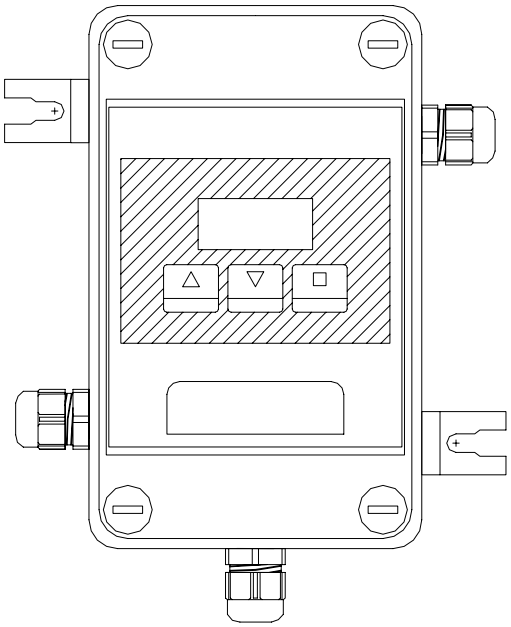
Instruction **Manual**

Conductivity / TDS Meter & Controller
Model: NANO-NC2



Supplied By:

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Manufacturer: Convergent Water Controls Pty Ltd, Sydney Australia.

Note: On-going product development at Convergent Water Controls may lead to changes in the specifications of this product.

Warranty: This product is guaranteed for a period of 12 months from installation date. The warranty applies to manufacturing or component defects which may cause the unit to malfunction under specified conditions. The guarantee does not cover damage due to abuse, tampering or improper installation.

Disclaimer: Convergent Water Controls will not be held liable for any consequential damage or loss arising resulting from product malfunction.

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1. INTRODUCTION

Ideally suited for water treatment, the NANO-NCD2 electronic controller has a conductivity range of 1 to 10 000 microsiemens and can control the conductivity to a value anywhere in this range.

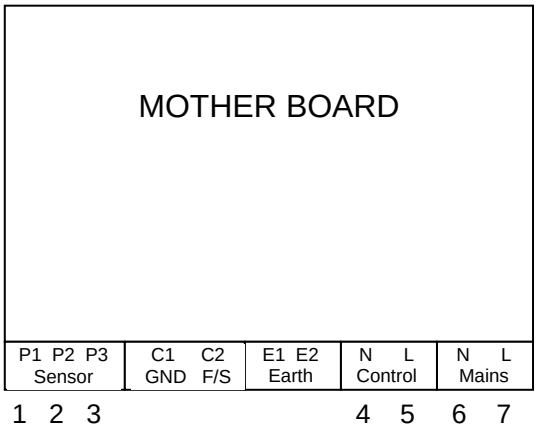
1.1 Features

- Simultaneous conductivity and setpoint readout on a dot matrix LCD display - instant comparison can be made.
- Display in either µS or TDS (selectable).
- Simple 3-button programming. Setting up is simple, easy and accurate!
- Output can be tested at the push of a button - even without connection of the probe.
- Inhibitor dosing control - Inhibitor pump can be connected to the internal screw connectors to operate on bleed.
- Intelligent electronic probe maintenance - cleans probe after it has been exposed to air.
- Mains 240VAC powered. All programmed parameters are stored in non-volatile memory (EEPROM).

2. INSTALLATION

2.1 Electrical Wiring Information

The diagram below show the Motherboard of the controller (in the base of the box) with the electrical terminals at the bottom of the PC Board. Starting from the left, wire the controller as follows:



1. Probe PR+ (brown/red wire)
2. Probe PR- (yellow wire)
3. Probe CM+ (blue wire)

C1. Probe Shield (grey) to circuit ground
C2. Flow Switch

4. Neutral for Solenoid
5. Active for Solenoid
6. Neutral 240VAC supply
7. Active 240VAC supply

E1. Earth
E2. Earth

Note: Do not remove link between 2 & 3 (i.e. terminals P2 & P3)

Note: If terminals C1, C2 & C3 are labelled AUX, please do not incorrectly assume these are connections to an Auxiliary relay contact. Terminals C1 & C2 are the Extra Low Voltage flow switch inputs, Terminal C3 is unused.

