

# User Manual

## INTRANAV RTLS

**INTRANAV NODE (IN5000)**  
**INTRANAV NODE with Wi-Fi (IN5200)**

 INTRANAV<sup>®</sup>

V1.0

## INTRANAV RTLS NODE (IN5200) - Quick Guide

IntraNav GmbH  
Frankfurter Str. 27  
65760 Eschborn, Germany



Phone +49 6196-20471 80  
Fax +49 6196-20471 89

Email: [info@intranav.com](mailto:info@intranav.com)  
Internet: [www.IntraNav.com](http://www.IntraNav.com)

Company address: Frankfurt am Main (HRB 92924)

board of management

Andreas Radix  
Ersan Günes  
Gonzalo Ibarra



AT	BE	CY	CZ	DK	EE	FI
FR	DE	EL	HU	IE	IT	LV
LT	LU	MT	NL	PL	PT	SK
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# 1 Legal information

## Warnings

This manual contains instructions that you must follow for your personal safety and to avoid damage to property. The notes are highlighted by a warning triangle and are for your personal safety. Notes on sole property damage are without a warning triangle. Depending on the hazard level, the warning notes are shown in decreasing order as follows.



**DANGER:** means that death or serious injury will occur if the appropriate precautions are not taken.



**WARNING:** means that death or serious injury may occur if the appropriate precautions are not taken.



**CAUTION:** means that slight physical injury may occur if the appropriate precautions are not taken.

**CAUTION:** means that damage to property may occur if the appropriate precautions are not taken.

If several hazard levels occur, the warning note for the highest level is always used. If a warning notice with a warning triangle warns against personal injury, the same warning notice may also contain a warning against damage to property

## Qualified personnel

The product/system associated with this documentation may only be handled by personnel qualified for the respective task, observing the documentation associated with the respective task, in particular the safety and warning instructions contained therein. Due to their training and experience, qualified personnel are capable of identifying risks and avoiding possible hazards when handling these products/systems

## Intended use of INTRANAV products

Note the following:



**WARNING:** INTRANAV products may only be used for the applications specified in the catalogue and in the associated technical documentation. If third-party products and components are used, they must be recommended or approved by INTRANAV. The proper and safe operation of the products requires proper transport, storage, assembly, installation, commissioning, operation and maintenance. The permissible ambient conditions must be observed. Instructions in the associated documentation must be observed.

## Brands

All designations marked with the property right note ® are registered trademarks of IntraNav GmbH. The other designations in this document may be trademarks whose use by third parties for their own purposes may infringe the rights of the owners.

## Disclaimer

We have checked the contents of this publication for compliance with the hardware and software described. Nevertheless, deviations cannot be excluded, so that we cannot guarantee complete conformity. The information contained in this publication is checked regularly and any necessary corrections will be included in subsequent editions.

## 2 Overview

### General

The INTRANAV NODE (IN5200), is a permanently installed antenna system for real-time indoor positioning. The NODE, also called anchor, receives the ultra-wideband (UWB) signals of the TAGs and transmits them to the INTRANAV backend where they are processed to position signals.

### Scope of delivery and accessories

#### 1 unit

**INTRANAV RTLS NODE**

Model: IN5X00

#### Accessories

#### 1 unit

Universal holder for INTRANAV NODE

### Power supply

The device can be operated with a voltage of 9 to 36 volts direct current (DC) or via Power-Over-Ethernet (PoE).

