

SURVIVOR[®] OTR-IMS

In-motion Truck Scale

Software User Guide



RICE LAKE[®]
WEIGHING SYSTEMS

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Revision History

This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
A	November 9, 2024	Initial manual release with product launch; Software Version 1.00; Firmware Version 2.06

Table i. Revision Letter History



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at www.ricelake.com/training or obtained by calling 715-234-9171 and asking for the training department.

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1.0 Introduction

This manual provides operation and setup instructions for the Survivor OTR-IMS system.



Manuals are available from Rice Lake Weighing Systems at www.ricelake.com/manuals

Warranty information is available at www.ricelake.com/warranties

1.1 Overview

The OTR-IMS system is an in-motion, single draft truck scale package that captures, displays and records legal-for-trade weights from vehicles crossing the truck scale in motion at speeds up to 6 mph without stopping the vehicle. Weight data can be transmitted via serial port to a PC to populate a spread sheet and to a printer to print weight, time and date, ID number, speed, direction, gross, tare and net weight for each transaction.

Features include

- Vehicle tare weight by identification number
- Single direction traffic weighing
- Bidirectional traffic weighing
- Capability to save weightment to database, print or send ticket via email

Required Hardware

The software interfaces with the following hardware:

- 1280 Enterprise Indicator
- New or existing concrete or steel deck Survivor OTR Truck Scale
- Speed sensors
 - One speed sensor for single direction weighing or
 - Two sensors for bidirectional weighing
- LaserLight3 Remote Display
 - One remote display for single direction weighing or
 - Two remote displays for bidirectional weighing

1.2 1280 Display

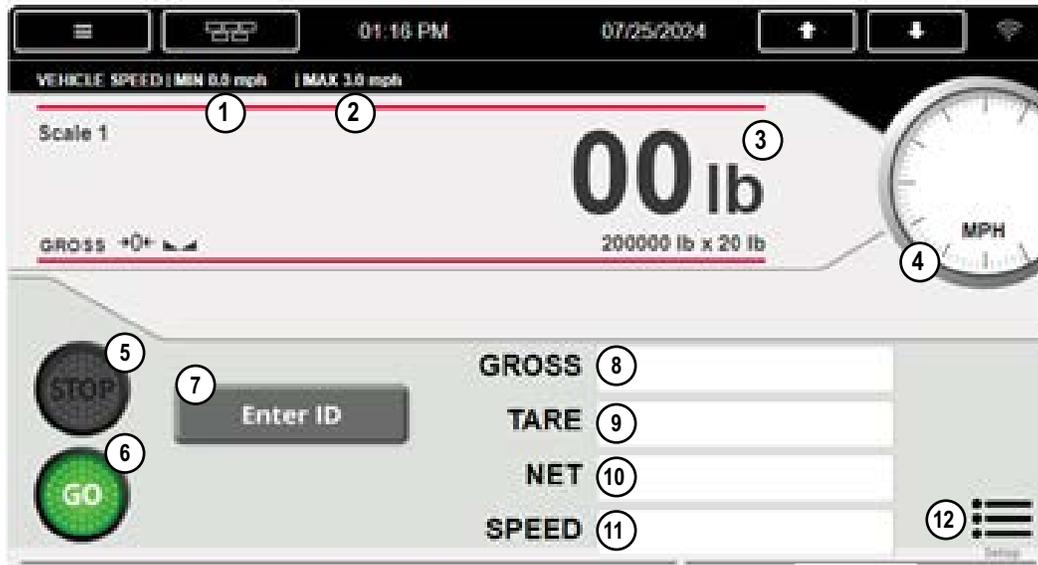


Figure 1-1. Home Screen

Item No.	Item	Description
1	Minimum Vehicle Speed	Displays allowable minimum vehicle speed
2	Maximum Vehicle Speed	Displays allowable Max Speed
3	Instant Weight Display	Displays live weight reading
4	Instant Speed Display	Displays live speed reading
5	Red Stop Light	Indicates vehicle is moving greater than Max Speed
6	Green Go Light	Indicates vehicle is moving less than Max Speed and scale is ready for weighment
7	Enter ID Button	Press to enter truck ID manually
8	Gross Weight	Displays Gross Weight associated with ID weightment
9	Tared Weight	Displays Tared Weight associated with ID weightment
10	Net Weight	Displays Net Weight associated with ID weightment
11	Registered Speed	Displays Max Speed associated with ID wieghment
12	Setup Menu	Press to enter program Setup Menu

Table 1-1. Home Screen

1.3 LaserLight3 Remote Display

The LaserLight3 displays status information about the weight value and speed of the vehicle on the scale as the vehicle crosses the scale.