Important: Flow switch input (terminals C1 & C2) is supplied with a wire link between the 2 terminals. When fitting a flow switch, replace the link with the 2 wires from the flow switch. Flow switch contact must be closed when there is flow and open when there is no flow. Flow switch contact MUST be Volt-Free.

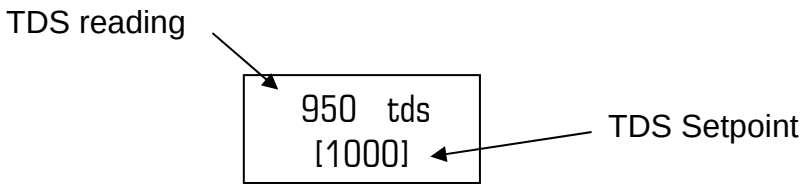
2.2 Probe Installation & Maintenance

The probe should be installed into a Tee such that the electrode tips are submerged in the water flowing through the Tee.
The probe's electrodes should periodically be cleaned to maintain accurate TDS measurements. The frequency of cleaning required will vary from one application to another. In a new installation, it is recommended that the probe be cleaned after 2 weeks of service.
To clean the probe, first unplug the probe lead and unscrew the probe from the Tee. The probe can normally be cleaned using a cloth or paper towel.
Occasionally the probe's carbon electrodes may be coated with certain substances which requires more vigorous cleaning (this coating may not always be visible). To clean a coated electrode, use a fine grit abrasive, such as emery paper.
After cleaning, apply more Teflon® tape to the probe thread and screw back into the Tee.
The controller should always be calibrated after probe cleaning.

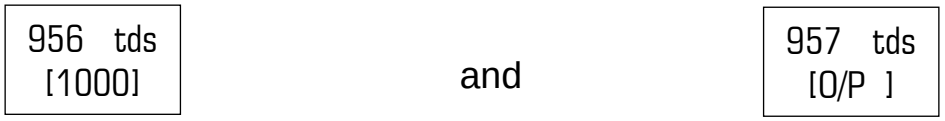
3. COMMISSIONING AND PROGRAMMING SETPOINT

3.1 Start-Up

After power-up, the TDS/Conductivity controller is ready to perform conductivity (TDS or μS) indication and control. All the relevant information is displayed on the LCD display as explained below.



When the output is activated, the display will alternate between:



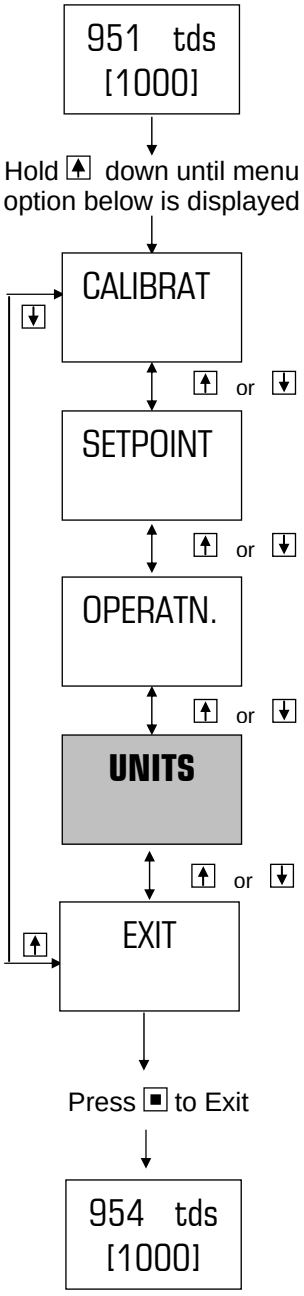
Status	Display
Normal operation:	**Measured TDS** & **TDS Setpoint**, as shown above
Programming mode:	Programming information (eg. “Setpoint”)

