

User manual for nDEC

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1. Introduction

nDEC is an advanced indoor climate measurer. The nDEC exists in different variants, and can measure temperature, air humidity, noise level, CO₂-level, carbon monoxide level, and the level of air pollution in a room, depending on the purchased variant.

The information that the nDEC collects is transmitted to our website myndec.com and our app "My nDEC", which is developed for iOS and Android. Access to the information on the website and the app is obtained with a username and a password.

All information is owned by you. You have the opportunity to set up several users for an nDEC, so more people have access to the information.

nDec requires a power source and a wireless WiFi-network.

It is possible to connect several nDECs.

Our website myndec.com

The website myndec.com works as a management center, where you via your username and password can add and remove nDECs. Furthermore, you have the possibility to manage who has access to the information. At myndec.com you can see the indoor climate as a function for an hour, a day, a week, or a month. You also have the option to export the collected information about the indoor climate to Excel, where you can continue to work with the data.

Our app My nDEC

Our app "My nDEC" quickly and easily gives an overview of the indoor climate here-and-now. Here you can see the status of the indoor climate in the form of smileys in the colors red, yellow, and green. The warnings can also be sent to you in the form of notifications, text-messages, or e-mails, if the values surpass the fixed limits. My nDEC is developed for both iOS and Android.

2. Technical data

Radio connection

WiFi 802.11 a/b/g/n & 802.15.4g

Bluetooth 3.0 (2.1 compatible)

3G (available if ordered)

AES128 encryption



Electric power connection

Micro USB (1A) connection

Coating

IP40 white plastic

External dimensions

96x96x25 mm

Sub-g radio range

45- 105 meters (depending on the building and the location)

Protocols

Wireless M-Bus, 6LowPAN, New Nordic Engineering-NuP

Data security

All connections are encrypted. New Nordic Engineering’s data center complies with the state’s data security requirements, and uses the same data center company as NemID and Det Fælles Medicinkort. All data consignments are encrypted.

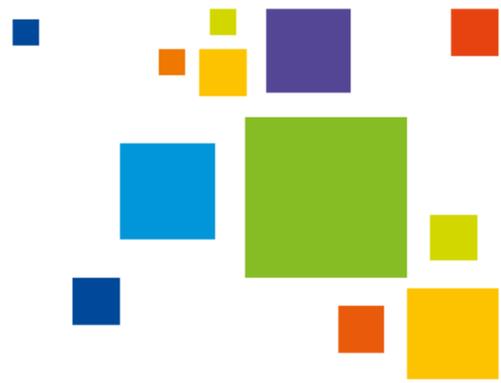
Operating safety

All New Nordic Engineering’s services use replicated systems and 24 X 7 surveillance (<http://www.bfi.dk/> - certified).

Sensors

New Nordic Engineering uses sensors that measure within the limits mentioned below:

Sensor	Min. measurement	Max. measurement	Recommended
Temperature	-40 degrees celsius	125 degrees celsius	20-22 degrees celsius
Air humidity	0%	100%	30% winter / 65% summer
Noise level	0 db	160 db	60 db
CO ₂ -level	0 ppm.	5.000 ppm	>800 ppm



The VOC-sensor measures the following gasses:

Gas	Min. measurement	Max. measurement	Recommended level
Carbon monoxide	1 ppm	1.000 ppm	<25 ppm
Nitrogen dioxide	0,05 ppm	10 ppm	<2ppm
Ethanol	10 ppm	500 ppm	<50 ppm average over 8 hours
Hydrogen	1 ppm	1.000 ppm	
Ammonia	1 ppm	500 ppm	<20 ppm
Methane	10 ppm	>1.000 ppm	
Propane	10 ppm	>1.000 ppm	
Iso-butane	10 ppm	>1.000 ppm	

The presence of gasses in the indoor climate is divided into three groups: Air pollution, carbon monoxide, and ammonia.

Measuring units

The DeciBel (or dB)- scale is used all over the world to measure noise levels. dB is divided into three scales: dB(A), dB(B), and dB(C). The nDEC uses the dB(A)-scale. The scale is used to determine how high the intensity of the sound pressure is in all of the frequencies that the human ear can perceive. 60dB is the equivalent of a normal conversation.

Ppm stands for 'parts per million' and is the equivalent of 1% of 1% of 1%. Ppm is used as a measuring unit for the presence of gasses.

3. Measurements

The sensors in the nDEC make several measurements every 30 or 80 seconds, and collect measurements so the nDEC updates every 5 minutes.

Temperature

The thermometer in the nDEC can measure temperatures from -40°C to +125°C. The recommended temperature of a living room is 20-22°C.

Air humidity

The hygrometer in the nDEC can measure from 0-100% air humidity. During summer the air humidity should lie between 60-65%, and 25-39% during a winter with freezing periods.



