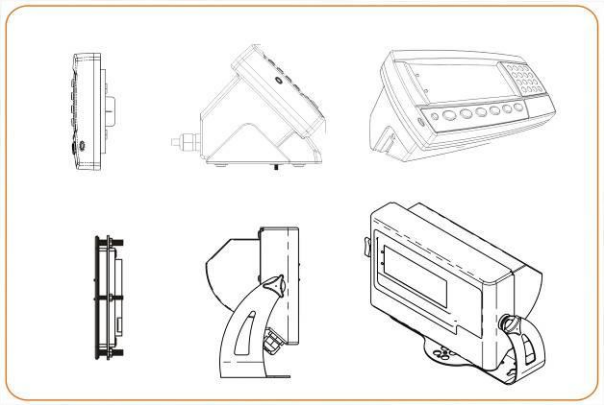
R400 Series – Data Sheets



- 100,000 d @ 0.25 µV/d
- Trade approved Australia, Europe and USA
- Built in RS232/RS485
- IP65 ABS or stainless steel housing
- 16 x 350 ohm cells
- Ethernet and Profibus DP support
- Robust precise analogue output module

The R400 series of indicators are designed with both the installer and operator in mind and cover a wide range of applications. They are engineered and built to last with reliability being foremost. The modular design allows for the installation to be commissioned with only the components required, saving on time and money.

Flexibility is the key with its award winning modular accessory design. Modules include: additional serial options, input/outputs, analogue outputs, external buttons, Ethernet, Alibi (Data Storage Device) and battery or AC option.

Superior housings - two housing types are available:

- R420 (ABS) rated to IP65
- R423 (stainless steel) rated to IP66

Both housings are designed with extra attention to detail to increase their reliability in the field, thereby reducing unplanned downtime and servicing costs. For example, the R423 uses a high impact polycarbonate lens to protect the LCD from knocks.

Simple setup - use the menu system directly via the alpha numeric keypad or the configuration utility View400 on a PC.

Operator friendly - large multi-segment display that uses logical prompts along with dedicated and programmable function keys. Printing can be tailored with custom record, docket or reports printouts. Primary display is 29mm (1.1") and secondary display 18mm.

Rugged Load Cell Input - Designed to take 16x320 ohm load cells; providing flexibility and reducing the need for summing hardware, simplifying the installation and saving money. The load cell input is protected with onboard transorbs to limit damage from external voltage surges.

Networking Capability - Support for both Ethernet and Profibus DP to improve integration into larger control systems

Modules

The R400 Series flexibility is provided through its broad range of modules that are easy to configure and neatly connect into the rear of the indicator. There are 4 module slots where an indicator can be equipped with only the features required for a given installation.

Robust Input/Output Modules (M4301, M4311, M4321, M4331)

An R400 indicator can be equipped with up to 32 I/O. These I/O are electrically isolated, designed for direct connection into PLC's and are capable of driving low voltage actuators directly.

- Isolated high side (400mA current source) drivers are capable of driving low voltage actuators directly or can be connected directly with PLC controllers.
- Each module has 8 digital I/O ports which are limited to maximum input voltage of 30V and can drive up to 400mA.
- Direct connection between I/O points is supported
- Inputs are isolated to resist against system noise.

Button Module (M4302)
The Button Module provides 4 voltage free inputs for use with switches or thumbwheels. The voltage free inputs eliminate the need to wire up complicate input driver circuits.

Isolated Communication Modules

Communication modules are in addition the built in RS232/RS485 ports on the R400 indicators.

- **Fully isolated** and recommended for application where there is a risk of lightening or surges or where additional communication ports are required.
- M4201 RS232/RS232, M4202 RS232/RS485, M4203 RS485/RS485

Precise Robust Analogue Output Module (M4401)

The analogue module provides a 4-20mA or 0-10V analogue output and two digital I/O.

- **Isolated** so as to resist against system noise and interference therefore reducing unnecessary callouts;
- **Precise** with a 400Hz (2.5msec) update rate and 1/65,000 resolution. The fast update and high D to A conversion rate give a smooth output curve which helps a PLC to see more realistic readings (2.5msec step)
- **Scalable** to suit the input on the PLC.
- **Two digital I/O** provided the same as the M4301

Data Storage Device Module (M4501)
The Data Storage Module provides non volatile alibi memory storage (6M bytes) according to WELMEC 7.2 L. Compatible with later versions of software.

Ethernet (M4221)

The Ethernet Module provides 10/100 Base TX with auto negotiation (1 Raw bi-directional port and 10 Raw transmit only ports).

Accessories

Converter 0-10V/4-20mA Input (M4902)

Connects to the Load Cell Input on R400 series indicators for a voltage or current input. Useful where an indicator needs to take an input from load pins on a crane scale for example. Suitable for pressure, displacement or strain transducers that output 4-20mA or 0-10V analogue signals.

Opto-link

The magnetically coupled opto-link on the front panel provides a convenient temporary connection to a laptop - no need to access rear of the indicator.