3.2 Select Displayed Units (ie. TDS or μS)

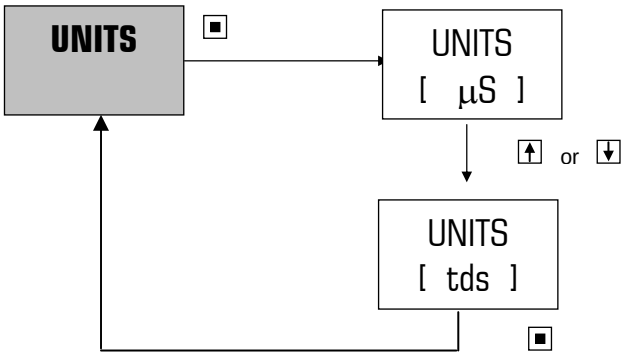
Conductivity can be displayed in either:

tds (ie. Total Dissolved Solids), or
μS (ie. microsiemens)

To leave the display in **μS** , ie. factory default setting, proceed to section 3.3.



Example:
Changing the units from μS to tds



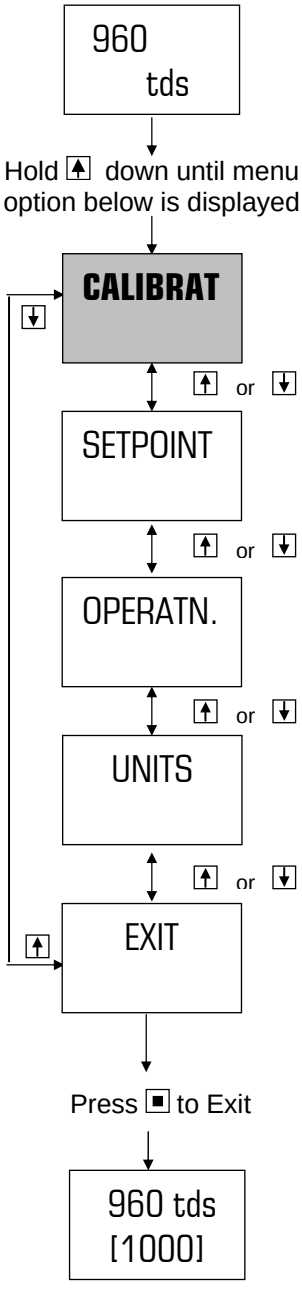
Note: Shading represents flashing

3.3 Calibration

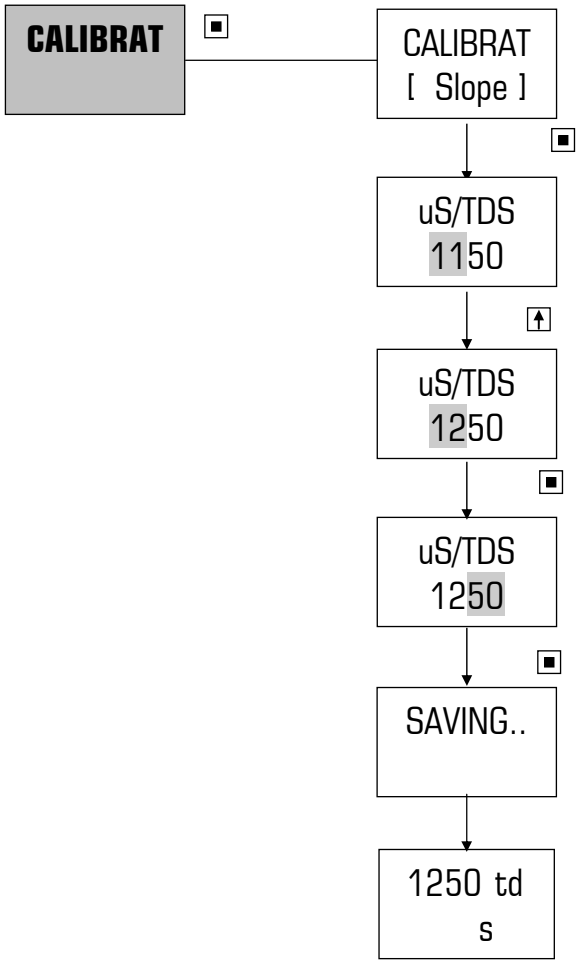
The NANO Range of conductivity/TDS controllers features a 2 point calibration procedure. The first calibration point is ZERO calibration, which is performed with the probe dry. The second point is the slope calibration and this calibration should be performed with the TDS/conductivity in a solution which is as close as possible to the Setpoint value. First check the ZERO calibration point by unscrewing the probe from the installation. Dry the probe tip and wait for the reading to stabilise. The reading should be zero or very close to 0 uS/TDS. Should the controller require the zero calibration to be reset, follow the ZERO calibration procedure. Check the slope calibration as follows:

Take a sample of water and measure the TDS/Conductivity with a hand-held conductivity meter. Should the Conductivity/TDS readout on the display differ from the sample taken, calibrate the slope as follows:

SLOPE CALIBRATION

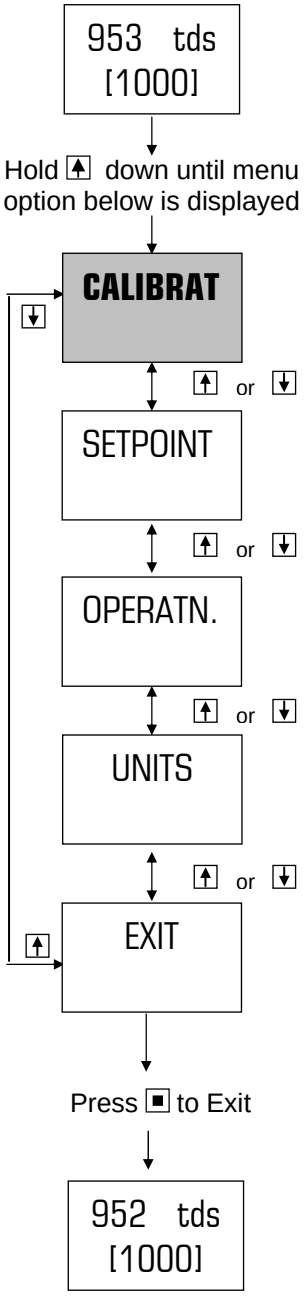


Example:
Calibrate from 1150tds to 1250tds

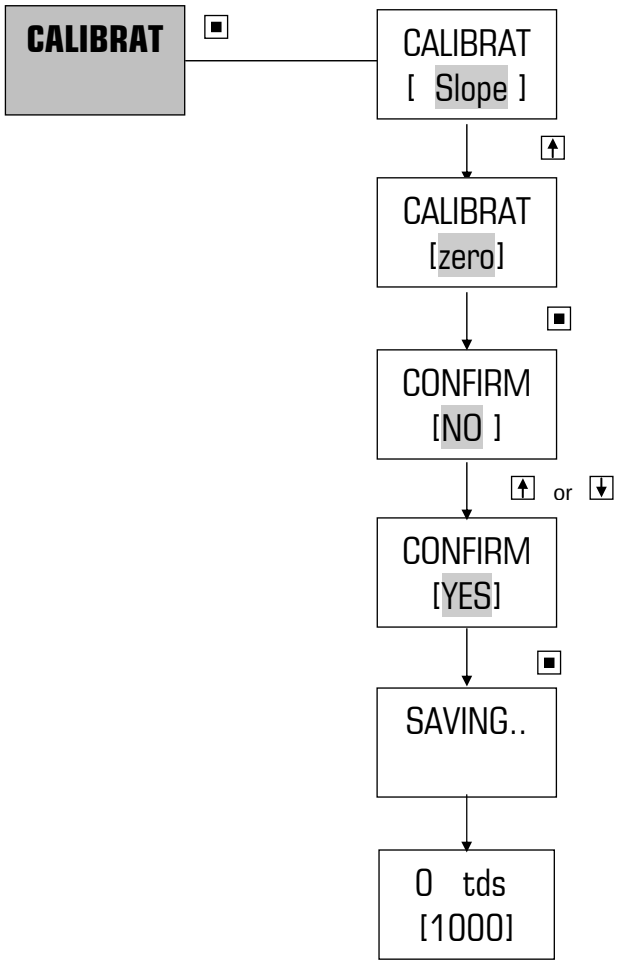


Note: Shading represents flashing

ZERO CALIBRATION



Example:
Zero calibrate whilst probe is exposed to air



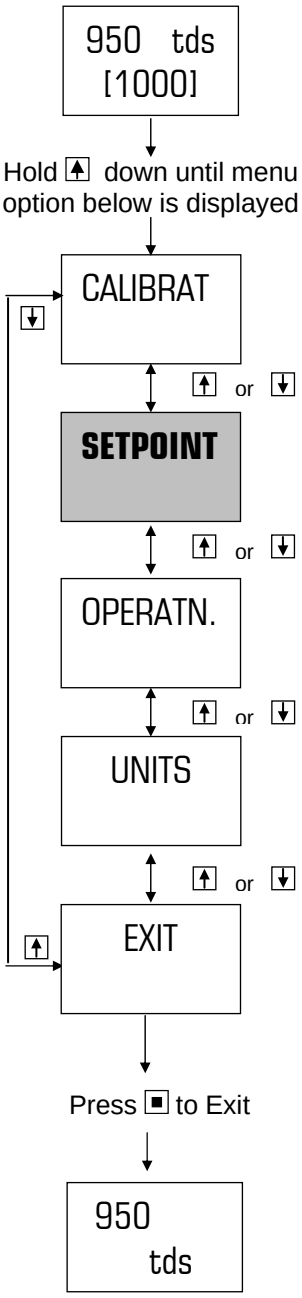
