

NPK-Kit Instruction Manual

The NPK Meter kit is designed to measure the NPK (Nitrogen, Phosphorus and Potassium) in Nutrient feed (drip) and drain samples in both the laboratory and field environments.

These instructions will enable the user to set up and operate the NPK Meter and accessories quickly. To see a video demonstration of how to use the NPK meter please scan the QR code below.



Unpacking the Kit

The kit comprises the following:

NPK Meter; Multiprobe Sonde ready assembled with 4 removable solid state probes (N, P, K and Reference); 1 x 50ml Measuring Cylinder; 100ml Reagent A with 5ml syringe; 100ml Reagent B with 5ml syringe; 3 x 100ml beakers; Hard Carry Case; 500ml MultiCal Standard 1; 500ml MultiCal Standard and 1 x stirrer.

Preparation:

Unpack the equipment from the case and attach the Sonde to the NPK Meter.

Remove the 100ml Reagent A and B bottles. Place the three empty beakers in the holes vacated by the reagents.

You will require a beaker of DI water for rinsing, and a tissue for dabbing the probe dry.

Conditioning the NPK Sonde:

Prior to calibration it is important to condition the sensors. Failure to do this will lead to the sensor readings drifting after initial calibration leading to inaccuracy in the sample testing.

Dispense around 20ml of MultiCal 1 Solution into the left hand beaker in the Case and place the Sonde in the solution. Ensure the protective probe cover is unscrewed and removed. Stir the solution with the Sonde.

Turn on the NPK Meter. The user will be prompted to press 'READ' to condition the probe. A timer of 20 minutes will start.

If the probe has recently been used you can skip this step by pressing the '▶' button.

However leaving the probe to condition for 10 minutes is still recommended even if it was conditioned recently.

Calibration

Using the measuring cylinder provided dispense 50ml of MultiCal 1 in the left hand beaker. Rinse the cylinder and place 50ml of MultiCal 2 in the centre beaker.

The NPK Probes and Reference Electrodes will need equilibrating. Place the Sonde in the MultiCal 1 beaker, stir and allow to stand for 10 minutes or more prior to calibration.

It is advisable to prepare a run of samples measure in one session to maximise efficiency and accuracy. To this end it may be useful to purchase an NPK Sample Rack and some extra beakers.

Scan the QR code for details on the accessories.



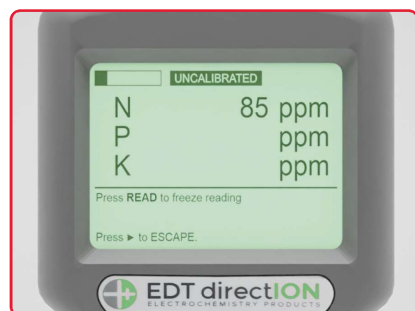
The Calibration:

The NPK meter will need to be calibrated prior to analysis. This is a 2-point automatic calibration. Cal 1 is for 50ppm N, 50ppm K and 10ppm P. Cal 2 is a decade higher: 500ppm N, 500ppm K and 100ppm P.

The NPK meter is set up for a 2 point Calibration with Auto End point activated. (We provide instructions to change settings in the Options section.)

1. Switch on the NPK meter
2. With the probe still in the MultiCal standard 1 press the 'CAL' button.
3. Follow the on-screen instructions as it establishes the set points for N, K and P.
4. When instructed remove the Sonde from the MultiCal 1 beaker and dab any residue from the probes using a tissue.
5. Insert the probe in the MultiCal 2 Standard and stir using the probe. Leave to stand and then press 'CAL' to start the second point Calibration.
6. Follow the on-screen instructions as it establishes the set points for N,K and P.
7. When the "Calibrated" icon appears remove the Sonde and rinse in the DI water and dab with a tissue.

You are now ready to measure a sample.



Sample Measurement

Using the measuring cylinder, dispense 50 ml of sample into the right hand side beaker. Many samples may contain residues and particles. It is not necessary to filter or remove these.

1. Stir the sample briefly with the Sonde and then press '**READ**' to measure as instructed on the screen.
2. The Meter will automatically read the N concentration. Follow the on-screen instructions until a stable K result is displayed.
3. To measure P you need to add reagents. This is best done whilst the probe is removed. Remove the Sonde and shake off any sample into the beaker and add 5ml of REAGENT A (Green). Stir and press '**P**' as instructed. There is a minute countdown.
4. When instructed add REAGENT B (Red) and repeat.
5. Replace the Sonde and stir further when the timer gets down to zero.
6. At the end of the second countdown the meter will display the NPK results in ppm.

Make a note of the results on the display.

If you wish to store the results in the instrument memory press the '▼' button. The screen will briefly show "**stored**" and the data will be stored in the file system.

The Results:

The results are displayed in ppm Nitrogen, Phosphorous and Potassium (NPK).

It is possible to measure in ppm for Nitrate (NO_3^-), Phosphate (PO_4^{3-}) and Potassium (K^+) but this requires a different set of standards so is not possible with the standard set provided.

To order a set of these new standards please contact sales@edt.co.uk.



Settings & Options

There are several parameters that can be adjusted and these can be accessed using the '▶' key which also acts as an **ESCAPE** button.

Press the '▶' button to access the **PARAMETERS ADJUST** screen and the following options:

- Data options
- Auto End Point
- Calibration
- Recalibration Alert
- Clock.
- Date Format
- Change units from ppm to mV for diagnostics.

Data Options

- Press the '▼' button to highlight Data Options.
- Press '**READ**' to review the stored files or to set and change the **User ID**
- To download the data to an excel file you will need a *DK400 Data Kit*

Auto End Point

- Press the '▼' button to highlight the **Auto End Point** option.
- Press '**READ**' to toggle the feature **ON** or **OFF**

Calibration

- Press the '▼' button to highlight the Calibration option.
- Press '**READ**' to toggle the feature between 2 Points or 1 Point.
- Changing the Calibration format will cancel the current Calibration and move the instrument to the Uncalibrated state

Recalibration Alert

- Press the '▼' button to highlight the Recalibration Alert option.
- Press '**READ**' to display the last Calibration date and set a 7 day recalibration alert by pressing the '▼' button

Clock

- Press the '▼' button to highlight the **Clock** option.
- Press '**READ**' to display the date and time. Follow the on screen instructions.

Date Format:

- Press the '▼' button to highlight the **Date Format** option.
- Press '**READ**' to toggle between the date formats

Units

- Press the '▼' button to highlight the **Units** option.
- Press '**READ**' to toggle between ppm - N, P, K and mV

It is envisaged that the NPK mode will be selected. To use the NO_3^- , PO_4^{3-} & K^+ option you will need specific standards so please contact sales@edt.co.uk.
The mV mode is used for diagnostics purposes.

Troubleshooting & Diagnostics

Once calibrated the instrument will offer a “Press ‘▼’ to show probe slopes and offsets” option.

The mV values for all calibration points are displayed.

The perfect slopes are as follows:

Nitrate: -59.16 mV

Phosphate: -73.94 mV

Potassium: + 59.16 mV

In practice the probes are normally around +/-49 to +/-55mV slopes. If the slopes are lower please report the data to info@edt.co.uk. One or more sensor may need replacing or cleaning.

For further support scan the QR Codes for our technical support and YouTube channel.



NPK Calibration Video



NPK Meter Kit



EDT TV

