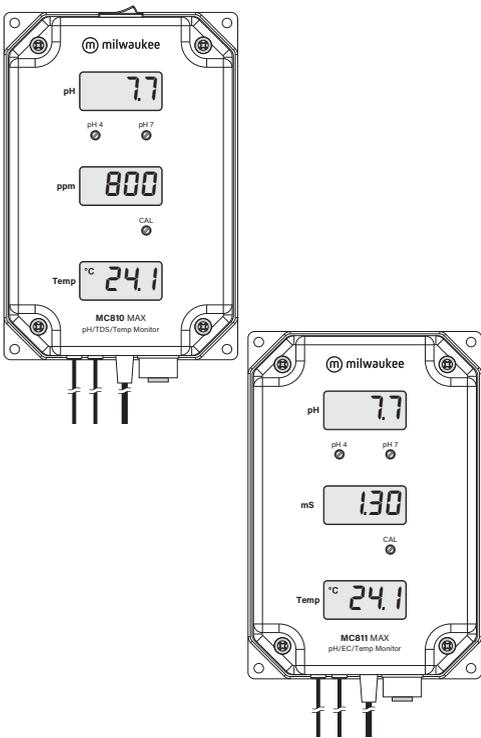


USER MANUAL

MC810 MAX pH/TDS/Temperature MC811 MAX pH/EC/Temperature Monitors



milwaukeeinstruments.com (USA & CAN)
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CERTIFICATION

Milwaukee instruments conform to the **CE European Directives.**



Disposal of Electrical and Electronic Equipment. The product should not be treated as household waste. Instead, hand it over to the appropriate collection point for the recycling of electrical and electronic equipment, which will conserve natural resources.

Please note: proper product disposal prevents potential negative consequences for the environment and human health. For more information, contact your city, your local household waste disposal service, or the place of purchase.

RECOMMENDATIONS FOR USERS

Before using this product, make sure it is entirely suitable for your specific application and for the environment in which it is used. Any variation introduced by the user to the supplied equipment may degrade the instrument's performance. For your and the instrument's safety do not use or store it in hazardous environments.

WARRANTY

These instruments are warranted against defects in materials and manufacturing for a period of 2 years from the date of purchase. Electrodes and probes are warranted for 6 months. This warranty is limited to repair or free of charge replacement if the instrument cannot be repaired. Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered by warranty. If service is required, contact your local Milwaukee Instruments Technical Service. If the repair is not covered by the warranty, you will be notified of the charges incurred. When shipping any product, make sure it is properly packaged for complete protection.

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Milwaukee Instruments reserves the right to make improvements in design, construction and appearance of its products without advance notice.



CARE & MAINTENANCE

pH Probe

- Inspect the BNC connector for corrosion. Replace the probe if necessary.
- Inspect the electrode for scratches or cracks. If any present, replace the probe.
- Remove the protective cap. If the bulb or junction are dry, soak in **MA9015** Electrode storage solution overnight. If any salt deposits are present, rinse the probe with water.
- To ensure a quick response, the glass bulb and the junction should not be allowed to dry. Store the electrode with a few drops of **MA9015** storage solution (or **MA9004**, pH 4.01 buffer solution) in the protective cap.
- Clean the electrode (at least once a week) by soaking it for 30 minutes in **MA9016** Electrode cleaning solution (or **M10016**).
- After cleaning, rinse with tap water, then soak the electrode in **MA9015** storage solution for one hour before calibration.
- Never use distilled or deionized water to store pH electrodes.

TDS & EC Probes

Clean the sensor (at least once a month) by soaking it for 30 minutes in **MA9016** Electrode cleaning solution (or **M10016**). For a more thorough cleaning:

- Clean the pins with fine sandpaper to loosen any debris.
- Flush with tap water after cleaning.

After every series of measurements, rinse with tap water.

ACCESSORIES

MA911B/2	Double junction, plastic body pH electrode with 2 m (6.6') cable and BNC connector
MA9004	pH 4.01 buffer solution (230 mL)
MA9007	pH 7.01 buffer solution (230 mL)
MA9010	pH 10.01 buffer solution (230 mL)
MA9015	Electrode storage solution (230 mL)
MA9016	Electrode cleaning solution (230 mL)
MA9061	1413 µS/cm calibration solution (230 mL)
MA9062	1382 ppm TDS calibration solution (230 mL)
M10004B	pH 4.01 buffer solution (20 mL sachet, 25 pcs.)
M10007B	pH 7.01 buffer solution (20 mL sachet, 25 pcs.)
M10010B	pH 10.01 buffer solution (20 mL sachet, 25 pcs.)
M10031B	1413 µS/cm calibration solution (20 mL sachet, 25 pcs.)
M10032B	1382 ppm TDS calibration solution (20 mL sachet, 25 pcs.)
M10442B	1500 ppm TDS calibration solution (20 mL sachet, 25 pcs.)
M10016B	Electrode cleaning solution (20 mL sachet, 25 pcs.)
MA9310	12 Vdc adapter, 220 V
MA9311	12 Vdc adapter, 110 V

TDS CALIBRATION (MC810 with MA811 probe)

Preparation

Always use fresh calibration solutions and perform electrode maintenance prior to calibration.