Note: Shading represents flashing

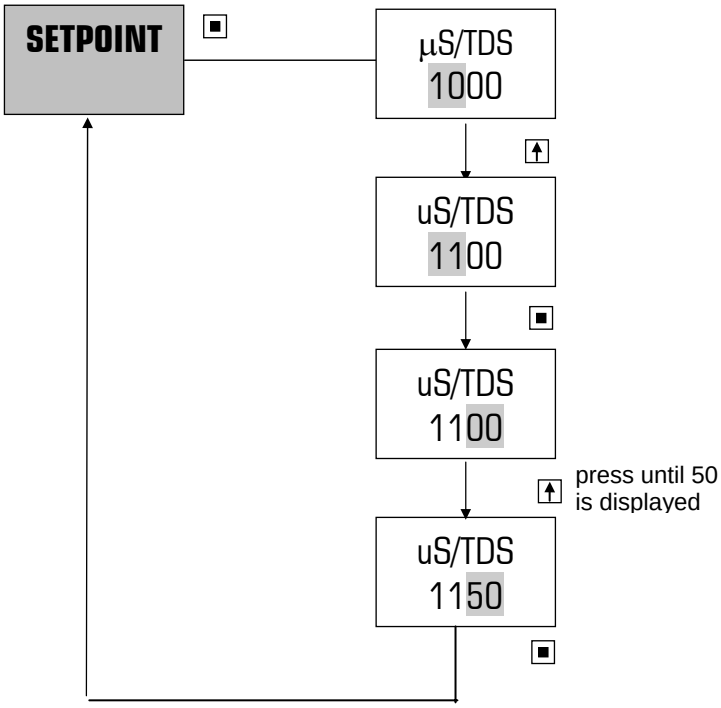
3.4 Set Conductivity Setpoint

The main function of the NANO range of Conductivity/TDS controller is conductivity bleed control, ie. the solenoid opens (ie. bleeds) when the TDS rises above the setpoint. When this occurs, the system water is flushed to drain and fresh make-up water dilutes the system, thus lowering the conductivity of the cooling tower water.

The setpoint is entered as an actual number (eg. 1000 TDS), in 1 μS/TDS increments.

