



Accurately Weighing Africa



WIM 2000

SASCO SLOW SPEED ADVANCED
WEIGH-IN-MOTION SYSTEM

High Volume High Accuracy

SASCO WEIGHING SYSTEMS

SMART SUPPORT
0861 422 134
OR +27 83 680 0722
E-mail: info@sascoafrica.com
Web: www.sascoafrica.com
24 hours, 7 Days a week

GROUP SUPPORT H/O
2 Blackburn Street
Apex Industrial | Benoni

Phone: +27 (0) 11 746 6000
Fax: +27 (0) 11 746 6100

WIM 2000

Overloading regulations that have been enacted across most Africa countries. Twenty two African countries have agreed under the COMESA-EAC-SADC Tripartite Vehicle Load Management Agreement, to both standardize permissible limits and seek to build from national prosecution systems, a multi-national African overloading management system.

The Road Logistics Industry must now ensure that trucks comply with overloading regulations. This requirement relates to both total weight and axle weights.

The Weighing Industry has sought to promote multi deck weighbridges as the solution to the Road Logistic Industries compliance challenge.

Multi deck weighbridges are used in the weighing of goods for sale but also provide axle weights in addition to total weight, however multideck weighbridges are trade approved scales used primarily for trade weighing, are expensive, and require a significant amount of space.

Sasco is a market leader in the supply of a range of multi deck weighbridges, multideck automation, and ERP systems integration.

Notwithstanding this fact, Sasco consistently challenges the status quo and concluded that the Road Logistic Industry actually needed weighing solutions that deliver specifically what is required.

That solution is the Sasco range of weigh-in-motion solutions delivering accurate total weight and axle weights cost effectively.

Attractions of Weigh-in-Motion

Weigh-in-motion (WIM) is a technology used to determine the weight of vehicles as they are moving. In contrast to traditional truck scales, which require vehicles to stop to be weighed, WIM systems are increasingly used for commercial vehicle weight enforcement, offering several advantages over conventional truck scales.

One of the main advantages of WIM systems is their speed and efficiency. Because vehicles do not have to stop to be weighed, WIM systems can quickly and accurately determine the weight of many vehicles. WIM therefore allows for more efficient commercial vehicle weight enforcement, eliminating the need for vehicles to queue up at traditional truck scales.

Secondly, in addition to their speed and accuracy, WIM systems also offer the advantage of being able to collect data on the weight and size of vehicles. This information can be used for various purposes, such as monitoring trends in vehicle weight and size and identifying potential safety concerns. Traditional truck scales do not have this capability.

Finally, WIM systems are also more cost effective than traditional truck scales and because they do not require vehicles to stop, WIM systems can be installed in locations where traditional truck scales cannot, such as on bridges or at intersections. This allows for more comprehensive commercial vehicle weight enforcement without the need for expensive and time-consuming construction of traditional truck scales.



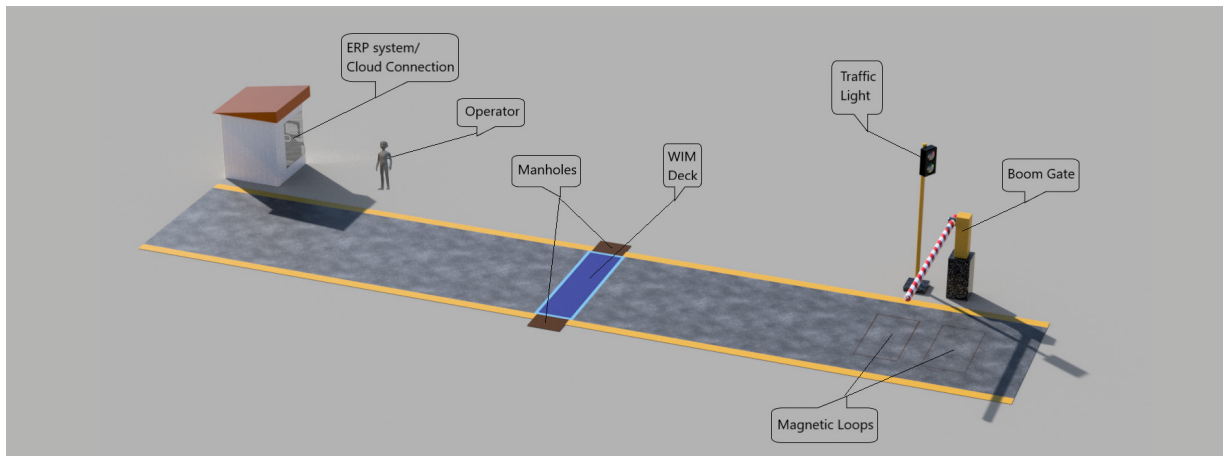
WIM 2000 WITH TRAFFIC LIGHTS AND DISPLAY BOARD