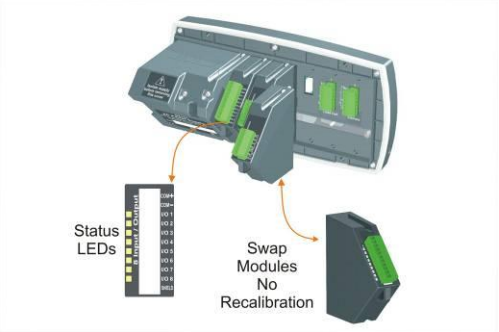
- Transfer of setup and calibration information
- Download of software upgrades

Relay Module

The relay module, used in conjunction with an I/O module, provides 8 voltage free relay outputs rated to 250VAC and 8A.

- DIN rail mountable.
- Provides N/O (normally open) and N/C (normally closed) contacts for each output.

Smart Weighing



Superior Diagnostics

R400 series indicators have a range of diagnostic tools and features that aid system commissioning and maintenance.

Hardware configuration report summarises how the indicator hardware is setup, providing a record for maintenance purposes or fault finding

Force Output and Test Input functions allow the installer to specifically test I/O to assist in site setup

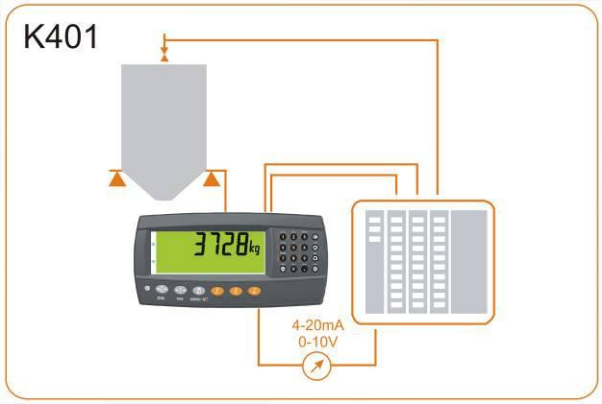
Modules can be swapped in and out without recalibration of the indicator, saving time and effort

Status LED on each I/O;

Overload counter to review if the scale has been overloaded.

..now that's smart weighing.

R400 Series – K401 – Data Sheet



- Counting with piece weight entry
- Custom unit switching
- Set pointing
- Reporting
- Custom printing
- PLC integration

The K401 is a general purpose indicator suitable for weigh bridges, general trade weighing, multiple indicator weighing systems and process control. The Scale Entry/Exist features make the K401 ideal for unmanned weigh bridges.

Programmable printing for customized dockets and reports can support two separate printers

- Comprehensive print tokens allow for all instrument data to be printed in a variety of formats
- Custom print strings can be assigned to multiple instrument events, for example long and short press of a print key.

Custom Unit Switching allows for complete flexibility

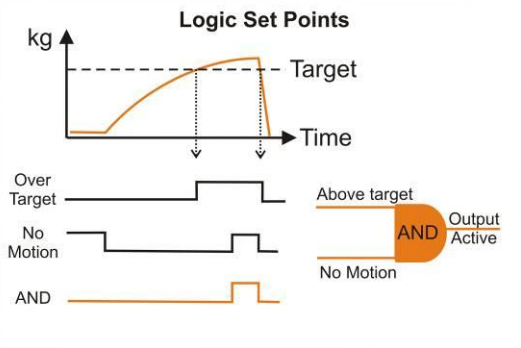
- programme for standard weight units (kg, lb, t etc) or
- define alternative weighing units for your application (litres or force for example)

Flexible set point configuration for improved system integration. A set point can be individually configured to instrument status or weight target triggers. Each set point can be:

- independently configured for a given function
- associated with a given output
- configured for high or low logic
- defined to use a given weight source – Gross, Net, Alternate Units or Piece count

The large multi-line display assists the operator by displaying current weight and total weight and product name.

Smart Weighing



R400 Logic set points are based on the status of the inputs and the defined mask that is used to match IO1-IO24 for the logic set points.

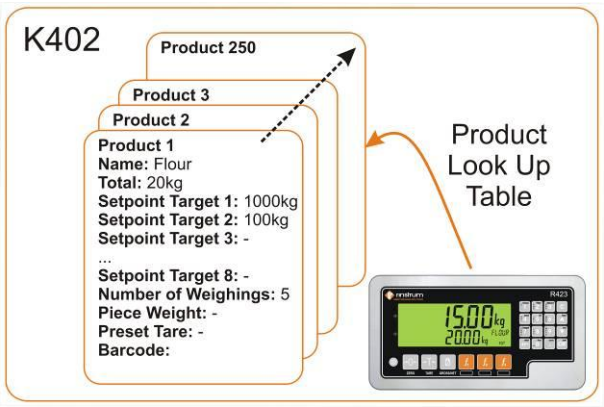
- AND logic set point active when all inputs in mask are on.
- OR logic set point active when any inputs in mask are on.
- XOR logic set point active when only one input in mask is on.

For applications that require a combination of multiple conditions eg.

