SSWIM SYSTEM SPECIFICATIONS

SLOW SPEED WIM AXLE LOAD SCALE

1. **PART 1 – GENERAL**
	1. **Layout.** The Slow Speed Weigh-In-Motion (SSWIM) Scale System will have the following basic lane layout:

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1. Single Axle SSWIM Scale
2. Traffic Detection Loops
3. Traffic Signal

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1. iSINC Controller
2. Remote Weight Display

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1. Optional: Operator Display Computer
2. Optional: Weigh Ticket Printer
3. Optional: Axle Sensor
	1. **System Operation.** The slow speed Weigh-In-Motion (WIM) scale system will operate at speeds up to 20 km/h (12.5 mph).
		1. After the power is turned on, the system will automatically start up ready to weigh vehicles. The traffic signal will effectively control traffic onto the SSWIM scale. When the system is ready, the light will display green allowing a truck to cross the scale. As a truck starts to pass over the scale system, the light will turn to red preventing following traffic from crossing the scale until the previous truck weighing is complete.
		2. After the vehicle passes over the SSWIM scale, the iSINC system controller will compute its axle weights, axle group weights, gross vehicle weight, axle spacing, length and classification. The gross vehicle weight will be displayed on the remote weight display. If the system is supplied with the optional operator display computer then all the vehicle information will be displayed on the computer display.
		3. A vehicle data record will be stored on the controller for each vehicle that is weighed. With optional Autopoll and iAnalyze software packages, the stored vehicle data can be retrieved later over a network connection and viewed or used to generate reports.
		4. Initial system setup and calibration may be performed from a laptop computer or from the optional operator display computer connected to the iSINC controller through the network. The administrator will be able to load pre-defined vehicle classification schemes. The controller setup will be password protected.
	2. **Accuracy and Performance**. The Slow Speed Weigh-In-Motion (WIM) Scale System will meet or exceed ASTM E 1318-09 Type IV specifications for WIM accuracy.
		1. The accuracy of the system increases with a decrease in speed.

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| **Speed** | **Dynamic Accuracy** |
| 3-5 km/h (2-3mph) | Gross Wt. +/- 2.0% of applied |
| 5-10 km/h (3-6mph) | Gross Wt. +/- 3.0% of applied |
| 10-20 km/h (6-12mph) | Gross Wt. +/- 4.0% of applied |

* + 1. The dynamic accuracy is specified for a 95% confidence level when installed as per IRD recommendations.
1. **PART 2 – PRODUCTS**
	1. **Single Axle Scale**
		1. The Slow Speed Weigh-In-Motion (SSWIM) / Static Axle Load Scale will be a combination in-motion and static scale designed for weighing at low speeds.
		2. One 3 m x 0.610 m (10 ft x 2 ft) scale platform will be used per lane. The scales will incorporate the following features:

 The platform will be supported by two double shear beam load bars. All pads will be identical for easy scale maintenance. The platform will be no more than 175 mm (7 in.) thick and mounted on the load bars with stainless steel bearing pads.

 The load bars will be of a totally sealed design to prevent intrusion by water, salt, dirt and other debris. The scale will be sealed along the frame using a flexible sealant. The scale vault will incorporate sufficient drainage to prevent water buildup under the scale platform. For this reason, a drain conduit will be installed during the pouring of the concrete vault.

 All connections within the load bar from the transducers will be sealed and potted forming a completely water-resistant system. The signal cable from each load bar will be a single length of shielded cable, which will be sealed to the water-resistant military connectors on the load bars.

 The weighpad frames will be cast into a 760 mm (30 in.) deep concrete pit.

 The scales will be fastened to the load bars with six high strength bolts (three per each of two load bars). The load bars will be fastened to the bearing pads with four high strength bolts (two per each of two load bars). All access holes on the scale surface will be sealed with expansion plugs allowing for easy disassembly.

 The scale platform must be anchored to the load bars, and must be flush with the road surface so it is not damaged by road maintenance such as sweeping and snow removal.

 The signal cable will be routed away from the scale vault through a rigid conduit. This conduit will be heat traced in cold climates to prevent ice accumulation in the scale pit.

 The scales and scale frames will be protected from lightning using ground rods.

 The load bars will connect to the interface electronics for system operation.

 The SSWIM scale will accommodate a capacity of at least 20 tons per axle.

1. **PART 3 – INSTRUMENTS AND OPTIONS**
	1. **iSINC Controller**
		1. The iSINC roadside controller will consist of an integrated control and processing unit enclosed in a NEMA 4 rated enclosure. The controller unit will include a power supply, sensor interface modules, output control modules for control of traffic signals, communications modules to communicate with variable message signs and a communication port to allow remote or local access to the system for setup and remote diagnostics. The entire system and enclosure will be compact and suitable for mounting on a roadside pole or structure.
		2. The SSWIM scale load bars will interface to the controller through a dedicated Scale Sensor Module (SSM) card. The traffic detection loops will interface to the controller through a dedicated Loop Sensor Module (LSM) card. Surge protection for sensor connections will be provided on separate modules with pluggable connectors. The interface cards and the separate surge protection modules will be easy to replace in the field.
		3. The iSINC controller has optional capabilities to interface to several more types of sensors and other equipment such as overview cameras, license plate cameras and AVI (Automatic Vehicle identification) or RFID (Radio Frequency Identification) tag readers. The optional capabilities may require additional equipment, interface modules and customized configuration not included with a base SSWIM system.
	2. **Remote Weight Display.** The remote weight display will show the gross vehicles weight to the drivers immediately after they are weighed.
		1. The display will be a variable message sign with Red or Amber LEDs, a minimum 16 x 96 pixel display area and pixel spacing of 8 mm to 12 mm. Typically, the display font will be 4” to 6” high for legibility at distances up to 250 feet.
		2. The outdoor display will automatically adjust brightness for the current lighting conditions.
		3. The remote display will be mounted on a single pole approximately 100-150 feet past the last traffic loop sensor. The remote display will have network connection to the iSINC controller.
	3. Optional Equipment
		1. *Operator Display Computer.* The computer will run an IRD Operator Display application under Windows 7/10 to display the scale weight and print weigh tickets. The computer running the application will have a minimum Core i3 2.0 GHz processor, 4GB RAM, 250GB HD.
		2. *Printer.* An optional ticket printer may be used in conjunction with the application on the operator display computer.
			* The printer will be a Star Micronics SP700 series dot matrix printer or equal, which allows for multiple ticket copies to be printed at one time.
			* The operator display software may also be used with any typical laser printer.
		3. *Axle Sensor.* An optional low speed axle sensor may be added to the system to provide more accurate axle spacing and length measurements for use in vehicle classification.