JTECH MEDICAL

INSTRUCTIONS FOR USE

Your reliable source for objective data

OBJECTIVE FUNCTIONAL TESTING SYSTEMS

INTAKE EVALUATE ANALYZE REPORT

Publication information

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Contents

Graphic Symbol Definitions

		Meaning
	An ISO 7010-M002 symbol	Consult Instructions
	An ISO 15223 symbol	Keep Dry, do not immerse in water or other liquids
		Information symbol
IPXN	An IEC 60529 symbol	IPXN, N=0 no protection against ingress of water. N=1 protection against vertically falling water drops
	An ISO 7000-0434A symbol	Caution
	An IEC 60417-5840 symbol	Indicates type of protection against electric shock: Type B applied part
	An IEC 60417-5140 symbol	Non-Ionizing Radiation
	An ISO 15223 symbol	Warning: devices are non sterile
FC	FCC Logo	Devices comply with Part 15 of the FCC Rules
	An IEC 60878 symbol	Indicating Degree of protection against electric shock: Class 2 Electrical equipment
	An ISO 15223 symbol	Indicating upper and lower temperature limits
	An ISO 15223 symbol	Indicating upper and lower humidity limits
	An ISO 15223 symbol	Indicating upper and lower atmospheric pressure limits
CE 2797	“Conformité Européenne” (“European Conformity”)	Devices meet the provisions of Regulation (EU) 2017/745
	An EN 980 symbol	Identifying the Manufacturer
EC REP	An EN 980 symbol	Identifying the Authorized Representative for European Communities
MD	An ISO 15223 symbol	Identifying the device as a medical device
	An IEC 60878 symbol	Signifying Alternating Current
	An IEC 60878 symbol	Signifying Direct Current
UK CA 0086		Devices meet the provisions of UK Conformity Assessment

Conventions Used Throughout This Manual

The following conventions are used in the manual to describe the devices, and operation:

- Calibration - The process of using a known force or angle to adjust the device parameters so that any arbitrary force or angle input can be accurately determined.
- CV - The coefficient of variation (CV) is defined as the ratio of the standard deviation (σ) to the mean (μ), or in mathematical terms, CV = σ / μ. In probability theory and statistics, CV serves as a normalized measure of variability to help describe the relative scatter or spread of a data sample. A smaller CV suggests a higher level of consistency. A calculated CV less than 15% (0.15) is often used as an indicator of consistent effort by subjects during biometric strength tests.

  The Northstar software calculates CV using population standard deviation. Note that this differs from CV calculated using the sample standard deviation, which can give a very different result.
- Device - This refers to a JTECH Medical testing device, used in conjunction with the Northstar software to record test data.
- Exam - This term is used to refer to a group of tests performed with the same device.
- Repetition, or Rep - A single instance of measuring performance for a designated device.
- RF - Radio Frequency.
- ROM - Range of Motion.
- Side - Either left or right, noted as L and R, respectively.
- Test - Used to refer to a group of repetitions performed for one or more sides with a given device.
- Threshold - The minimum force or angle that must be exceeded to start or end a repetition. This is also the minimum force or angle that can be reached before the repetition ends.
- Zero or Zero Calibration or Set Zero - The process of determining the device parameters when no force or angle is applied to the device.

LED States

Receiver LED states	Explanation
Off	Off, the Receiver is not powered
On 	The Receiver is powered.

Device LED states	Explanation
Off	Off power state.
Solid GREEN 	Device is indicating that the battery has completed charging.
Solid GREEN, blinking BLUE 1 time per second, 	The device is plugged in, receiving power from an external source, and the battery is actively charging.
Alternating BLUE / GREEN 	The battery is overheated (thermal fault) warning.
Solid ORANGE 	Unknown battery status.
Blinking RED 10 times per second 	The device has a low battery and is awaiting for a communication link with the Receiver.
Solid RED 	Battery is critically low (Less than 20 minutes remaining).
Blinking RED 5 times per second 	Battery is dead. This happens on any attempt to turn the device on.
Blinking RED 1 time per second 	The device has a low battery and actively communicating with the Receiver.
Solid RED blinking OFF 1 time per second 	The device has a low battery and is attempting to reestablish communication with Receiver.
Blinking BLUE 1 time per second 	The device is in testing mode and actively communicating with the Receiver.
Solid BLUE blinking OFF 1 time per second 	Waiting to reestablish communication with the Receiver.
Blinking BLUE 10 times per second 	The device is waiting for a communication link with the Receiver.

Warnings and Notifications

	Protection against ingress of liquids: Not protected against ingress of liquids. Keep Dry, do not immerse in water or autoclave any portion of the receiver, devices, or accessories.
	Type of protection against electric shock: Type B applied part.
	Devices emit non-ionizing radiation.
	**Warning:** Devices are not sterile.
	**Warning:** Devices should only be used by trained professionals. JTECH provides optional training to increase user efficiency and accuracy. Users should not solely use data from devices for diagnosis.
	**Warning:** No modification of equipment is allowed. Do not open the receiver, device, transceiver or receiver housings. Opening of housings by anyone other than an authorized JTECH service representative will void your warranty. Devices have no user serviceable parts.
	**Warning:** Ensure accessories are properly and fully inserted prior to use.
	**Warning:** Use only a factory-suppliedpower supply. Use of another charger may result in electrical shock or equipment damage. It is not recommended that you charge the devices by connecting them to a computer.
	**Warning:** Devices are not intended for use while attached to the charger. Never attempt to operate the device while it is connected to the charger as electrical shock or damage to the device may occur.
	**Warning:** Users should corroborate data from devices with their visual observation of the patient's capabilities.
	**Warning:** This device is not suitable for use in the presence of flammable anesthetic mixture with air, with oxygen or nitrous oxide, or in magnetic environments such as MRI.
	**Warning:** Follow all directions as specified by the CaviWipe product being used. Allow devices to dry before use.
	**Notice:** Devices are precision medical devices and should be treated with care. Avoid dropping, banging, or other impacts to the devices.
	**Notice:** Use only within designated operating parameters, i.e. temperature and humidity limits.
	**Notice:** Any serious incident that has occurred in relation to these devices should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.
	**Warning:** Discontinue use of any product if skin irritation develops.
Waste Disposal	
	**Warning:** Devices contain Lithium Polymer batteries. Do not dispose of any device in fire.
	Disposal Instructions: Devices are not known to contain any hazardous materials. Consult your local waste management facility on proper disposal of solid waste. Recycling should be used where available.

EMC Notice

The JTECH Medical wireless system includes a variety of devices containing a built-in radio frequency transceiver that transmits to, and receives data from, the receiver. For more information on EMC see appendix “EMC Guidance” on page 38.