- An output that is only to be active when weight is above target and stable.
- Pass band: weigh is between two targets

..now that's smart weighing.

R400 Series – K402 – Data Sheet



- 250 Product storage
- Counting with piece weight entry
- Custom unit switching
- Set pointing configured on a product basis
- Reporting
- Custom printing

The K402 adds multiple-product configuration to the K401, making it ideal for applications where there are a variety of products that have fixed attributes that need to be recalled.

Powerful product configuration allows for parameters to be stored for each product. For each product the following can be stored:

- set point target
- piece weight
- units conversions
- full accumulation data

Products can be recalled easily by the operator by using the product name - either select from the most recently used 10 products or use an alphanumeric product search via the keypad. Product selection via an external thumb-wheel is also supported.

Counting is made easy with either the piece weight is entered or determined through a sample. This piece weight can then be stored against the product id.

Multi-segment display assists the operator for piece weight counting by displaying the number of pieces on the primary line and the piece weight on the secondary line.

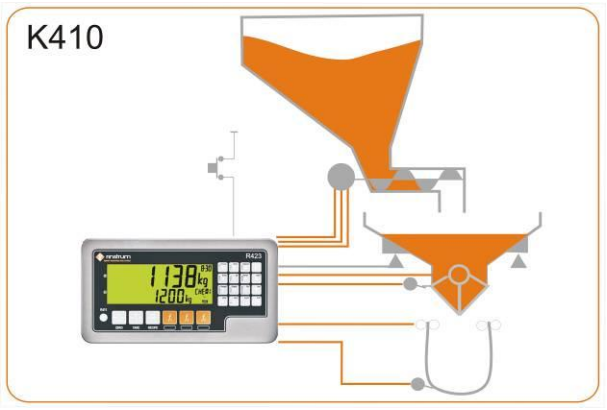
Smart Weighing

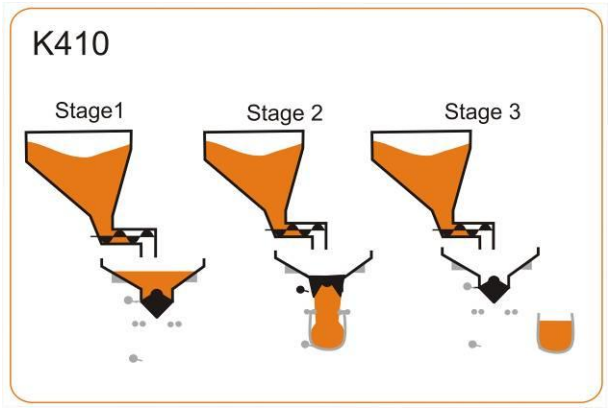
Powerful Product Configuration

- Database of up to 250 complete sets of product parameters
- Combine with logic set points for pass band where the weight is between two targets
- Combine with custom printing functionality to print product subtotals and product names
- Select products using the keyboard or use external inputs from switch contacts (eg. thumb wheel)

..now that's smart weighing.

R400 Series – K410 – Data Sheet





- 100 Recipes (Products)
- 3 set batching stages- Fill, Dump and Pulse
- 1 Material/3 Speed Fill
- Fill correction using jogging or in-flight
- Negative batching
- Batch suspend
- Dump to time or weight

The K410 is a single material filling application used for dosing, bagging and silo discharge.

Easy setup: The K410 uses three set batching stages: fill, dump and a finish stage. The defined I/O simplifies setup - defining the fill outputs, interlocks and enables that would generally be used on filling systems.

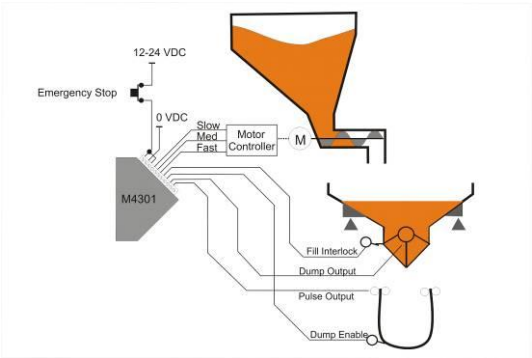
Negative batching is supported by setting the fill direction which defines if the weight is increasing or decreasing while batching - ideal for discharge and dosing applications.

Batch Suspend can be allocated to a function key - the batch will pause and adjust the tare weight when resuming the batch. Ideal for when a material feeding the batch needs to be topped up during the batch without affecting the batched amount, or when feeding from multiple bulker bags etc.

Timer based multiple batching uses the Real Time Clock to control the batch start time and the duration between repeat batches - ideal for bio-fuel applications.

When using timer based batching, the current weight is displayed along with the time to go before the next batch, keeping the operator informed.

