

iManifold[®]

DRIVEN BY iCONNECT[®]

iManifold[®] Operation and Maintenance Instructions



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www.iManifold.com

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Product Description

The iManifold® hardware and application is designed for adding and removing refrigerant, performing physical measurement, measurement conditioning, measurement verification, data acquisition, data management, data sharing, and data reporting. The iManifold is also used to verify and quantify performance, service, install, troubleshoot, commission and retro-commission air conditioning, heat pumps and refrigeration systems by service technicians, maintenance personal, installers, verifiers, operators, and mechanics.

The iManifold requires a user-supplied smart device (smart phone or tablet) to operate the user interface via a free download of the iManifold App. The iManifold replaces typical mechanical analog gauges used for pressure measurement with high accuracy electronic pressure transducers. In addition, there is the enhancement of wired and wireless measurements of temperature, current, humidity, vacuum and weight. This provides additional diagnostic capability and increased technician productivity.

Utilizing native features of the smart device (GPS, Phone, Camera, Email etc.), data management and diagnostic capabilities are considerably extended giving a full-featured, rich user experience that significantly increases productivity and reduces call backs.

Warning

Information contained in the iManifold and the iManifold application is only for use by formally trained competent technicians practicing within the HVAC/R community. The manufacturers' installation, operation, and service information should always be consulted, and should be considered the first and best reference for installing, commissioning and servicing equipment. North Park Innovations, the author and publishe assume no liability for typographical errors or omissions of information in this guide



iManifold Safety

- Please read this documentation and become familiar with the operation of the iManifold prior to use. Pay close attention to safety instruction, warnings, and advice to prevent personal injury or damage to the product.
- Keep this document on hand so it may be referred to as needed.
- Transfer this document with the product if put into the possession of another user.



Personal Safety

- Always wear approved eye protection.
- Make sure all connections are tight and secure before operating.
- Do not exceed the pressure rating of the hoses—hoses may burst.
- Do not operate the iManifold if there is damage to the instrument or the refrigerant lines.
- Do not contact the iManifold or hoses with non-insulated electrical components.
- Do not expose the iManifold housing to solvents or other corrosive materials as they can damage the housing.
- Do not use the iManifold in ways it was not intended for use.
- Refrigerant mediums used with the iManifold may pose risk to the user from freezing, frostbite, suffocation, and fire explosion or static shock. Follow all safety precautions in this manual and in the MSDS for the refrigerant medium that you are using.
- If there is visual evidence of damage to the iManifold, or you suspect damage due to a drop or fall, do not use the iManifold. Damage may not be visible. If you suspect damage return the iManifold to Stride Tool for inspection and/or service.
- Refrigerant can generate static electricity as it flows through a refrigerant hose. Although there is integrated protection for the refrigerant manifold itself, devices attached to the iManifold should also be protected from static discharge. Prior to attaching a USB cable to the iManifold, make sure that the unit is discharged by connecting a bonding strap to the manifold and attaching to a known ground.



Working Safely with Flammable Refrigerants

You should take the same care when handling flammable or slightly flammable refrigerants as you do for the hydrocarbon refrigerants. The following points summarize the safe handling guidelines:



- Follow all refrigerant and equipment manufacturers safety instructions and suggestions
- Work in a well-ventilated area
- Eliminate sources of ignition within 3m (10ft) of the system and associated service equipment
- Use a suitable detector to warn of a build-up of flammable refrigerant in the air
- Have a fire extinguisher available
- Comply with state and local regulations covering liquefied petroleum gases.
- Store small containers in well-ventilated areas, away from heat or sources of ignition
- Prohibit smoking in areas of storage or use

Refrigerant Handling Caution

EPA-Approved Section 608 certification is legally required to service building air conditioning and refrigeration systems with CFC and HCFC refrigerants. This includes the connection of analog refrigerant pressure gauges or digital refrigeration system analyzers to any stationary AC or refrigeration system/appliance. Refrigerant gasses are thought to harm the atmosphere. Follow all federal and local regulations when handling refrigerants.



iManifold Ratings/Standards Compliance

- FCC
- C-Tick
- CE
- RoHS



Environmental Concerns

- At the end of the iManifold product useful life, send the product to a collection facility for electronic devices per local requirements. Optionally you can return the product to North Park Innovations for disposal.
- Dispose of old/spent batteries properly. Follow all local regulations.

Installing Batteries/External Power

The iManifold operates on 4.5 volts DC power supplied from 6 AA batteries (2 sets of three in series wired in parallel). There are two sets of battery holders. Pay special attention to the polarity of the batteries as they are not in a standard configuration. The iManifold will operate with three batteries in the left or right holder if for any reason 6 batteries are not available, but the total battery life will be reduced by half versus using 6 batteries.

The iManifold can be powered through a user supplied micro USB charger/power supply for extended use or as a backup power supply. The batteries cannot be charged in the unit through the external USB.

Connecting Hoses to the iManifold

The iManifold is used like any typical 4 valve manifold gauge set. All four valves are in the closed position for measuring suction (low side) and discharge (high side or liquid) pressures. The four valve manifold allows for increased productivity and speed when the manifold is used during the evacuation and charging process.

Smart Device/Tablet Requirements

Minimum Compatibility Requirements: Bluetooth equipped smart device, iPhone 4s and higher (iPad 3 or higher) / Android 4.1 or higher (Jelly Bean).

The iManifold Application

The iManifold Application is an evolving application designed to increase the productivity and efficiency of technicians. Please refer to the Quick Start Guide included to understand the basic features and operation of the iManifold. For detailed operation and demonstrations of current features, visit www.iManifold.com.

Download iManifold® App from the Apple App Store or Google Play



-or-



iManifold Application Display Symbols

- SLT: Suction Line Temperature
- LLT: Liquid Line Temperature
- DLT: Discharge Line Temperature
- ODA: Outdoor Air
- SADB Supply Air Dry Bulb
- SAWB: Supply Air Wet Bulb
- RADB: Return Air Dry Bulb
- RAWB: Return Air Wet Bulb
- RH: Relative Humidity
- DL: Discharge Line
- BT: Box Temperature (Refrigeration)

iManifold Buttons, LED Patterns, and Operation

1. Press Power Button to turn on, Press and hold Power Button for a half second to shut off.
 - a. All LEDs light up for 1 second at start up
 - b. Green LED lights, Status LED flashes quickly
 - c. Green LED remains lit, Status flashes heartbeat during operation
2. Connect to iManifold (follow quick start guide for pairing)
 - a. Bluetooth or Bluetooth LE flashes depending on the type of device connected.
3. Low Battery LED
 - a. Red LED Flashes slow at 10% REMAINING
 - b. Red Battery LED flashes fast for 3 seconds at 0% remaining
 - c. If the unit is powered on with 0% battery remaining, user will see red battery LED flash then unit shut down unless the battery is completely exhausted.
4. Wireless LED is not currently active.
5. Beeper
 - a. 3 rising notes at startup
 - b. 3 descending notes at shutdown
 - c. 2 rising notes on connect
 - d. 2 descending notes on disconnect
 - e. 1 note on Bluetooth button press

Servicing the iManifold

Valves and handles are user serviceable. Contact Stride Tool for replacement parts.

Firmware may be updated over-the-air through the iManifold application or by loading the newest version of firmware on the internal 8 gigabyte SD card located under the left battery compartment. After loading firmware on the SD card, the firmware will load onto the instrument at power up. Version 1.0.0.0 of the firmware requires a manual update of the firmware the first time to receive over-the-air firmware updates in the future. Press in on the SD card to eject it from the SD card holder.

Visit www.iManifold.com/videos for instructional videos.

Please DO NOT RETURN to vendor or wholesaler!

If in need of service:

- Call customer service for support at 1-888-467-8665
- Obtain an RMA if return is required
- Package securely and insure if desired, and return to

**North Park Innovations Group Inc.
P.O. Box 900, 6442 Route 242 East
Ellicottville, NY 14731 USA**

If you have any comments or suggestions, such as adding refrigerants or additional features, please email us at info@stridetool.com.

Maintaining the iManifold

Wipe the iManifold with a clean, soft towel and lukewarm water. Do not place in dishwasher or other cleaning device. Do not use detergents to clean housing. Do not subject meter to water at or above 122°F (50°C).

If the iManifold is going to be used in rain, to maintain the IP rating, use of the optional foam insert is required to keep moisture from entering at the probe connections and USB port. In order to maintain the IP rating, the iManifold must be hung in the vertical position.

Care must be taken when batteries are changed. Make sure the door is properly fastened and properly seated to avoid compromising the IP rating.

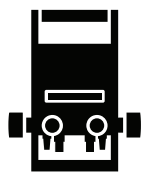
The iManifold is designed to withstand a 6 ft drop, but it may be damaged from a fall. Avoid dropping the iManifold. Damage to the manifold, manifold handles, housing or electronics may occur if the iManifold is dropped.

Currently Available Accessories

Part No.	Description
901-M	Thermistor Pipe Strap Surface Probe. Perfect tool to measure pipe surface temperatures. Quick and easy installation. Patented design. 8" elastic strap.
902-M	Thermistor Air Probe (0.5") with 4" cord
903-M	Thermistor Air Probe (0.5") with 12 ft. cord
904-M	3.5" General Purpose Thermistor Puncture Probe. Used to measure temperatures by insertion or immersion. 6 ft. cable (uncoiled).
905-M	Thermistor Pipe Clamp Surface Probe
908-M	Thermistor Extension Cable, 10 ft. Allows an operator to extend certain leads depending on use and location. Can be used with any thermistor units.
909-M	Thermistor Extension Cable, 50 ft. High quality extension cable will accurately send temperature readings to your display. Can be used with any thermistor probes.
TB-52	15-Pocket Professional Tool Bag

Product Specifications

Feature	Values
Measurement Types With optional probes	Pressure: psi, bar, kPa, Mpa, Feet of head Temperature: °F, °C, °K Rough Vacuum: inHg, inH2O, mbar, hPa, Pa, Torr Precision Vacuum: Micron, Pa, Toor Humidity: %Rh Wet bulb: °F/C Dewpoint: °F/C Enthalpy Btu/Lb., kJ/Kg Current: Amps Weight: Lbs., oz., Lbs. & oz., Kg, g,
Sensor types Future Wireless Accessories	Pressure: 2x pressure sensor, onboard barometric pressure Temperature: 4 x NTC thermistor Wireless RH/Temperature Air Wireless Dry bulb temp clamp/immersion/penetration Wireless Thermistor Vacuum Wireless Current Transformer (CT) Wireless Strain Gauge Scale
Measuring cycle	0.5 second user adjustable 0.5, 1, 2 seconds
Connections	Pressure connections 3 x 1/4" SAE + 1 x 3/8" SAE Vacuum port
Interfaces	Bluetooth, Bluetooth LE, ZigBee, Mini-USB
Wireless protocol	ZigBee
Measurement ranges	Pressure: -14.5 to 232 psig (Low Side) / -14.5 to 580 psig (High Side) Temperature: -40°F to 300°F Humidity: 0-100% non-condensing
Overload Pressure	LP/HP 580 psi /1450 psig (40 bar relative / 100 bar relative)
Burst Pressure	LP/HP 725 psig /1740 psig (50 bar relative / 120 bar relative)
Resolution	0.1 psi, 0.1°F/C/K
Accuracy (nominal temperature)	Temperature: +/- 0.3°F (0.2°C) or +/- 0.5% of reading, whichever is greater
Accuracy (pressure)	Pressure: <.5% FS accuracy at 77°F (25°C). This considers the components of total error band: Room Temp Errors: Zero Offset, Span Error, Non Linearity, Non Repeatability, Hysteresis, Temperature Related: Temperature Sensitivity of Offset (TSO), Temperature Coefficient of Span Output (TCS)
Number of Refrigerants	45+ (Additional can be added)
Selectable Refrigerants	R12, R22, R32, R123, R124, R134a, R236ea, R236fa, R245ca, R245fa, R290, R401A, R401B, R402A, R402B, R404A, R406A, R407A, R407C, R407F, R408A, R409A, R410A, R413A, R414B, R416A, R417A, R417C, R420A, R421A, R421B, R422A, R422B, R422C, R422D, R424A, R426A, R427A, R428A, R434A, R437A, R438A, R500, R502, R507A, R508B, R600A, R1234yf
Measureable medias	All refrigerants listed above, not for use with ammonia (R717) and or other refrigerants that contain ammonia
Ambient conditions	Operating Temperature: -4 to 140°F Limited by batteries Storage Temperature: -20 to 140°F Humidity in area of use: 10 to 99%RH (non-condensing)
Housing	Material: Al, brass, steel, ABS Dimensions: 10.5" x 5.5" x 3" Weight: Approximately 3 lbs. with batteries
IP Class	54
Power Supply	Power source 6 x 1.5 V AA batteries, rechargeable/non-rechargeable, USB
Standards	FCC/CE/C-Tick
Warranty	2 year limited warranty instrument, 1 year probes Terms: See Stride Tool website or catalog



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www.iManifold.com
www.npinnovations.com

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California Proposition 65 WARNING: This product contains a chemical known to the state of California to cause cancer, birth defects and other reproductive harm.

NOTE: This instruction manual is subject to change without notice. Please visit our web site at www.iManifold.com/instructions to download the latest version of this instruction manual.

Designed and assembled in the USA using domestic and imported parts.

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