Sasco's WIM Range

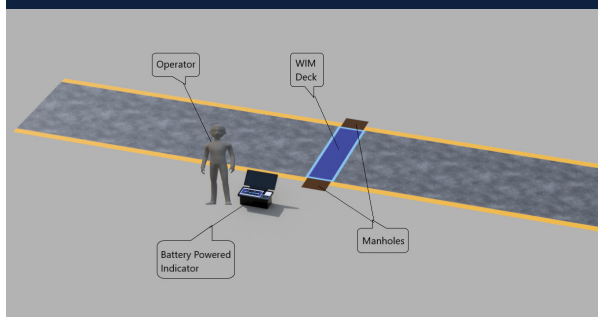
The capabilities of Sasco's WIM range include exceedingly accurate slow-speeding in-motion weighing of vehicles up to 5kmph right through to high-speed in-motion weighing of vehicles at up to 120 kmph, but with lower accuracy.

Through our wide range of solutions comprising Low-Speed Basic (WIM 1000), Low-Speed Advanced (WIM 2000), Low-Speed Ultra (WIM 3000), Low-Speed Cybernetic (WIM 4000), Sasco has pioneered the development of slow-speed road weigh-in-motion for the African market.

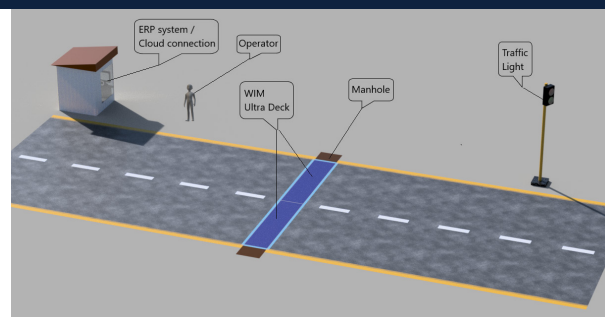
In addition to our range of slow-speed weigh-in-motion solutions, Sasco also offers a high-speed cybernetic (WIM 5000) weigh-in-motion system.