Smart Weighing

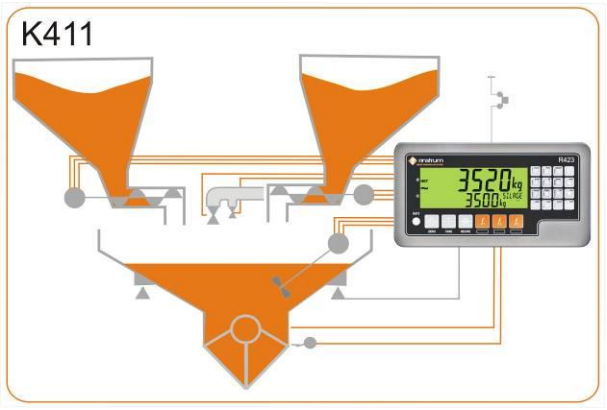


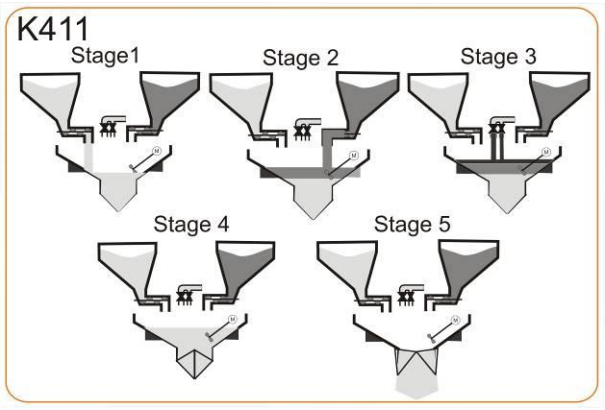
Predefined fill, dump and finish configuration for fast setup.

IO1	All Stages	Batch Interlock
IO2	Stage 1	Slow Fill
IO3	Stage 1	Medium Fill
IO4	Stage 1	Fast Fill
IO5	Stage 1	Fill Interlock
IO6	Stage 2	Dump Enable
IO7	Stage 2	Dump Output
IO8	Stage 3	Pulse Output

..now that's smart weighing.

R400 Series – K411 – Data Sheet





- 100 Recipes (Products)
- 10 Batching stages
- Fill, Dump, and Pulse stages
- 6 Materials/3 Speed Fill
- Fill correction using jogging or in-flight
- Dump to time or weight
- Negative batching and Batch suspend
- Timer based multiple batching using Real Time Clock

The K411 provides a powerful and flexible batching controller that builds on the K410 functionality where up to 10 batching stages can be defined for an application as either a fill, dump or pulse stage. It is suitable for multi-head batching machines and more complex control systems.

Detailed reporting with material usage and batch statistics, along with QA records of every batch run possible when combined with the data logger;

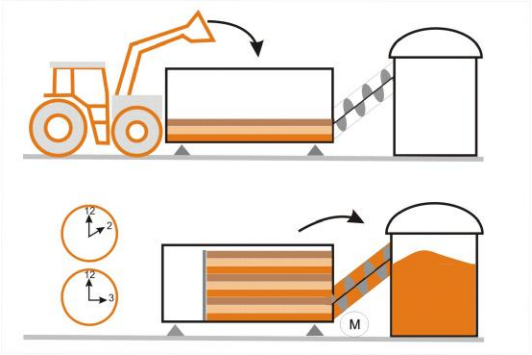
Batching operation flexibility where batch size can be varied by either weight or proportion and the operator can set number of batches to run.

Overall system accuracy of the K411 allows for unprecedented filling control with uncertainty of less than 1 millisecond.

The 32 I/O control points available on R400 indicators allow for complex control with multiple set points, enables and interlocks. As the outputs are isolated high side (current source) drivers they are capable of driving low voltage actuators directly or can be connected directly with PLC controllers.

The multi-line display shows batch progress, current weight, target weights, material name along with dedicated batch status annunciators. For example in a batch out scenario current net weight and target weight along with name of the material that is being batched is displayed.

Smart Weighing



Functions for Industry

Automatic proportion calculation after first fill stage

- Proportions of remaining batch are adjusted automatically according to first material fill quantity
- Ideal for applications with a manually loaded first fill stage

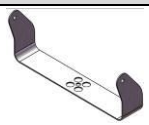
Timer based multiple batching

- The Real Time Clock is used to control the batch timing for time based batching
- Ideal for bio-fuel and dosing applications

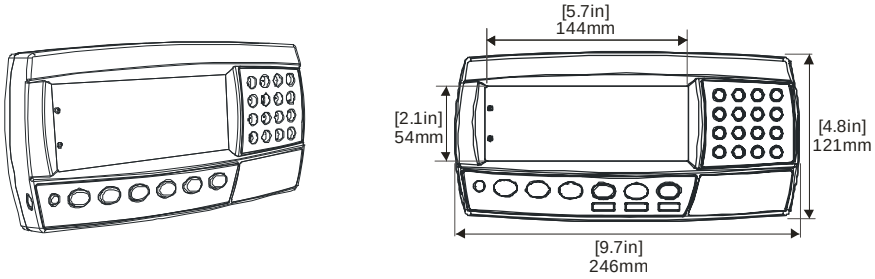
..now that's smart weighing.