Figure 1-2. Front Panel Speed Display

1.4 Sensors

Refer to the radar sensor user manual and installation guide for more information on the radar sensors.

Install one speed sensor and one remote display at the end of the scale facing each required direction of traffic. Speed sensor must be placed so that it can detect vehicle speed along the entire length of the scale. Maximum cable run length is 100 ft.

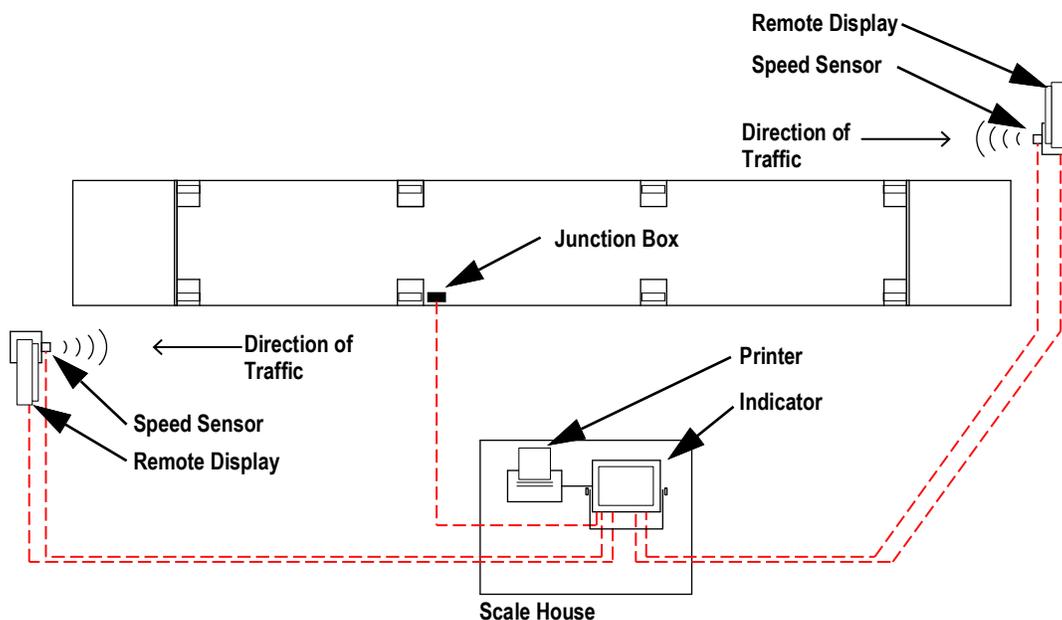


Figure 1-3. In-Motion Layout



NOTE: Single direction traffic does not allow detection of vehicle movement if the vehicle is entering the scale from the wrong direction. If a vehicle is not detected prior to weight being detected on the scale, the indicator displays "WRONG DIRECTION" and the remote displays "DIRECTION ERROR." No weight information is displayed as a result of this condition.

2.0 Operation

The system is equipped with both a static and weigh-in-motion modes of operation. This is selected from the indicator setup menu. When placed in the static mode the scale functions as a normal static truck scale showing real-time weight on the remote display and on the indicator display. The same truck tare database and ID numbers are used for both static and WIM weighing. When truck scale is in static mode, the Speed Sensors are ignored and no velocity information is displayed. When the system is in weigh in-motion mode, and a vehicle stops on the scale, the system automatically changes to static weighing mode.

The system communicates status with the following display messages:

Status	Description
Initiation	Before weighing can occur, the scale must be empty, stable at zero and the remote must display green numbers. 
Weight Stability	If the system cannot reach a stable weight, or there is insufficient Data Acquisition Time , the indicator and LaserLight3 display INVALID WEIGHT .
Maximum Speed	LaserLight3 displays live speed value in green if speed is below Max Speed during weighing. If the vehicle speed exceeds the Max Speed , the LaserLight3 displays the words SLOW DOWN in red below the live vehicle speed. If system does not clear by registering the speed below Max Speed long enough for system to register weight, system displays INVALID WEIGHT . 
Minimum Speed	If a vehicle slows to a stop on the scale while the system is in In-Motion mode, the system automatically reverts to static mode and displays captured weight. 
Change Speed	If the vehicle's speed changes more than the change in speed value, the weighing process is aborted and INVALID WEIGHT displays.
Directional Error	On a bidirectional system, if both speed sensors detect multiple vehicles, DIRECTION ERROR displays.
Data Acquisition Time	If the vehicle is not on the scale for the required Data Acquisition Time , the weighing process is aborted and INVALID WEIGHT displays.

