=3
INS001=795, SBE49 CTD, 16017, 0.000, 0.000, 0.000, 0.0000
INS002=796,SBE49 CTD2,16017,0.000,0.000,0.000,0.0000
INS003=704, Digiquartz Depth, 16066, 0.000, 0.000, 0.000, 0.0000
[DVL]
no obj=0
[NP-OUT]
no obj=3
INS001=649,EIVA runline control,9999,0.0,0.0,0.0,RLN,2
INS002=671, Position (Exp.) to NaviScan, 9001, 0.000, 0.000, 0.000, POS, 2
INS003=670, Gyro to NaviScan TEST, 9003, 0.0, 0.0, 0.0, CALCGYRO, 2
```

The file includes first a copy of the general setup as defined in the NaviPac global parameters. Hereafter it includes a section per sensor type:



- GPS The GPS receiver
   GYRO Defines the gyro instruments
   MOTION Defines the motion (roll, pitch & heave) sensors
- ACQ
   Define data acquisition inputs such as bathy sensors
- DVL Doppler logs
  NP-OUT
- NF-OUT
   Special data outputs

Each instrument will be defined by

- NaviPac type number
- User defined name
- ATTU (TimeBox) port number

In NaviScan Configuration you may import this via the File menu:

🎉 NaviScan.BIN - NaviScan Config								
File	Equipment	View	Options	Tools	Help			
	New Ctrl+N							
Open Ctrl+O								
Save Ctrl					rl+S			
	Save As							
	Add Shared NaviPac Setup							
	1 C:\EIVA\\Db\NaviScan.BIN							
	Exit							

Figure 3 NaviScan.BIN - NaviScan Config - Add Shared NaviPac Setup



🕺 Select shared NaviPac to Naviscan s	setup fi	le				×
$\leftarrow$ $\rightarrow$ $\checkmark$ $\uparrow$ $\blacksquare$ $\rightarrow$ This PC $\rightarrow$ O	S (C:)	> EIVA > NaviPac > Db	~	Ö	, ○ Search Db	
Organize   New folder						
This PC	^	Name			Туре	Size
🧊 3D Objects		Archive			File folder	
Desktop		📕 Bak			File folder	
Documents		ISAFE			File folder	
Downloads Music		📙 Previous 🔬 Gensetup.DB.INI	Anke Schlem	m (ans@	Peiva.com) is signed in Contiguration setti	1 KB
		🔬 Gensetup.DB_w19_su	pport.INI		Configuration setti	4 KB
Pictures		🔬 NP2NS.INI			Configuration setti	1 KB
📑 Videos		<				>
File name: NP2NS				~	Shared NP to NS setu	

Figure 4 NP2NS.INI

And voila - the setup is totally setup

NaviScan - NaviScan Config File Equipment View Options Tools	Help	- 🗆 X
0 4 4 4 5 6	⊠ ★	
🖃 🖉 NaviScan.bin	EIVA runline control	UDP 9999 127.0.0.1
System Parameters	MDL From NaviPac	ATTU 16053 127.0.0.1 XYZ 0.000 0.000 0.000
🗄 🖻 Geodesy	Digiquartz Depth	ATTU 16066 127.0.0.1 XYZ 0.000 0.000 0.000
E Runline Control	Position (Exp.) to NaviScan	UDP 9001 127.0.0.1 XYZ 0.000 0.000 0.000
EIVA runline control	GPS1 (NMEA) From NaviPac	ATTU 21000 127.0.0.1 XYZ 0.000 0.000 0.000
<ul> <li>➡ Motion</li> <li>➡ MDL From NaviPac</li> <li>➡ Bathy</li> <li>➡ Digiquartz Depth</li> <li>➡ Navigation</li> <li>➡ Position (Exp.) to NaviScan</li> <li>➡ GPS1 (NMEA) From NaviPac</li> </ul>		-
For Help, press F1		NUM

Figure 5 NaviScan Configuration with instruments using the ATTU format

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