⚠	**WARNING:** Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual. Carefully read the information contained in this section.
⚠	**WARNING:** The use of portable and mobile RF equipment can affect the normal operation of medical electrical equipment.
⚠	**WARNING:** Making any modifications or using any accessories not specifically approved by JTECH Medical may reduce immunity to electromagnetic interference or increase electromagnetic emissions.
⚠	**WARNING:** The devices and receiver should not be used while stacked on, or adjacent to, other electrical or medical electrical equipment. If stacked or adjacent use is necessary, all electrical equipment should be observed to verify normal operation.

Wireless information

The devices and receiver transmit in a 2.4GHz wireless frequency.
Contains FCC ID: OUR-XBEE or MCQ-S2CTH
Contains IC: 4214A-XBEE or 1846A-S2CTH
Contains: 005NYCA0378 or R210-105563

FC This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i) this device may not cause harmful interference and (ii) this device must accept any interference received, including interference that may cause undesired operation.

Declaration of Conformity

These devices are:

- Class I measuring medical devices per Annex VIII of Regulation (EU) 2017/745
- Class I measuring devices per UK MDR 2002
- Class I medical devices per CFR Title 21 Part 888 Subpart B
- Class II medical devices per Schedule 1, Part 1 of SOR/98-282 of the Canadian Medical Devices Regulations

These devices also meet the following Technical Standards, to which Conformity is declared:

- IEC 60601-1
- IEC 60601-1-2

These devices are designed and manufactured in a facility certified to the following international standards:

- ISO 13485

Intended Use

The intended use of the devices is to assist the clinician with establishing an objective assessment of a person’s physical strength, range of movement, and (with the Algometer) establishing pain tolerance levels. The devices are intended to be used as non-invasive, non-surgical and transient devices. The devices are indicated for use when objective assessment of strength, range of motion, or pain tolerance is required.

Indications/Contraindications for Use

The devices are indicated for use when objective assessment of strength, range of motion, or pain tolerance is required. The devices should not be used in the following circumstances: on or near the eyes, on or near fractures, on or near open wounds, on or near burned tissue, with patients suffering with severe osteoporosis, and for any purpose other than indicated.

System Setup

Initial Battery Charge

Performing the required initial charge for your new device batteries is essential before attempting to use them. When not in use, devices remain in a “power-off” state to conserve battery life. If not used, the device can remain in the off-power state for several days without needing a recharge. However, if the device has not been charged within 30 days, we recommend recharging the battery before use.

⚠	**Warning:** Devices should not be used for testing while connected to the charger.
⚠	**Warning:** Use only a factory-supplied, medical-grade power supply certified to charge medical devices. Use of another charger may result in electrical shock or equipment damage. It is not recommended that you charge the devices by connecting them to a computer.
ℹ	**Notice:** Device batteries should be fully charged before attempting to use them with your system. Each device must charge for at least four (4) continuous hours before its first use.
ℹ	**Notice:** Be careful not to drop devices while connected to the charger as it may cause damage to the device.

Charging Device Batteries

1. Plug the battery charger daisy chain plug into the device charging jack. You can charge up to four devices at a time. Place the device on a flat surface or back in the case while it charges.
2. Plug the battery charger into a properly rated wall outlet. Batteries should be charged for four (4) continuous hours each time you charge.
3. Once a device is charged, disconnect it from the battery charger.
4. Charge all devices with your system before establishing communications with your computer.

Battery Life

The devices have rechargeable Lithium Polymer batteries. The devices are able to operate for approximately eight (8) hours of continual use. In order to conserve battery life, the devices have an automatic shut-off, which will trigger after 10 seconds of inactivity.

Displaying Device Battery Voltage

Follow the steps in the Northstar software manual.

Device Operation

After initial charging is complete, we recommend you contact JTECH Medical to complete the software installation and setup. Please consult your Software User Guide for specific software related setup instructions.

Features and Benefits

- The JTECH Medical system is a battery powered wireless testing system, which allows for flexibility and mobility in testing.
- Hands Free Wireless Testing - no tethers or cables to interfere with testing or clinic set up.
- Impact resistant PVC plastic housings.
- Ergonomic designs.
- Designed for testing criteria for published research.
- Built-in long-life rechargeable Lithium Polymer batteries mean there is no need to replace batteries.
- Additional device specific Features and Benefits can be found under the device specific sections.

Available Upgrades

In addition to adding devices, the following upgrade products are available:
Northstar Software modules **-** For more information on upgrades, contact your JTECH Medical sales representative. See “Contact Information” on page 24.

Wireless Receiver (9RF401)

Used to send and receive wireless transmissions to/from JTECH Medical wireless devices.

Instructions for using wireless receiver:

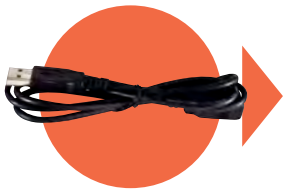
1. Connect the Wireless Receiver to the USB Extension Cable.
2. Connect the USB Extension Cable to an open USB port on your computer.

For troubleshooting information, please see page 19.

For technical specifications, please see page 25.

Northstar Software

For instructions on operating the Northstar software, please refer to the Northstar software manual.



Detachable Parts

USB Extension Cable (7WR001) – The USB Extension Cable is used to connect the USB Receiver to a USB port on your computer.

(9RF404) (9RF403)

Incorrect motion

Correct motion

Wireless Dual Inclinometers (9RF403, 9RF404)

Used to convey functional abilities concerning Range of Motion (ROM).

1. If using the alignment rails accessory, attach the alignment rail to the inclinometer by setting the "Feet" of the inclinometer on top of one alignment rail. Repeat for other inclinometer. To remove the alignment rail, grasp the alignment rail and inclinometer in opposite hands and pull to separate.
2. If using VELCRO® straps, attach the VELCRO® strap to the subject and then attach the back of the inclinometer to the VELCRO® strap using a slight twisting motion. To remove the inclinometer from the VELCRO® strap, peel the inclinometer from the VELCRO® strap and then remove the strap from the subject.
3. Push the "On" button on the Inclinometer to enable communication with the Wireless Receiver. If necessary, repeat this procedure for the other Inclinometer.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

For troubleshooting information, please see page 19.

For technical specifications, please see page 26.

Features and Benefits

- Eliminates placement changes and repeat procedures.
- Provides recording of the Total Range of Motion, Upper Segment Extreme and Lower Segment Extreme for spine range of motion measurements (vital data for AMA-based impairment rating).
- Features Dynamic, Static, and Auto-rep testing modes for the spine and extremities.
- Measure extremities with either dual or single inclinometry.
- Capable of simulated goniometry.

Accessories

VELCRO® Straps (AA 026) – The VELCRO® straps can be used for dynamic range of motion inclinometry testing. Comes in a set with Small, Medium, and Large straps.