Calibration can be performed using one of the standard solutions: 1382 ppm for TDS factor 0.5 or 1500 ppm for TDS factor 0.7.

If possible, use plastic beakers to minimize any EMC interferences. For accurate calibration and to minimize cross-contamination, use two clean beakers, one for rinsing the probes and one for calibration.

Pour sufficient calibration solution to cover the sensing portion of the probes (4 cm / 1 1/2").

Procedure

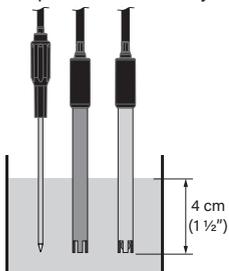
- Immerse the probes in the rinse beaker. Raise and lower several times to ensure the entire cell area is filled with solution. Discard this solution.
- Pour calibration solution into the calibration beaker.
- Dislodge any bubbles off the two electrodes (prongs).
- Center the probes in beaker away from beaker walls.
- Wait a few minutes for the measurement to stabilize.
- Use the calibration screwdriver to adjust the ppm trimmer until the reading shows "1380" ppm (with factor 0.5) or "1500" ppm (with factor 0.7).

EC CALIBRATION (MC811 with MA812 probe)

Follow the TDS calibration procedure steps and use 1413 µS/cm (**M10031**) calibration solution. When the mS readout shows "1.41", calibration is complete.

MEASUREMENTS

- Remove the pH electrode protective cap.
- Immerse the tips of the probes at least 4 cm (1 1/2") into the sample. Center the probes in beaker away from beaker walls.



- The three readouts will display all parameters values simultaneously.

Note: Initial variation in readings may be due to the pH electrode conditioning and to the temperature compensation of TDS/EC measurements. Allow readings to stabilize!

PRELIMINARY EXAMINATION

Thank you for choosing Milwaukee Instruments!
This user manual will provide you the necessary information for correct use of the instrument.

Each **MC810** MAX or **MC811** MAX monitor is supplied with:

- **MA911B/2** pH electrode
- **MA811** fixed TDS probe (**MC810**)
- **MA812** fixed EC probe (**MC811**)
- Fixed temperature probe
- **M10004** pH 4.01 buffer solution (sachet)
- **M10007** pH 7.01 buffer solution (sachet)
- **M10032** 1382 ppm calibration solution (sachet) (**MC810**)
- **M10442** 1500 ppm calibration solution (sachet) (**MC810**)
- **M10031** 1413 $\mu\text{S}/\text{cm}$ calibration solution (sachet) (**MC811**)
- **M10016** Electrode cleaning solution (sachet, 2 pcs.)
- Calibration screwdriver
- 12 Vdc power adapter
- Instrument quality certificate
- Instruction manual

Note: Save all packing material until you are sure that the instrument works correctly. Any damaged or defective item must be returned in its original packing material with the supplied accessories.

GENERAL DESCRIPTION

The **MC810** and **MC811** monitors provide measurement and 24 hour continuous tracking of pH, conductivity — TDS with **MC810** and EC with **MC811** — and temperature.

Quick to setup and simple to use, these monitors can be calibrated at one or two points for pH, and at one point for TDS (**MC810**) or EC (**MC811**).

Results are monitored with 3 large LCD readouts, for simultaneous display of all three main parameters, and the temperature range is factory calibrated.

The unit can be mounted above the sample to be tested or rested on a flat surface next to the sample, and the 2 m (6.6') probes cable length allows for a correct positioning and adequate viewing.

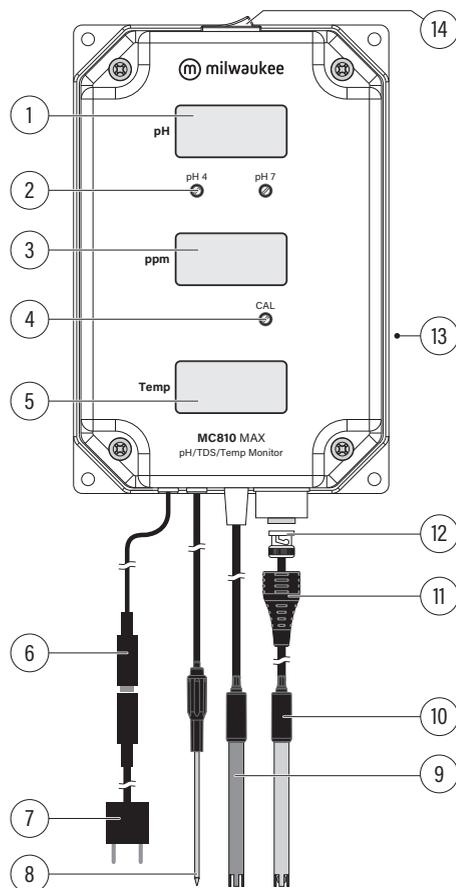
An **external switch** atop the **MC810** converts EC conductivity to TDS (ppm) using a fixed 0.5 or 0.7 conversion factor.

