SMART WEIGHING SOLUTIONS

In Motion Axle Scale

Installation Guide

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1.Introduction

1.1. Overview

Thank you for your purchase of a Rinstrum In-Motion Axle Scale. Correct installation and maintenance of the scale is important for accuracy and achieving trouble free operation. Below is an overview of the installation.

1.2. Site Preparation

- Flat and level approach to and from the scale platform equal to the distance of the vehicle being weighed.
- Recommend a minimum of 80 foot "flat and level" approach on either side of the scale. Failure to provide suitable approach may affect scale accuracy.
- A poured concrete approach to the scale is not required but will improve accuracy and reduce maintenance - a minimum of a 10 foot poured concrete approach is recommended.

1.3. Foundation

- Scale should rest on a 12 inch bed of CA-6 Structural Fill (crushed stone).
- Two 6 inch layers of CA-6 structural is required, each 6 inch layer of fill to be compacted to a dry density of 95% in compliance with ASTM "D 698".
- Fill should extend at least 1 foot beyond limits of the scale
- Top layer to be "Flat and Level" to within 1/8 inch for best results.
- Installer is responsible for providing foundation drainage to prevent frost heave.

1.4. Drainage

- Suitable drainage is required to prevent water accumulation in the scale and to prevent potential frost heave.
- The scale has a 4 inch Schedule 40 PVC drain connection point. Drain outlet must be connected to gravity or rock (French) drain.

1.5. Power

- 120VAC power required at point where controller is to be installed.
- Outdoor applications use buried 1 inch conduit to supply power.
- Indoor applications use 120VAC duplex outlet.
- There is a soft power on/off function that retains memory of its state. Once an instrument is turned on it will automatically start up again if the external power is interrupted.

1.6. Cabling

- Scale is provided with up to 100 feet of home run cable that should be run in 1 inch conduit between scale and controller.

1.7. Controller

- Standard controller is a 12 X 14 X 8 inch fiberglass enclosure with door mounted printer and red/green traffic control lights on both sides. Controller can be mounted indoors or a protected outdoor environment. Controller should not be exposed to direct sunlight or driving rain without additional protection.

Reference drawing P057-600

1.8. Equipment for Scale Installation

- Transit, measuring tape, shovel, rake, plate compactor or equivalent
- Suitable parts to mount Controller
- Backhoe or equivalent
- Minimum of approximately 14 ton of CA6 Limestone road-pack (Note: soft ground will require a minimum of 6-8” of 2”stone under the CA6)
- Crane or equivalent to set scale: Use provided 3/8” chain pick points (4 places) to lift scale

2.Specifications

Capacity	40,000 lbs (20t) per axle
Display Resolution	20 lbs (10kg)
Operating Speeds	Structurally Certified for "in road use" at 40 mph up to 50,000 lbs (22.7t) Recommended 2-3 mph (5km/h) Speed error above 7 mph
Static Overload	150% overload on 80,000 lbs load cells = 120,000 lbs (60t)
SCALE	
Precast foundation	Dimensions: 8.5 x 12 x 11.5' (2.6 x 3.7 x 3.5m) Weight: 16,000 lbs (7.3t)
Scale Insert	Dimensions: 2.5' x 11' x 5" (0.76 x 3.4 x .125m) Weight: 1,500 lbs (0.7t)
Mounting Assembly	Outboard, In-tension cradle assembly, self-contained
Load Cells	4 x 20,000 lbs (10t) folded shear beam load cells Stainless Steel, Hermetically Sealed, IP68 ingress Protection, M12 Watertight connectors
ELECTRONICS	
Zero Cancellation	+/- 2.0mV/V
Span Adjustment	0.1mV/V to 3.0mV/V
A/D Type	24bit Sigma Delta with ±8,388,608 internal counts
Operating Environment	Temperature: ambient 5 ℉ to 140 ℉ (–15 to +60℃) Humidity: <90% non-condensing
Display	LCD with 4 alpha-numeric displays and LED backlighting: Primary display: 6 x 1.12" (28.4mm) high digits with units and annunciators 2nd display: 9 x 0.7" (17.6 mm) digits with units 3rd display: 8 x 0.2" (6.1 mm) digits 4th display: 4 x 0.3" (7.6 mm) digits
Serial Outputs	Serial 1A: RS-232 serial port for remote display, network or printer supports. Serial 1B: RS485 transmit only for remote display
Battery Backed Clock Calendar	Battery life 10 years minimum
Additional Communications *	Module: RS232/RS232 Module: RS232/RS485 Module: RS485/RS485
Data Storage Device *	1
Ethernet TCPIP*	1
SITE REQUIREMENTS	
Approach – customer provided	Minimum 80' (25m) "flat and level" approach on either side of the scale recommended A poured concrete approach to the scale is **not** required but will improve accuracy. Minimum 10' (3m) poured concrete approach is recommended.
Foundation – customer provided	12" (30cm) bed of CA-6 Structural Fill (crushed stone) **Reference drawing P057-600**

3.Installation General

3.1. Introduction

The following steps are required to set up the indicator.

- Inspect unit to ensure good condition.
- Use connection diagrams to wire as required.
- Connect Power to indicator and press **<POWER>** key to turn the instrument On.
- To turn instrument OFF press and hold **<POWER>** key for three seconds (until display blanks).

3.2. General Warnings

- Indicator not to be subject to shock, excessive vibration or extremes of temperature (before or after installation).
- Inputs are protected against electrical interference, but excessive levels of electro-magnetic radiation and RFI may affect the accuracy and stability.
- The unit should be installed away from any sources of excessive electrical noise.
- The load cell cable is particularly sensitive to electrical noise and should be located well away from any power or switching circuits.
- For full EMC or for RFI immunity, termination of cable shields and correct earthing of the instrument is essential.