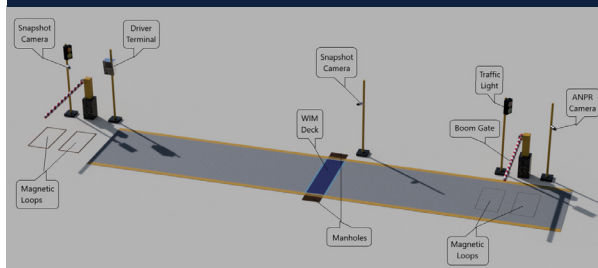
WIM 2000



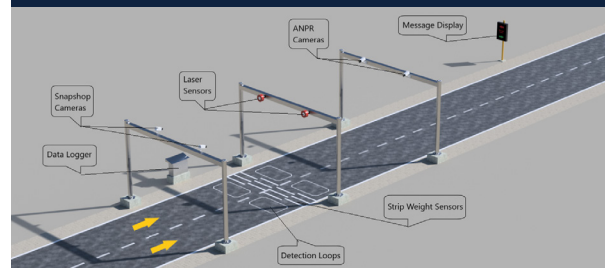
WIM 1000



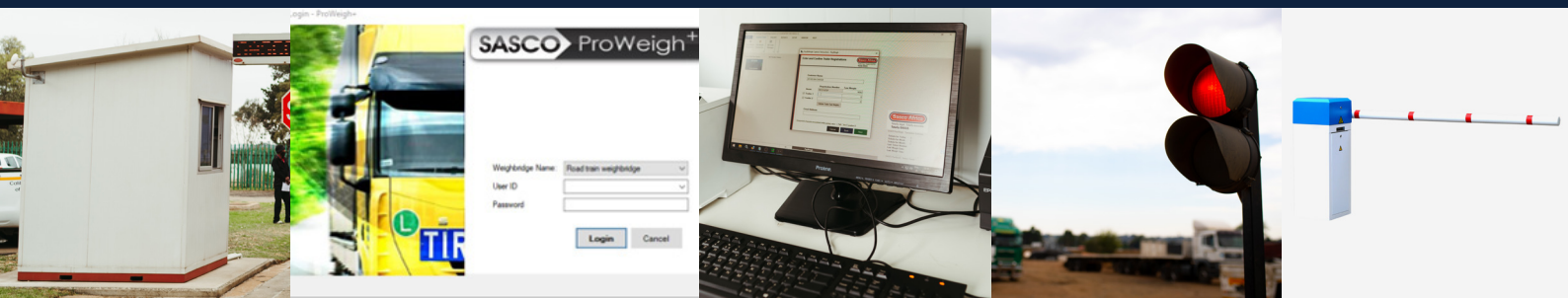
WIM 3000



WIM 4000



WIM 5000



COMPONENTS SPECIFIC TO WIM 2000

WIM 2000 Overview

The WIM 2000 comprises a WIM Deck, SW 2000 Indicator a PC loaded with ProWeigh+ software, one traffic light and one access boom and delivers the same weighing data as a multi deck weighbridge but at a fraction of the cost.

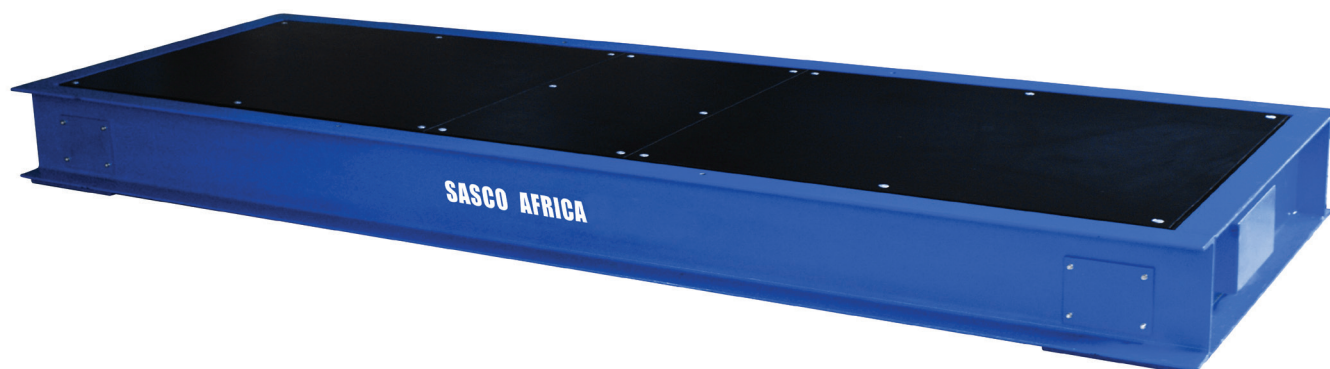
The WIM 2000 System delivers the same accurate total weights and axle weights as the WIM WIM 4000, but the weighing operations are manned.

The WIM 2000 is the optimal solution for high volume truck weighing where accurate total weights and axle weights are required but the weighing process is not for trade purposes.

WIM Deck

The WIM 2000 uses the Sasco WIM Deck.

The WIM Deck is a steel weighing deck approximating 3 sqm in size and is flush mounted in the ground. Therefore, the concrete civil works around the deck are straightforward but the WIM Deck approaches must be level for at least 10m on the approach side.