Table 2-1. Error Messages

2.1 Weigh-In-Motion Mode Operating Procedure (Automatic Weighing)

2.1.1 Single Direction Weighing Operating Procedure

1. Scan driver RFID or press **Enter ID** button on the indicator and enter the Truck ID to use custom database weighing settings (Figure 1-1 on page 6). If no tag ID is entered, system reverts to system default settings.
2. Drive forward if LaserLight3 displays live speed as zero or in green.
3. Maintain a speed of less than **Max Speed** across the scale (see speed note in Table 2-1 on page 8).
4. Once vehicle is fully off of the scale, the system:
 - Stores a record in the transaction database and/or emails it to configured email address.
 - Prints an outbound ticket.

2.1.2 Weigh In/Out Weighing Operating Procedure

Weigh In

1. Scan driver RFID or press **Enter ID** button on the indicator and enter the Truck ID to use custom database weighing settings (Figure 1-1 on page 6). If no tag ID is entered, system reverts to system default settings.
2. Drive forward if LaserLight3 displays live speed as zero or in green.
3. Maintain a speed of less than **Max Speed** across the scale (see speed note in Table 2-1 on page 8).
4. Once vehicle is fully off of the scale, the system:
 - Stores a record of the weighment in the inbound database.
 - Prints an inbound ticket (Figure 3-1 on page 11).

Weigh Out

1. Scan driver RFID or press Enter ID button and enter the Truck ID.
2. If LaserLight3 displays green speed value, drive forward.
3. Maintain a speed of less than **Max Speed** across the scale (see speed note in Table 2-1 on page 8).
4. Once vehicle is fully off of the scale, the system:
 - Performs value swapping if necessary.
 - Calculates Net weight based on inbound weighment.
 - Stores a record in the transaction database.
 - Prints an Outbound ticket (Figure 3-3 on page 11).
 - Deletes inbound weighment from database.

2.2 In-Motion Weighing System Process

The system in-motion weight capture process is the same for single direction and Weigh In/Out weighments.

1. When ID is entered, system checks database for **Tare**, **Threshold** and **Peak** associated with ID.



NOTE: The system reverts to default settings if no ID is entered or ID database **Tare**, **Threshold**, or **Peak** value is 0.

2. The approach of the vehicle is detected by the speed sensors when the steering tires first enter the platform. The speed sensor defines the direction of travel and the speed of the approaching vehicle.
3. Vehicle proceeds at less than the **Max Speed** over the scale.
4. When weight is measured above the **Truck Threshold**, the system determines when the last axle of the vehicle is on the platform and, system starts capturing weights at the A/D sample rate.
5. The weighing process continues until the **Peak Time** is exceeded.
 - Throughout the weighing process, the system monitors the action of the vehicle looking for any operational errors. If an error is detected, and error message is displayed for both the operator and the vehicle driver, and the weighing process is aborted (see Table 2-1 on page 8).
6. If speed was *non-zero* and there were no errors, system calculates maximum scale weight by averaging middle 1/3 of all captured weights within the and weight displays.

7. System performs the following actions:
 - **If Weigh In/Out is Enabled**
 - System queries the inbound database with entered ID
 - If ID is found, weighment is considered outbound and system:
 - Performs value swapping (if necessary)
 - Calculates Net weight based on the inbound weighment
 - Stores a record in the transaction database
 - Prints Outbound ticket
 - Deletes inbound weighment
 - If ID is not found, weighment is considered inbound and system stores a record in the inbound database and prints an inbound ticket.
 - **If Weigh In/Out is Disabled**
 - If Truck Tare value is associated with Truck ID, system Tares to value in database.
 - System stores a record in the transaction database. Net field of database is 0.
 - System prints an Outbound Ticket.
8. When the weight is calculated, the system performs the following:
 - Remote display shows the total weight
 - Laserlight3 display returns to green 0.0.



NOTE: Scale must return to zero before system resets to step 1.

