
SR Scales®

by SR Instruments, Inc.

MODEL SRV711



**Remote Display
Zoological Platform
Scale System**

Operating and Service Manual

Serial Number: 149+

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PACKING CHECKLIST – Model SRV711 Remote Display Zoological Platform Scale System

√	DESCRIPTION	QUANTITY
	DISPLAY UNIT	1 ea
	SCALE PLATFORM	1 ea
	DISPLAY CABLE	1 ea
	PACKAGE OF SIX (6) “D” CELL BATTERIES	1 ea
	QC INSPECTION SHEET	1 ea
	CALIBRATION CERTIFICATE	1 ea
	WARRANTY CARD	1 ea
	MANUAL	1 ea

ASSEMBLY

STEP 1: Unpack the scale system and check parts against the **PACKING CHECKLIST**. If there are any missing or damaged parts, please call the Service Hotline: 1-800-654-6360.

#	PART NAME
1	Display Unit
2	Scale Platform
3	Display Cable

STEP 2: Verify that the serial number on the Display Unit (1) matches that on the Scale Platform (2).

STEP 3: Holding Scale Platform on its side, connect the Display Cable (3) to the cable connector on the scale. **Note:** For safety reasons, it is recommended that the cable be either run through a conduit or run internally through the wall.

STEP 4: Carefully lower the Scale Platform to the floor making sure not to crimp the Display Cable (3). **Note:** If it is run through conduit, pull any slack in the cable up through the Conduit.



Figure 1: Display and Wall Bracket

STEP 5: (Figure 1) Mount the Display on the wall at desired height and location by mounting two screws to the wall and mating the mounting bracket on the back of the display to the screws on the wall.



Figure 2: Example Zoological Application

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REPLACEMENT PARTS and ACCESSORIES

Part #	Description
ES7485	Display Label
PF1904-2	Plastic Foot
FCS3152-3	Cable Assembly 65”
FCS3152-2	Cable Assembly 42”

SYSTEM DESCRIPTION and INTENDED USE

SYSTEM DESCRIPTION

The SRV711 Remote Display Zoological Platform Scale System employs the latest in microprocessor and load cell technology to provide accurate and repeatable weight data. Four (4) identically matched transducers are strategically placed to ensure an accurate representation of the animal's weight.

The animal's weight is displayed on a 16-character dot matrix LCD. With a push of a button, weight data may be viewed, in either pounds or kilograms, with a displayed resolution of 0.1 lb or 0.1 kg for each.

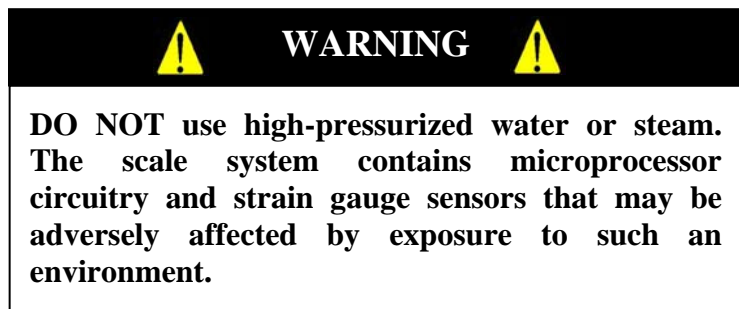
INTENDED USE

The SRV711 Remote Display Zoological Platform Scale System is designed for use as a weighing system for animals up to 1000 pounds or 454 kilograms.



MAINTENANCE and CLEANING

The SRV711 readout for the Remote Display Zoological Platform Scale System is made of a powder-coated aluminum casting. Exercise caution when cleaning the display window as it is made of clear polyester and can be scratched by abrasive cleaners. Mild soap and water is recommended for general cleaning and disinfecting.



STORAGE and TRANSPORTATION

If storing this equipment for periods longer than three (3) months, remove the batteries. To maintain proper operation of this instrumentation, storage and transport conditions should not vary outside the following conditions: Relative Humidity 0% to 85%, Ambient Temperature 14°F to 122°F (-10°C to +50°C).

