

# NGNS04 Brochure

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This brochure provides general information of SkyDec's NGNS04 (Military) Navigation host-system and an insight on options and features.



04SERIES Brochure

# 1 Contents

1	Contents .....	2
2	Introducing SkyDec .....	3
3	SkyDec' s NGNS04 .....	3
3.1	Physical appearance .....	3
3.2	Typical set up.....	4
3.3	Nature .....	4
3.4	Turnkey performance .....	4
3.5	Proven concept .....	5
3.6	BIT functionality .....	5
4	Options .....	5
4.1	Internal encrypted Military SAASM GPS .....	5
4.2	Internal eLoran receiver module.....	5
4.3	DGPS .....	5
4.4	External displays.....	5
4.5	External signal extenders.....	5
5	Maintenance package .....	6
	Annex 1, NGNS04 general drawing.....	7
	Annex 2, NGNS04 feature list.....	8
	Annex 3, NGNS04 general specifications .....	9
	Annex 4, References list.....	10

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## 2 Introducing SkyDec

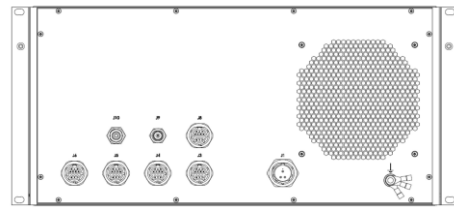
SkyDec is a renown innovative Dutch company supplying Defence markets around the world with highly robust, precise and reliable navigation solutions.

Our in-house R&D enables short response times when it comes to new developments or re-design, being SME we can act fast without the burden of heavy overhead.

The family range of products is designed and manufactured in accordance with relevant Military Standards so that they can withstand severe operational conditions without performance loss. Interfaces with other platform's equipment are tailor made to customer's requirements, meaning that the systems can be interfaced with all kind of new or legacy (in case of an overhaul) equipment. DDU functionality is incorporated in most of our host systems.

## 3 SkyDec's NGNS04

### 3.1 Physical appearance



The NGNS04 is a 19" rackmount unit, 5U high and approximately 420 mm deep (without handles), and weights approximately 14 kg A general drawing can be found in [Annex 1](#). The outside box is made out of anodized aluminium panels that are attached onto the inner frame-parts.

On the front panel all operating controls can be found:

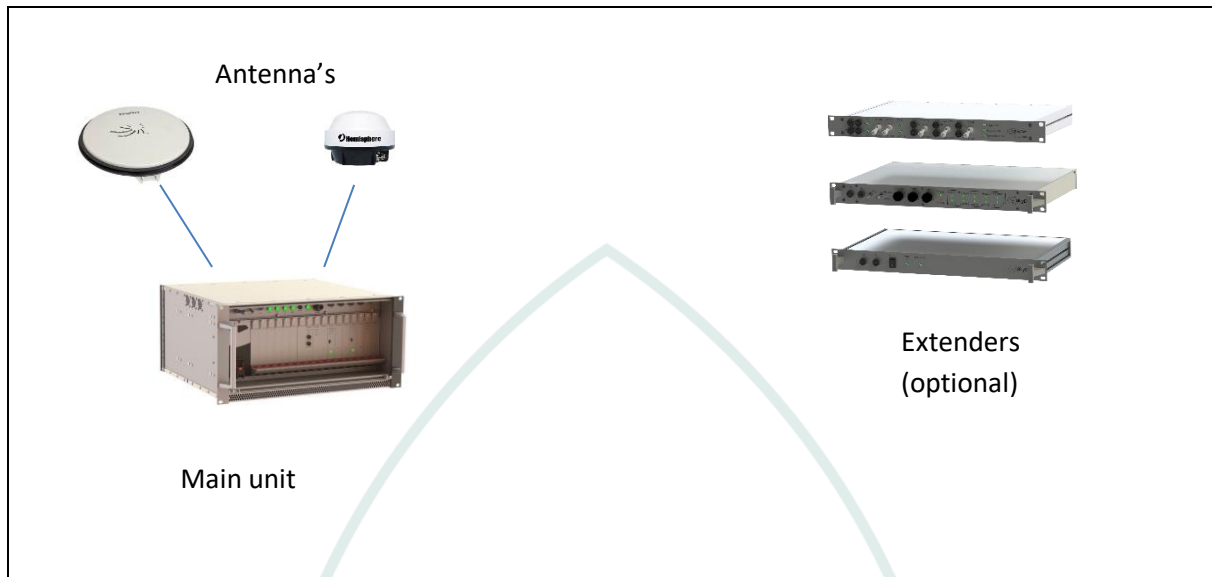
- The on/off switch
- The Zeroize switch (to erase krypto-keys)
- Fuses
- Control LED's
- Power units
- Slot cards (with and without USB port)