Alignment Rails (8MH068) – The Alignment Rails magnetically attach to the Inclinometers for easy visual confirmation of alignment.

Wrist Lanyard (7AC006) – The Wrist Lanyard is used to help prevent dropping devices when carrying, or when performing some tests.

Wireless Muscle Tester (9RF405)

Used to convey a subject's ability to resist force for a given muscle or muscle group. Also used for determining max force a subject can exert.

1. Attach appropriate accessory to Muscle Tester by inserting the metal shaft on the accessory into the accessory receptacle on the Muscle Tester. **Note:** A Flat Pad, or Curved Pad must be used with the Muscle Tester.
2. Push the "On" button on the Muscle Tester to enable communication with the Wireless Receiver.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

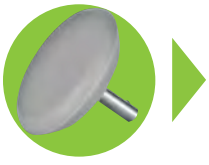
For troubleshooting information, please see page 19.

For technical specifications, please see page 27.

Features and Benefits

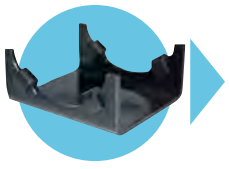
- Produces very stable make or break tests.
- Reduces "roll-over" and tilting with a 2.4" high ergonomic design that fits in the palm.
- Uses snap-in-place Quick Connect™ system for changing accessory pads, which is much faster than old-fashion screw-on methods.
- Measures up to 200 pounds for strong performers.
- Test protocols can be customized according to number of tests, starting force, newtons/kilograms/pounds, test time and number of repetitions.
- Axis Compensation™ "smart" load cell technology. Maintains accuracy even when force is applied off-center.

Accessories



Flat Pad (8AC008) – The flat pad can be used for exerting force against flat items.

Curved Pad (8AC009) – The curved pad can be used for exerting force against items that are not completely flat.



Muscle Tester Cradle (9AC001) – The Muscle Tester Cradle provides a stable platform to rest the muscle tester.

Wrist Lanyard (7AC006) – The Wrist Lanyard is used to help prevent dropping devices when carrying, or when performing some tests.

Wireless Grip (9RF406)

Used to convey functional abilities concerning grip strength.

1. Attach the positionable handle on the appropriate rung of the Grip gauge by placing the Y-end on the chosen rung, then rotating the C-end to the opposing rung and pushing the quick lock spring over the rung, locking the handle in place.
2. Push the "On" button on the Grip to enable communication with the Wireless Receiver.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

For troubleshooting information, please see page 19.

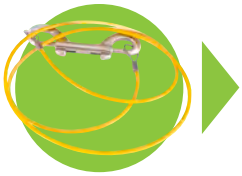
For technical specifications, please see page 28.

Features and Benefits

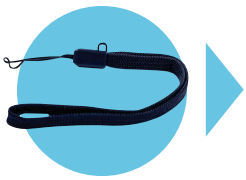
- Uses standard gauge for comparison to published norms.
- Helps determine consistency of effort in workers compensation and FCE exams.
- Measures up to 200 pounds for strong performers.
- Test protocols can be customized according to number of tests, starting force, newtons/kilograms/pounds, test time and number of repetitions.
- Axis Compensation™ "smart" load cell technology. Maintains accuracy even when force is applied off-center.

Rung Positions

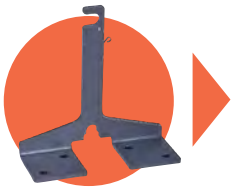
Accessories



Grip Cable (9AK103) – The Grip Cable is used for attaching weights to the Grip.



Wrist Lanyard (7AC006) – The Wrist Lanyard is used to help prevent dropping devices when carrying, or when performing some tests.



Grip Stand (8MH234) – The Grip Stand holds the grip securely in a vertical position for testing on a table or desk.

Wireless Algometer (9RF407)

Used to convey pain response and pressure threshold.

1. Attach appropriate accessory to Algometer by inserting the metal shaft on the accessory into the accessory receptacle on the Algometer.
   Note: One of the Algometry Tips must be used with the Algometer.
2. Push the "On" button on the Algometer to enable communication with the Wireless Receiver.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

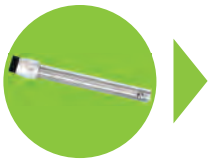
For troubleshooting information, please see page 19.

For technical specifications, please see page 29.

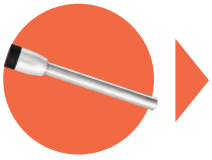
Features and Benefits

- Multiple tip sizes for different testing applications.
- Replaceable rubber tips.
- Use for both Algometry and Finger strength testing.
- Measures up to 25 lb.
- Axis Compensation™ "smart" load cell technology. Maintains accuracy even when force is applied off-center.

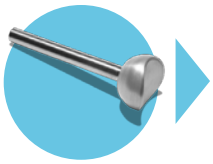
Accessories



0.5cm² Algometer Tip (8AC006) – The 0.5cm² Algometer Tip can be used for cervical testing.



1.0cm² Algometer Tip (8AC005) – The 1.0cm² Algometer Tip conforms to normative testing.



Finger Tip Adapter (8AC007) – The Finger Tip Adapter converts the Algometer for testing individual finger strength.

Notice: It is recommended not to use the Flat Pad with the Algometer for anything other than calibration. Improper use of the Flat pad could result in exceeding the force limits of the device. Exceeding the force limits of the device can permanently damage the internal components of the Algometer.

Wrist Lanyard (7AC006) – The Wrist Lanyard is used to help prevent dropping devices when carrying, or when performing some tests.

Wireless Algometry End Test Switch (RF116) – Used by patients during pain response or pressure threshold tests to end the current test.

Wireless Goniometer (9RF408)

Used to convey functional abilities concerning hand and extremity Range of Motion (ROM).

1. If necessary, attach the Goniometer extension arms by aligning the extension's metal pins or holes with the metal pins or holes on the Goniometer. Press straight down until the extension makes contact with the Goniometer arm.
2. If necessary, to remove the extension arms grasp the extension arm near the metal pins and gently wiggle the extension as you pull it away from the goniometer arm. Do not bend or twist the extension to disengage as the extension may break.
3. Push the "On" button on the Goniometer to enable communication with the Wireless Receiver.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

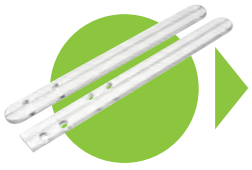
For troubleshooting information, please see page 19.

For technical specifications, please see page 31.

Features and Benefits

- Extensions for large extremity alignment.
- Real-time Numerical Data
  As the goniometer is opened and closed, the degrees of motion from the neutral starting position of the goniometer are displayed in real-time in the software test screen.
- Accommodates flexion through hyperextension.
- Can be used for small-digit hand range of motion (ROM).
- Measure up to 210°.