The device complies with PoE class 802.3af



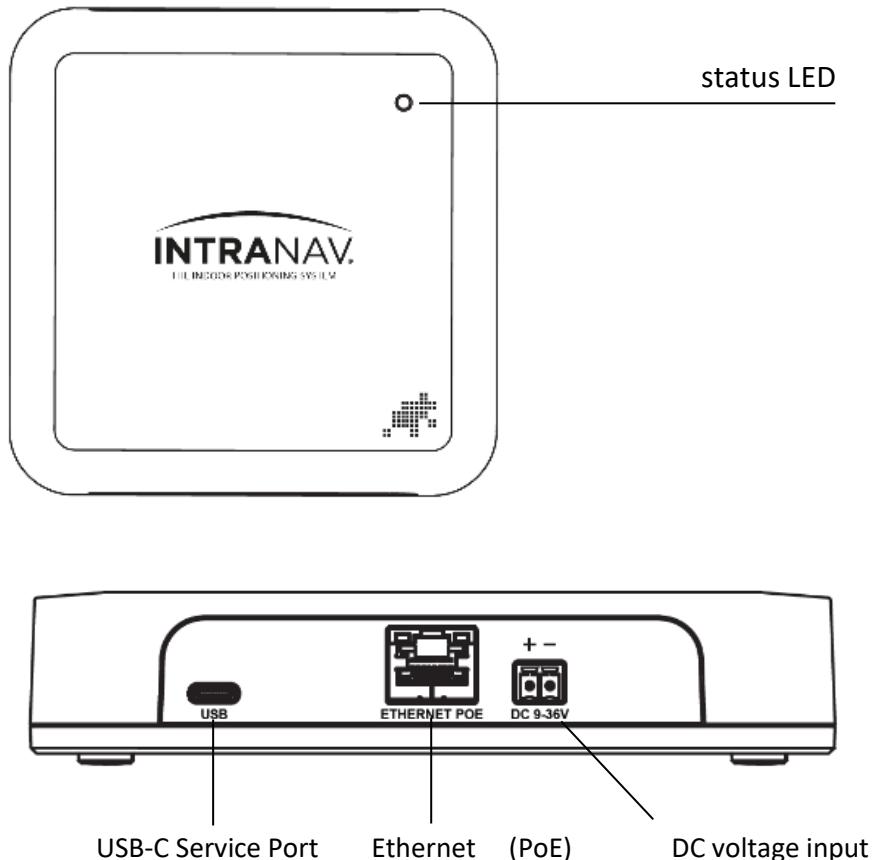
**CAUTION:** The supply voltage of the device must not exceed the following values: U <36V; I < 1.5A; P < 2W

## Fields of application

The device is designed to operate in an environment of 10°C to +50°C. For this reason, it is essential to ensure that the INTRANAV NODE (IN5200) is never used outdoors, as moisture or water can cause a short circuit. If you want to use INTRANAV RTLS NODEs outdoors, there is a special outdoor version available.

## Product dimension

Dimensions approx. 150 x 150 x 30 (mm) & weight approx. 180 (gr. )



# 3 Installation, commissioning, maintenance and safety

## General notes

- Before installing the units, read carefully all the points listed in "3. Installation, commissioning, maintenance and safety" to ensure proper installation and operation.
- The devices can only be used in connection with the INTRANAV RTLS solution.
- The correct structure, installation and use of the localization system tools and clients are described in the corresponding manuals.

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## Installation and operation

- To achieve an optimal indoor location, the device should be mounted in such a way that there is a direct line of sight to the mobile location sensors (INTRANAV TAGs).
- Before using the device, make sure that the device is not damaged and cannot be damaged during use.
- Never cover the antenna with metallic or shielding objects.
- The specified ambient temperatures of the devices must be maintained.
- Do not power on the device until completely installed.
- Ensure that all screws are securely and firmly screwed into the wall or bracket and can support the weight of the unit and wiring.
- The housing of the device must never be crushed, pierced or exposed to other mechanical force.
- The ambient temperature of the device must not exceed 50 °C. Avoid mounting locations with direct sunlight.

- The devices must be installed in accordance with the currently prevailing BG regulations "Electrical installations and equipment" (BGV A3). The devices must be mounted in such a way that they can be accessed at any time (opening the housing cover) to enable maintenance work to be carried out later.

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## Connection of cables and wires

- When connecting the cables, always ensure that they are in perfect condition and not damaged.
- Before putting the device into operation, check whether the cabling has been carried out correctly and whether it is connected to the network.
- Only the cabling described in the manual, enclosed with the device or specified accordingly is to be used. IntraNav GmbH assumes no liability for damage or impairment of functionality resulting from the use of other cables.

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## Supply voltage

- When the supply voltage is connected to the mains plug, the status LED flashes for a moment. The status LED is active when voltage is applied.
- The device can be supplied with power via the Ethernet cable.
- Do not supply the device with voltage via the mains input and PoE at the same time.
- Check that the nominal voltage of the power supply corresponds to the values in the "Technical Data" section.



**CAUTION:** The supply voltage of the device must not exceed the following values: U <36V; I < 1.5A; P < 2W

## Ethernet

- When installing and connecting the Ethernet connection, the respective valid general conditions and their legal basis must be observed.
- The Ethernet connection is connected to the Ethernet socket of the device. The cable must be assembled into the RJ45 plug before connecting it to the socket.
- Powering the device with PoE (Power over Ethernet) requires an appropriate infrastructure such as PoE-Injector or PoE-Switch.