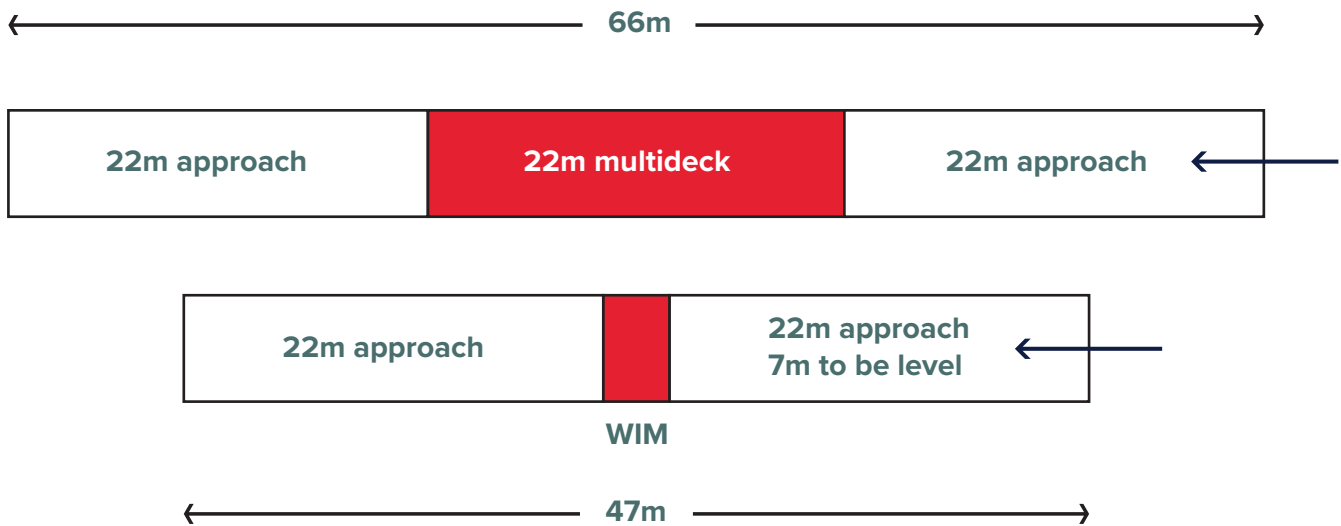


PRO-WIM FLUSH MOUNTED DECK IS JUST 2.9 SQM

The WIM Deck is highly robust and can accommodate axle loadings of up to 30T per axle which is exceptionally strong.

Vehicles of any length can be weighed, and this is done in motion at speeds not exceeding 5 kmph. Once completed, vehicle total weight and group axle weight data is generated.

One of a number of advantages the WIM Deck has over multi deck weighbridges, is the amount of space required. Taking a normal articulated truck length of 22m and the requirement for the truck to be straight when approaching the weighing device, the relative space requirements are as follows:



SW 2000 Indicator

The WIM 2000 uses the Sasco SW 2000 indicator.

The WIM 2000 is powered by the SW 2000, an indicator developed specifically for the WIM 2000.

The SW 2000 is a specific axle weighing indicator and is capable of measuring at speeds of up to 5 kmph the precise loadings of axles as the truck's tyres pass over the WIM 2000 deck.



The specifications of the SW 2000 are:

- a. Enclosure Material: Hard Industrial Grade Plastic
- b. Units of Measurement: kg, ton, lb., kilo lb.
- c. Power Supply and Consumption AC Adopter 110 ~ 240V 50/60Hz.
- d. Working Humidity: < 90% RH
- e. Working Temperature: -10°C to 60°C / 14°F to 140°F
- f. Driving Number of Load cells: Up to 24 x 350 Ω or 12 x 700 Ω
- g. A/D Converter: 24bit – 4.8kHz
- h. Conversions per second: 200/s
- i. Division: 1, 2, 5, 10, 15, 20, 25, 50
- j. Communication Interface: RS232, USB, Bluetooth, LET/5G (Optional)
- k. Baud rate: 4800, 9600 bit/s
- l. Mini Weighing Capability: 20e
- m. Approval: OIML

Proven Operational Accuracy

Under normal operating conditions, the accuracy of the WIM 2000 has been validated through parallel multi deck weighbridge cross testing to consistently deliver the following results:

EXCEPTIONAL TOTAL ACCURACY	PERCENTAGE ERROR ON TOTAL WEIGHT	PERCENTAGE ERROR ON AXLE GROUP
3 Kmph	<1%	<2.5%
5 Kmph	± 1%	<2.5%

Approach speeds in excess of 5 Kmph onto the WIM 2000 will impact the accuracy of the system.