SPECIFICATIONS

MAXIMUM WEIGHT CAPACITY	1000 lb or 454 kg
PLATFORM SIZE	36 3/16 in x 54 1/8 in x 2 3/4 in (92 cm x 137 cm x 4 cm)
DISPLAY TYPE	16-Character dot-matrix LCD
DISPLAY RESOLUTION	0.1 lb or 0.1 kg
ACCURACY	0.2% +/- 1 digits of displayed resolution for calibrated range
AUTO ZERO	One button operation
AUTO POWER DOWN	After 5 minutes
HOLD	Temporarily stores displayed reading in memory
LAST WEIGHT RECALL	Press hold button to recall last stored displayed reading
AVERAGING	Automatic digital filter
POWER SUPPLY	Six (6) “D” cell batteries
CALIBRATION	Calibration is traceable to NIST standards
OPERATING CONDITIONS	Normal operating conditions for this product: Ambient Temperature Range: 40°F to 95°F (5°C to 35°C), Relative Humidity Range: 0%-85%. Avoid exposure to high-pressure water or steam.
STORAGE and TRANSPORTATION	Storage and transport conditions should not vary outside the following conditions: Relative Humidity 0% to 85%, Ambient Temperature 14°F to 122°F (-10°C to +50°C). Remove batteries if storing longer than three (3) months.

BUTTON FUNCTIONS



Figure 3: SRV711 Display Label

ZERO



The “**ZERO**” button is used to zero the system before placing a patient onto the scale system. When pressed, the display message will indicate “**PLEASE WAIT**” “**HANDS OFF**”. Ensure that nothing is in contact with the scale system during this procedure. The display will read “**WEIGHT 0.0 LB**” (or **KG**).

WEIGH



The “**WEIGH**” button wakes up the display and shows the patient’s weight if it should Auto Power Down before the weighing process is done.

HOLD



The “**HOLD**” button freezes the displayed weight and stores it away in memory. Press “**HOLD**” to store the weight into memory. To recall last weight reading, press “**HOLD**”.

LB/KG MODE



Weight data may be viewed in either pounds or kilograms. Pressing the “**LB/KG MODE**” button allows the operator to toggle between the two readings. Both pounds and kilograms are displayed in a resolution of 0.1.

BASIC SYSTEM OPERATION

SETTING SYSTEM ZERO



Make sure scale is free and clear of any obstructions and press the “**ZERO**” button. The displayed message will indicate “**ZERO**” “**PLEASE WAIT**” “**HANDS OFF**” “**PLEASE WAIT**”. Ensure that nothing is in contact with the scale while zeroing the system. In a few seconds, the display will read “**WEIGHT 0.0 LB**” (or **KG**). **Note:** It is recommended that the system be zeroed prior to each new patient.

After the scale has been set to zero, position the patient on the scale. The patient’s weight will be displayed in either pounds or kilograms.

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BASIC SYSTEM OPERATION Cont'd

CONTINUOUS WEIGH

In this default mode, the weighing surface remains active. Press the **“HOLD”** button once to lock the displayed reading and store it in memory as the **“last weight”** for recall later.

AUTO-HOLD

This mode is for patients unable to remain still for the weighing procedure. It locks, stores, and displays the patient’s weight as soon as the **“WEIGH”** button is pressed once. **Note:** No weight will be displayed until the button is pressed.

To enable this mode, before zeroing the system, press and hold the **“HOLD”** button for approximately five (5) seconds until the display reads **“AUTO-HOLD ENABLED”**.

To return to CONTINUOUS WEIGH mode when finished, press and hold the **“HOLD”** button for approximately five (5) seconds until the display reads **“CONTINUOUS WEIGH”**.

BATTERY REPLACEMENT

STEP 1: The display will read **“REPLACE BATTERIES”**.

STEP 2: (Figure 4) Unscrew the panel screw on the Battery Compartment Cover and remove the Battery Compartment Cover

STEP 3: Remove and replace ALL 6 “D” cell batteries. Refer to diagram in the battery compartment for placement.

STEP 4: Press the **“WEIGH”** button to confirm display is working

STEP 5: Secure the battery cover using the panel screw.

STEP 6: Zero the system.



Figure 4: Battery Compartment Cover and Panel Screw

THEORY OF OPERATION

SR Instruments patient weighing systems are digital scales. Strain-gauge force cells convert the force of an applied weight into an analog signal. This signal is amplified by an operational amplifier and converted to a digital signal by an analog to digital converter. The digital signal is transferred to a micro-controller where it is filtered, converted to appropriate units and displayed on a liquid crystal display.

