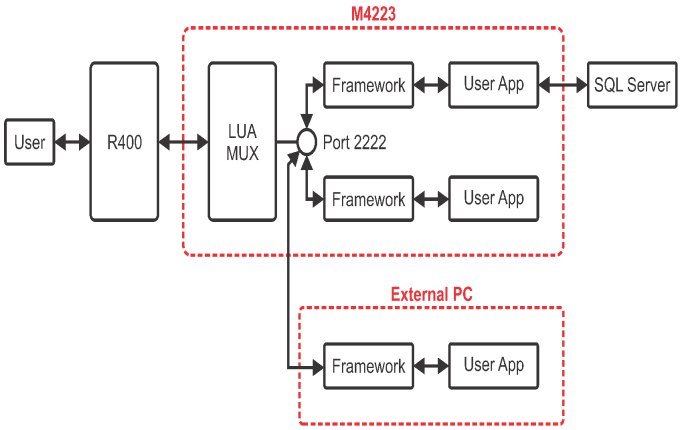
R400 Lua Programmable Indicators



- 100,000 d @ 0.25 µV/d
- Trade approved Australia, Europe and USA
- Lua programmability
- Ethernet Port
- USB Host Port
- Built in RS232/RS485
- IP65 ABS or stainless steel housing
- 16 x 350 ohm cells
- Telnet/SSH remote access

The R400 series hardware now supports programmability using Lua, a powerful lightweight scripting language, in conjunction with supporting libraries that simplify the process of writing scripts to control the R400 indicator. The modular design of the R400 hardware combined with Lua programmability offers the ultimate in flexibility.

Programmability

Programmability is implemented using Lua and the supporting libraries and devices contained on the M4223 module. Connection to the module is via its Ethernet port and the module uses embedded Linux for an operating system. The M4223 module also has a USB HOST port that can be connected to a USB HUB and a variety of standard USB devices.

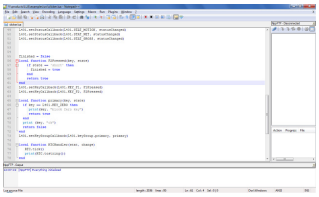
Using the Lua module an R400 indicator can be configured to handle an extensive range of applications. The module comes with a range of standard Lua libraries that allow for the following:

- Direct control of the R420 LCD display
- Custom Key handling
- Direct control of accessory hardware (I/O, serial ports, analogue outputs)
- Ethernet TCP and UDP messaging, SQL database connection
- Local File system using the M4223 on-board flash memory or connect to USB memory sticks.
- Local timers

The entire interface with the instrument is conducted through IP sockets. This means that you can write:

- Multiple applications that run on the M4223 each communicating with the R420, the outside world and each other.
- Applications that run on one instrument and control a network of instruments with a common database, simply by specifying the IP address of each device.
- Applications that run remotely from other hardware.

Toolchain



Telnet and SSH support on the M4223 allows for remote login to the device for diagnostics and support.

Unlike other programmable devices the LUA script does not need to be compiled and re-programmed into the unit. You simply edit the script files directly on the device and reboot.

For the hard-core enthusiast or for simple changes, logon to the device and edit the LUA scripts using the built in VI editor.

For a more familiar interface most developers opt to use a local windows editor like Notepad++ working with the files directly via FTP.

Professional developers can also develop on Ubuntu linux or in a linux VM using Eclipse and running/debugging the application locally. Since the connection to the R420 is via an IP socket there is no difference in running the script locally or remotely other than the fact that files are stored on your local machine rather than in the M4223.

Security

Your applications are protected directly with linux login security. Once you set a unique root login password it is not possible for any information stored on the device to be recovered without using your password. The reset mechanism clears out all user created script and data to restore the M4223 to factory configuration.

Open Source

**

By using linux and LUA the M4223 is a fully open source implementation allowing you full access to the hardware capability of the device and the ability to field upgrade units as new features are added over time.

All of the Lua library source code is freely available which is an invaluable training tool as well as giving you full control on how your applications interact with the system.

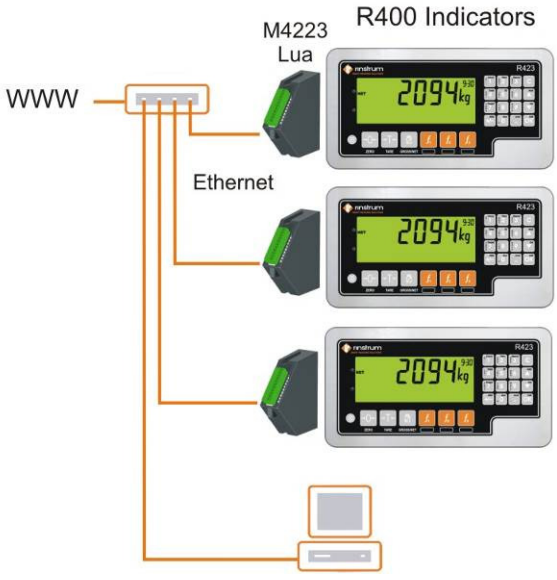
LUA is a modern, dynamically typed, open source scripting language that powers a huge range of applications across all platforms including Windows, MAC OSX, Linux, Android, and IOS. It is the language of choice for cross-platform games developers and is used in many well known applications like World of Warcraft, Adobe Lightroom, Angry Birds and Wireshark.

The investment in LUA for your company is not limited to the embedded weighing applications. With LUA, applications can be developed on Windows, MAC OSX, Linux, IOS and Android using the very same libraries you developed on the weighing devices.

Who knows, in your spare time you might just spin out the worlds next Angry Birds.

