SENDit™

Wireless Load Cell Interface

Installation Manual

RICE LAKE WEIGHING SYSTEMS

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PN 167466 Rev F

An ISO 9001 registered company

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www.ricelake.com

Contents

1.0 Introduction

The SENDit Wireless Load Cell Interface transmitters and receivers are efficient communication devices that replace the need for traditional wire runs. Compatible with a broad range of transmitting and receiving devices, SENDit is designed to work with ScaleCore-based products as shown in Figure 1-1 on page 3. SENDit transmitters can interface with virtually any strain-gage sensor. This manual provides the details for SENDit and SENDit installation, configuration and calibration.

Manuals and additional resources are available from the Rice Lake Weighing Systems website at www.ricelake.com
Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Safety

Safety Signal Definitions:

DANGER ***Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.***

WARNING ***Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.***

CAUTION ***Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.***

IMPORTANT ***Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.***

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

WARNING

Failure to heed could result in serious injury or death.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not use this unit if any of the components are loose or cracked.

Do not remove or obscure warning labels.

Do not use near water.

Do not place fingers into slots or possible pinch points.

Do not make alterations or modifications to the unit.

There are no user serviceable parts within the SENDit units. Any repairs are to be performed by qualified service personnel only.

1.2 Options

Part No	Description
162172	Charger, SENDit for 6V SLA battery
162173	Battery, SENDit 6V SLA
162175	Enclosure, SENDit for 6V SLA battery
150964	RS-232 13' (4 m) serial cable with 9-Pin (female) connector
150965	RS-232 13' (4 m) serial cable with 9-Pin (male) connector
160110	AC adapter, SENDit (INTL) 6V
162178	Antenna kit, remote standard antenna
139309	Antenna kit, long range Omni with 3 M coax
139310	Antenna kit, corner reflector 9 DBI with 3 M coax
139311	Antenna kit, corner reflector 12 DBI with 3 M coax
139312	Antenna kit, Yagi 15 DBI with 3 M coax
144345	30 M coaxial cable, for use with non-vehicle mount antenna kits
162177	Cordset, SENDit. Pre-wired for use with single channel transmitters or receivers
162184	Load cell connector, SENDit. Field wire-able, 4-6 mm straight.
162185	Load cell connector, SENDit. Field wire-able, 6-8 mm straight.
162186	Load cell connector, SENDit. Field wire-able, 4-6 mm right angle.
162187	Load cell connector, SENDit. Field wire-able, 6-8 mm right angle.

Table 1-1. Options

1.3 Overview

The SENDit offers an effective wireless load cell cable replacement in systems where it would be difficult to have a load cell cable. Replacing the cable with an RF link, the output is then set to match the device that the cable was connected to.