Noise level

Noise levels are measured in decibel (dB). The noise meter in the nDEC can measure noise up to 160 dB. The noise level should be below 60 dB. This is equivalent to a normal conversation between two people.

CO₂-level

The CO₂-meter in the nDEC can measure up to 5000 ppm. Outside the CO₂-level lies at about 420 ppm. This varies concurrently with the seasons. Inside, it is recommended that the level does not exceed 800 ppm. The factory inspectorate's limit for the CO₂-level is 1.000 ppm.

Air pollution

Air pollution comes from traffic and industry, among other things, and it is the substance nitrogen dioxide that is measured. The nDEC can measure air pollution from 0,05-10 ppm. The lowest measurement is equivalent to the average annual pollution level in a big city, such as London or Berlin. In these cities, measurements of up to 0,2 ppm can be made.

Carbon monoxide

Carbon monoxide is a clear and odorless gas, which can be lethal if inhaled. Carbon monoxide arises as a consequence of incomplete burning of wood in a woodburning stove. The nDEC measures carbon monoxide from 1-1.000 ppm. It is recommended that the content of carbon monoxide does not surpass 9 ppm indoors. Humans should only be exposed to a maximum of 25 ppm over a time period of 8 hours.

4. nDEC

The nDEC is available in several variants:

- PRIME: Without built-in sensors, and the only function is to collect and transmit data from external sensors
- SAFETY: Contains sensors that measure temperature, air humidity, noise, pollution, and carbon monoxide
- AIR: Contains sensors that measure temperature, air humidity, noise, and CO₂
- ALL: Contains sensors that measure temperature, air humidity, noise, CO₂, air pollution, and carbon monoxide

The amount of sensors built in to the nDEC determines the functionality. Common to all nDECs is that they require access to power and a WiFi-network.

5. nSENSOR

nSENSOR is a battery-driven unit that measures one or two parameters of the indoor climate. For example temperature, air humidity, or movement. nSENSORS work with an nDEC. An nSENSOR does not require a connection to power or WiFi. nSENSOR is available in several variants, and can be added as needed:

- TEMP: Contains sensor that measures temperature (spring 2016)



- TEMP/HUMIDITY: Contains sensors that measures temperature and air humidity (spring 2016)
- MOVE: Contains sensors that measure movement (spring 2016)
- LUX: Contains sensor that measures lighting conditions (Second half of 2016)

6. Wireless networks

The nDEC can be connected to any wireless network that it can receive signals from.

It is possible to use a 3G-network for the nDEC. 3G-networks can be bought in stores that sell electronics for a few hundred Danish kroner. Along with this, a sim-card has to be bought.

7. Browsers

Our website myndec.com can be used with the browsers mentioned below. We recommend that you always use the newest version of your browser.

- Internet Explorer version 10 or newer
- Microsoft Edge
- Safari
- Google Chrome
- Firefox

8. Installation

1. Find a central placement for your nDEC and hang it up on the wall at a height between 1 and 1,5 meters.
2. Attach the power source to your nDEC and connect to power.
3. nDEC will light green, while it is getting ready for set-up.
4. When the nDEC lights blue, it has created its own network, which is needed for the set-up. This can take up to 2 minutes.

Set up a user account for your nDEC

5. While your nDEC is getting ready: Go to the page <https://myndec.com> on your PC, tablet or smartphone. Choose "New User".
6. up your nDEC-account with a username and password of min. 8 characters, which you will use to log in to your nDEC-account.



Connect your nDEC to your network

7. Now you have to start setting up your nDEC: Find the list of available networks on your PC, tablet, or smartphone, and choose the network with the name Setup_nDec_XX. XX will be equal to numbers and letters.
8. Now you will be shown the networks that the nDEC can be connected to. Choose which network on the list that you wish to use for your nDEC. If you are not shown a list, write the name of the network that your nDEC needs to be connected to.
9. Type in the password of your network and your nDEC username that you set up in step 6. Your nDEC will turn off the blue light when it has established a connection with the chosen network.
10. Log on to your regular network again. Sometimes this happens automatically.

Log on to your nDEC-account

11. Now log on to myndec.com: After a few minutes you can see your nDEC. Your nDEC will be set up under the name "HOME". You can change the name of your nDEC, if you like.
12. Users are set up by clicking on the passport photo icon (user administration) in the top right corner at myndec.com. Users can see all data. Users can be assigned the administrator role, which gives the right to set up and delete units and users.
13. Your nDEC spends about an hour adapting to its new environment. Afterwards, the measurements can be read.