3.3. Electrical Safety

- For your protection all mains electrical hardware must be rated for environmental conditions of use.
- Pluggable equipment must be installed near an easily accessible power socket outlet.
- To avoid the possibility of electric shock or damage to the instrument, always switch off or isolate the instrument from the power supply before maintenance is carried out.

3.4. Cleaning

To maintain the instrument, never use harsh abrasive cleaners or solvents. Wipe the instrument with a soft cloth slightly dampened with warm soapy water.

4.Installation

Step 1: Site selection and measure

- Choose site with flat and level approaches twice the length of your longest truck.
- A small gradient is acceptable provided the scale is used in one direction only.
- Curves, humps, items to jump over such as raised dumps are not acceptable.
- Truck must be straight when it crosses the scale.
- Layout the scale area and approaches

Step 2: Excavate

- Excavate and compact 14' x 10'5" area 2' deep.
- If ground is soft you will need to dig at least 6-8” deeper to install a layer of 2” limestone packed with plate compactor.
- Depth of 2” limestone will be determined by the soil condition. The softer the soil, the deeper the 2” limestone needs to be installed.
- Dig trench for home run cable and drains

Reference drawing P057-600

Step 3: Dig drain line and lay drain

- Dig a drain line for scale pit. It is acceptable to run drain into a sump well provided the pump is on all the time.
- If the area around scale gets water saturated it is best to install a field tile (French drain) in the sub base to keep water away from bottom of scale.
- Lay 4" tile drain
- Separate drain line connection to scale is a 4” Sch 40 PVC coupling.
- Bottom of drain pipe is 8” down from top of scale deck.
- Both drains must run downhill away from scale and foundation

Step 4: First layer of CA6

- Install and level first 6" layer of CA6 crusher run stone
- Compact to 95% using plate compactor

Step 5: Second layer of CA6

- Lay second layer of stone, compact flat and level.
- Surface should be level within 1/8” and is 11 ½” below grade. (Top of Scale Deck)

Step 6: Review final level

- Lay a straight 2x6 on CA-6 foundation, it should have no gaps under the board in either direction
- The entire foundation must be flat and level.
- This is the most critical step to achieving accuracy

Step 7: Set scale

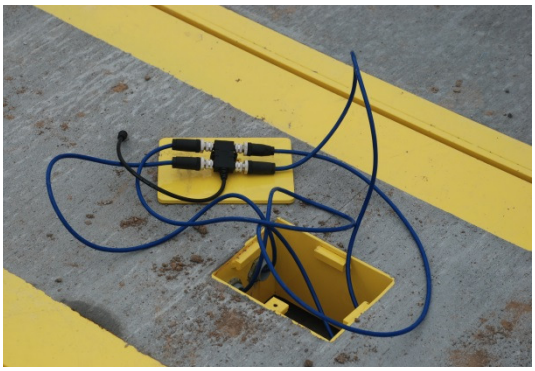
- Set the scale using 50' of masons twine to ensure it is parallel to the road

Step 8: Connect Drain

- Slope 4" PCV drain away from foundation

Step 9: Controller conduit

- Install a 1” PVC electrical conduit from scale to Controller location.
- Conduit for homerun cable can be attached to either side of scale.
- Connection point is 9 ½” below grade.

Step 8: Connect Load cells • Make watertight electrical connections at scale and controller	
Step 9: Backfill and final compacting • Back fill perimeter of scale, drains and conduit runs • Compact material around scale using CA6 and plate compactor.	
Step 9: Install Controller • Install controller • Complete electrical connections. • Connect load cell cable • Apply power, turn on indicator and Zero • Weigh trucks	
Step 10: Review installation • Run a truck with known weights on scale at least 4 times and take an average of the weight. • You then call 877 829 9152 and they will step you through a Dynamic Calibration of the scale and answer any questions that you may have.	

5. Appendix - Error Messages

5.1. Weighing Errors

These messages show status messages or errors that may occur during normal weighing operation.

Error	Description	Resolution
(U.LOAD)	The weight is below the minimum allowable weight reading.	Increase the weight or decrease the minimum allowable weight reading.
(O.LOAD)	The weight is above the maximum allowable weight reading. Warning - overloading may damage mechanical scale elements.	Check the condition of load cell connections. Check for damaged load cell.
(ERROR) (RANGE)	The weight reading is beyond the limit set for Zero operation. The operation of the **<ZERO>** key is limited in the setup during installation. The indicator cannot be Zeroed at this weight.	Increase the Zero Range (Z.RANGE) or use the **<TARE>** key instead.
(ERROR) (MOTION)	Scale motion has prevented a **<ZERO>** or **<TARE>** operation from occurring on command.	Try the operation again once the scale is stable.
(ERROR) (ADC)	An error with the ADC has prevented a <ZERO> or <TARE> operation from occurring	Ensure loadcell cabling is correct.

5.2. Axle Weighing Errors

Error	Description
(WEIGHT) (LOW)	The captured axle weight was below the value set in MIN.WGT
(TOO) (FAST)	The capture was shorter than the time set in MIN.TIM.
(TOO) (SLOW)	The capture took too long.
(WRONG) (WAY)	Truck crossed the weigh bridge in the wrong direction (only when using start and end inputs).
(ERROR) (ILOCK)	The interlock went low during an axle capture or the interlock time was exceeded.
(ERROR) (Exxxx)	Axle weighing will be aborted if an application error occurs during the truck.
(ERROR) (O.LOAD)	Axle weighing will be aborted if the scale is overloaded during the truck.
(ERROR) (U.LOAD)	Axle weighing will be aborted if the scale is underloaded during the truck

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