Detachable Parts



Goniometer Extension arms (9AK113) – Aids in visual confirmation of alignment, or in aligning the Goniometer to extremities. Comes in a set of two (2) arms.

Wrist Lanyard (7AC006) – The Wrist Lanyard is used to help prevent dropping devices when carrying, or when performing some tests.

Wireless Pinch Gauge (9RF409)

Used to convey functional abilities concerning pinch strength.

1. Push the “On” button on the Pinch Gauge to enable communication with the Wireless Receiver.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

For troubleshooting information, please see page 19.

For technical specifications, please see page 32.

Features and Benefits

Pinch Dynamometer:

- Uses standard gauge for comparison to published norms.
- Helps determine consistency of effort in workers compensation and FCE exams.
- Measures up to 50 pounds for very strong performers.
- Axis Compensation™ “smart” load cell technology. Maintains accuracy even when force is applied off-center.

Detachable Parts

Wrist Lanyard (7AC006) – The Wrist Lanyard is used to help prevent dropping devices when carrying, or when performing some tests.

Wireless Static Force Gauge (9RF410)

Used to convey functional abilities concerning static strength in a variety of applications such as lifting, pushing, or pulling, or to convey a subject's ability to resist force for a given muscle or muscle group.

1. Attach appropriate accessory to Static Force Gauge by threading the metal shaft on the accessory into the accessory attachment receptacle or force input receptacle on the Static Force Gauge.
2. Push the "On" button on the Static Force Gauge to enable communication with the Wireless Receiver.

For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

For troubleshooting information, please see page 19.

For technical specifications, please see page 33.

Features and Benefits

- Measures up to 500 lbs.
- Six (6) different accessories to create the tests you want.
- Auto Direction (push or pull) selection after first rep.
- Determine weight or mass of objects.
- Axis Compensation™ "smart" load cell technology. Maintains accuracy even when force is applied off-center.

Wireless Static Force Gauge MAX (9RF119)

Designed for greater capacity (750 lbf). Used to convey functional abilities concerning static strength in a variety of applications such as lifting, pushing, or pulling, or to convey a subject's ability to resist force for a given muscle or muscle group.

1. Attach appropriate accessory to Static Force Gauge by threading the metal shaft on the accessory into the accessory attachment receptacle or force input receptacle on the Static Force Gauge.
2. Push the "On" button on the Static Force Gauge to enable communication with the receiver.

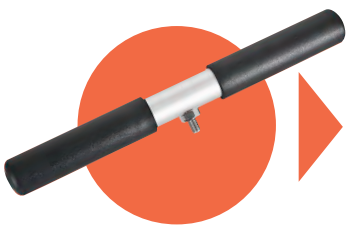
For instructions on performing specific tests, please refer to the multimedia help system in the Northstar Software.

For troubleshooting information, please see page 19.

For technical specifications, please see page 34.

Features and Benefits

- Measures up to 750 lbs.
- Six (6) different accessories to create the tests you want.
- Auto Direction (push or pull) selection after first rep.
- Determine weight or mass of objects.
- Axis Compensation™ "smart" load cell technology. Maintains accuracy even when force is applied off-center.



Accessories

T-Bar (AC012) – The T-Bar is essential for doing lifting or pulling tests that require the use of two hands. Attaches to the Accessory Attachment receptacle.

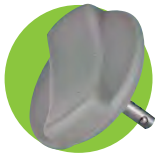
Static Force Gauge Accessories (Continued)

D-Handle (9AC003) – The D-Handle is the perfect choice for doing one-hand lifts or pulls. Attaches to the Accessory Attachment receptacle.

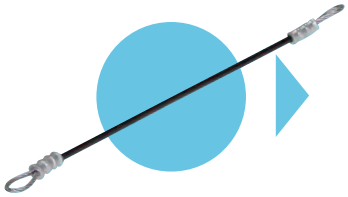
Hook w/Stud (741) – The hook attachment allows you to use virtually any item for lifting or pulling tests. Attaches to the Force Input receptacle.

Threaded Pad Adapter (8MH097) – Adapts the threaded Force Input receptacle to allow the metal shafts on the flat or curved pads to be inserted into the Static Force Gauge.

Flat Pad (8AC008) – The flat pad can be used for exerting force against flat items, or muscle testing. Attaches to the Threaded Pad Adapter.



Curved Pad (8AC009) – The curved pad can be used for exerting force against items that are not completely flat, or muscle testing. Attaches to the Threaded Pad Adapter.



12” Cable (9AC007) – The cable can be used for different lifting, pushing or pulling, or static strength tests.

4” Push Disk (9AC004) – The 4” Push Disk can be used for exerting force against flat items. The Push Disk offers more surface area for pushing activities, and greater flexibility for various testing applications than the Flat pad. Attaches to the Force Input receptacle.

Optional V-Slot (745) – The optional V-Slot makes it easy to exert force against the corner of walls or other structures for doing push tests. Attaches to the Force input receptacle.

Optional 16” T-Bar (AC014) – The 16” T-Bar allows for wider placement between hands when performing lifting or pulling tests.

Frequently Asked Questions

The following section is provided to help you with questions about your JTECH Medical Wireless Functional Testing System.

What happens if I take the device out of range during a test?

If the device is transmitting to the receiver when it moves out of range (beyond 3 meters), communications for all active devices can be lost and the data cannot be retrieved. To re-establish communications, move the device back within the transmission range and restart the test.

Can my receiver pick up signals from other devices like wireless phones or wireless networks?

Wireless networks, cordless phones or other devices can potentially cause interference with your JTECH Medical wireless system. As a precaution, we recommend that you minimize their usage within the transmission range of your JTECH Medical wireless system.

Is there any other type of interference I need to worry about?

As with any radio transmission, high-powered electromagnetic devices should be avoided. For example, you should not operate your system near microwave ovens or X-ray machines.

Can I block the signal during testing?

Unlike infrared systems, the JTECH Medical wireless system is not based on line of sight, so standing between the device and the receiver should not interfere with the signal, provided you are within the operational distance.

How do I know when the device's battery is low?

See the device LED codes on page 4. Additionally, there is a "low battery" indicator in the software.

How long do devices continue to operate after the low power signal?

The amount of operational time after the low power signal varies for each device, but approximately 20 minutes.

Can I use the device without fully charging it?

Yes. The device will function without a full charge, but the operational time will be significantly reduced. You should place the device back on the charger to completely charge the battery as soon as possible.

Warning: Devices are not intended for use while attached to the charger. Never attempt to operate the device while it is connected to the charger as electrical shock or damage to the device may occur.

Warning: Use only a factory-supplied, medical-grade power supply certified to charge medical devices. Use of another charger may result in electrical shock or equipment damage. It is not recommended that you charge the devices by connecting them to a computer.

How long do the batteries take to charge?

The initial charge may take up to six (6) continuous hours of charging to complete. The first charge is important as it can affect the amount of power the battery will hold. Subsequent charges should be completed between four (4) to (6) hours, or until the device indicates that charging is complete.

What happens if I leave the device on the charger too long?

We have designed special circuitry to protect the device's electronic components. Charging automatically turns off between four (4) to six (6) hours, or when charging is complete. Devices should be left to charge until they indicate that they are done. As with any Lithium Polymer battery, leaving devices connected to the charger for extended periods (e.g. weeks) can reduce the overall life of the battery. Leaving devices connected over the weekend should not affect the life of the batteries.

What happens if my device does not recharge?

Because of the sensitive electronics inside, devices are not designed for battery replacement in the field. If a device fails to hold a charge, contact JTECH Medical Customer Service.

What are the current travel restrictions for Echo Devices?

Current regulations do not prohibit Echo Devices from being stored in carry-on or checked baggage. Since the batteries are already installed safely in the devices, there are no FAA, TSA or DOT restrictions on checking Echo devices. If the devices are checked, they should be secured properly in the hard case to guard against the device being turned on during transport.

More information and Frequently Asked Questions are available for your JTECH Medical wireless devices by visiting our online support at http://help.jtechmedical.com

Troubleshooting Your Devices

Problem	Probable Cause	Possible Solution
Device does not appear to respond to the charger. The LED does not light.	Bad Connection or Inoperable Battery.	Check the USB daisy chain connection to the charger and the device. If the daisy chain connections appear to be good; remove all other devices and try connecting the device to a different USB connection on the USB daisy chain. If the LED does not light up after 60 minutes, contact JTECH Customer Service for repair options.
The Enter button will no longer click when pressed.	Possible damaged switch.	Please contact JTECH Support for repair options.
Device LED blinks rapid RED and then stops after a few seconds on any attempt to turn the device on.	Dead battery Indicator.	Charge the device for one complete cycle (between 4 to 6 hours) and attempt to use it again.

Problem	Probable Cause	Possible Solution
Device does not turn on and/ or the LED does not blink when trying to turn on.	The device software has locked up or the battery charge is fully depleted.	 Use reset pin to press the reset switch through the reset pin hole on the device. If the device still does not turn on, connect the device to the charger for 1 hour. If the device turns on after 1 hour, allow the device to continue charging. Otherwise contact JTECH support for repair options.
LED blinking rapidly while attempting to connect, but device does not connect.	Radio needs to be reconfigured.	Connect to charger for 10 - 20 seconds minimum (This will reconfigure the radio). Disconnect and attempt wireless connection again.

Additional device troubleshooting information can be found by visiting our online support at http://help.jtechmedical.com

Storage and Cleaning of Devices

Notice: The devices are sensitive electronic devices, and should be handled with care. If handled and cared for properly, the devices have all been designed and manufactured to provide years of accurate and reliable use. Avoid dropping, banging, or other impacts to the devices. Use only within designated operating temperatures.

Storage

When devices are not in use, store them in the protective carrying case.

1. If devices are stored for periods longer than 30 days, recharge batteries before using.
2. Store in an area with a controlled temperature within the recommended temperature range. (See temperature and humidity limits in “Technical Specifications” on page 25 through page 38.)
   Important Notice: Never store devices in an automobile, except when transporting them, regardless of the season.

Cleaning, Disinfection, and Sterilization

Warning: Keep dry, do not immerse any part of any device, receiver, or accessory in water or other fluid.

Devices and accessories are non-sterile devices and are not compatible with sterilization techniques such as autoclave.

- Do not autoclave devices or accessories.
- Do not clean with abrasive materials.
- Do not clean with solvents, or disinfectant not approved by JTECH Medical.

Recommended Cleaning of JTECH Medical Wireless Devices

- Wipe surfaces with a soft, dry cloth.

Recommended Alternative Method for Cleaning JTECH Medical Wireless Devices and Accessories.

- CaviWipes disinfecting towelette
  - Use only as directed, following all instructions and warnings on the CaviWipes packaging.

Warning: Follow all directions as specified by the CaviWipe product being used. Allow devices to dry before use.

Maintenance

Devices are not user serviceable and do not include a service manual.
For any service including maintenance, repair, and calibration, contact JTECH Medical Customer Support. See “Contact Information” on page 24.

Product Registration

Please register your JTECH Medical Wireless System as soon as possible. Your registration ensures that you have easy access to JTECH Medical Customer Service and Support. Software registration is required to receive your site key, which is necessary to run the software.

To register your system, contact JTECH Medical Customer Service. See “Contact Information” on page 24.

Repair Policy

Important Notice: JTECH will not accept any products without a JTECH issued RMA number.

Warning: Devices have no user serviceable parts.

To have your JTECH Medical Wireless Device repaired

Although the evices are manufactured with great care, and tested thoroughly prior to shipment, it is possible that your devices may require repair. If this unlikely event arises, please follow these instructions in order to ensure accurate and prompt servicing of your devices.

1. Contact JTECH Medical Customer Support to obtain a Return Material Authorization (RMA) number. See “Contact Information” on page 24.
2. Carefully package all devices, mark the RMA# on the outside of the package, and ship the devices using a service that offers both insurance and tracking of your package. Return the wireless device component (do not include accessories) postage paid and insured to JTECH Medical.

Notice: JTECH reserves the right to refuse or to return-collect any merchandise sent for repair without prior authorization from our Customer Service Department. Please refer to page 23 for steps on requesting an RMA.

Authorized repairs must be shipped to:
JTECH Medical
7633 S Main Bldg D
Midvale, UT 84047
ATTN: RMA# (insert number)

Notice: JTECH Medical is not responsible for loss or damage during shipping.

Customer Support

JTECH Medical provides customer support for all the products we sell. You may register up to three individuals from your office to serve as eligible customer support contacts (this can be done anytime during your support agreement). The three contacts are registered for the life of your support agreement. Please note that support will only be available to the registered individuals from your office.

Support Policies

Hardware

Your hardware is shipped with a limited warranty (Please refer to the warranty section on page 24). You will be charged for any hardware issues (repair, replacement, shipping, etc.), after the initial warranty time period. You can buy extended warranties for your JETCH Medical wireless devices.
Please contact JTECH Medical Customer Service for more information on JTECH Guardian Hardware Maintenance plans.

Northstar Software

One registered user is eligible to receive Northstar software support for six (6) months from the date of purchase.

Before Calling for Support

1. Refer to the device user's guide in this manual first. This user's guide was written to acquaint you with the devices. The guide explains how to use the devices and how to review the data. Please read through this documentation carefully.

2. Refer to the troubleshooting section in your documentation. Many hardware issues can be resolved by referring to this section on page 19. Additional troubleshooting information can be found by visiting our online customer support at http://help.jtechmedical.com

3. If your question deals with the optional software usage, refer to the software user's guide in this manual first. The user's guide was written to acquaint you with the software. The Northstar Software User guide explains how to install and use the Northstar program. Please read through this documentation carefully.

4. If you are unable to solve your problem using the included documentation, please have a registered support contact call JTECH Medical Customer Support. See "Contact Information" on page 24.

To receive more accurate and efficient support please have the following information ready when you call

1. Name of clinic and support contact
2. Customer number
3. Date of purchase
4. Product name or type and Product serial number(s)
5. Description of the problem

If you are calling in regards to the Northstar software please also have the following:

6. Computer specifications

Product Return Policy

- New hardware may only be returned for credit within 15 days of receipt. No cash refunds will be issued.
- No returns of used or purchased demonstration inventory will be accepted.
- No software returns will be allowed after the seal on the software package is broken.

Hardware items returned for credit within 15 days will be subject to a 20% restocking fee*, provided the items are in new condition and in the original packaging. If items require refurbishing or repair, the cost of service or repair will be deducted from the amount of credit. A Return Material Authorization (RMA) number must be obtained from JTECH Customer Service prior to returning any merchandise. When phoning or writing for an authorization number to return merchandise, please provide the Customer Service Department with:

1. Your name or customer number as it appears on the invoice or packing slip.
2. Your telephone number and person to contact.
3. Your P.O. number if applicable.
4. The part or catalog number(s) and description.
5. The reason for the return.

JTECH reserves the right to refuse or to return-collect any merchandise sent back without prior authorization from our Customer Service Department. Authorized returns must be shipped to:

JTECH Medical
7633 S Main Bldg D
Midvale, UT 84047
ATTN: RMA# (insert number)

When returning merchandise, please include a copy of your original invoice or packing slip to ensure prompt issuing of credit. Return the wireless component (including all accessories) postage paid and insured to JTECH Medical.

Notice: JTECH Medical is not responsible for loss or damage during shipping.
Important Notice: JTECH will not accept any products without a JTECH issued RMA number.

*Restocking fee does not apply to government contracts.

Hardware Limited Warranty

The devices are designed to perform reliably, meet manufacturer's specification, and provide long lasting service. In spite of diligence in manufacturing, eliminating malfunctions resulting from random component failure is impossible. Should the product fail to work properly within the designated warranty period, JTECH will, at its option, repair or replace the product with a new or reconditioned unit at no charge. Warranty begins at the date of purchase. New hardware includes a standard one year limited warranty.

In view of the varied conditions in which the equipment will be used, it is sold "as is" and JTECH's responsibility does not go beyond the terms set forth above. JTECH will not be responsible for medical expenses or any direct, incidental, or consequential damages arising from the use of this product. JTECH shall in no way be liable for the loss of revenue or profits resulting from, or alleged to result from, use of this product.

THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING AN IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES SHALL JTECH BE LIABLE FOR ANY DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THE REMEDIES SET FORTH IN THIS WARRANTY SHALL BE THE ONLY REMEDIES AVAILABLE, EXCEPT AS SPECIFICALLY PROVIDED BY STATE LAW. NO PERSON HAS ANY AUTHORITY TO BIND JTECH TO ANY REPRESENTATION OR WARRANTY EXCEPT AS SPECIFICALLY SET FORTH HEREIN.

Note: Northstar Software is covered by a separate license and warranty agreement. See the software licensing and warranty agreement below.

For Government Use: Please refer to the hardware warranty on the installation media you received.

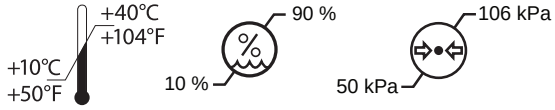
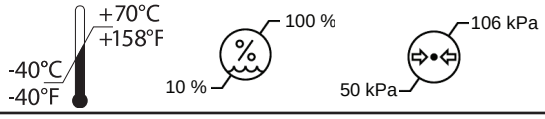
Contact Information

Phone: (385) 695-5000
Email: info@jtechmedical.com
Website: www.jtechmedical.com
Chat online: chat.jtechmedical.com

Address:
7633 S Main Bldg D
Midvale, UT 84047
United States of America

Technical Specifications for Wireless Receiver (9RF401)

Used to send and receive wireless transmissions to/from JTECH Medical wireless devices.

Dimensions	11.4 cm x 4.1 cm x 2 cm (4.5 in x 1.6 in x 0.8 in)
Weight	0.04 kg (0.08 lb)
Operating Temperature, Humidity, and Atmospheric Pressure	
Transportation and Storage Conditions	
Power Source	USB port (This device is not intended to make contact with the patient)
Input Power	5V ⎓, 0.5A
Type of Protection against electric shock	Not applicable (This device is not intended to make contact with the patient)
Degree of protection against electric shock	Not applicable (This device is not intended to make contact with the patient)
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

(9RF404) (9RF403)

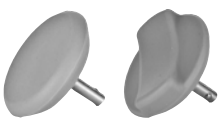
Technical Specifications for Wireless Dual Inclinometers (9RF403, 9RF404)

Used to convey functional abilities concerning Range of Motion (ROM).

Dimensions/Weight	7.2 cm x 2.7 cm x 6.6 cm (2.85 in x 1.07 in x 2.59 in) / 0.09 kg (0.20 lb)
Accuracy	±2°
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F +10°C +50°F 90 % 10 % 106 kPa 50 kPa
Transportation and Storage Conditions	+70°C +158°F -40°C -40°F 100 % 10 % 106 kPa 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to “off power” state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Muscle Tester (9RF405)

Used to convey a subject's ability to resist force for a given muscle or muscle group. Also used for determining Max force a subject can exert.

Dimensions/Weight	10.2 cm x 6.1 cm x 5.3 cm (4.02 in x 2.40 in x 2.11 in)/ 0.2 kg (0.45 lb)	
Accuracy	±8 N (2 lbf)	
Maximum Force Input	890 N (200 lbf)	
Operating Temperature, Humidity, and Atmospheric Pressure		
Transportation and Storage Conditions		
Internal Power Source	Non-User serviceable, Lithium Polymer battery	
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge	
Battery conservation	Devices transition to "off power" state when not in use	
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012	
Type of Protection against electric shock	Internally powered equipment	
Degree of protection against electric shock	Type B equipment	
Protection against harmful ingress of water	IPX0 - ordinary equipment	
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide	
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**	
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment	
RF frequency	2.4GHz wireless frequency	
RF transmit power	1-6.3 mW (0-8 dBm)	
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086	
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282	
Flat Pad (8AC008)/Curved Pad (8AC009) 	Dimensions (l x w)	1.49 x 2.25 in. / 1.68 x 2.25 in
	Weight	0.15 lb.
	Maximum Force Input	500 lbf*
	Material Type	Rubber Pad: Silicone / Shaft: Stainless Steel

Technical Specifications for Wireless Grip (9RF406)

Used to convey functional abilities concerning grip strength.

