

R400 Series LUA Application Solutions

The R400 Series indicators offer programmability through our Lua module in addition to the standard application firmware— this combination of programmability and standard application firmware means an R400 Series can be configured to suit a large number of single scale, static weighing applications.

The R457 is an indicator in a full stainless steel housing with waterproof USB host, Ethernet connections and cable glands for load cell and accessory connections. The USB host on the front of the indicator can support a variety of USB devices including point of sale printer, keyboard or USB stick.

The Ethernet functionality includes an embedded web server to allow the operator remotely to monitor the instrument with any device with a web browser. For example, you can view the current weight and status from your phone. The R457 carries Rinstrum’s Lua based scripting engine which allows for a variety of Lua applications to be used. The modular design allows for the installation to be commissioned with only the components required, saving on time and money.

1. Dealer Responsibility

The Dealer is to work with the customer to fully understand the application and its hardware requirements (communications, input/output, analogue, scale input etc). The Dealer is responsible for:

- Application and Hardware Specification (and that the application is within the R400 hardware specs.)
- Questionnaire R400-756 and/ or L001-706 (depending on complexity of the application) to be completed by Dealer with above information
- Installation and commissioning

2. Rinstrum Responsibility



- Develop Lua scripting as required to meet Application Specification provided by Dealer.



- Configuring the hardware according to the Hardware Specification and Application Description – Questionnaire R400-756 and/ or L001-706 as provided by the Dealer.
- Up to 1 hour of support during Dealer commissioning

3. Customisation Levels

Customisation is divided into four levels according to complexity of the customer application, summarized below. Rinstrum will assess the customer application as documented to assist with clarifying the application and the applicable level and expected pricing and timing for development.

Customisation		
	LUA-MOD	Simple modification to an existing custom lua application.
	LUA-DEV1	Simple standalone application, standard web site, up to 4 IO, primary interface via R4 indicator with K401 as the basis
	LUA-DEV2	Complex application on R4 or C5 with some integration to other basic equipment/software/systems and weighing by web interface
	LUA-DEV3	Complex application, complex web interface with additional pages, database features, interworking with 3rd party equipment or networking multiple indicators
	LUA-DEV4	Bespoke application requiring development of new capabilities, complex testing required on site with third party equipment
	LUA-LIC1	Reorder Lua license for Dev 1 project. Generated from Lua Module serial number.
	LUA-LIC2	Reorder Lua license for Dev 2 project. Generated from Lua Module serial number.
	LUA-LIC3	Reorder Lua license for Dev 3 project. Generated from Lua Module serial number.

Tiers explained in detail:

Tier 1

- Custom application development
- Single R400 with K401 firmware
- Up to 4 IO points
- No external interfaces
- Capability exists to install and service the equipment
- Standard web interface and application manual
- Weighing interface via indicator buttons and LCD

Tier 2

- C500 or R400 with firmware that allows lua control of LCD and keypad
- Batching or recipe management
- Truck weighing
- Custom database
- Up to 8 IO points
- Any modifications to web interface beyond the standard configurable options
- Integration with external devices via standard protocols (eg: barcode scanner, tag reader)
- Can be completely bench tested by developers using standard or provided equipment
- Test process documented in project specification
- Integration with 3rd party software system using available protocols
- Software integration details documented in project specification including data formats, responses, test account(s) and credentials
- Software integration tested and verified using external tools (eg: postman.com)
- Capability exists to install and service the equipment
- Weighing via web interface
- Custom application manual

Tier 3

- T750 or R400 with non-lua firmware
- Axle or rail weighing
- Networking more than one scale/indicator
- Custom comms messaging
- OEM - indicator is used as a component of a 3rd party product
- Up to 16 IO points
- Test process may need to be developed as part of the project
- Integration with 3rd party equipment
- Customer equipment required for testing
- Any modifications to existing hardware
- May require interview with customer representative to understand the problem
- More complex 3rd party software integration requiring customer input during development or testing
- Complex web interface with additional pages, database features or dialogue flows

Tier 4

- Prototyping of experimental features not attempted before
- Custom analogue signal processing
- More than 16 I/O points
- Possible site visits and data capture during development
- Large scale OEM deployments (100+ units)
- Non-standard communications protocol
- External testing/approvals
- Requires exploration of the problem with customer and analysis of existing solutions

4. What is possible with R400 using a Lua module?

An R400 indicator enhanced with the Lua module can handle an extensive range of applications. It allows:

- Direct control of the R400 LCD display
- Custom key handling and local timers
- Direct reading and control of hardware (I/O, serial ports and analog)
- Ethernet TCP and UDP messaging and SQL database connection
- SSH with SCP and SFTP
- Combines CLI & file transfer
- