Ralston Instruments LC20 Digital Pressure or Temperature Gauges Instruction Manual

Contents

Ralston Instruments

Ralston Instruments LC20 Digital Pressure or Temperature Gauges

Specifications

- **Product:** Ralston LC20 Digital Pressure or Temperature Gauges
- **Model:** All models of Ralston LC20
- **Bluetooth:** Only for Bluetooth-enabled LC20s with model numbers ending in B1
- **Accessories:** Available at ralstoninst.com/LC20-accessories
- **Power Source:** AC/DC power adapter model D-000410
- **Batteries:** Non-rechargeable, batteries not recharged via USB

Product Usage Instructions

Important Safety Notices

- Do not operate in hazardous locations.
- Read and fully understand the instructions and hazards of the product before use.
- Use eye protection while using this device.
- Avoid overpressuring the LC20 to prevent damage.
- Follow installation instructions and local regulations for safe operation.

Features Overview

- Front features include Power, LCD, navigation arrows, Bluetooth antenna port, Micro USB port, pressure sensor option, and pressure equalizing vent.
- Back features include a battery access door, warning label, Bluetooth antenna, external temperature probe (for models with TX), and temperature sensor option (for models with TA).

Power Management

- Use FieldLab Desktop software to configure display and power management for maximizing battery life in the field.

Graphic Pressure or Temperature Meter

- Visualize pressure or temperature graphically on the LCD display.

High / Low Readings

- Track continuous Maximum and Minimum pressure or temperature readings over time.

Engineering Units

- Change between 18 standard pressure engineering units or 4 standard temperature units on the fly. Customize units with FieldLab Desktop.

Live Readings on PC

- View real-time pressure and/or temperature readings on your PC via USB or wireless connection using FieldLab Desktop.

FAQ

Q: Can I use rechargeable batteries with the LC20?

A: No, the LC20 requires non-rechargeable batteries.
Rechargeable batteries should not be used.

Q: How can I create custom engineering units?

A: Custom engineering units can be created using the FieldLab Desktop software and added to the LC20 gauge as needed.

Q: What should I do if I encounter a warning message on the display?

A: If a warning message appears on the display, refer to the user manual for guidance on how to address the specific issue.

Included Items

- Items included in the package. If any items are missing, please contact your Ralston Instruments distributor.
- LC20 Pressure or Temperature gauge
- 2 x AA batteries
- 2-meter USB Micro-B cord
- Bluetooth antenna*

- **Note:** Only for Bluetooth-enabled LC20s with model numbers ending in “B1

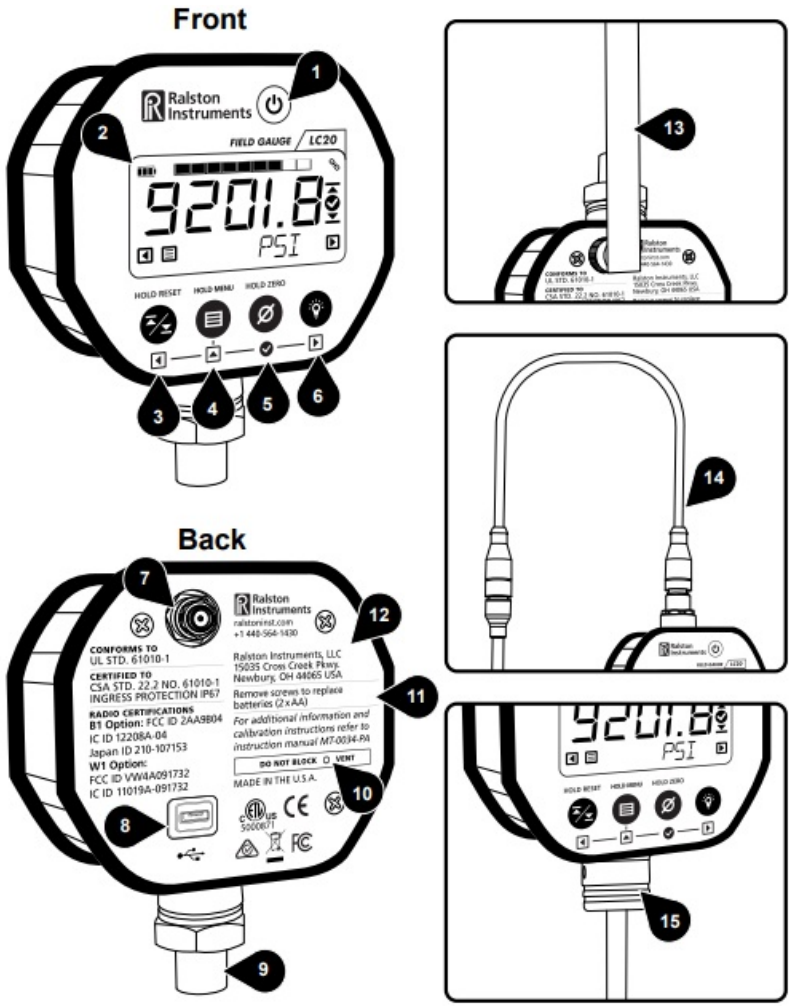
Need Accessories?

- Accessories can be found at ralstoninst.com/LC20-accessories

Important Safety Notices

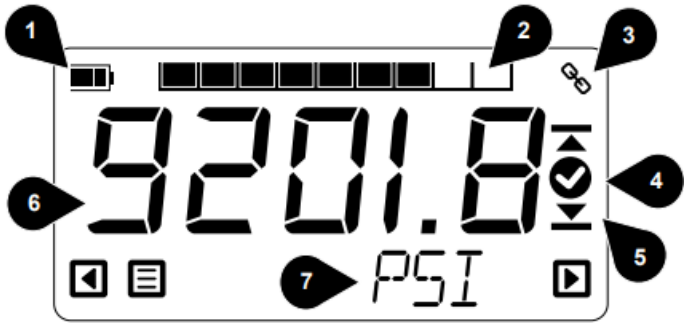
- **WARNING:** Do not operate in hazardous locations.
- **WARNING:** Do not use LC20 until you have read and fully understand the instructions and hazards of the product.
- **WARNING:** Contents may be under high pressure or temperature.
- **WARNING:** Any modifications to this product with custom parts can result in hazardous operation of the product.
- **WARNING:** Use eye protection while using this device.
- **WARNING:** Do not overpressure LC20 or damage may result.
- **WARNING:** This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer, and is known to the State of California to cause birth defects or other reproductive harm.
    - For more information go to **www.P65Warnings.ca.gov.**
- **CAUTION:** Installation of LC20 must be under Ralston Instruments installation instructions.
- **CAUTION:** Installation of LC20 must be under applicable local, national, and international standards and electrical codes.
- **CAUTION:** Batteries are not rechargeable and will not be recharged via USB.
- **CAUTION:** Use only approved AC/DC power adapter model D-000410.
- **CAUTION:** Protection impairment may occur if used in a manner not specified by Ralston Instruments.
- **CAUTION:** Only those personnel trained in the use of this device shall operate it.

LC20 Features Overview



1. Power
2. LCD display
3. Left arrow / High/Low/Reset
4. Up Arrow / Menu
5. Accept / Zero
6. Right Arrow / Backlight
7. Bluetooth antenna port*
8. Micro USB port
9. Pressure sensor option
10. Pressure equalizing vent
11. Battery access door
12. Warning label
13. Bluetooth antenna*
14. External temperature probe (LC20 models that contain the letters “TX” in the model number.)
15. Temperature sensor option (LC20 models that contain the letters “TA” in the model number.)
    - Only for Bluetooth-enabled LC20s with model numbers ending in “B1”

LCD display



1. Battery indicator
2. Graphical pressure/temperature meter
3. Connection symbol (USB or wireless)
4. Check mark to indicate success
5. High and low arrows
6. Main pressure/temperature display
7. Secondary display

Power Management

- Configure display and power management to maximize battery life in the field using FieldLab Desktop software.