Dimensions/Weight	20.7 cm x 4.1 cm x 10.2 cm (8.15 in x 1.62 in x 4.01 in)/ 0.42 kg (0.92 lb)
Accuracy	±8 N (2 lbf)
Maximum Force Input	890 N (200 lbf)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F / +10°C +50°F; 90 % / 10 %; 106 kPa / 50 kPa
Transportation and Storage Conditions	+70°C +158°F / -40°C -40°F; 100 % / 10 %; 106 kPa / 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to “off power” state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Algometer (9RF407)

Used to convey pain response and pressure threshold.

Dimensions/Weight	6.35 cm x 4.6 cm x 7.3 cm (2.50 in x 1.80 in x 2.88 in)/ 0.16 kg (0.35 lb)
Accuracy	±1 N (0.3 lbf)
Maximum Force Input	111 N (25 lbf)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F; +10°C +50°F; 90 %; 10 %; 106 kPa; 50 kPa
Transportation and Storage Conditions	+70°C +158°F; -40°C -40°F; 100 %; 10 %; 106 kPa; 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to “off power” state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Algometer End Test Switch (RF116)

Used by patents during pain response or pressure threshold tests to end the current test.

Dimensions	2.6 cm x 6.35 cm x 4.6 cm (1.04 in x 2.50 in x 1.80 in)
Weight	0.08 kg (0.18 lbs)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F +10°C +50°F 90 % 10 % 106 kPa 50 kPa
Transportation and Storage Conditions	+70°C +158°F -40°C -40°F 100 % 10 % 106 kPa 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to “off power” state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 C Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Goniometer (9RF408)

Used to convey functional abilities concerning hand and extremity Range of Motion (ROM).

Dimensions/Weight	27.4 cm x 4.1 cm x 3.6 cm (10.8 in x 1.61 in x 1.42 in)/ 0.14 kg (0.30 lb)
Accuracy	±1°
Maximum angle	210°
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F; +10°C +50°F; 90 %; 10 %; 106 kPa; 50 kPa
Transportation and Storage Conditions	+70°C +158°F; -40°C -40°F; 100 %; 10 %; 106 kPa; 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to “off power” state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Pinch Gauge (9RF409)

Used to convey functional abilities for pinch strength.

Dimensions/Weight	10.9 cm x 5.4 cm x 4.0 cm (4.28 in x 2.11 in x 1.58 in)/ 0.2 kg (0.45 lb)
Accuracy	±22 N (0.5 lbf)
Maximum Force Input	222 N (50 lbf)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F; +10°C +50°F; 90 %; 10 %; 106 kPa; 50 kPa
Transportation and Storage Conditions	+70°C +158°F; -40°C -40°F; 100 %; 10 %; 106 kPa; 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to “off power” state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0; NON STERILE; CE 2797; MD; UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Static Force Gauge (9RF410)

Used to convey functional abilities concerning static strength in a variety of applications such as lifting, pushing, or pulling, or to convey a subject's ability to resist force for a given muscle or muscle group.

Dimensions/Weight	7.1 cm x 4.6 cm x 5.0 cm (2.80 in x 1.80 in x 1.97 in)/ 0.18 kg (0.40 lb)
Accuracy	±8 N (2 lbf)
Maximum Force Input	2224 N (500 lbf)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F +10°C +50°F 90 % 10 % 106 kPa 50 kPa
Transportation and Storage Conditions	+70°C +158°F -40°C -40°F 100 % 10 % 106 kPa 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to "off power" state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications for Wireless Static Force Gauge MAX (9RF119)

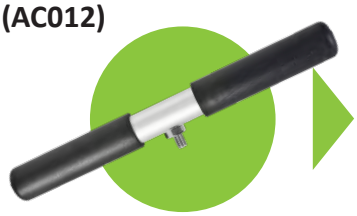
Used to convey functional abilities concerning static strength in a variety of applications such as lifting, pushing, or pulling, or to convey a subject's ability to resist force for a given muscle or muscle group.

Dimensions/Weight	8.89 cm x 6.35 cm x 6.68 cm (3.5 in x 2.5 in x 2.63 in)/ 0.43 kg (0.94 lb)
Accuracy	±8 N (2 lbf)
Maximum Force Input	3336 N (750 lbf)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F +10°C +50°F 90 % 10 % 106 kPa 50 kPa
Transportation and Storage Conditions	+70°C +158°F -40°C -40°F 100 % 10 % 106 kPa 50 kPa
Internal Power Source	Non-User serviceable, Lithium Polymer battery
Recharge time	Four(4) - six(6) continuous hours of charging following initial charge
Battery conservation	Devices transition to "off power" state when not in use
Specified Power Supply, (Battery Charger)	JTECH Medical PN: PW012
Type of Protection against electric shock	Internally powered equipment
Degree of protection against electric shock	Type B equipment
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
This device contains:	**Contains FCC ID: OUR-XBEE or MCQ-S2CTH** **Contains IC: 4214A-XBEE or 1846A-S2CTH** **Contains: 005NYCA0378 or R210-105563**
RF operating distance	3 meters (9.8 feet) from the Receiver, indoor environment
RF frequency	2.4GHz wireless frequency
RF transmit power	1-6.3 mW (0-8 dBm)
Symbols	IPX0 NON STERILE CE 2797 MD UK CA 0086
Device Classification	US: Class I per CFR Title 21 Part 888 EU: Class I measuring per Annex VIII of Regulation (EU) 2017/745 Canada: Class II per Schedule 1, Part 1 of SOR/98-282

Technical Specifications and Warnings for Static Force Gauge Accessories

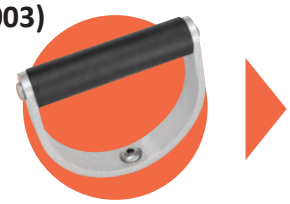
Used to convey functional abilities concerning static strength in a variety of applications such as lifting, pushing, or pulling, or to convey a subject's ability to resist force for a given muscle or muscle group.