## Operating the device

- Due to its design, the device is not intended for use in EX zones.
- The intended operation of the system according to EN 60950-1 is only guaranteed when the housing cover is mounted (cooling, fire protection, radio interference suppression).
- In case of emergency (e.g. damaged housing, ingress of liquid or foreign objects) immediately disconnect the power supply to the device.
- The INTRANAV NODE detects mounting and position changes and goes into fault as soon as a shock or an improper change of the antenna is detected by the integrated accelerometer.

- You must configure the INTRANAV NODE accordingly before configuring it on the INTRANAV.IO platform.
- An INTRANAV NODE is ready for operation when the status LED is permanently lit.
- The LED behavior is described as follows:

Display Status LED	Description
Lights green	Supply voltage OK
Flashing green	Connection to network and INTRANAV.IO backend successfully established and available
Flashing red	Error: Accelerometer alarm
Glow red	Error: See error code INTRANAV.IO platform for more information
Flashing yellow	Warning: No network connection
Lights yellow	Warning: See error code INTRANAV.IO platform for more information
Glow blue	NODE faultless in operation
Flashing blue	NODE (Here-I-Am) mode

The signal behavior of the status LED may vary slightly depending on the firmware release and configuration. Please always refer to the INTRANAV.IO platform or current manual for the exact LED code.

## Cleaning and maintenance

- The device may only be installed and opened by appropriately trained personnel.
- Repairs to the device must only be carried out by an authorised service centre or trained key users.
- Unauthorized opening and improper repairs can cause considerable danger for the user.

- Unauthorized opening of the devices will result in the exclusion of warranty and liability of IntraNav GmbH.
- Never use liquids, abrasive cleaners, alkaline cleaning agents, sharp or abrasive tools to clean the housing.

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IntraNav GmbH  
Frankfurter  
Str. 2765760  
Eschborn

Phone +49 6196-20471 80  
Fax +49 6196-20471  
[89info@intranav.com](mailto:89info@intranav.com) \_COPY17

Commerzbank  
FrankfurtIBAN  
DE91 5004 0000 0571  
9141 00BIC  
COBADEFFXXX

Commercial  
registerRegistral court  
Frankfurt a. M.  
HRB 92924

## 4 Technical data

Property	Description
Radio procedures	IEEE 802.15.4-2011 UWB (Ultra Wideband)
Frequency range	UWB Channel 5 (6.4GHz)
Transmission power	-34 dBm
Antenna	Omnidirectional integrated antenna (max. 70m range)
Sensors	3-axis acceleration sensor Integrated temperature sensor Integrated air pressure sensor
Supply voltage	Supply voltage by means of <ul style="list-style-type: none"> <li>- Power-Over-Ethernet</li> <li>- 9-36V DC</li> <li>- USB-C</li> </ul>
Ethernet	RJ45 Ethernet 100Mbit/s (full duplex) DHCP Yes IEEE 802.3af, Class 0 (<2W)
Wi-Fi Version (IN5200)	Wi-Fi: 2412~2472MHz (2,4GHz) 19.60dBm(802.11b), 19.40dBm(802.11g), 18.60dBm(802.11n-HT20) for EU power WPA & WPA2 Enterprise
Status LED	RGB LED
Protection class	IP 54
Dimensions	Approx. 150 x 150 x 30 mm
Weight	Approx. 180 g
Temperature range	10°C ... +50°C

## 5 Marking

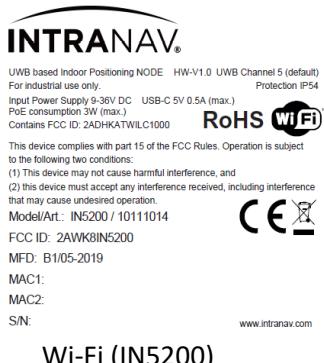


INTRANAV NODE Front panel

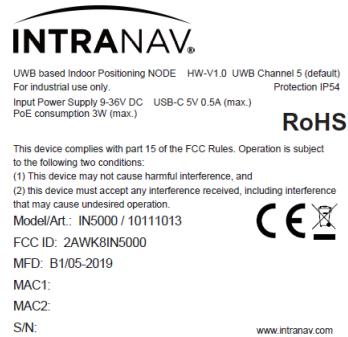


INTRANAV NODE Back panel

With NODE ID and MAC address on label



Wi-Fi (IN5200)



Non Wi-Fi (IN5000)

## 6 Approvals

### EU Declaration of Conformity

The current EU Declaration of Conformity for this product is available on request or by e-mail to [info@intranav.com](mailto:info@intranav.com).