Graphic Pressure or Temperature Meter

- See pressure or temperature graphically.

High / Low Readings

- See continuous Maximum and Minimum pressure or temperature readings over some time.

Easily Change Engineering Units

- Change to any of the 18 standard pressure engineering units or 4 standard temperature units on the fly. Manage frequently used units or remove unused units with FieldLab Desktop.

Custom Engineering Units

- Create custom engineering units using FieldLab Desktop and add them to any LC20 gauge.

View Live Readings on Your PC

- View real-time pressure and/or temperature readings on your PC from your LC20 gauge using FieldLab Desktop via USB or wireless.

Log Data on Your PC

- Log pressure and/or temperature data on your PC from your LC20 gauge using FieldLab Desktop via USB or wireless.

Use Your LC20 with a PC

Ralston FieldLab Desktop software enables you to:

- Log data directly to your PC from one or multiple LC20s.
- Export data sets in .csv format.
- Export well-presented data sets in PDF format with graphs.
- Update LC20 firmware to access new features as they are released.
- Calibrate your LC20.
- Create custom engineering units.
- Customize settings on your gauge.

1. **Download & Install FieldLab Desktop**
    - Visit **RalstonFieldLab.com** to download and install FieldLab Desktop on your Windows PC.
2. **Open & Follow onscreen instructions in FieldLab Desktop software**
3. **You're ready to begin!**
    - Find detailed support articles for changing settings, viewing live readings, and logging data at **support.ralstoninst.com**

Update the LC20 and FieldLab Desktop

Update the FieldLab Desktop Software

Open FieldLab Desktop on your computer, select "FieldLab Desktop" from the text menu at the top, and select "Check for Updates" from the menu.

Updating your LC20

1. Open FieldLab Desktop on the computer you use to manage your LC20.
2. Connect the LC20 to your computer with a micro USB cable.
3. Select the LC20 from the Devices screen in FieldLab Desktop. Any available updates will be displayed.

Use Your Mobile Device with Your LC20

Note: Only for Bluetooth-enabled LC20s with model numbers ending in "B1".

Install FieldLab Mobile App

- Scan the QR code with your mobile device to install the FieldLab Mobile app.
- If you have an Apple iPad or iPhone, download it from the Apple App Store.

- If you have an Android phone or tablet, download it from the Google Play Store.

Establish Bluetooth Connection to LC20

1. Connect the Bluetooth antenna to the LC20.
2. With the LC20 powered on, open the FieldLab Mobile app on your mobile device. If prompted, allow Bluetooth and Location services.
3. Tap the [Scan] button to find your LC20.
4. When your LC20 appears on the screen in the mobile app, select [Connect].

- You can connect multiple LC20 gauges to the FieldLab Mobile app.

Set Logging Interval and Measurement Units

- Before you start logging, set your desired logging interval and measurement units in the mobile app.

Start and Stop Logging on LC20

Start Logging

- While the LC20 is connected to FieldLab Mobile, select [Start Logging] in the FieldLab Mobile app.
- What Happens When You Leave Bluetooth Range While Logging Once you start logging, data is saved locally to the LC20.
- You can monitor live readings from your mobile device in the FieldLab Mobile app while connected and within Bluetooth range, which is 100 meters max.
- If your mobile device leaves Bluetooth range, it will lose its connection with the LC20, and FieldLab Mobile will be unable to display live readings.
- Regardless, the LC20 will continue to log data for as long as it has battery/USB power or until the LC20 memory is full.

Stop Logging

- Select [Stop Logging] in the FieldLab Mobile app.
- Once you stop logging, the FieldLab Mobile app will automatically import the data set from the LC20 and save it to the Data Sets section of FieldLab Mobile.