3.0 Serial Communications – Tickets, PC

Weigh In Ticket – Auxfmt 1

The program uses Auxiliary Print Format #1 for inbound weigh tickets. Format is modified through the 1280 front panel or by using Revolution® PC software.

```

IN

Truck ID      333

Gross         6300 lb
Tare          0 lb
Net           6300 lb

      HH:MM PM MM/DD/YYYY

      Speed 3.2 mph
  
```

Figure 3-1. Auxiliary Print Format #1 – Default

```

IN

Truck ID      333

Gross         6300 lb
Tare          0 lb
Net           6300 lb

      HH:MM PM MM/DD/YYYY

      Speed STATIC
  
```

Figure 3-2. Auxiliary Print Format #1 – Static Reading

Weigh Ticket – Auxfmt 2 Weigh out (if Weigh-In / Out enabled)

The program uses Auxiliary Print Format #2 for outbound weigh tickets. Format is modified through the 1280 front panel or by using Revolution® PC software.

```

OUT

Truck ID      333

Gross         6300 lb
Tare          0 lb
Net           6300 lb

      HH:MM PM MM/DD/YYYY

      Speed 3.2 mph
  
```

Figure 3-3. Auxiliary Print Format #1 – Default

User Strings

If additional information is needed on the print tickets, user strings can be added to print format in Revolution® PC software. Add <USn> to print format where N represents the user sting number

User String Number	Data Output
User String 1 <US1>	Truck ID
User String 2 <US2>	Gross Weight
User String 3 <US3>	Time
User String 4 <US4>	Date
User String 5 <US5>	Tare Weight
User String 6 <US6>	Net Weight
User String 55 <US55>	Reprint Ticket
User String 60 <US 60>	Direction Name
User String 61,62 <US61><US62>	Speed or STATIC

Table 3-1. User Strings

4.0 Application Setup and Configuration

4.1 Setup Menu

The **Setup** menu can be password-protected and offers access to the following:

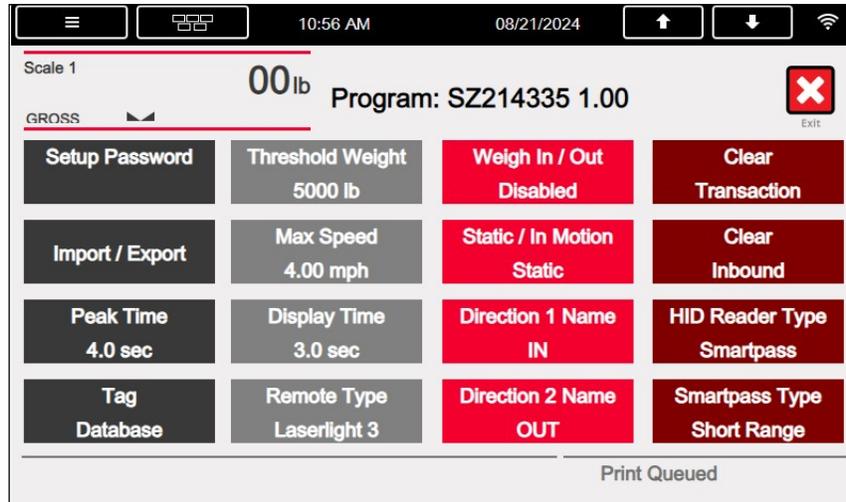


Figure 4-1. Setup Menu

Parameter /Icon	Default	Description
Setup Password	""	Changes the entry password. If not set, system will not prompt for a password to enter the setup menu
Threshold Weight	5000 lb	Weight required to initiate weighing
Weigh In / Out	Disabled / Enabled	If enabled, program logs weight twice per ID. One gross weight per ID for inbound transactions and one net weight per ID, calculated from inbound and outbound weighments.
Clear Transactions	-	Clears Transaction; Yes, No
Import / Export	-	Export database to micro SD or USB drive; Standard 1280 function
Max Speed	4.0 mph	Max speed allowed for weighing. Remote display reads "SLOW DOWN" in red below the live vehicle speed if max speed is exceeded. NTEP legal-for-trade maximum speed range is 1-6 mph with a maximum change of 3 mph within a weighing cycle.
Static / In-Motion	Static / In-Motion	Toggle between in-motion weighing and standard static weighing NOTE: If scale is in Static mode, Weigh-In/Out is not available
Clear Inbound	-	Clears Inbound database
Peak Time	4.0 sec	Wait time at peak, stable weight before transaction is logged; NTEP legal-for-trade minimum 1.5 seconds
Display Time	3.0 sec	Length of time axle weight is displayed on the remote display after transaction is finalized
Direction 1 Name	IN	Change direction 1 name
HID Reader Type	HID / Smartpass	Toggle between HID and smartpass reader type
Tag Database		View, Add, Edit, Delete tags from the Tag Database Section 4.3 on page 14
Remote Type	Laserlight 3	NOTE: System does not work with the Laserlight 2
Direction 2 Name	OUT	Change direction 2 name
Smartpass Type	Short Range / Long Range	Change smartpass card type; NOTE: If reader type is set to HID, Smartpass Type is not available

Table 4-1. Truck In/Out Application Setup and Configuration

4.2 Import/Export Database

Database information can be imported and exported onto an SD Card or a USB Flash Drive. System diagnostics can be exported via ports in the 1280 Enterprise Indicator. See the 1280 Enterprise Indicator Technical Manual for SD and USB port locations and Import/Export processes.