T-bar (AC012)



Dimensions (l x w)	12 x 1.25
Weight	0.81 lb.
Maximum Force Input	750 lbf*
Material Type	Rubber Grip: Vinyl / Handle: Aluminum

D-Handle (9AC003)

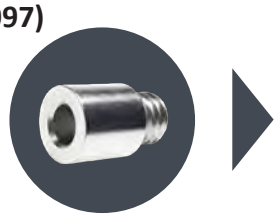


Dimensions (l x w x d)	5.25 x 4.8125 x 1.0625 in.
Weight	0.60 lb.
Maximum Force Input	500 lbf*
Material Type	Rubber Grip: Vinyl / Handle: Aluminum

Hook w/ Stud (741)

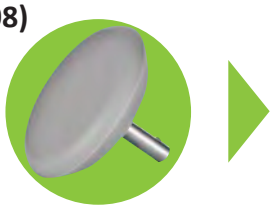
Dimensions (l x w)	3 x 1 in.
Weight	0.09 lb.
Maximum Force Input	500 lbf*
Material Type	Stainless Steel

Threaded Pad Adapter (8MH097)



Dimensions (l x w)	0.82 x 0.63 in.
Weight	0.02 lb.
Maximum Force Input	750 lbf*
Material Type	Stainless Steel

Flat Pad (8AC008)



Dimensions (l x w)	1.4375 x 2.25 in.
Weight	0.15 lb.
Maximum Force Input	750 lbf*
Material Type	Rubber Pad: Silicone / Shaft: Stainless Steel

* ℹ **Notice:** Accessory Maximum Force Input applies to the accessory only, and does not apply to the accessory when attached to any device.

Technical Specifications and Warnings for Static Force Gauge Accessories

(Continued)

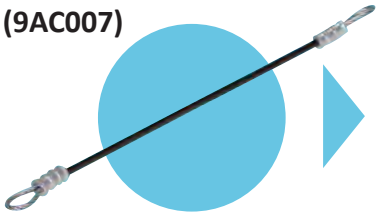
Curved Pad
(8AC009**)**

Dimensions (l x w)	1.625 x 2.25 in.
Weight	0.81 lb.
Maximum Force Input	750 lbf*
Material Type	Rubber Pad: Silicone / Shaft: Stainless Steel

4” Push Disk
(9AC004**)**

Dimensions (l x w)	1.70 x 4 in.
Weight	0.60 lb.
Maximum Force Input	400 lbf*
Material Type	Rubber Pad: Neoprene / Metal Disc: Aluminum

12” Cable
(9AC007)



Dimensions (l x w x d)	12 x .1875 in.
Weight	0.09 lb.
Maximum Force Input	500 lbf*
Material Type	Vinyl-Coated Galvanized Wire Rope

Optional **V-Slot**
(745)

Dimensions (l x w)	1.13 x 1.25 in.
Weight	0.02 lb.
Maximum Force Input	750 lbf*
Material Type	Nickel-Plated Steel

Optional **16” T-bar**
(AC014**)**

Dimensions (l x w)	16 x 1.25 in.
Weight	1.1 lb.
Maximum Force Input	750 lbf*
Material Type	Rubber Grip: Vinyl / Handle: Aluminum

* **Notice:** Accessory Maximum Force Input applies to the accessory only, and does not apply to the accessory when attached to any device.

Warning: Discontinue use of any product if skin irritation develops.

Technical Specifications for Power Supply (PW012)

The specified power supply (battery charger) is certified to charge JTECH Medical wireless devices. The power supply works with the daisy chain to charge your JTECH Medical wireless devices.

Power supply connection may vary according to the country shipped to

Dimensions	7.8 cm x 5.2 cm x 3.5 cm (3.1 in x 2.0 in x 1.4 in)
Weight	0.16 kg (0.36 lb)
Operating Temperature, Humidity, and Atmospheric Pressure	+40°C +104°F +10°C +50°F 90 % 10 % 106 kPa 50 kPa
Transportation and Storage Conditions	+70°C +158°F -40°C -40°F 100 % 10 % 106 kPa 50 kPa
Input Voltage	100-240 VAC ~
Input Frequency	50-60 Hz
Input Current	0.5 A (rms) for 115 VAC 0.3 A (rms) for 240 VAC
Enclosure Leakage Current	100 uA max. @ 264 VAC, 63 Hz
Maximum Output Voltage/Current	5 V / 3 A ⎓
Maximum Output Power	15 W
Type of Protection against electric shock	⧈ Class II
Manufacturer, Model	JTECH Medical PN: PW012
Protection against harmful ingress of water	IPX0 - ordinary equipment
Degree of Safety of Application in the presence of flammable mixtures	This device is not suitable for use in the presence of flammable anesthetic mixture with air, or with oxygen or nitrous oxide
Symbols	⧈ IPX0 NON STERILE CE

EMC Guidance

⚠	**WARNING:** Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual. Carefully read the information contained in this section.
⚠	**WARNING:** The use of portable and mobile RF equipment can affect the normal operation of medical electrical equipment.
⚠	**WARNING:** Making any modifications or using any accessories not specifically approved by JTECH Medical may reduce immunity to electromagnetic interference or increase electromagnetic emissions.

Guidance and Manufacturer's Declaration - Electromagnetic Emissions		
The Echo Devices are intended for use in the electromagnetic environment specified below. The customer or user of Echo Devices should assure that they are used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 2	The Echo Devices must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected.
RF emissions CISPR 11	Class B	The Echo Devices are suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A and D	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

⚠	**WARNING:** The Echo devices and receiver should not be used while stacked on, or adjacent to, other electrical or medical electrical equipment. If stacked or adjacent use is necessary, all electrical equipment should be observed to verify normal operation.

Guidance and Manufacturer's Declaration - Electromagnetic Immunity			
The Echo Devices are intended for use in the electromagnetic environment specified below. The customer or user of the Echo Devices should assure that they are used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC-61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	The Echo Devices must emit electromagnetic energy in order to perform their intended function. Nearby electronic equipment may be affected.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/ output lines	± 2 kV for power supply lines ± 1 kV for input/ output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	<5 % U_T (>95 % dip in U_T) for 10ms 40 % U_T (60 % dip in U_T) for 100ms 70 % U_T (30 % dip in U_T) for 500ms	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The Echo Devices are intended for use in the electromagnetic environment specified below. The customer or the user of the Echo Devices should assure that they are used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	Portable and mobile RF communications equipment should be used no closer to any part of the Echo Devices, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 800 MHz to 2.3 GHz where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1 - At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 - These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Echo Devices are used exceeds the applicable RF compliance level above, the Echo Devices should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Echo Devices. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [*V*1] V/m.			

Recommended separation distances between portable and mobile RF communications equipment and the Echo Devices

The Echo Devices are intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Echo Devices can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Echo Devices as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter** m		
	150 kHz to 80 MHz **d=1.2√P**	**80 MHz to 800 MHz** **d=1.2√P**	**800 MHz to 2.5 GHz** **d=2.3√P**
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Transmitter and Receiver Specifications

Bandwidth	2.4GHz
Modulation	DSSS
ERP	0 dBm

NORTHSTAR

OBJECTIVE FUNCTIONAL TESTING SYSTEMS

INTAKE EVALUATE ANALYZE REPORT