View Data Sets

- Select the [Data Sets] button in the FieldLab Mobile app.

Export and Share Data Sets

1. Select the [Data Sets] button in the FieldLab Mobile app.
2. Select the data set you want to share.
3. Select the [Share] button.

Operation Instructions

Conditions of Use

- **Environment:** Indoor use or temporary outdoor use. For long-term or permanent outdoor use, a suitable enclosure may be required.
- **IP67 Rating:** LC gauges with external thermal probes must have the thermal probe cable installed in M12 connector on gauge to maintain IP67 rating. Note: Only for models with detachable thermal probes that include the letters “TX” in the model number.
- LC gauge requires (2) AA Batteries, power from a PC via USB or power from AC power adapter D-000410 via USB to operate.
- **RF Exposure Statement:** The LC20 device when used with approved antenna complies with the FCC and IC portable RF Exposure limits set forth for an uncontrolled environment and is safe for intended operation as described in the user manual. To comply with RF exposure limits established in the ANSI C95.1 standard, the distance between the antenna and the user should not be less than 25 cm (10 inches) for USA and 34 cm for Canada.
- Further RF exposure reduction can be achieved if the product can be kept as far as possible from the user’s body.

Installation Instructions

- Ensure that the gauge is oriented in such a way that the “Power” button is always easily accessible.
- If a pressure sensor option is installed, then seal pressure connection with thread sealant prior to assembling it in any pressure system.
- If temperature sensor option is installed, then connect thermal probe using a rated thermal well or other approved device.
- Place gauge in area that is protected from damage from weather, excessive temperature, impact or humidity.

Connecting to Accessories or Other Equipment

Connect to a PC via USB cable

- Use only approved USB cable P/N D-000040

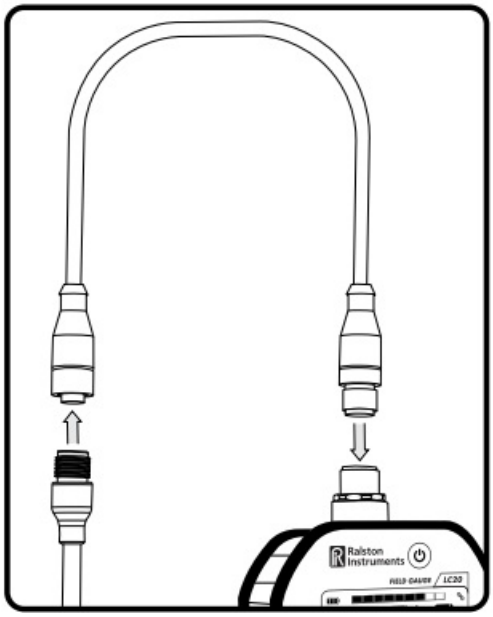
Connect to AC Mains

- Use only approved power adapter P/N D-000410 and approved USB cable P/N D-000040

Connect to External Thermal Probe

- **Note:** Only for models with detachable thermal probes that include the letters “TX” in the model number.

- **Note:** Only for models with detachable thermal probes with the letters “TX” in the model number.



- Connect the thermal probe cable to the gauge using the male end of the thermal probe cable.
- Connect the thermal probe to cable using female end of thermal probe cable.
- If the cable is being installed permanently, then secure cable following all applicable electrical standards.
- Use only approved thermal probe P/N D- 000403 that has been calibrated with this device.
- Use only approved thermal probe cable P/N D-0000404.
- External thermal probe is calibrated with the base unit. If thermal probe is changed, then use FieldLab Desktop to update the serial number and calibration coefficients of the new thermal probe.

Connection of Antenna

- **Note:** Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.