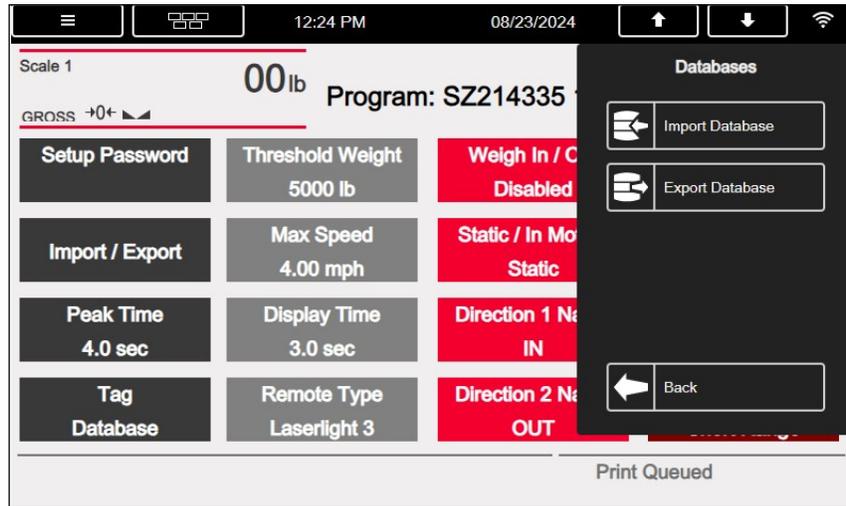


Figure 4-2. Import/Export Database

4.3 Tag Database

The tag database is a record of regular users and any custom settings of Tare, Threshold Weight and Data Acquisition time. The tag database can be altered using Revolution software or by selecting the Tag Database in the Setup Menu (Figure 4-1 on page 13).

Press Page Up or Page Down to navigate the Tag Selection.

Return to the Setup Menu by pressing .

ID	Tare	Threshold	Peak
220	0	15000	3.5
250	0	22000	4.5
280	0	24500	4.5
320	0	23500	2.0
350	0	32500	4.0
37	0	5000	4.0
38	0	6000	4.0
380	0	40000	3.0

Figure 4-3. Tag Database

4.3.1 Add New Tag Entry

To add a new tag to the database:

1. Select  Add Entry ([Figure 4-3 on page 14](#)).
2. Enter a unique Scan/Tag ID number to identify vehicle.
3. Chose Tare Type:
 - **Enter Tare** - Manually enter a vehicle specific tare weight.
 - **Live Weight** - Tag uses system default tare.
4. Enter Tag Threshold Weight:
 - **Yes** - Manually enter a tag threshold weight.
 - **No** - Tag uses system default threshold weight.
5. Enter Tag Peak Time
 - If peak time is zero, tag uses system default peak time.

4.3.2 Edit Existing Tag Entry

1. Select tag to be edited. Tag displays red ([Figure 4-3 on page 14](#)).
2. Select  Edit Entry.
3. Chose Tare Type:
 - **Enter Tare** - Manually enter a vehicle specific tare weight.
 - **Live Weight** - Tag uses system default tare.
4. Enter Tag Threshold Weight:
 - **Yes** - Manually enter a tag threshold weight.
 - **No** - Tag uses system default threshold weight.
5. Enter Tag Peak Time:
 - If peak time is zero, tag uses system default peak time.

4.3.3 Delete Existing Tag Entry

1. Select tag to be edited. Tag displays red ([Figure 4-3 on page 14](#)).
2. Select  Delete Entry. Entry instantly deletes.

5.0 Database Tables

Report Database is used for Reporting in the iRite program.