9. Restart

Restart

If you wish to restart your nDEC, the easiest way to do so is by disconnecting the power supply for a few seconds and reconnecting the power again. Afterwards, the nDEC will light up blue, and then turn off the blue light by itself. The nDEC automatically searches for software updates when the power has been disconnected. Therefore, it is important not to disconnect the power again during the first hour.

10. Administration and reading via the web

On our website myndec.com you have the opportunity to create an overview over the indoor climate on a monthly, weekly, daily, or hourly plan. The collected data is shown in graphs, and it is possible to see the exact time of the measurements. Additionally, it is possible to follow the indoor climate "live", as the graphs are updated every 5 minutes.

A username and password is required to gain access to the collected data on myndec.com.



Edit your account settings

Click on your username in the top right corner. This will enable you to see your username, which is repeated in the section "Organization". If you are several people, who all need to be able to read the nDEC's measurements, it is a good idea to change the name to something that describes you: an address, a department, or a company name. This is also where you can change the e-mail address and phone number.

Click on "Notifications". Here you can choose between e-mail, text-message, and push-notifications. If you choose e-mail, it is required that your e-mail address is typed in. For text-messages, you have to type in your phone number. Push-notifications will only be visible on phones with the downloaded app.

Click "change password", if you wish to change your password.

Add an nDEC

Add another nDEC by following step 7-10 in the installation guide. Afterwards, go to myndec.com and click on the tool wrench (unit administration) in the top right corner. The new nDEC will now be on the list of units and can be named, and the graphs from this nDEC can be assigned a color. In the section "Categories" you can indicate if your nDEC is placed in a home, or an office (a workspace). You can also set up your own categories, with a better description of the nDEC's placement.

Add user

Click on the little passport-photo icon in the top right corner. Click on "Add user". After this, a new user is set up with a username, password, e-mail-address, and phone number. User name and password is chosen by the administrator. E-mail address and phone number indicates the two options that users have to receive notifications. Additionally, it is possible to assign the administrating role to the new user, and hereby give the new user rights to administrate units and users. An e-mail will automatically be sent to the new user, which has confirm the decision.

Delete user

Click on the user that you wish to delete. Click on "Delete".

Administration of units

Click on the tool wrench (unit administration) in the top right corner. A list of units is shown, and it is now possible to edit a unit:

- Click on a unit
- It is now possible to give the unit a name and assign it a color, in which the graph will be shown. It is beneficial to give the unit a name that describes the location, for example "Reception" or "Classroom A".
- Click "Show sensors", and the sensors in the unit will be shown.



Reference models

The reference models are a set of basic settings in the nDEC, which are chosen based on recommendations and Danish law within the area. The reference models contain limit values for the sensors' measurements, which determine, when a warning is sent.

Selection of display on graphs

A graph is shown for each type of sensor. It is possible to choose to have a graph shown for one sensor at a time. This is done in the section "Type in one or more categories". Hold the cursor over the section, and a list of possible sensors is shown. If a sensor is not selected, the graphs for all types of sensors are shown below each other. It is also possible to choose a "Category" (for example Home or Office). This function is practical for users with many nDECs at different addresses, who that way can choose, for example, to see the temperature in all rooms in the category "office" or "classroom".

Selection of time period

Select which time period the graphs should show by clicking on the calendar icon at the top of the page. Here you can choose between days, weeks, and months and insert a number. Afterwards, click on the magnifying glass, and wait for a moment until the desired time period is shown on the graphs.

Click on "Time range" to insert a start-date, an end-date, and a time for the period that the graph should show. Then click on the magnifying glass, and wait for a moment until the desired time period is shown on the graphs.

You can also choose to indicate an area of the graph that you wish to have a closer look at: Place the cursor on the graph and hold down the button on the mouse while you mark up the time period that you desire to have a closer look at.

Hold the cursor over the graph to see the time of a measurement.

Export data to spreadsheet

There are several ways to export the collected data. At the top of the page under the section, where you can choose a time interval the button "Export" is shown. When you click on this button, two options occur: "Export". Here a file is downloaded with values for every five minutes – the same frequency that the graphs are updated with. The second option: "Export raw data", which contains all measurements behind the updates that happen every five minutes. Here, the amount of data is significantly larger, but also more exact. Data is exported from all units and all sensors, and these are saved in an Excel spreadsheet, which is downloaded to the computer.



11. Reading via app

Our app gives a quick overview of the indoor climate, which is transmitted by green, yellow, and red smileys.

The menu

Gain access to the menu by clicking on the little menu in the top left corner.