- **Note:** Only for Bluetooth-enabled LC20s with model numbers ending in “B1”. Use only approved antenna P/N D-000041.
- Use only approved antennae.
- Thread approved antenna into gauge Bluetooth port.
- Align antenna vertically for best signal reception.
- Do not obstruct line of sight between antenna and receiver with metal or dense materials or a reduction or loss

of signal may result.

Instructions for Cleaning or Decontamination

- Clean the enclosure with a mild water-based cleaner. Do not use aggressive solvents.
- A flush pressure sensor or thermal probe with alcohol based cleaner (or another cleaner compatible with 316 Stainless steel) if toxic or other hazardous substance is used.

Button Functions

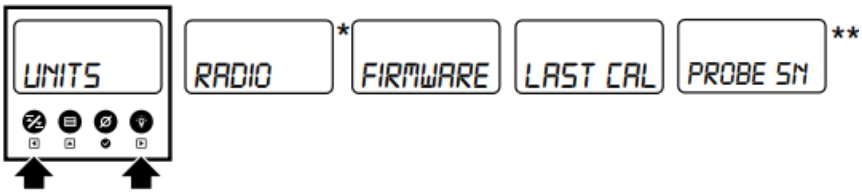
Power	• Press and hold to turn on. • When LC20 is on, press and hold to turn off. **Note:** The LC20 will power off automatically after 10 minutes of no use unless it is logging data. If it is logging data, it will never power off automatically. You can adjust Auto Power Off settings in FieldLab Desktop software.
Hi/Low/ Reset	• Press button once to display highest pressure or temperature reached. • Press button again to display lowest pressure or temperature reached. • Press and hold button to clear high and low values. • Hi/Low/Reset applies to the Active Sensor. If there are 2 sensors, then change sensors to use Hi/Low/ Reset for the other sensor.
Menu	• If 2 sensors, quick press to change sensors. • Long press initiates MENU and follow prompts.
Zero Pressure	• With no pressure applied, press and hold button to zero reading.
Backlight	• Press button to illuminate backlight. **Note:** Light will turn off after a set time. Both time and brightness can be adjusted in FieldLab Desktop software.

Menu Functions

Menu

1. Push and hold the Menu/up-arrow button until MENU appears.

2. Push the Right and Left Arrow buttons to scroll through the menu items.
    - **Note:** Only for Bluetooth-enabled LC20s with model numbers ending in “B1”
    - **Note:** Only for models with detachable thermal probes that include the letters “TX” in the model number.



Change Units

1. Push and hold the Menu/up-arrow button until MENU appears.

2. Scroll to UNITS

3. Push the Zero/checkmark button to enter the UNITS submenu.

4. Scroll to your desired measurement unit.

5. Press the Zero/check-mark button to change to the displayed engineering unit.

Turn Off/On Bluetooth Radio

- **Note:** Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.
- **Note:** Bluetooth radio is always on by default when you power on the LC20.

1. Push and hold the Menu/up-arrow button until MENU appears.

2. Scroll to RADIO

3. Push the Zero/check-mark button to enter the Radio submenu.

4. Push the Zero/check-mark button to toggle the radio power.

View Firmware Version

1. Push and hold the Menu/up-arrow button until “MENU” appears.

2. Scroll to FIRMWARE.

3. Press the Zero/check-mark button to view firmware version.

View Last Calibration Date

1. Push and hold the Menu/up-arrow button until MENU appears.

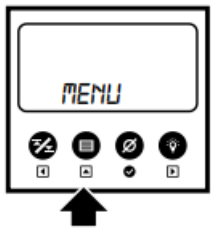
2. Scroll to LAST CAL.

3. Press the Zero/checkmark button to view the last calibration date.

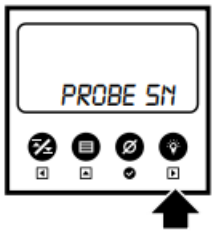
View Temperature Probe Serial Number

Note: Only for models with detachable thermal probes that include the letters “TX” in the model number.