The products described in this document meet the requirements of the following EU directives:

- RoHS Directive 2011/65/EU

Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment; Official Journal of the EU L174, 01/07/2011, p. 88-110

- Radio Equipment Directive 2014/53/EU (RED, Radio Equipment Directive)

Directive of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the provision of radio equipment on the market; Official Journal of the EU L153, 22/05/2014, p. 62-106

### RoHS

RoHS directive (restriction of the use of certain hazardous substances)

The products described in these operating instructions meet the requirements of the EU Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Applied standard:

- EN 50581

Technical documentation for the assessment of electrical and electronic equipment with regard to the restriction of hazardous substances

## RED (Radio Equipment Directive)

### Health and safety protection

The products described in this document meet the requirements of the tightened standards:

Art. 3 (1) a) Protection of health and safety

- EN 62368-1Equipment for audio/video, information and communication technology - Part 1: Safety requirements
- EN 62311Evaluation of electrical and electronic equipment with respect to limitations of human exposure to electromagnetic fields (0 Hz to 300 GHz)

The products described in these operating instructions meet the requirements

of Art. 3 (1) b) EMC Harmonized Standards:

- ETSI EN 301 489-1Electromagnetic compatibility and Radio spectrum Matters (ERM) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 1: Common technical requirements
- ETSI EN 301 489-17Electromagnetic compatibility and Radio spectrum Matters (ERM) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 17: Specific conditions for Wideband Transmission Systems
- ETSI EN 301 489-33Electromagnetic compatibility and Radio spectrum Matters (ERM) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 33: Specific conditions for Ultra Wide Band (UWB) equipment

- EN 55011Industrial  
, scientific and medical equipment - Radio disturbance characteristics - Limits and methods of measurement
- EN 55032 Class A, Class B Electromagnetic compatibility of multimedia equipment and devices - Emission requirements
- EN 55035Electromagnetic compatibility of multimedia equipment - Immunity requirements
- EN 61000-6-1Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN 61000-6-2Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN 61000-6-3Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- EN 61000-6-4Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

### Art. 3 (2) Efficient use of the radio spectrum

- ETSI EN 300 328Broadband transmission systems  
- Data transmission equipment using 2,4 GHz ISM band and broadband modulation techniques - Harmonised EN covering essential requirements under Article 3.2 of the EU Directive 2014/53/EU
- ETSI EN 302 065-2  
Short Range Devices (SRD) using Ultra Wide Band (UWB) technology

- Harmonised EN covering essential requirements under article 3.2 of the EU directive 2014/53/EU; Part 2: Requirements for Ultra Wide Band site surveillance

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## FCC

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: The operators should cease operation when the harmful Interference occurs to other users.

## RF Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This equipment may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious legal penalties.

This device may not be employed for the operation onboard an aircraft, a ship or a satellite is prohibited.

### Note

The specified approvals are only valid if the corresponding symbol is printed on the device.

## 7 Recycling and disposal



The products are low-polluting, recyclable and meet the requirements of the WEEE Directive 2012/19/EU for the disposal of waste electrical and electronic equipment.

Do not dispose of the products at public disposal points.

For environmentally friendly recycling and the disposal of your old device, please contact a certified disposal company for electronic waste or your IntraNav contact person.

Please note different country-specific regulations.

## 8 Troubleshooting

If a fault occurs, inspect the unit for the following faults and take appropriate action. If other undefined errors occur, contact IntraNav support. ([www.IntraNav.com](http://www.IntraNav.com))

**F: NODE Status LED is not lit.**

**A:** Check the power supply

**F: NODE Status LED lights red or yellow**

**A:** Refer to the instructions for the error code

**Q: NODE is not listed among the network devices in the platform.**

**A:** Check the network connection and settings. Disconnect all wires and cables, wait 3 seconds and reconnect the wires and cables.

**Q: NODE is displayed on platform on wrong position.**

**A:** Make sure that the NODE ID has not been swapped.

**Q: Poor localization performance**

**A:** Make sure that the NODEs are all set up in a square and that no objects are obstructing the line of sight to the TAGs.