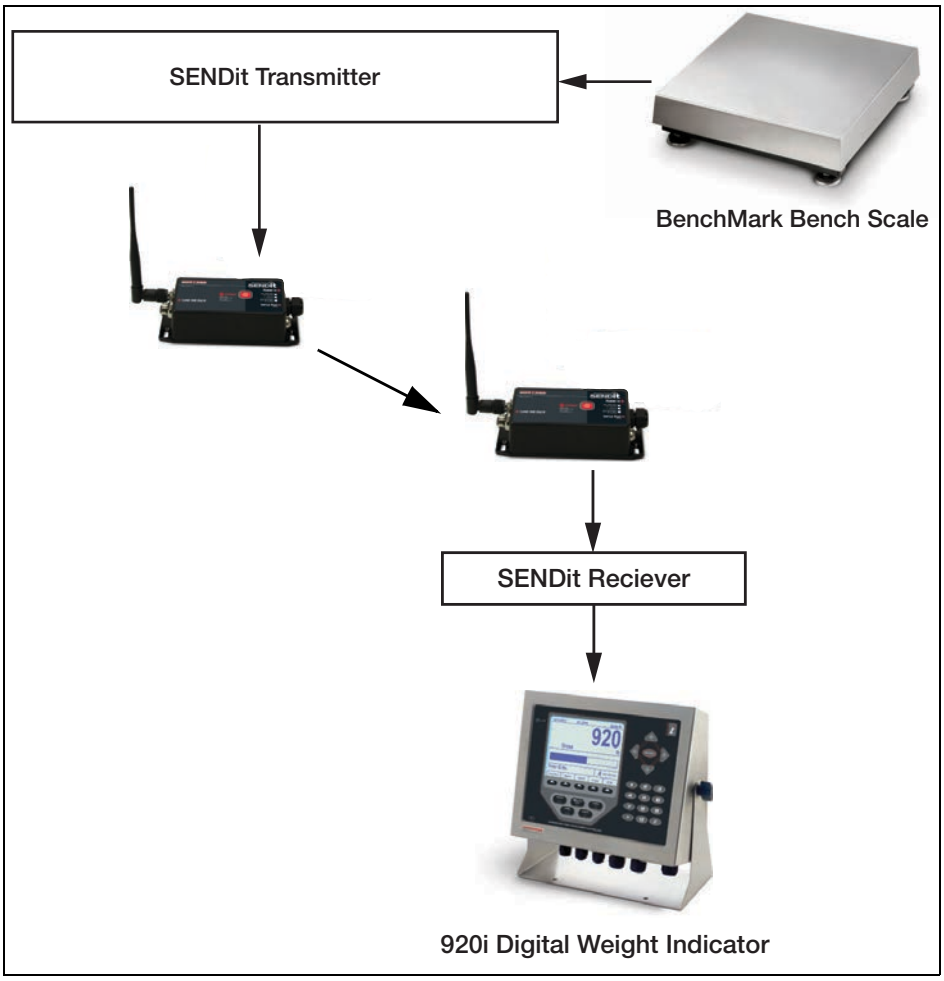


Figure 1-1. SENDit Connectivity

1.4 Front Panel

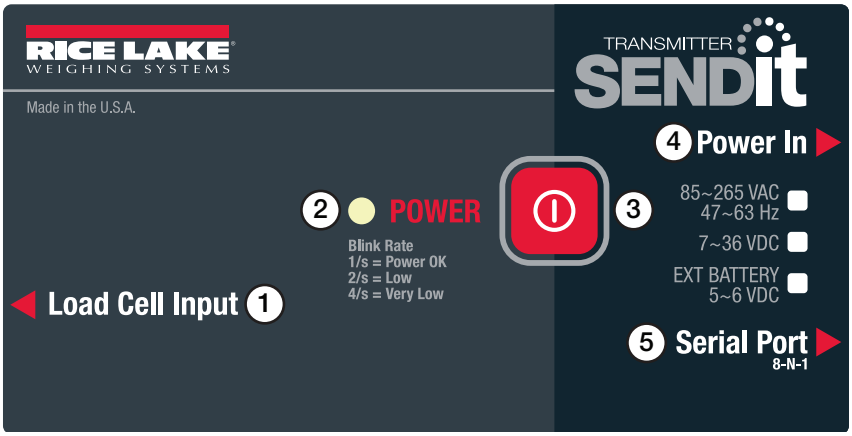


Figure 1-2. Transmitter Front Panel

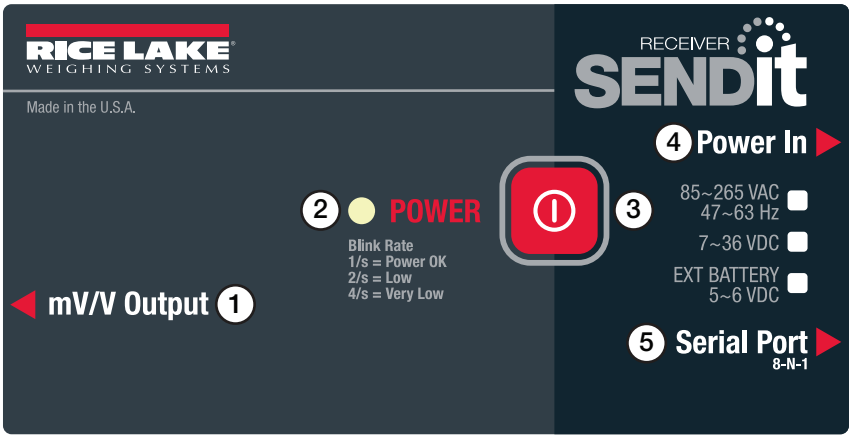


Figure 1-3. Receiver Front Panel

Item No.	Description
1	Load Cell connector (Transmitter) - located on the side of the unit. mV/V Output (Receiver) - located on the side of the unit.
2	Transmitter Power LED – Indicates state of indicator power. Steady short blinks – good battery (or AC power). Two blinks then a pause – low battery. Four blinks then a pause – very low battery. Receiver Power LED – Indicates state of indicator power. Steady short blinks – RF connected, good battery (or AC power). Two short blinks then a pause – RF connected, low battery. Four short blinks then a pause – RF connected, very low battery. Steady long blinks – RF disconnected and good battery (or AC power). Long blink, short blink then a pause – RF disconnected and low battery. Long blink, three short blinks – RF disconnected and very low battery.
3	Power Button Press & release – turns unit on Press & hold for one to four seconds – will auto zero Press & hold five seconds – turns unit off
4	Power In Connection – Located on the side of the unit. Type of power source will be checked on the overlay. All SENDit units are currently 5-6 VDC.
5	Serial Port – located on the side of unit.

Table 1-2. Front Panel

2.0 Installation

This section describes procedures for connecting load cell, power, and serial communications cables to the SENDit.

2.1 Unpacking and Assembly

SENDit transmitter and receiver units are factory paired. Take care when unpacking orders of multiple units to keep the paired sets together. In the event a transmitter or receiver must be replaced or the units must be re-paired, see Figure 2-3 on page 6 for paring information.

Immediately after unpacking, visually inspect the contents to ensure all components are included (refer to the packing list) and undamaged.

If any parts were damaged in shipment, notify Rice Lake Weighing Systems, and the shipper immediately.

2.2 Mounting the Enclosure

The SENDit can be mounted either vertically or horizontally to a flat surface.

If mounted inside an enclosure or I-beam, use the correct antenna for the environment and distance. Please call Rice Lake Weighing Systems if assistance is needed to select an antenna, or reference the antenna selection guide in the appendix.

Note ***Antennas must be placed in appropriate line-of-sight for reliable communications. Ensure antennas are securely connected to both the transmitter and receiver.***

IMPORTANT ***A standard antenna and coax connector are resistant to water, but not waterproof. Seal the TNC base with an adhesive heat shrink boot if antenna is exposed to water.***