Strain-gauge force cells each contain four strain gauges mounted in a full Wheatstone-bridge configuration. These bridges convert the physical movement of the force cell, due to the applied mass on the system, into minute changes in electrical resistance. These changes in resistance produce a voltage difference across the Wheatstone-bridge, which is amplified by the operational amplifier. The amplifier is configured to current sum the output of each cell, with potentiometers serving to adjust the sensitivity (voltage out per unit of weight applied) of each bridge. The offset potentiometer produces a small current, which nulls the output of the amplifier for an unloaded system.

The output of the operational amplifier is digitized by the analog to digital converter. The converter integrates the analog signal onto the integrating capacitor over a short interval. The integrating capacitor is then discharged at a rate proportional to the reference voltage applied to the converter. The residual voltage on the integrating capacitor is then multiplied by a factor and again discharged at a rate proportional to the reference voltage. The residual voltage from this discharge is again multiplied by a factor and again discharged. The time taken to discharge the capacitor is proportional to the voltage from the operational amplifier, which is proportional to the applied load on the force cells. The time is stored as a binary number in the analog to digital converter and is transferred to the micro-controller when the conversion is complete.

The micro-controller averages and filters the digital output of the analog to digital converter, subtracts the value saved during the system zero operation and scales the filtered output, then displays the result on the liquid crystal display. The micro-controller performs a rolling average of data for continuous weigh and, for AutoHold, the micro-controller averages the data before locking in on the reading. If the data variance is greater than 0.1% in the AutoHold mode, the micro-controller will reset the filter and start a new averaging period.

The micro-controller can be placed in a calibration mode, where the system can be re-calibrated. In the calibration mode, the result of the weigh operation is scaled to match the value by adjusting the “up” and “down” calibration buttons. This new calibration factor is then stored in the non-volatile memory.

CALIBRATION

IMPORTANT

CALIBRATION CHECK - Qualified service personnel only should perform this procedure. Load cells have no user serviceable components and should not be tampered with for any reason. Re-calibration is generally not required, but should be verified periodically to ensure accuracy. Recommendation for calibration check is at least once every 12 months, or as individual maintenance policy requires.



Figure 5: Internal Calibration Button Diagram

Note: Ensure that nothing is in contact with the scale system during this procedure. Remove hands from the system when noting the displayed calibration results.

STEP 1: (Figure 5) Simultaneously press and hold the hidden calibration buttons on the label (“+” and “-”). The display will read “**HOLD TO CAL**” as the right hand digit counts down from 9 to 0 to enter the CAL mode.

STEP 2: When in the CAL mode, press the “**ZERO**” button to zero the display.

STEP 3: Place a known calibrated weight, traceable to NIST, onto the weighing surface and compare it to the displayed reading. **Note:** DO NOT USE barbell weights or calibrate to a mechanical scale.

STEP 4: Use the “+” and “-” buttons to make any necessary adjustments to the displayed value. The displayed value should be within 0.1% of the calibrated weight, plus or minus 1 digit of reading.

STEP 5: When adjustments are completed: Press the “**HOLD**” button to SAVE the settings, or press the “**WEIGH**” button to CANCEL. Both choices will EXIT the CAL mode.

CALIBRATION TOLERANCE TABLE		
LOW LIMIT	APPLIED LOAD	HIGH LIMIT
99.8	100.0	100.2
199.6	200.0	200.4
299.4	300.0	300.6
399.2	400.0	400.8
499.0	500.0	501.0
598.8	600.0	601.2
698.6	700.0	701.4
798.4	800.0	801.6
898.2	900.0	901.8
998.0	1000.0	1002.0

CAUTION

The integrated circuits and semiconductors on the printed circuit boards may be damaged by electrostatic discharge (ESD). Be sure to use proper handling precautions at all times.