Home	Back to the front page on the app
My account	This is where you manage the settings for your account
Measurements	This is where you get general information about the measurements.
Installation guide	This is where you get help to install an nDEC
Support	Link to support formula
Go to myndec.com	Link to website with the option to see graphs
Log out	Logs you out and jumps to the log-in site

Adjustment of your account

Click on the little menu in the top left corner of the screen. Choose "My account". Here, your username is shown. It is possible to type in an e-mail address, a phone number, a land code (+45 for Denmark), and choose the language. Type in an e-mail address, if you wish to receive notifications by e-mail. Type in your phone number if you wish to receive warnings as push-notifications on the screen and/or as text-messages. If you do not type in an e-mail address or a phone number, you will not receive any warnings or notifications.

At the bottom of the screen you can switch of warnings as text-messages, e-mails, and push-notifications.

Reading of measurements

At the bottom of screens an icon is shown for each of the sensors in the nDEC. You can scroll through the menu by swiping sideways.

All measurements from an nDEC is shown if you click on a smiley on the screen's main section. From this overview, it is possible to have a closer look at the measurements from a single sensor. Click on a sensor's smiley. Then, an average is shown for the latest 24 hours, plus the lowest and highest value. Here, it is possible to switch off warnings from the sensor, if desired.

Alarms

In the top right corner of the screen an icon is seen for a bell. If the bell is marked with lines around it, it is a sign that measurements outside the norm have been registered. Click on the bell to see which measurements are in question, and when they were registered.



12. Troubleshooting

The nDEC does not exist/is not found (no new devices)

Ensure that the nDEC is connected to power. Check if the nDEC lights blue. If this is the case, it is not connected to a network. Follow the installation guide under the step "Connect your nDEC to your network".

The nDEC jumps off the network

Your nDEC can find its way back to the network that it is automatically tied to. It will automatically try to reconnect every hour. Therefore, you will not have to actively do anything if it jumps off the network. The reason for the nDEC jumping off the network could be security in your network, which ensures that unknown devices can not connect for longer periods of time. Contact your network provider, and ask to have your nDEC put on the list of approved devices. Your network provider will most likely need the nDEC's MAC-address. You will find this number on a sticker on the back of the nDEC.

The nDEC jumps off a 3G-network

Check that there is a stable power source connected to your 3G-network. If you use a 3G mobile network with a sim-card, please note that some networks switch to standby after as little as 5 minutes without activity. The nDEC cannot find its way back to a network that is on standby. The nDEC is programmed to send information every 5 minutes.

13. Support

If you need support for your nDEC, or if you have suggestions for improvements, you can contact us on the site: myndec.com/support. Here you will find a form, which helps us sort the inquiries, so we can get back to you with an answer as soon as possible. Our goal is to get back to you on the following workday as a minimum.

14. Service provision

A minor service provision is charged annually. The service provision covers:

- automatic updates of software on your nDEC
- updates and improvements of the app My nDEC
- updates and development of myndec.com
- storage of your data
- maintenance and development of data security



15.FAQ – Frequently asked questions

Q: What do I need to know, before starting the set-up?

A: You need to know the name and password of the network that your nDEC is going to be connected to. If anyone else than yourself needs notice, you will need their phone number and/or email address.

Q: What is the best placement for my nDEC?

A: Your nDEC should be placed on the wall in a height between 1 and 1,5 meters.

Q: My nDEC is not working – why?

A: Your nDEC needs to be connected to power and a network. If your nDEC is blinking green, it is a sign that it is starting up, so you just have to wait for the next step of the set-up. If your nDEC is blinking blue, it is because it has not yet been connected to a network. This may be due to the fact that you have not yet typed in the name and password of the network that you wish to use for your nDEC. When your nDEC is no longer blinking blue, it means that it has been connected to a network.

Q: I lost my subscription number, where can I find it?

A: It happens! Go to myndec.com and click "Forgot password?", then you will receive an e-mail.

Q: Where can I find the app?

A: If you have an iPhone, go to Apples App Store and search for "My nDEC". If you have an android device, go to the Google Play Store and search for "My nDEC". You can also choose to follow the links at the top of this page.

Q: What is the ideal for the different values?

A: Temperature in rooms should be between 20-22 degrees Celsius, air humidity during the summer <60%, air humidity during the winter <40%, Noise level <55 db. CO₂ should be <800- 1000 ppm. Air pollution should be <0,2 ppm. and carbon monoxide <9 ppm. Human beings should not be exposed to 25 ppm. over a period of 8 hours.

Q: Can I share the measurements with others?

A: That depends on your description! If you do not have a subscription, that allows the access of multiple users, you can always download your information to an excel-spreadsheet and share it.

Q: There are "gaps" in my timeline? Why? How do I solve this?

A: The gaps in your timeline can be due to the fact that your nDEC jumped off the network, or that it has been without power for a while. You should check whether your network is stable, and the the chords have been connected correctly.

On the website n.build/support you will find a list of the most frequently asked questions. The list is updated continuously.

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