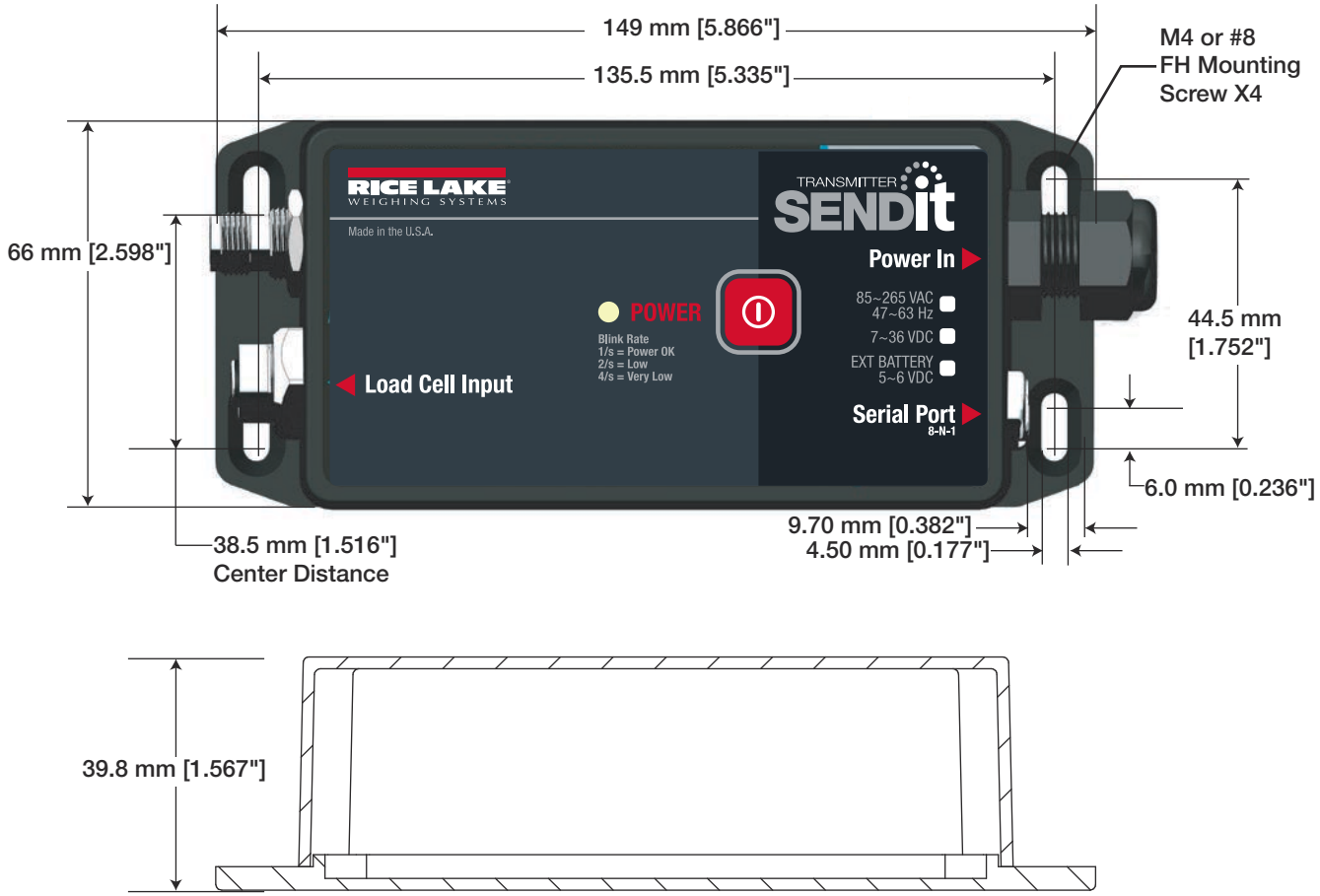


Figure 2-1. Mounting Dimensions

2.3 Cable Connections

2.3.1 Connect Transmitter

Using the optional pre-wired cable (Table 2-1) or the field wire-able connector (Figure 2-2), connect a SENDit transmitter to the load cell or j-box; eliminating the need for a homerun cable.

Note ***See Section 4.0 on page 9 for calibration procedure.***

SENDit Load Cell Wiring

Use cordset PN 162177

SENDit Connector Pin #	Wire Color	Function
1	Brown	+Excitation
2	White	-Excitation
3	Blue	+Signal
4	Black	-Signal

Table 2-1. Load Cell TB-Input Device

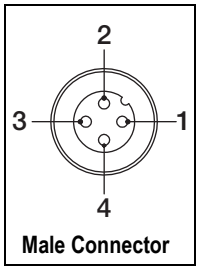


Figure 2-2. Field Wire-able Connection

2.3.2 Connect Receiver

1. Connect the power source (Table 2-2) to the transmitter.
2. Using a 9 pin serial cable, connect the transmitter to a computer. This allows setup with the *MSI TranSend mV/SENDit Receiver Calibration* program. See Section 4.0 on page 9.

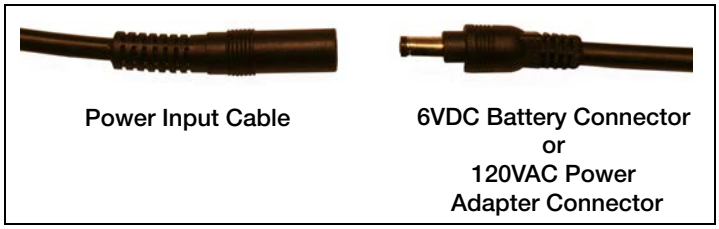


Figure 2-3. Power Input Wiring

Part No	Description	Comments
162172	6V Battery Charger	Universal Power, US Plug. Requires changing plug type for international sales.
162173	6V Battery Option Kit	Battery (161679) and interface cable (159817)
162175	Enclosure for 6V SLA Battery	Used for installations where the battery needs to be rigidly mounted.
160109	6V Wall Cube, US Plug	Power Adapter, 12W 6VDC Wall Mount. Universal Input 90-264VAC. 2.1mm Coax Power Plug. US, Canada, Japan
160110	6V Wall Cube, International Plugs	Power Adapter, 18W 6VDC Wall Mount. Universal Input 90-264VAC. 2.1mm Coax Power Plug. Contains blades for international mains. US, UK, Europe, Aus, China

Table 2-2. Power Connection Options

3.0 RF Pairing

IMPORTANT ***Keep paired sets together when unpacking multiple sets of SENDit transmitter and receiver units.***

3.1 Pairing Receivers and Transmitters

SENDit transmitter and receiver units are factory paired. Take care when unpacking orders of multiple units to keep the paired sets together. In the event a transmitter or receiver must be replaced or the units must be re-paired, use the following instructions to pair the SENDit receiver and transmitter units. The *MSI mV Scale Calibration* software can be downloaded from the Rice Lake Weighing Systems website.