INITIALIZATION

INITIALIZATION PROCEDURE

To be used ONLY IF REPLACING IC5 or if DISPLAY READS DOUBLE

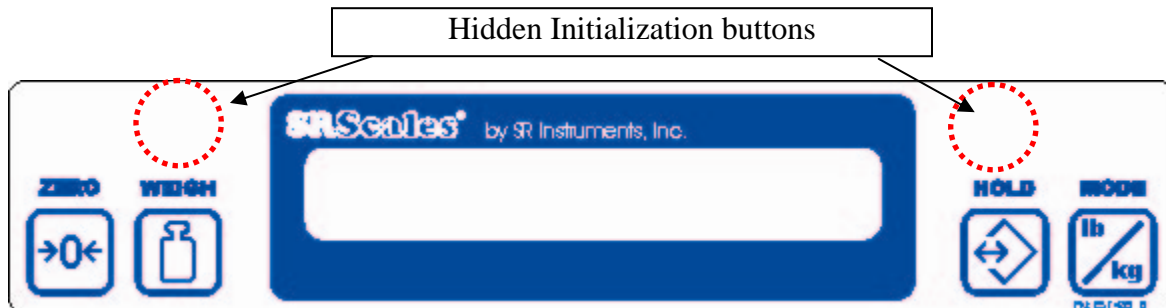
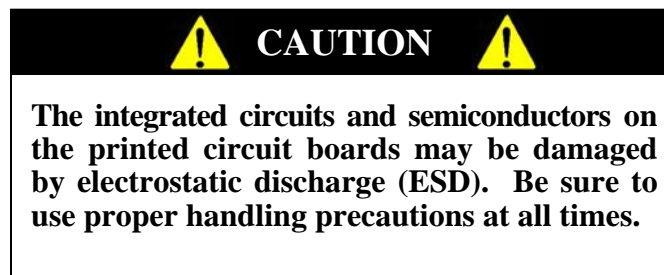


Figure 6: Location of Hidden Initialization Buttons

STEP 1: (Figure 6) The Initialization buttons are hidden in the label in the positions indicated.

STEP 2: Simultaneously press buttons indicated to initialize the system. The display will read, "HOLD TO INIT" and count down from 9 to 0. When initialization is complete, the display will read "INITIALIZING" and then return to the WEIGH mode.

STEP 3: Follow the **CALIBRATION** procedure.



TROUBLESHOOTING

SYMPTOM	REASON/CORRECTIVE ACTION
Display reads twice as much weight as it should	Follow initialization procedure then the calibration procedure.
Display flashes “weighing”	Check weigh switch on label for damage (from pens, etc.)
For additional information or assistance, telephone the Service Hotline: 1-800-654-6360 or e-mail: sri@srinstruments.com	

WARRANTY

TWO (2) YEAR LIMITED WARRANTY

Each **SR Scales**® system is manufactured with high quality components. SR Instruments, Inc. warrants that all new equipment will be free from defects in material or workmanship, under normal use and service, for a period of two (2) years from the date of purchase by the original purchaser. Normal wear and tear, injury by natural forces, user neglect, and purposeful destruction are not covered by this warranty. Warranty service must be performed by the factory or an authorized repair station. Service provided on equipment returned to the factory or authorized repair station includes labor to replace defective parts. Goods returned must be shipped with transportation and/or broker charges prepaid. SR Instruments, Inc.'s obligation is limited to replacement of parts that have been so returned and are disclosed to SR Instruments, Inc.'s satisfaction to be defective. The provisions of this warranty clause are in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on SR Instruments, Inc.'s part, and it neither assumes nor authorizes any other person to assume for SR Instruments, Inc. any other liabilities in connection with the sale of said articles. In no event shall SR Instruments, Inc. be liable for any subsequent or special damages. Any misuse, improper installation, or tampering, shall void this warranty.

DAMAGED SHIPMENTS

Title passes to purchaser upon delivery to Transportation Company. Any claims for shortage or damage should be filed with the delivery carrier by purchaser.

RETURN POLICY

All products being returned to SR Instruments, Inc. require a Return Goods Authorization number (RGA). To receive an RGA, call our Technical Service Team at 716-693-5977 or toll-free in the USA and Canada at 800-654-6360.

When inquiry is made, please supply model and serial numbers, purchase order, if the scale was bought on contract, and reason for return.

Generally, deleted, damaged, and outdated merchandise will not be accepted for credit. A minimum restocking charge of 15% will be assessed on return of current merchandise.

All returns are to be shipped **FREIGHT PREPAID** to: SR Instruments, Inc., 600 Young Street, Tonawanda, NY 14150.

RESTOCKING FEE

- **15% fee** for any scale that has been opened and used
- **10% fee** for any scale returned that has been ordered incorrectly or refused delivery with no model change
- **5% fee** if an error in ordering has been made and a different model exchanged
- **No fees** will be charged if the scale is returned because of an error on the part of SR Instruments, Inc.
- **No returns** accepted after 60 days.

SRScales®

By **SR**® Instruments, Inc.

**Precision & Technology in
Perfect Balance®**