R400 Series Specification Table

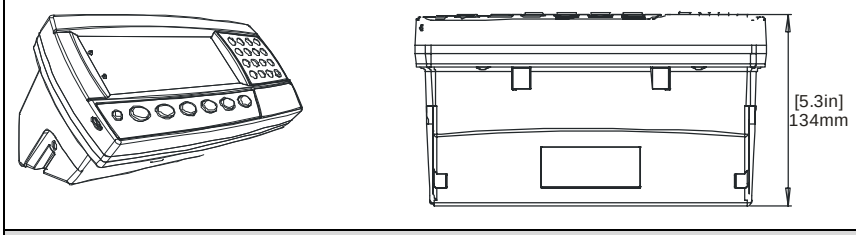
Resolution		Up to 100,000 d, minimum of 0.25uV/d			
Approvals		10,000 d @0.7uV/d NMI(S-463), OIML R76 III/III L NTEP 08-720 MID 2004/22/EC - WELMEC 2.1 & 7.2 FCC, CE, C-tick			
Zero Cancellation		+/- 2.0mV/V			
Span Adjustment		0.1mV/V to 3.0mV/V			
Excitation		7.4V for up to 16 x 350 or 32 x 700 ohm load cells (4-wire or 6-wire plus shield) Maximum total load cell resistance: 1,000 ohms			
A/D Type		24bit Sigma Delta with ±8,388,608 internal counts			
Operating Environment		Temperature: –10 to +50°C ambient (14 °F to 122 °F) Humidity: <90% non-condensing			
Display		LCD with 4 alpha-numeric displays and LED backlighting: Primary display: 6 x 28.4mm (1.12") high digits with units and annunciators 2nd display: 9 x 17.6 mm (0.7") digits with units 3rd display: 8 x 6.1 mm (0.2") digits 4th display: 4 x 7.6 mm (0.3") digits			
Setup and Calibration		Full digital with visual prompting in plain messages			
Digital Filter		Sliding window average from 0.1 to 30.0 seconds			
Zero Range		Adjustable from +/- 2% to +/- 20% of full capacity			
Standard Power Input		12 to 24VDC (15 VA max) - ON/OFF key with memory feature			
Variants	**AC**	AC power supply Input: 110/240VAC 50/60Hz Output: 12VDC 15VA			
	Battery	2.5AH NiMH rechargeable battery pack Charger Input: 110/240VAC 50/60Hz Output: 12VDC			
Optical Data Communications		Magnetically coupled infra-red communications Conversion cables available for RS232 or USB			
Correction		10 point linearity correction			
Serial Outputs		Serial 1A: RS-232 serial port for remote display, network or printer supports. Serial 1B: RS485 transmit only for remote display Transmission rate: 2400, 4800, 9600 or 19200 baud			
Assignable Function Keys		3			
Operating Modes		Single Range, Dual Range and Dual Interval			
Battery Backed Clock Calendar		Battery life 10 years minimum			
Application Software		K401	K402	K410	K411
Functions		Custom printing, custom unit switching, counting, manual hold, peak hold, auto output totalising		1 Material 3 fixed batching stages - fill, dump and pulse 3 Speed Fill	6 Material Up to 10 Batching Stages 3 Speed Fill, Fill, Dump & Pulse stages
				Inflight & jogging correction, Negative batching Batch suspend Timer (RTC) based multiple batching	
Products/Recipes		1	250	100	100
Set points		8			
Analogue Output *		1			
Additional Communications *		Module: RS232/RS232 Module: RS232/RS485 Module: RS485/RS485			
Button Input *		4 Buttons			
Data Storage Device *		1			
Profibus-DP		Used with Rinstrum 1400 Profibus-DP Module			
Ethernet *		1			
Housing Options		**R420**		**R423**	
Case Materials		ABS		Stainless Steel	
Packing Weights		Indicator: 1kg (35 oz)		Indicator: 1.2kg (42 oz)	
Environmental IP Rating (panel mounted or with rear boot)		IP65		IP66	

R420 Rear Boot for IP65 standalone unit		R420 Brackets		R423 Bracket
				
Rear Boot	Rear Boot with Desk Stand	Stainless Steel Wall Mounting M4003	Stainless Steel Post Mounting M4004	Stainless Steel Desk/Wall/Post Mounting