1. Power on the transmitter and receiver units.
2. On the connected computer, navigate to the *MSI mV Scale Calibration* program.
3. Double click MSI mV Scale Calibration.exe. Select ***RF Pairing*** from the drop-down menu.

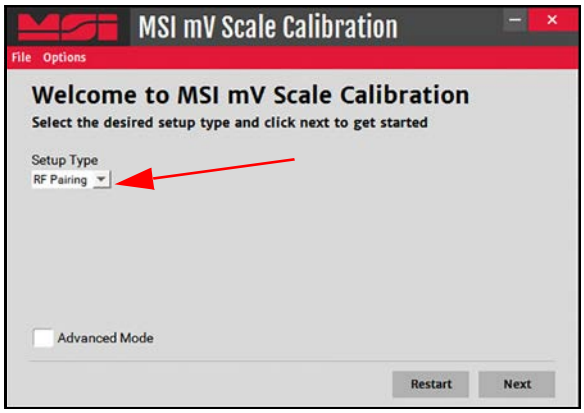


Figure 3-1. RF Pairing

4. Press **Next**.
5. Select the COM port the SENDit receiver is connected to.

Note ***If no Com Port selection is available, ensure the serial cables are properly connected, the Drivers are installed properly, and that the SENDit Pair is powered up. Once an acceptable connection has been made, restart the Calibration program.***

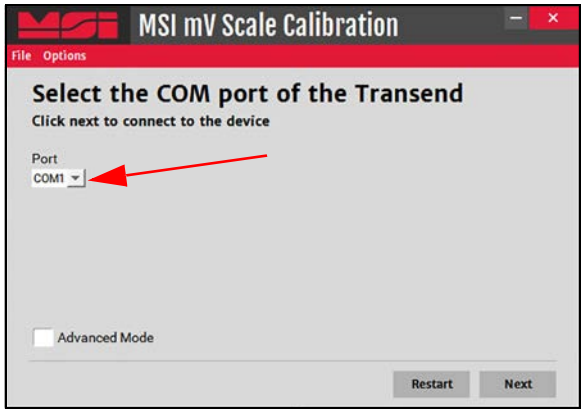


Figure 3-2. COM Port Selection

6. Enter the RF Channel and network ID.

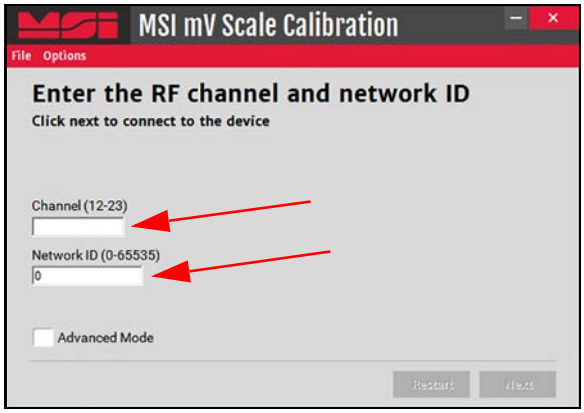


Figure 3-3. RF Channel and Network ID

7. Press **Next**.
8. Connect the transmitter to the computer and select its COM port. If the computer has only one COM port, disconnect the receiver and then connect the transmitter to the port.
9. Press **Next**. The set up is complete.
10. Power cycle both units and the units are ready for use.

If the pairing is not successful, repeat the above procedure until a successful pairing is obtained.

4.0 Calibration

Use the following instructions to calibrate the SENDit receiver unit. The *MSI mV Scale Calibration* software can be downloaded from the Rice Lake Weighing Systems website.

1. Power on the transmitter and receiver units.
2. On the connected computer, navigate to the *MSI mV Scale Calibration* program.
3. Double click MSI mV Scale Calibration.exe.
4. Select ***Calibration*** from the drop-down menu.