The back panel is equipped with:

- A power connector
- Data connectors
- RF connectors
- A grounding stud

### 3.2 Typical set up

The below picture images a typical set up.



### 3.3 Nature

The circuit boards that are inside the system, are designed by SkyDec's in-house R&D team based on a rich history and experience in the Military sector. The team achieved to develop boards that bring highest precision, reliability and robustness, also diminishing latency for the multiple interfaces and DDU functions. PCB's are regarded as LRU.

Compared with other products in our range, the NGNS04 brings extra flexibility by its architecture with replaceable slot cards that are freely accessible from the front of the system.

An overview of features can be found in [Annex 2](#).

### 3.4 Turnkey performance

Although being host systems for Military SAASM/M-code GPS receivers, the NGNS04 delivers robust navigation, timing and synchronization straight out of the box when equipped with a multi GNSS receiver. The multi GNSS receiver can be individually configured to perform on GPS, Galileo, GLONASS, BeiDou and QZSS

Interfaces are mutual agreed and laid down in an Interface Control Document (ICD) in the pre-production phase. During FAT all functions and interfaces are tested against that ICD, so it will be pretty much plug and play when the systems come on board.

For general specifications see [Annex 3](#)

### 3.5 Proven concept

The NGNS04 is a proven concept that is widely in use by various Naval Forces for many years for both surface and submarine application.

A selection of SkyDec customers is given in [Annex 4](#), note that a number of programs need to remain un-disclosed.

### 3.6 BIT functionality

The NGNS04 is delivered with the Sentinel monitoring/maintenance program that can run on a Windows laptop or PC. The graphical interface brings status information of all critical components of the system. It is also used for installation and Software upgrades.

This feature brings next level access to the system, system information and monitoring/maintenance tasks.

## 4 Options

### 4.1 Internal encrypted Military SAASM/M-Code GPS

The NGNS04 is designed to host MIL SAASM/M-Code GPS receivers made by a variety of manufacturers, like Trimble, Rockwell Collins L3 and Novatel. Where applicable TAA's are in play, giving us authorisation and all needed integration details to host said receivers.

Krypto-key loading and handling is in accordance with corresponding - mandatory - guidelines.

Procurement of MIL SAASM/M-Code GPS receivers is controlled by the United States Government.

### 4.2 Internal eLoran receiver module

In addition to satellite based navigation systems, the NGNS04 can hold an internal eLoran module aside the GNSS/GPS receiver as an option. Based on the low frequency signals, transmitted from land stations with high antennas, eLoran positioning can hardly be jammed or spoofed, making it very reliable. The internal eLoran receiver will be kept calibrated by GNSS as long as that is available, to achieve highest possible accuracy in a situation that GNSS/GPS is denied. eLoran is backwards compatible with Loran-C.

### 4.3 DGPS

If requested, the system can hold a DGPS receiver board enabling the use of DGPS corrections.

Satellite based augmentation systems (SBAS) are embedded by default. The use of correction signals enhances position accuracy.

### 4.4 External displays

The NGNS04 can be equipped with a dedicated interface for a choice of (third party) displays. That enables displaying navigation information on the bridge (if no ECDIS is present), the chart room or in e.g. the commander's cabin.