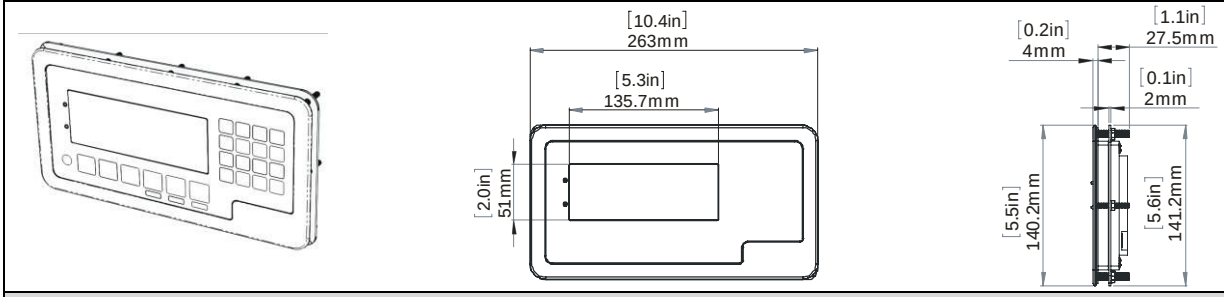
ABS Panel Mount



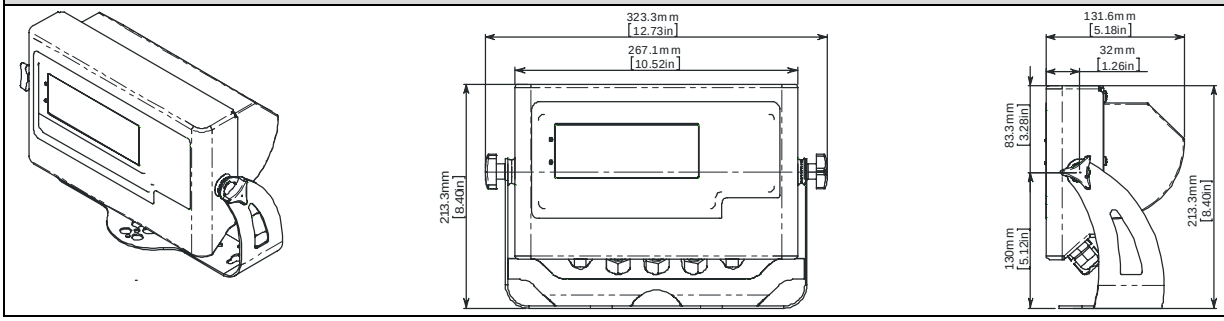
ABS with Rear Boot



Stainless Steel Panel Mount



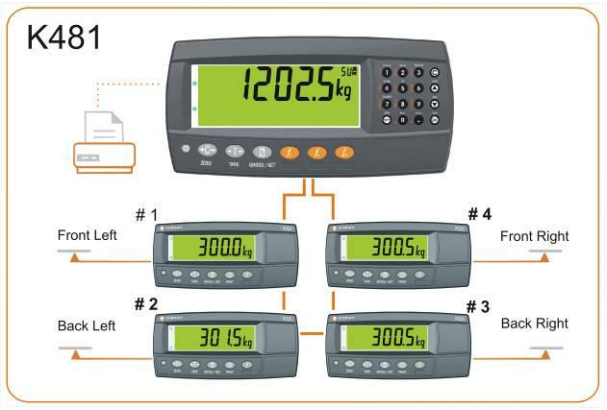
Stainless Steel with Rear Housing and Stand

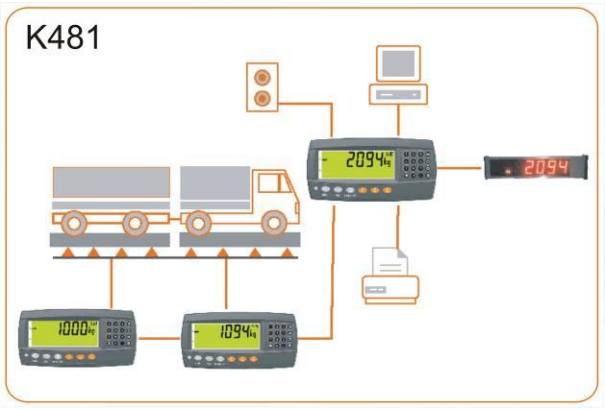


Specifications are subject to variation for improvement without notice. Illustrations are indications only and variation may be evident between products.

*Optional modules

R400 Series – K481 – Data Sheet





- Up to 9 slave units
- Up to 4 subtotals
- Subtotal can add or subtract slave values
- Sum R300 indicators
- Sum R400 indicators
- Built in serial ports
- Complies to Technical Schedule S1/0/A

The K481 Summing Indicator is based on the R400 Series indicator hardware. It shares the same style operator interface and setup menus making it easy for both the operator and the installer. The K481 can sum both R300 Series and R400 Series indicators.

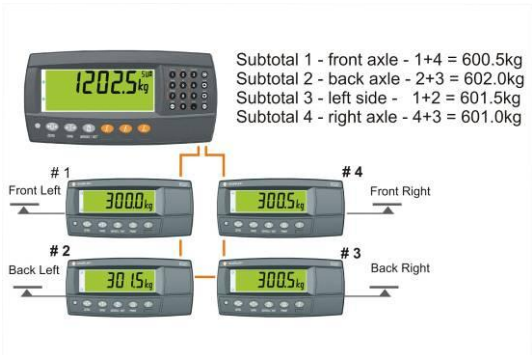
Sum Nine (9) Slave Units: The K481 can sum up to nine slave indicators from either the R300 or R400 range. These can be connected together on a multi-drop serial RS485 bus or RS232 ring network. The summing indicator polls each of the slave units summing all of the weight readings, and displays the resulting total weight.