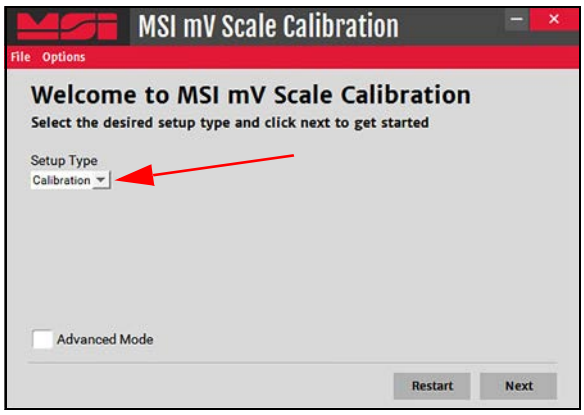


Figure 4-1. Calibration

5. Press **Next**.
6. Select the COM port the SENDit receiver is connected to from the drop-down menu.

Note ***If no Com Port selection is available, ensure the serial cables are properly connected, the Drivers are installed properly, and that the SENDit Pair is powered up. Once an acceptable connection has been made, restart the Calibration program.***

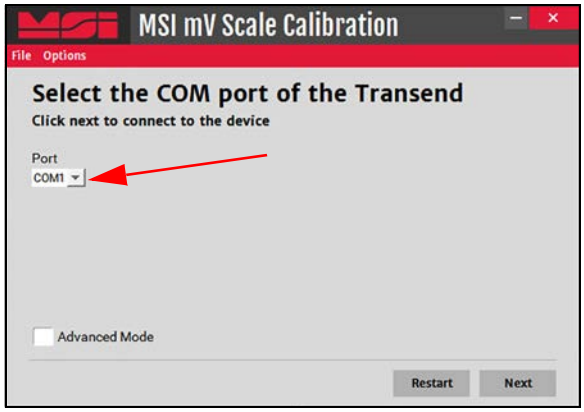


Figure 4-2. COM Port Selection

7. Check the ***Advanced Mode*** dialogue box to change the upper and lower range percent detected by the SENDit system, if necessary.