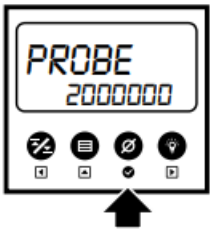
1. Press and hold the Menu/up-arrow button until MENU appears.



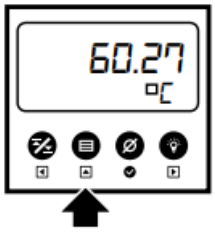
2. Scroll to PROBE SN.



3. Press the Zero/checkmark button to enter the Probe submenu and view the serial number.



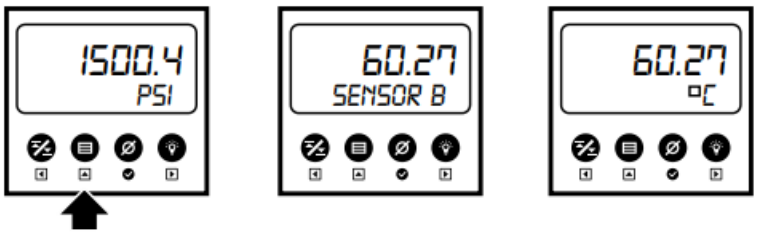
4. Press the Menu/up-arrow button to exit.



Change the Sensor Displayed on the Screen

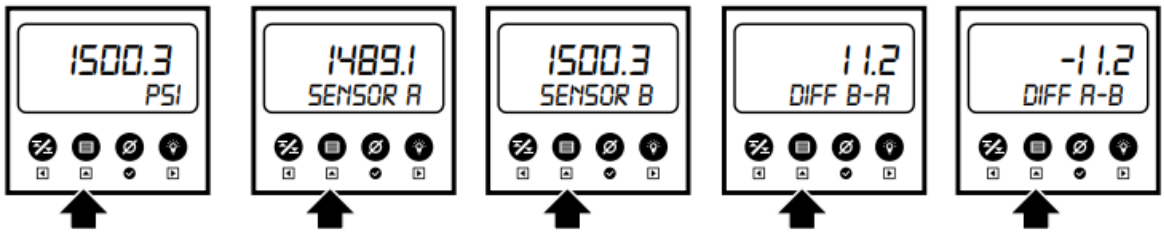
Note: Only for LC20s with two sensors.

- Press the Menu/up-arrow button to change the sensor shown on the LC20 screen.



View Differential Pressure

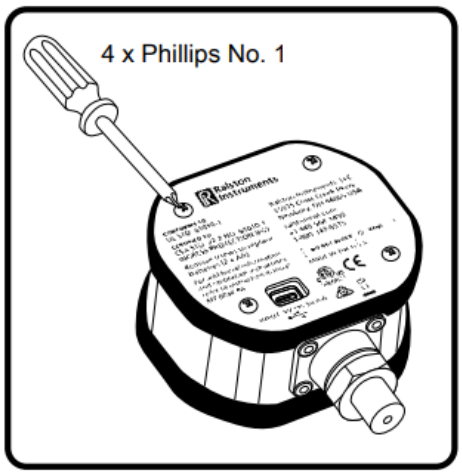
- **Note:** Only for LC20s with two pressure sensors that have the same max pressure.



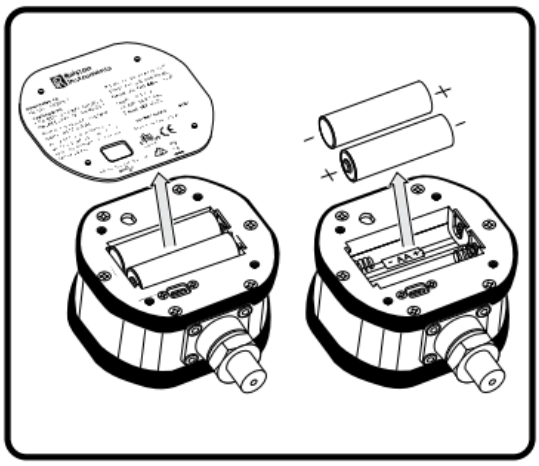
- Press the Menu/up-arrow button.
- Each time you press the Menu/up-arrow button, you will advance to the next view.