Four (4) Subtotals: Up to 4 subtotals can be defined to add or subtract slave values. Each subtotal can be named to assist the operator and for custom printing.

Support for R400 Series Modules and Accessories: The K481 uses the R400 series Accessories and supports many of the R400 series modules – additional communications modules, button module, input/output modules and analogue module.

Applications: multiple deck weigh bridges, car balancing systems, aircraft weighing, medical bed weighing applications and shipyard centre of gravity ballast determination.

Smart Weighing



Designed to support applications where balance or relative weight is important.

Up to 4 subtotals can be defined - these subtotals can add or subtract slave weight values. In a car balancing scenario four subtotals are defined:

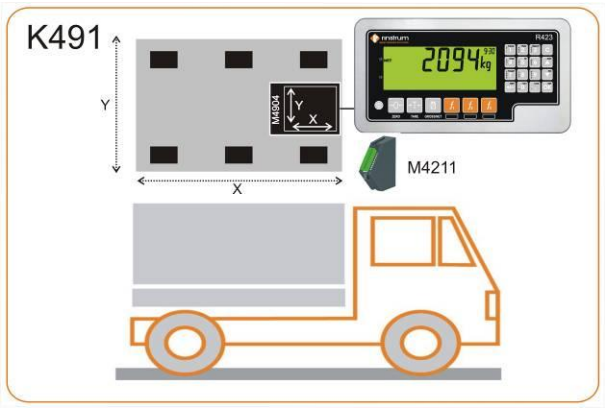
- Front Axle = 1+4
- Back Axle = 2+3
- Left Side = 1+2
- Right Side = 3+4

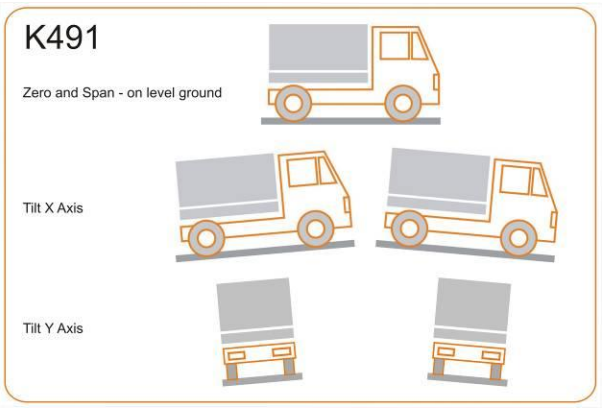
..now that's smart weighing.

R400 Series – K481 Summing Specification Table

Approvals		Australia NMI S1/0/A FCC, CE, C-tick	
Operating Environment		Temperature: –10 to +50°C ambient (14 °F to 122 °F) Humidity: <90% non-condensing	
Display		LCD with 4 alpha-numeric displays and LED backlighting: Primary display: 6 x 28.4mm (1.12") high digits with units and annunciators 2nd display: 9 x 17.6 mm (0.7") digits with units 3rd display: 8 x 6.1 mm (0.2") digits 4th display: 4 x 7.6 mm (0.3") digits	
Standard Power Input		12 to 24VDC (15 VA max) - ON/OFF key with memory feature	
Variants	**AC**	AC power supply Input: 110/240VAC 50/60Hz Output: 12VDC 15VA	
	Battery	2.5AH NiMH rechargeable battery pack Charger Input: 110/240VAC 50/60Hz Output: 12VDC	
Optical Data Communications		Magnetically coupled infra-red communications Conversion cables available for RS232 or USB	
Serial Outputs		Serial 1A: RS-232 serial port for remote display, network or printer supports. Serial 1B: RS485 transmit only for remote display Transmission rate: 2400, 4800, 9600 or 19200 baud	
Assignable Function Keys		3	
Battery Backed Clock Calendar		Battery life 10 years minimum	
Application Software		**K481**	
Functions		Up to 9 Slaves (R300s or R400s all one type) Up to 4 Subtotals Custom Printing, Auto Output	
Products/Recipes		10	
Set points		8	
Analogue Output *		1	
Additional Communications *		Module: RS232/RS232 Module: RS232/RS485 Module: RS485/RS485	
Button Input *		4 Buttons	
Data Storage Device *		1	
Ethernet *		1	
Housing Options		**R420**	**R423**
Case Materials		ABS	Stainless Steel
Packing Weights		Indicator: 1kg (35 oz)	Indicator: 1.2kg (42 oz)
Environmental IP Rating (panel mounted or with rear boot)		IP65	IP66

R400 Series – K491 Tilt Compensation – Data Sheet





- 2 Axis tilt compensation
- Supports R400 series modules & accessories
- I/O Modules
- Communication Modules (RS232/RS485)
- Up to 250 Products
- Built in RS232/RS485 ports
- Up to +/- 15 degree compensation