Hello World Example


```
--------------------------------------------------------------------------
-- Hello World
--
-- Configures a rinApp application, displays 'Hello World' on screen
and waits for a key press before exit
--------------------------------------------------------------------------

-- Require the rinApp module
local rinApp = require "rinApp"

-- Add control of an L401 at the given IP and port
local L401 = rinApp.addL401()

-- Write "Hello world" to the LCD screen.
L401.writeBotLeft("HELLO")
L401.writeBotRight("WORLD")

-- Wait for the user to press a key on the instrument keypad
L401.getKey()

-- Clean-up the application and exit
rinApp.cleanup()
os.exit()
```



R400 Hardware

Flexibility is the key with its award winning modular accessory design. Modules include: additional serial options, input/outputs, analogue outputs, external buttons, Ethernet 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.

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.

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.

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

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.

rin-LINK

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

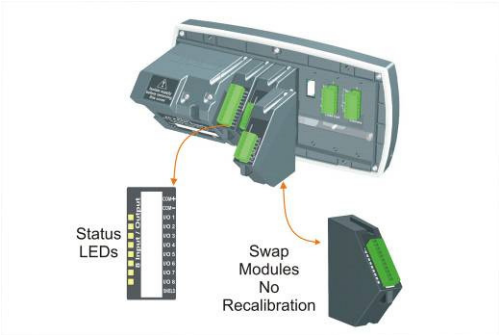
- Transfer of setup and calibration information
- Download of software upgrades

Relay Modules (M4901 and M4906)

The relay modules, used in conjunction with an I/O module, provide 8 voltage free relay outputs rated to 250VAC and 8A, available in either 12 or 24V.

- 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

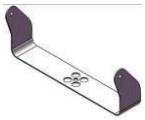
Modules can be swapped in and out without recalibration of the indicator, saving time and effort

R400 Series Specification Table

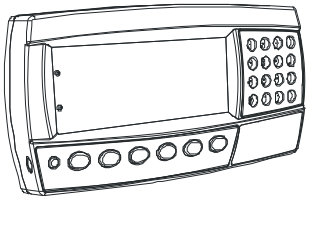
Resolution		Up to 100,000 d, minimum of 0.25uV/d	
Approvals		10,000 d @0.7uV/d NMI(S-463), OIML R76 III/III L NTEP 08-720 FCC, CE, C-tick	
Zero Cancellation		+/- 2.0mV/V	
Span Adjustment		0.1mV/V to 3.0mV/V	
Excitation		7.4V for up to 16 x 350 or 32 x 700 ohm load cells (4-wire or 6-wire plus shield) 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	
Keys		6 large and 16 small (alpha numeric keypad) programmable through Lua	
Operating Modes		Single Range, Dual Range and Dual Interval	
Battery Backed Clock Calendar		Battery life 10 years minimum	
Modules			
Lua Module (M4223)		Ethernet Port/USB Port Embedded Linux Operating system Web Interface LUA Multiplexer (for multiple connections to a single R400 device) Lua 5.1.5 64 MB SDRAM, 64 MB Flash	
Analogue Output * (M4401)		1	
Additional Communications *		Module: RS232/RS232 Module: RS232/RS485 Module: RS485/RS485	
Button Input *		4 Buttons	
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

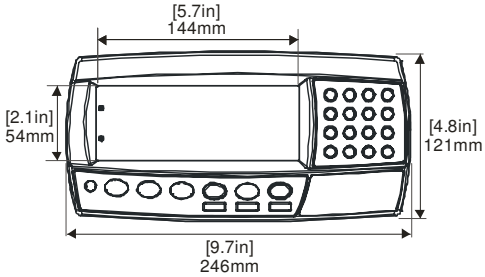
* Optional modules

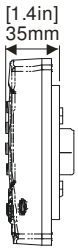
Specifications are subject to variation for improvement without notice. Illustrations are indications only and variation may be evident between products.

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

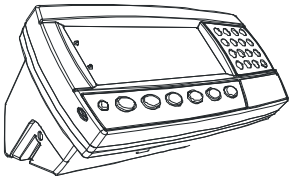
ABS Panel Mount

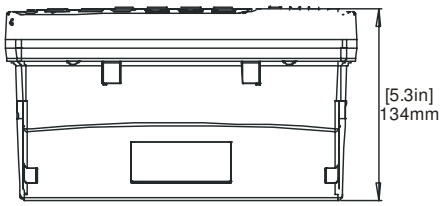


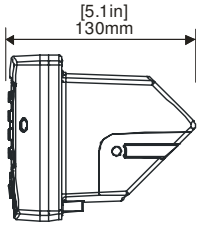




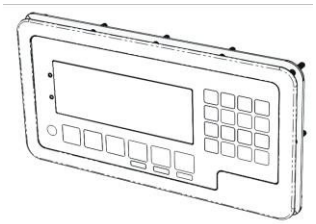
ABS with Rear Boot

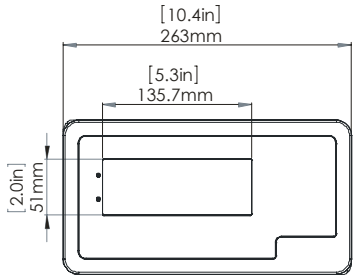


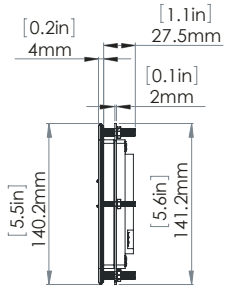




Stainless Steel Panel Mount







Stainless Steel with Rear Housing and Stand