Field	Type	Description
ID	String	Truck ID - 15 alphanumeric
Tare	Real	Gross weight
Threshold	Real	Threshold Weight
Data	Real	Data Acquisition Time

Table 5-1. Tag ("Tag") Database 1,000

Field	Type	Description
ID	String	Truck ID - 15 alphanumeric
Gross	Real	Gross weight
DT	Datetime	Time/date of weighment

Table 5-2. Inbound ("Inbound") Database 1,000

Field	Type	Description
ID	String	Truck ID - 15 alphanumeric
Gross	Real	Gross weight
Tare	Real	Tare weight
Net	Real	Net weight
DT	Datetime	Time/date of weighment

Table 5-3. Transaction ("Trans") Database 5,000



NOTE: System deletes 25% of oldest records when the transaction database reaches maximum capacity.

6.0 Hardware Setup

6.1 1280 Screen Size/Type

NIT	1280 Screen Size/Type (12 in or 7.5 in)
500	7.5 in

Table 6-1. 1280 Screen Size/Type

6.2 Option Card Location

Slot	Type
1	Single Channel A/D Card
2	Dual Serial
3	Dual Serial (Optional for bidirectional)
4-6	Not used

Table 6-2. Option Card Locations

6.3 Digital I/O

Slot	Bit	Type	Function
0	1	Output	Green Light
0	2	Output	Red Light
0	3-8	Off	Currently Not Used

Table 6-3. Digital I/O

6.4 Serial Ports

Port	Type	Description	Setup
1	CMD	Custom America Printer	19200, 8, N, 1
2	CMD	Stop N Go LaserLight 3	115200, 8, N, 1
7	PROG	Direction 1 - Speed Sensor	115200,8,N,1
8	CMD	Stop N Go LaserLight 3 (used for bidirectional)	115200,8,N,1
9	PROG	Direction 2 - Speed Sensor (used for bidirectional)	115200,8,N,1
10	CMD	Optional HID/Smartpass Reader	9600,8,N,1

Table 6-4. Serial Ports

6.5 Ethernet TCP/IP Port

Port	Type	Description	Setup
10001	CMD	Waits for connection from software/device i.e. Revolution or Interchange	TCP Server
10001	CMD	LaserLight 3	TCP Client1
10002	CMD	Currently Not Used	TCP Client 2
3000	CMD	Web Server	Web Server

Table 6-5. Ethernet TCP/IP Port

6.6 USB Port

Port	Type	Description	Setup
3	CMD	Currently Not Used	-

Table 6-6. USB Device Port

6.7 SD Card Slot

Port	Type	Description	Setup
-	CMD	8 GB Micro SD Card	Images
-	CMD	Currently Not Used	-

Table 6-7. SD Card Slot

6.8 Sensor Wiring

DB9 Pin #	Signal Name	Direction (wrt Radar)	Description
1	VIN	PWR	VCC Power Supply
2	TX1	Output	RS232 Transmit Signal from radar
3	RX1	Input	RS232 Receive Signal into radar
4	RX2	Input	RS232 Receive Signal into radar
5	GND	PWR	Radar GND (battery "-" terminal)
6	TX2	Output	RS232 Transmit Signal from radar
7	Trig O/P 1	Output	"Open Drain Output 1"
8	Trig O/P 2	Output	"Open Drain Output 2"
9	GND	PWR	Radar GND (battery "-" terminal)

Table 6-8. Sire Signal Descriptions (DB9 Connector)

7.0 Specifications

Scale Construction and Installation

Scale Deck Type - Steel or Concrete

Scale Installation - Above Ground or Pit

Weighing/Load Receiving Element

EZ Series OTR

Load Cells - RL75058-LP 75K

Indicating Element

1280-2A

Remote Display

LaserLight3

Speed Sensor

Weatherproof K-Band Doplar Radar

Speed Sensor Requirements

Radar RF out - 5 mW maximum

Radar fcenter - 24.125GHz or 24.200 GHz

Operating °F (°C)-40 (-40) min to 185 (85) max

Pickup Distance - 2000+ feet (600+ m) in most cases

Speed Measurement Range - 0.6mph to 206 mph (0.97km/h to 331 km/h)

Beam Angle - 9°Vx18°H

Beam Polarization - Linear

Weigh-In-Motion Legal-for-Trade Parameters

Speed Max - 6MPH

Speed Min - 1 MPH

Max Change - 3 MPH

Minimum DAT - 1.5 Seconds

Direction of Travel - Single or bidirectional

Off Platform Detection - Physical Barrier

n_{max} - 10,000d

e_{min} - 20 lbs

Max Capacity - 200,000 lb

CLC - 100,000

Accuracy Class - III L

Patent Pending

Certifications and Approvals



NTEP

CC Number: 24-071

Accuracy Class: III L; n_{max}: 10 000



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