The K491 is a general purpose indicator that uses an accessory module to connect to a 2 axis tilt sensor that provides tilt compensation. The K491 is ideal for specialist truck OEM's requiring electronics for accurate load weighing solutions where the load may be on an angle. Both the ABS R420-K491 and stainless steel R423-K491 are ideal for panel mounting in a truck cab, featuring a large display and programmable function keys. The application is for a truck to have accurate weight readings that can compensate for uneven surfaces where a weight reading might be taken

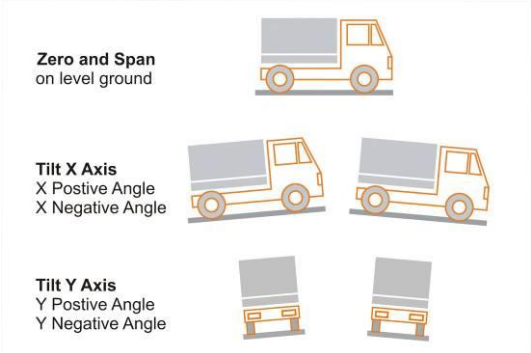
Simple calibration: Zero/Span calibration (at 0 angle) and tilt calibration to generate the four tilt parameters that are used to correct the reading.

Accessories: The K491 requires a tilt module and tilt sensor.

- Tilt Module (M4211)
- Rinstrum tilt sensor (M4) suitable for +/- 10 degree
- The tilt sensor must be correctly mounted given the axes that are providing data
- The K491 is compatible with a selection of the other sensors up to +/-15 degrees

Custom printing: dockets can be customised for the application. The built in RS232/RS485 port can be configured for printing.

Smart Weighing



Simple three stage calibration

1. Zero Calibration (at 0 angle)
   - Performed on level surface
   - Tilt sensor is automatically set to 0
   - Calibrates out any inaccuracies
2. Span Calibration (at 0 angle)
3. Tilt Calibration - this generates four tilt parameters that are used to correct the reading.

..now that's smart weighing.

R400 Series – K491 Tilt Compensation Specification Table

Resolution		Up to 100,000 d, minimum of 0.25uV/d	
Approvals		10,000 d @0.7uV/d NMI(S-463), OIML R76 FCC, CE, C-tick	
Zero Cancellation		+/- 2.0mV/V	
Span Adjustment		0.1mV/V to 3.0mV/V	
Excitation		7.4V for up to 16 x 350 or 32 x 700 ohm load cells (4-wire or 6-wire plus shield) Maximum total load cell resistance: 1,000 ohms	
A/D Type		24bit Sigma Delta with ±8,388,608 internal counts	
Operating Environment		Temperature: –10 to +50°C ambient (14 °F to 122 °F) Humidity: <90% non-condensing	
Display		LCD with 4 alpha-numeric displays and LED backlighting: Primary display: 6 x 28.4mm (1.12") high digits with units and annunciators 2nd display: 9 x 17.6 mm (0.7") digits with units 3rd display: 8 x 6.1 mm (0.2") digits 4th display: 4 x 7.6 mm (0.3") digits	
Setup and Calibration		Full digital with visual prompting in plain messages	
Digital Filter		Sliding window average from 0.1 to 30.0 seconds	
Zero Range		Adjustable from +/- 2% to +/- 20% of full capacity	
Standard Power Input		12 to 24VDC (15 VA max) - ON/OFF key with memory feature	
Variants	**AC**	AC power supply Input: 110/240VAC 50/60Hz Output: 12VDC 15VA	
	Battery	2.5AH NiMH rechargeable battery pack Charger Input: 110/240VAC 50/60Hz Output: 12VDC	
Optical Data Communications		Magnetically coupled infra-red communications Conversion cables available for RS232 or USB	
Correction		10 point linearity correction	
Serial Outputs		Serial 1A: RS-232 serial port for remote display, network or printer supports. Serial 1B: RS485 transmit only for remote display Transmission rate: 2400, 4800, 9600 or 19200 baud	
Assignable Function Keys		3	
Operating Modes		Single Range, Dual Range and Dual Interval	
Battery Backed Clock Calendar		Battery life 10 years minimum	
Application Software		**K491**	
Functions		**Custom printing, custom unit switching, counting, manual hold, peak hold, auto output and totalising**	
		Compensation +/- 15 degree tilt **Three step calibration process - Zero, Span, Tilt**	
Specialist K491 Module		**Tilt Module (M4211) is required**	
Compatible Tilt Sensors		**Rinstrum 2 Axis Tilt Sensor (M4904 +/- 10 degree tilt compensation)** **HL-Planar Technik NS-10/PL2-S or NS-15/PL2-S**	
Products/Recipes		250	
Set points		8	
Analogue Output *		1	
Additional Communications *		Module: RS232/RS232 Module: RS232/RS485 Module: RS485/RS485	
Button Input *		4 Buttons	
Data Storage Device *		1	
Ethernet *		1	
Housing Options		**R420**	**R423**
Case Materials		ABS	Stainless Steel
Packing Weights		Indicator: 1kg (35 oz)	Indicator: 1.2kg (42 oz)
Environmental IP Rating (panel mounted or with rear boot)		IP65	IP66