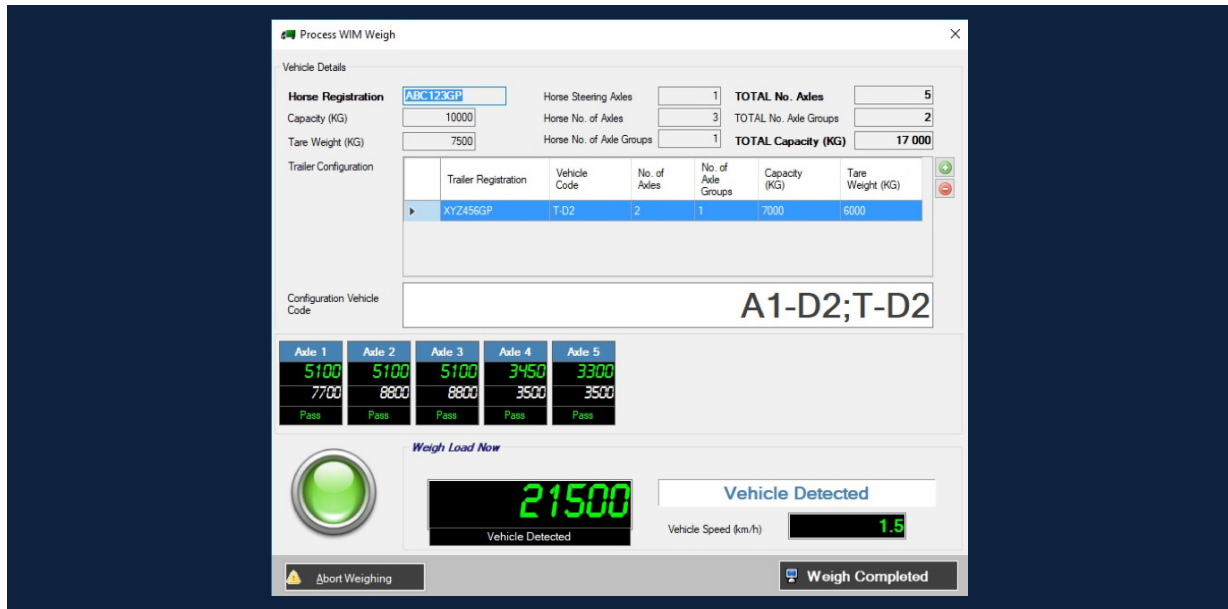
WIM 2000 Weighing Sequence

The WIM 2000 operates with ProWeigh+ software to deliver a simple to use three stage weighing sequence.

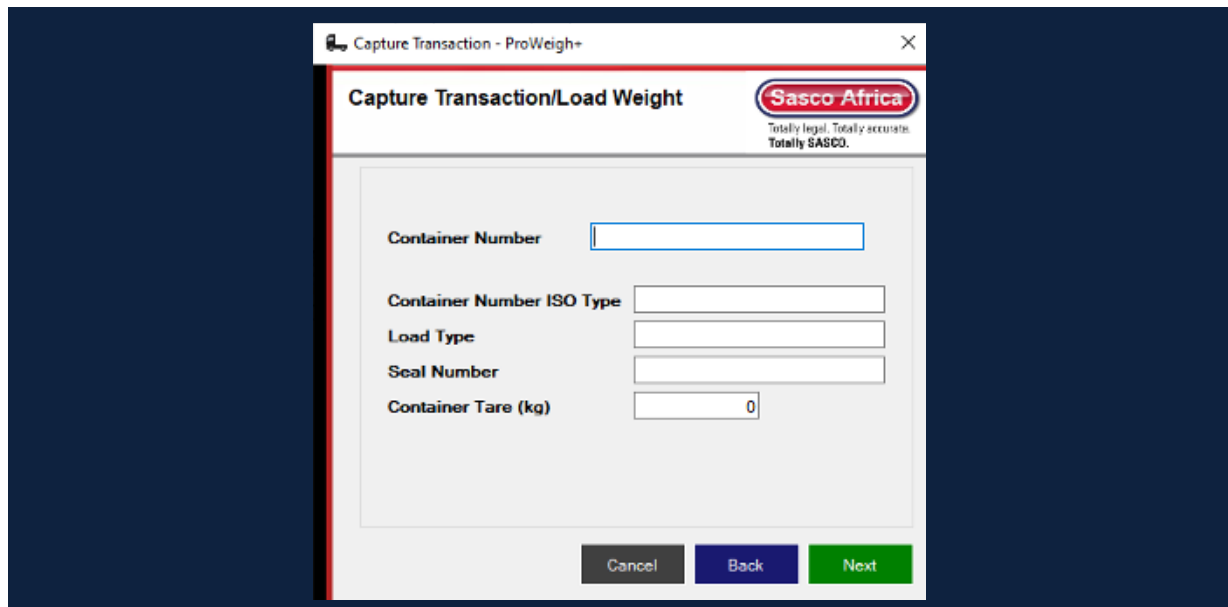
First action: Capture the registrations of the horse and trailer units. This must be inputted on the PC, key board or if Barcodes or QR Codes are being used these must be scanned.