Battery Installation

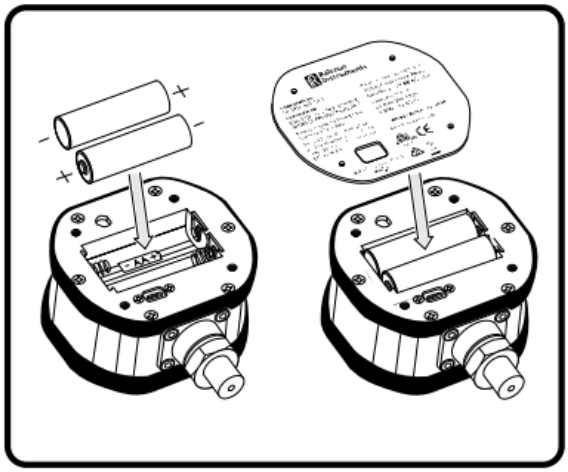
1



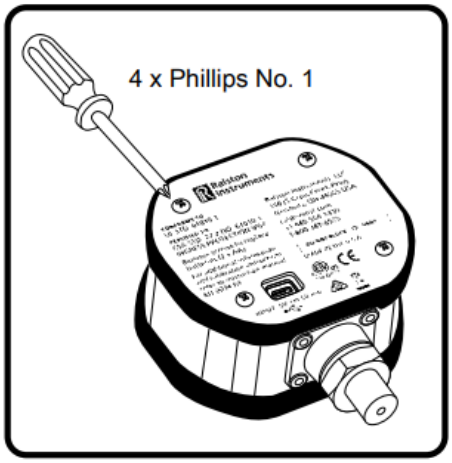
2



3



4



Recommended Alkaline AA Batteries (2X) (ANS| 15A, IEG LR6)

- **Duracell** MN1500
- **Energizer** EN91
- **Energizer** E91
- **Rayovac** Max Plus 815

Calibration

- Download the FieldLab Desktop software at [RalstonFieldLab.com]
- Follow instructions in software on how to calibrate pressure or temperature

Specifications

Antenna (for LC20 model numbers ending in “B1”)	D-000041 antenna
Batteries	2 x AA (LR6)
Battery Life	1,500 hours typical
Digital Interface	USB Micro-B (on back)
Dimensions (not including temp. probe)	3.5 x 4.1 x 2.2 in (8.9 x 10.4 x 5.6 cm)
Display	5 x 0.5 in (12.7 mm) upper digits 8 x 0.2 in (5 mm) lower digits
Electrical Rating	USB Mode - 5 VDC, 0.25W Battery Mode - 3 VDC, 0.25W Power Adapter - 90 ~ 264 VAC Input, 5 VDC @ 1 Amp Output
Environment	Indoor use Temporary outdoor use
Ingress Protection	IP67 (1 meter submersion for 30 minutes)
Materials of Construction	Polycarbonate, Aluminum, 316L Stainless Steel
Media Compatibility	Gases and liquids compatible with 316L S.S.
Operating Altitude (max)	10,000 ft (3050 m)
Operating Temperature Range (Enclosure)	-4 to 122°F (-10 to 50°C)
Power	2 x AA batteries, D-000040 power adapter (optional)

Protection Class	Pollution Degree 2
Relative Humidity	90% RH 14 to 95°F (-10 to 35°C) 75% RH 95 to 104°F (35 to 40°C) 45% RH 104 to 122°F (40 to 50°C)
Storage Temperature Range	-40 to 167°F (-40 to 75°C)
USB Cable	USB Micro, 2 meter, shielded
Weight	12 oz (340 g)