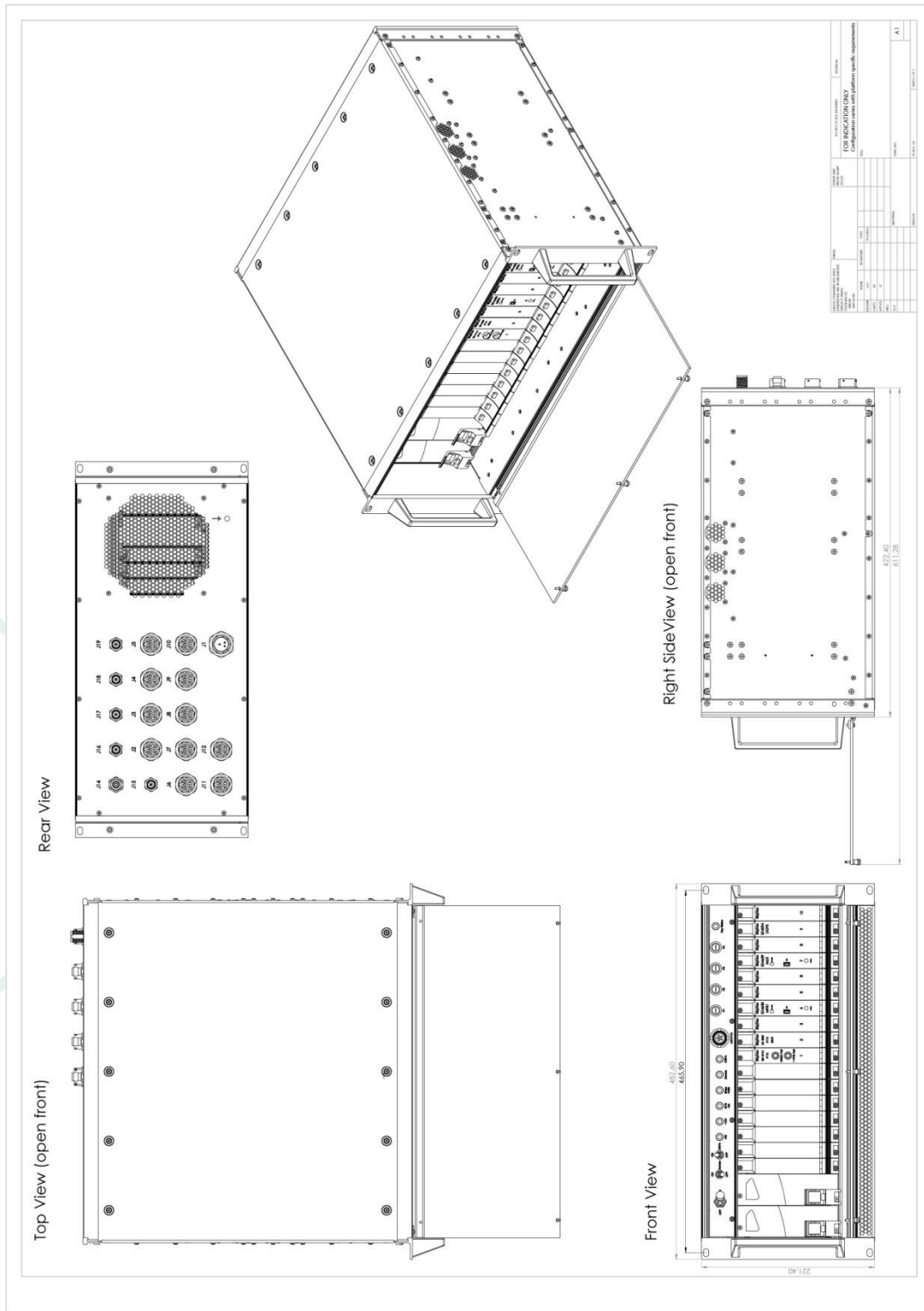
### 4.5 External signal extenders

In case that the amount of physical interfaces on the back panel of the NGNS04 is not enough to provide all needed connections, the set-up may include one (or more) signal extender(s).