Second action: For units that are pre-loaded on the Fleet Master database in ProWeigh, the correct configuration picture is automatically generated by the software. If not loaded on the Fleet Manager database, select the right configuration picture from the menu for the vehicle.

Third action: Once the weighing process is complete, print the weighing ticket. If ProWeigh is set up to integrate with the User's IT system or Sasco Cloud, all the relevant weighing information will also be immediately transmitted electronically to this data destination.




If the vehicle is carrying a container for which a SOLAS weighing is also required, there is an additional Four Action in the weighing sequence which requires the Operator to capture the container details, tare weight and vehicle tare.




Multiple Weighing Ticket Formats

The WIM 2000 has a flexible output functionality that enables weighing results, whether for an axle loading weighing or SOLAS weighing, to be presented in various formats being either human readable, QR code format or dual formats.

An axle loading weighing ticket in readable form is normally printed in the following format:

THIS DOCUMENTATION IS COMPLIANT WITH THE NATIONAL ROAD TRAFFIC AMENDMENT ACT, 64 OF 2008			
		WEIGHBRIDGE TICKET SLIP	
		Horse Registration	: ABC123GP
		Weighbridge Name	: Sasco Demo Weighbridge 1
		Company Name	: Sasco Customer Demo Company
		Site Name	: ****
Product	:		
TICKET NUMBER	SC00000023	TICKET DATE	2020/06/01 13:19:00
VEHICLE DETAILS			
Registration Number	ABC123GP	DEF456GP	GHI789GP
Type	****	****	****
Operator	****	****	****
Contact Person	****	****	****
Insurance Provider	****	****	****
Cover Type	****	****	****
Policy Number	****	****	****
TRADE WEIGHING DETAILS			
<u>First Weigh Details</u>		<u>Second Weigh Details</u>	
Weight (kg)	15 000	Weight (kg)	35 000
Date Time	2020/06/01 13:18.22	Date Time	2020/06/01 13:18.50
Operator	sa	Operator	sa
		<u>Weigh Calculations</u>	
		NETT Weight (kg)	20 000
		Product NETT (kg)	20 000
		Total Difference (kg)	20 000
		Total Cost	R0,00
LOADING DETAILS			
<u>Axle Groups</u>	<u>Actual kg</u>	<u>Permissible kg</u>	<u>Difference kg</u>
Group 1	5 000	7 700	(2 700)
Group 2	10 000	18 000	(8 000)
Group 3	10 000	18 000	(8 000)
Group 4	10 000	18 000	(8 000)
TOTALS	35 000 kg	61 700 kg	(26 700) kg Speed 2.6 km/h
CONSIGNEE DETAILS			
<u>Consignee Code</u>		<u>Address</u>	
<u>Consignee Name</u>			
<u>Document Number</u>	SAS000000023	<u>Contact Name</u>	****
<u>Document Type</u>	Sales	<u>Contact Number</u>	****
<u>Document Weight</u>	0		
<u>Consignee Code</u>		<u>Address</u>	
<u>Consignee Name</u>			
<u>Document Number</u>	SAS000000023	<u>Contact Name</u>	****
<u>Document Type</u>	Sales	<u>Contact Number</u>	****
<u>Document Weight</u>	0		
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Supplied by Sasco Metrology Services (PTY) LTD (v4.4.1)			Page 1 of 3

A SOLAS weighing ticket in readable form is normally printed in the following format.