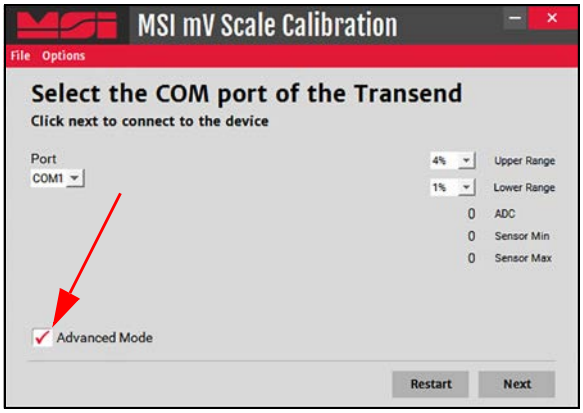


Figure 4-3. Advanced Mode

8. Press **Next**.
9. Enter the total scale capacity.

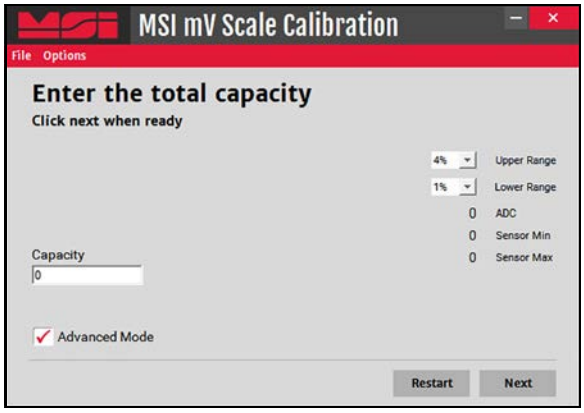


Figure 4-4. Scale Capacity

10. Press **Next**.
11. Remove all weight from the scale.

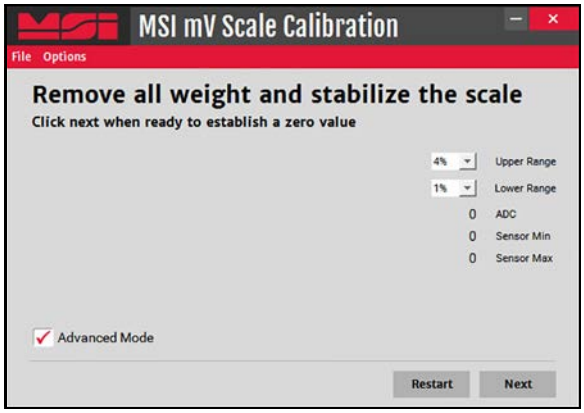


Figure 4-5. Zero Calibration

12. When scale is stable, press **Next**.

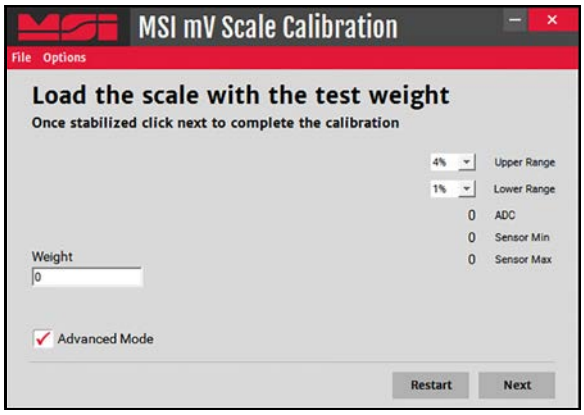


Figure 4-6. Span Calibration

13. Load test weights onto the scale.
14. Enter the appropriate weight value in the weight dialogue box.
15. Press **Next**. ***Calibration Complete*** displays.

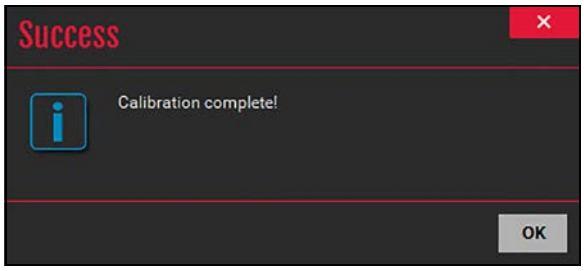


Figure 4-7. Calibration Complete

16. Press **OK** to return to the calibration start display.
17. Calibrate the indicator, see the indicator manual for instructions.

5.0 Appendix

5.1 Antenna Options

Note ***To meet FCC licensing rules, use only antennas supplied or recommended by Rice Lake Weighing Systems.***

Antenna placement is critical to problem-free use of the system.

- Ensure a relatively clear transmission path exists between the devices to be connected. Radio signals travel primarily by line of sight (LOS), obstructions between stations may degrade the system performance.
- When using a long range antenna, mount antenna on an elevated structure to ensure there is a clear LOS transmission path. This ensures the antenna will clear surrounding obstructions. Do not provide a ground plane for the antenna.
- Fixed station locations often benefit from directional antennas when the location of the other components of the RF network are fixed and/or in the same direction. Never use a directional antenna on a mobile system.
- If using the standard antenna, ensure the antenna is not blocked by any metal. Transmission is good through most kinds of glass so mounting a meter next to a window will work fine. If there is no clear line of sight location to mount the receiving device, consider switching to the long range antenna so the antenna can be set up remotely.
- The standard and long range antennas are vertical plane devices. They should be vertical, pointing up or down, when high off the ground. Do not mount them sideways. The long range 9 dBi antenna is particularly sensitive to off axis mounting. Use a level to ensure the antenna is exactly 90° perpendicular to the earth.
- Do not mount an omni-directional antenna next to metallic or concrete surfaces. This can result in reflections and undesired RF characteristics. Use a corner reflector instead.
- After installation, seal the antenna connection with an adhesive heat shrink boot. Failure to seal the antenna may result in liquid destroying the antenna and device it's connected to.

Note ***Rice Lake Weighing Systems does not recommend extending the coaxial cable beyond three meters. At 2.4 GHz more loss will result from coax losses than are gained by raising the antenna. If the antenna must be extended, use a very low loss 50 ohm coax such as RG-214, RF-195, or other low loss varieties.***

For very short extensions (<1m), cables made with RG-316 are suitable.