Pressure Specifications
(for all models with pressure connection, if included)

Pressure Accuracy	+/-0.1% of full scale (ASME Grade 4A / ISO Class 0,1)
Pressure Connection	¼" Male NPT

Temperature Specifications
(for all models with thermal probe, if included)

External Temperature Probe	M12 female, A Code, Silicone seal, IP67
External Thermal Probe Temperature Range	-22 to 302°F (-30 to 150°C)
Internal Temperature Probe	Permanently mounted - dimensions vary with model, IP67
Temperature Accuracy	+/-(0.27 + 0.004*|t|) °F +/- (0.15 + 0.002*|t|) °C

Bluetooth Radio Specifications

- **Note:** Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.
- Contains FCC ID 2AA9B04
- Contains IC ID 12208A-04
- Contains Japan ID 210-107153

Bluetooth Radio Information

Note: Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.

FCC Declaration of Conformity

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,
2. this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Declaration of Conformity

This device complies with Industry Canada's license-exempt RSS standards. Operation is subject to the following two conditions:

1. this device may not cause harmful interference
2. this device must accept any interference received, including interference that may cause undesired operation of the device.

KCC Notice of EMC Compliance (Republic of Korea Only)

- It is verified that this equipment has been registered under the Radio Waves Act (Article 58-2, Clause 3)
- Registration Number R-R-1Ra-LC20-XX-YY-ZZ

Standards and Agency Approvals

- This product complies with the following standards. Refer to EC Declaration of Conformity for specific details
- CAN/CSA-C22.2 No 61010-1-12: 3rd Edition
- UL 61010-1: 3rd Edition
- EN/IEC 61010-1:2010
- AS 61010-1, 3rd Edition
- IEC 61326-1:2012 2nd Edition
- Pressure Equipment Directive (PED) 2014/68/EU
- Electromagnetic Compatibility Directive (EMC) 2014/30/EU

Electromagnetic Specifications

- **Conducted RF** IEC 61000-4-6, performance criterion B
- **DC Power Burst** IEC 61000-4-4, performance criterion B
- **DC Power Surge** IEC 61000-4-5, performance criterion B
- **Electro-static Discharge** Immunity IEC 61000-4-2:2008, performance criterion B
- **Radiated Emissions** CISPR 11:2009, Group 1, Class B
- **Radiated, Radio-Frequency Electromagnetic Immunity** IEC 61000-4-3:2006, performance criterion A
- **RF Field Effects on Measurement Accuracy** Accuracy of Pressure and Temperature is not specified for RF fields > 3V/m

Support

Online Support

- For step-by-step instructions about how to use LC20, install accessories, and troubleshooting, go to: **support.ralstoninst.com**

Customer Service

- **Contact Customer service directly**
- **Hours: Monday–Friday 8:30 am-5:00 pm EST**
- **Phone: +1 440-564-1430 | +1 800-347-6575 (US and Canada)**
- **Email: support@ralstoninst.com**
- **For all models of Ralston LC20 Digital Pressure or Temperature Gauges**
- **Hours: 8:30 am – 5:00 pm EST**
- **Phone: 1 440-564-1430**
- **Toll-Free: 1 800-347-6575 (US and Canada)**
- **Support, Parts, and Service: support.ralstoninst.com**
- **Email: support@ralstoninst.com**
- **Ralston Instruments Pressure Calibration Specialists**
- **ralstoninst.com**

Documents / Resources

	Ralston Instruments LC20 Digital Pressure or Temperature Gauges [pdf] Instruction Manual LC20 Digital Pressure or Temperature Gauges, LC20, Digital Pressure or Temperature Gauges, Pressure or Temperature Gauges, Temperature Gauges, Gauges

References

- Ralston FieldLab
- Pressure Calibration Specialist - Pressure Gauge Manufacturers
- support.ralstoninst.com
- P65Warnings.ca.gov
- User Manual

Manuals+, Privacy Policy

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.