SOLAS COMPLIANT WEIGHING TICKET	
	WEIGHBRIDGE NAME Sasco P&W Pomona DATE AND TIME: 2018/07/11 8:00:00 SANAS CERTIFICATE: 1121990 CALIBRATION CERTIFICATE: 1121990 CALIBRATION DATE: 2019/01/19
TICKET NUMBER PM00002473	TICKET DATE 2018/07/11 8:00:00
TRANSPORTER INFORMATION	
Horse Registration: TESTGP	Driver Name: _____
Trailer 1 Registration: TRAILER01GP	Captured by: sa
Trailer 2 Registration: _____	_____
Transporter Name: Test Company	_____
CARGO INFORMATION	
Customer Name: Test Company	_____
Container Number: MSKU2666542	_____
ISO Type: ST20	_____
Load Type: _____	_____
Container Tare: 10 000 kg	_____
Seal Number: S12346	_____
Empty Vehicle Weight: 14 000 kg	_____
Gross Vehicle Weight: 80 kg	_____
Gross Cargo Weight: -13 920 kg	_____
Net Cargo Weight: -23 920 kg	_____
COMPLETED BY _____	DRIVER _____
DATE _____	DATE _____
<small>This document also confirms that the minimum mass of the drive axles have been checked and that the mass on the steering axle has been checked for both over and under loading.</small>	
<small>The contents of this document are protected by copyright.</small>	
<small>Supplied by Sasco Africa Holdings (PTY) LTD (v3.1)</small>	<small>Page 1 of 1</small>

EXAMPLE OF A TYPICAL PAPER FORM OR ELECTRONIC FORM SOLAS WEIGHING TICKET GENERATED BY EITHER WIM-PW OR WIM-UM.

An axle loading ticket in QR form is normally printed in the following format:



EXAMPLE OF PROMPTED QR CODE

Optional Data Integrator Module

The WIM 2000 operates using the ProWeigh+ software with all the integration functionality that ProWeigh+ offers.

ProWeigh+ offers two distinct integration methods, the first being Business Connector which synchronizes data between your various WIM systems with a central database, from here it can then be integrated into a host of applications including ERP's such as SAP, Sage, and Syspro as well as reporting tools like QlikView and Microsoft PowerBI.

The second method is Web Services which is a standardized messaging protocol which allows you to closely interact with ProWeigh to maintain and monitor various aspects of the software. This is well suited for large workflow-controlled environments.

Figure 1: Webservices

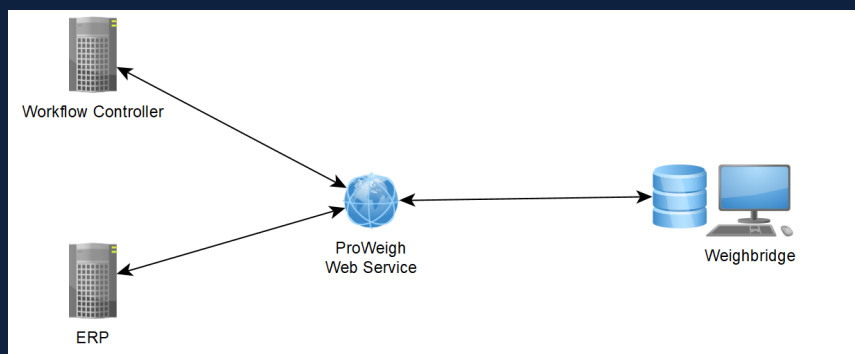
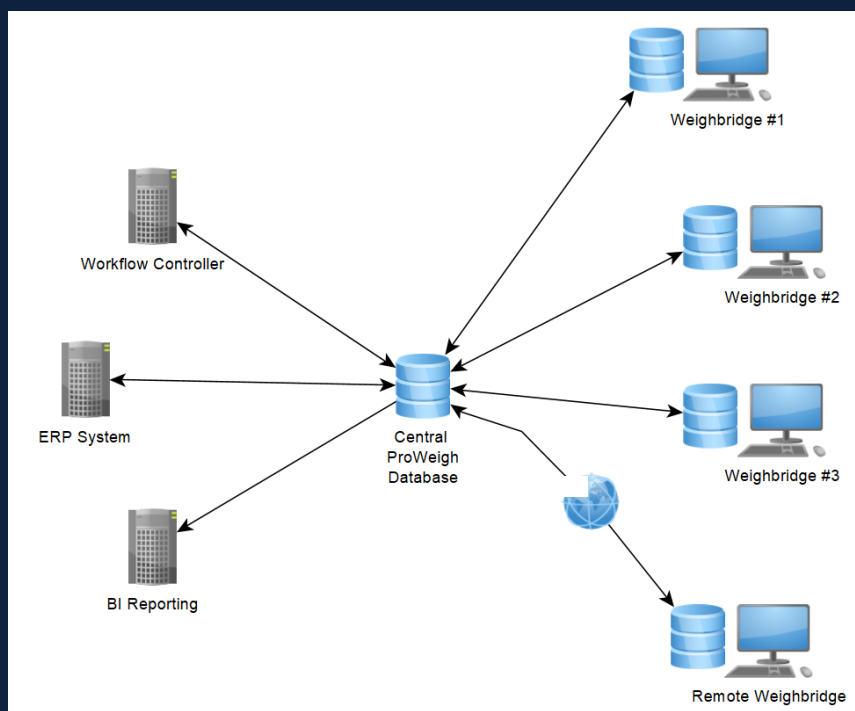