The **MA911B/2** is a double junction, gel-filled pH electrode, supplied with 2 meter (6.6') cable with a BNC connector, water protected by a rubber sleeve.

The **MA811** and **MA812** probes are easy to clean and require very little maintenance.

The fixed temperature probe is a rugged, easy to clean, stainless steel probe that allows for temperature compensated measurements.

FUNCTIONAL DESCRIPTION & LCD DISPLAY



1. pH readings
2. pH calibration trimmer
3. TDS (**MC810**) or EC (**MC811**) readings
4. TDS (**MC810**) or EC (**MC811**) calibration trimmer
5. Temperature readings
6. Power supply connector
7. 12 Vdc power adapter
8. Fixed temperature probe
9. **MA811**, fixed TDS probe (**MC810**)
MA812, fixed EC probe (**MC811**)
10. **MA911B/2** pH electrode
11. Protective sleeve for BNC connector
12. BNC connector (pH electrode)
13. Temperature unit selection (back of the monitor)
14. EC to TDS conversion switch (**MC810**)

SPECIFICATIONS

pH	
Range	0.0 to 12.0 pH
Resolution	0.1 pH
Accuracy	± 0.2 pH
Calibration	Manual, 2-point (trimmer)
Probe	MA911B/2

TDS (MC810)	
TDS Factor	0.5 or 0.7
Range	0 to 1990 ppm
Resolution	10 ppm
Accuracy	$\pm 2\%$ full scale
Calibration	Manual, 1-point (trimmer)
Probe*	MA811 (fixed)

EC (MC811)	
Range	0.00 to 5.00 mS/cm
Resolution	0.01 mS/cm
Accuracy	$\pm 2\%$ full scale
Calibration	Manual, 1-point (trimmer)
Probe*	MA812 (fixed)

Temperature	
Range	-10.0 to 60.0 °C (14.0 to 140.0 °F)
Resolution	0.1 °C / 0.1 °F
Accuracy	± 0.3 °C / ± 0.5 °F
Calibration	Factory calibrated
Compensation	Automatic, 5 to 50 °C (41 to 122 °F), TDS / EC readings only
Probe*	Stainless steel (fixed)

Power Supply 12 Vdc power adapter (included)

Dimensions 160 x 110 x 35 mm (6.3 x 4.3 x 1.4")

Weight 560 g (1.2 lb.)

* To be replaced by authorized technical personnel only.

GENERAL OPERATIONS

TURNING THE MONITOR ON

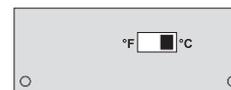
With the monitor installed in position, plug the power supply connector into the 12 Vdc power adapter (supplied), and connect it to the mains.

SELECTING TEMPERATURE UNIT

Option: Celsius (default), Fahrenheit

Temperature unit selection is done through an external switch, located at the back. To change the unit:

1. Remove the label and set the switch to the desired position.
2. Replace the label for better protection against humidity.



TDS FACTOR (MC810)

TDS factor is a conversion factor that is used to change an EC measurement to a ppm measurement.

MC810 is equipped with a switch, located on top of the instrument, that allows users to select between 0.5 (default option) and 0.7 conversion factor.

Press the switch to select option.



pH ELECTRODE CONNECTION

To protect against humidity, the pH probe's BNC connector is protected with a rubber sleeve.

1. Slide down the sleeve.
2. Connect the pH electrode to the BNC socket and slide the rubber sleeve over the connector. Ensure the connector is completely covered.



pH CALIBRATION

Preparation

Always use fresh calibration buffers and perform electrode maintenance prior to calibration (see CARE & MAINTENANCE section).

Pour the buffer solution into clean beakers. If possible, use plastic beakers to minimize any EMC interferences. For accurate calibration and to minimize cross-contamination, use two beakers, one for rinsing and one for calibration.

One- or two-point calibration can be performed using one of the three standard buffer solutions: 4.01, 7.01, or 10.01 pH.

Procedure

1. Remove the pH electrode protective cap.
2. Immerse the pH electrode (together with the EC or TDS electrode, working as matching pin) in the pH 7.01 rinse buffer solution. Raise and lower the electrodes several times. Discard this solution.
3. Slowly place the pH electrode (together with the EC or TDS working as matching pin) 4 cm (1 1/2") in 7.01 pH calibration buffer solution. Dislodge any bubbles that may adhere to the electrodes.
4. Wait a few minutes for the measurement to stabilize.
5. Use the calibration screwdriver to adjust the pH 7 trimmer until the pH reading shows "7.0".
6. Repeat step 2 using the second rinse buffer solution i.e. 4.01 or 10.01 pH.
7. Repeat step 3 using the second calibration solution i.e. 4.01 or 10.01 pH.
8. Wait a few minutes for the measurement to stabilize.
9. Use the calibration screwdriver to adjust the pH 4 trimmer until the pH reading shows "4.0" or "10.0".