## 5 Maintenance package

As applies for all our systems, we can offer a maintenance package that covers all repairs and updates for a period of 15 years after warranty ending for a fixed price per year and per system. This allows the customer to keep only a little set of first-response spare-parts.

# Annex 1, NGNS04 general drawing



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## Annex 2, NGNS04 feature list

- Up to 12 independent interfaces for sensor input and configurable NMEA output, customized to customers' requirements.
- Can simultaneously hold and use a CIV (GNSS) and MIL (GPS) receiver, built-in degradation options available.
- Galileo, GPS, Glonass, Beidou, WAAS/Egnos, DGPS.
- Factory configurable 1PPS interfaces (TTL or 10V).
- Fast start option available, enabling fast position acquisitions (input from rubidium clock and INS needed). Only available on selected receivers.
- Advanced BIT functions.
- Dynamic lever-arm corrected position. (Heading, Roll and Pitch input required).
- Outputs can be configured to refer to both corrected and un-corrected position.
- USB port to enable user-performed Diagnostics and Software Updates.
- Compatible with a variety of MIL GPS (SAASM/M-Code) receivers, to be obtained via FMS.
- Special Interface Module to enable e.g. hot-start, missile priming and special custom interfaces.
- eLoran option.

### Provisioned for

- Rubidium timing module option.
- Double LAN interface with PTP - IEEE 1588 Precision Time Protocol.
- Fiber optic LAN option.



## Annex 3, NGNS04 general specifications

<b>GENERAL</b>					
Description	<ul style="list-style-type: none"> <li>- A maximum of 12 outputs via MIL connectors in 3 different sets of data (in a variety of formats).</li> <li>- Compatible with a variety of MIL GPS (SAASM) receivers, to be obtained via FMS or DCS procedures, not included.</li> <li>- Front monitoring/maintenance port, monitoring software is part of delivery.</li> <li>- Easy extendable with extra functionality.</li> <li>- ICD, Operating- and Maintainer manual in softcopy.</li> <li>- Sentinel monitoring &amp; maintenance software included.</li> </ul> <p>Configuration is defined in a mutual agreed Interface Control Document (ICD), the unit will get an unique ID related to the platform name.</p>				
Dimensions	19" wide (483 mm, 5U high (222 mm) and approximately 420 mm deep (without handles)				
Weight	Approximately 11,7 kg (without slides) Approximately 14,9 kg (with slides)				
Power	85-264 VAC 47-63Hz / 125-373 VDC or 19-36 VDC				
Power consumption	<200 Watt, depends on opted receiver(s)				
<b>GNSS</b>					
Receiver type	72-channel GPS engine GPS L1C/A SBAS L1C/A QZSS L1C/A GLONASS L1OF BeiDou B1 Galileo E1B/C 2, ready for E5, E5a, E5b, E6				
Horizontal position accuracy CEP, 50%, 24 hours static, -130 dBm, > 6 SVs , combined GPS & GLONASS	<table border="0"> <tr> <td>Autonomous:</td> <td>2,5 m</td> </tr> <tr> <td>SBAS:</td> <td>2,0 m</td> </tr> </table>	Autonomous:	2,5 m	SBAS:	2,0 m
Autonomous:	2,5 m				
SBAS:	2,0 m				
<b>Shock, Environmental and EMC</b>					
Shock	According to BR3021 and STANAG 4137				
Vibration	According to MIL-STD 810F and IEC 68-2-6				
Operational Temperature	0 to 45°C				
Storage Temperature	-40 to 60°C				
Operational Humidity	95%				
EMC	According to MIL-STD 461F				

## Annex 4, References list

As an amount of programs needs to remain un-disclosed, this listing only shows a selection of customers where SkyDec supplied NGNS04 systems.

Customer	Amount (PCS)
Norway	>15
United Kingdom	>10
Germany	5
Turkey	>10
The Netherlands	5
Spain	10