Figure 2: Centralised Database



WIM 2000 Application Example

Company A is a logistics and warehousing business. The facility operates 24/7 with all vehicles departing through dedicated exit gate which is manned at all times.

Company A's customers want to ensure that their vehicles are fully compliant with over loading laws and that drivers have a compliant weighing ticket in the vehicle.

Company A would also like to automate the exit gate opening process and install a system that provides images of all vehicle leaving the premises. In addition, the weighing solution must also be integrated to **Company A's** ERP system, so that all data generated at the point of weighing can be integrated with databases on the ERP system.

Finally, with space being an issue, **Company A** therefore would prefer a solution that does not require installing a full-length weighbridge.

The optimal solution is the WIM 2000, installed flush in the ground at the exit gate. A weighing cabin will be erected next to the WM 2000, which will house the SW 2000 indicator, a PC and printer.

The following automation hardware will also be installed:

- APNR camera to read the departing vehicles registration numbers.
 - Traffic lights which ProWeigh will turn go green once the departing vehicles registration read by the APNR camera is uploaded into ProWeigh.
 - CCTV cameras linked which will capture images of the departing vehicles and these images will be combined with the weighing data in ProWeigh and then all this data will be transmitted to the ERP system.
 - Electrical cabling to the gate motor so that once the weighing is complete ProWeigh can trigger the gate to open.
 - Data cabling between the PC and the ERP system in the main office.
-

WIM 2000 Technical Specifications

WEIGHING HARDWARE	DETAILS
Deck width	0.76m
Deck length	3.2m
Required level approach	7m
Number of load cells	4
Load Cell approval	OIML
SW 2000 approval	OIML
Maximum weighing Speed	5 Kmph
Minimum weighing Speed	3 Kmph
Speed recorded	Yes
Weighing accuracy at maximum Speed	+ -99%
Weighing accuracy at minimum speed	>99%
Maximum number of axles	20
Manned or Unmanned	Manned
PC Required	Yes
Printer Required	Yes
Mains power required	Yes
Option of add on peripheral devices	Yes

WEIGHING SOFTWARE	DETAILS
ProWeigh	Version 4.6 or higher

WIM 2000 Technical Specifications

AUTOMATION AND OTHER HARDWARE	DETAILS
Computer (Normally One)	<ul style="list-style-type: none"> • CPU: Intel Core i5 (8th generation or newer) or • AMD Ryzen 5 (3000 Series or newer) • RAM: 8GB or Higher • Storage: 500GB or More • Network: Ethernet and Wi-Fi Serial Port if serial communication needed • USB: 4 ports minimum • Display Resolution: 1920 x 1080 Operating System: Windows 10 or Windows 11
Printer (Normally One)	<ul style="list-style-type: none"> • Monthly page volume up to 4,000 • Laser print technology • 84 different fonts • A4 print speed of 38 ipm • Tray options 100- 550 sheets
Traffic Lights (Normally One)	<ul style="list-style-type: none"> • LED • Honeycomb diffuser • SABS approved
Boom (Normally One)	<ul style="list-style-type: none"> • High speed operation • Low power usage • Boom with LED light strip • Break away barrier arm. • Built in battery backup. • Manual override. • Cabinet finish mild steel.

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