ANTENNA FCC STATEMENT

FCC ID: HSW-2450M

NOTE: This unit has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

RADIO FCC STATEMENT

Contains FCC ID: MCQ-PS2CTH

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

INTERNATIONAL RADIO CERTIFICATIONS

CANADA:

Radio Certificate Number: IC 1846A-PS2CTH

AUSTRALIA & NEW ZEALAND:

DIGI-090F15C247

The product is compliant with the following standards and/or other normative documents:

- Safety (article 3.1A) EN60950-1:2001
- EMC (article 3.1b) ETSI EN 301 489-1 v1.7.1 (2007-04) In accordance with the specific requirements of ETSI EN 301 489-17 v1.2.1 (2002-08)
- Spectrum (article 3.2) ETSI EN 300 328 v1.7.1 (2006-10)

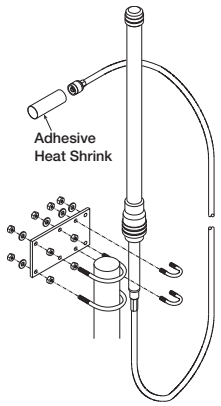
5.1.1 Standard Antenna

The standard antenna is an articulated 1/2 wave 2 dBi gain design with a standard TNC connector that mounts directly on the enclosure.

This antenna and coax connector, though resistant to water, is not water-proof. Seal the TNC base with an adhesive heat shrink boot if this antenna might be exposed to rain or other weather conditions where it could get wet.

This antenna must be vertically oriented and is suitable for most short to medium range applications.

5.1.2 Long Range OMNI 9 dBi Antenna



This omni-directional high gain antenna is remotely mounted with a low loss coaxial cable and increases the range up to four times.

The antenna must be vertically mounted. The vertical Beamwidth (-3dB point) is 14 degrees.

This antenna is supplied with a 10 foot (3m) coax cable pre-attached. The 10-foot cable allows placement of the antenna above the unit for ease of clearing possible obstacles to data transmission.

It is also available with an N connector for applications requiring longer coax cable lengths.

5.1.3 Vehicle Mount Whip Antenna

The vehicle mount whip antenna mounts directly to the roof of mobile vehicles and is weatherproof.

This 5 dBi gain whip mounts in a 3/4" hole on the roof of the vehicle.

The mount includes 17' of low loss coax terminated in a TNC connector.

5.1.4 YAGI Antenna

For maximum range, a 14 dBi gain Yagi Antenna is available by special order. Please contact Rice Lake Weighing Systems for details.

5.1.5 Corner Reflector Antenna

Corner reflector antennas are often the best choice for a wall mounted antenna. Rice Lake Weighing Systems offers a 14 dBi and a 9 dBi corner reflector.

14 dBi Corner Reflector

9 dBi Corner Reflector

5.1.6 Patch Antenna

The patch antenna is for applications where the standard antenna is vulnerable to physical damage or outdoor applications.

The patch antenna is mildly directional which requires more care in antenna placement for long range applications. Patch antennas are available by special order only. Please contact Rice Lake Weighing Systems for details.

6.0 Specifications

Accuracy:	±0.05% of applied load
Resolution:	Up to 10,000 d available
Enclosure:	NEMA 4, IP66 (excludes universal AC wall cube model) aluminum, black powder coated
Weight:	1.7 lb (0.75 kg)
Function Keys:	POWER
LED Annunciators:	Power on LED
Power Input:	5-6 VDC, 90-264 VAC (with optional AC/DC power adapter)
Optional Battery Life Estimate:	Over 130 hours of continuous use with the battery option
Operating Temperature:	-40° F to 185° F (-40° C to 85° C)
Auto-Off Mode:	Select for 15, 30, 45, 60 minutes or off
Auto Sleep Mode:	Power down during non-use and power up with weight change or any key press
Service Counters:	Counts number of loads applied over 25% of capacity and loads applied over capacity
Event Counter:	Counts number of loads applied over a user defined threshold. outputs to setpoints and a text string
Scale Inputs:	One scale input Four independent scale channels with digital summing
Transmitter Excitation Voltage:	+4.75 VDC, can drive (16) 350 Ω load cells or (32) 700 Ω load cells
mV/V Converter Excitation Voltage:	3 VDC or ±1.4 VDC minimum, 12 VDC or ±6 VDC maximum
Digital Filtering:	OFF, LO, Medium and HI selectable
Radio Link:	Direct sequence spread spectrum @ 2.4 GHz, license free 802.15.4
Radio Link Effective Range:	Up to 100 meters line-of-sight typical
Standard Antenna:	1/2 wave 2 dBi, articulated
RFI/EMI Shielding:	Exceeds NIST handbook 44 and CE standards
Data I/O:	RS-232
Connectors:	RS-232, 6-Pin M8
Internal Setpoints:	3 configurable setpoint outputs Offers setpoint relays, and setpoint status LED's

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WEIGHING SYSTEMS

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