Example:
Increasing factory default setpoint of 1000 μS to a new setting of 1150 μS

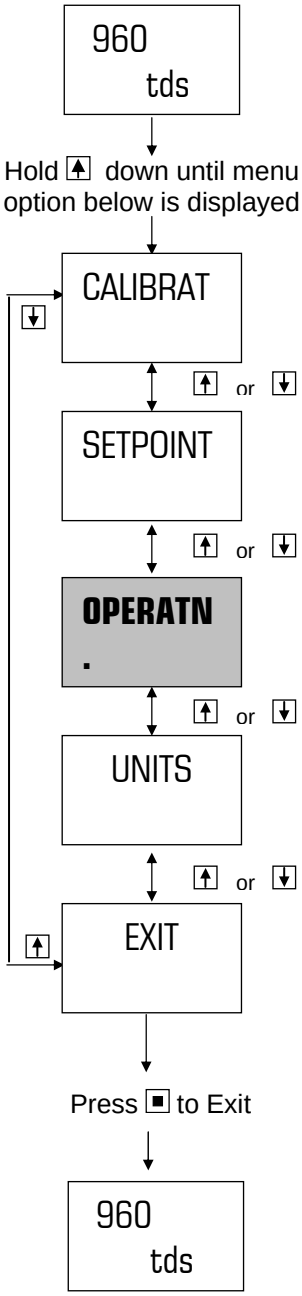




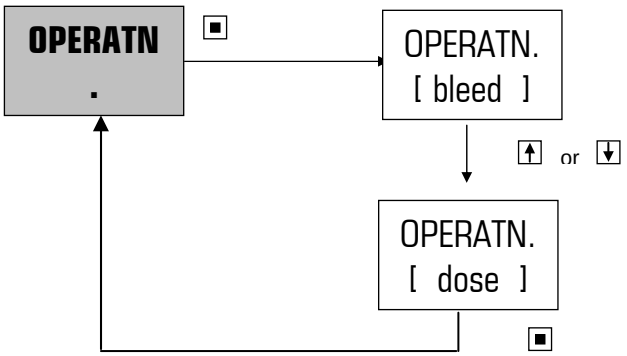
Note: Shading represents flashing

3.5 Set Operation

The NANO Conductivity/TDS controller can be set to operate either as a bleed controller or as a dosing controller.



Example:
Changing the factory default of Bleed Controller to Dosing Controller



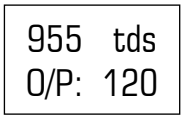
Note: Shading represents flashing

3.6 Testing the Output

The output can be manually operated to test its operation.

Once in test mode, the Output switches on and remains on for 2 minutes or until test mode is cancelled by pressing. ▣

Press the ENT pushbutton for a few seconds. The controller will activate the output and the following will be displayed:



The display shows that the output is activated and a count-down display will be initiated. The figure on the second line of display shows the remaining on time in seconds.

When the ENT pushbutton is pressed whilst the count-down is in progress, the controller will exit test mode and will revert back to the normal conductivity/TDS & Setpoint display.

4.FACTORY SETTINGS / PROGRAMMABLE OPTIONS

Item	Factory Setting	Option	Note
Setpoint	1000 μS	50 – 9,999 μS / TDS (in 1 μS / TDS increments)	Determine the desired system μS / TDS
Units	μS	TDS or μS	TDS = μS * 0.67
Operation	Bleed	Bleed / Dosing	**Bleed:** Output activates when μS / TDS > Setpoint **Dosing:** Output activates when 1 μS / TDS < Setpoint

5. SPECIFICATIONS

Power Supply:	220 – 240 VAC
Inputs:	Conductivity Probe – model SP-DCON-P10AT
	Flow Switch: Volt-free contact
Outputs:	240VAC applied to the Bleed Output – 5 Amp rated. Potential Free contact supplied on request
Resolution of measured conductivity:	1 μS / TDS
Hysteresis:	3 % hysteresis fixed
Controller Enclosure rating:	IP55 (ie. completely weatherproof)
Operating Temperature:	0 - 50°C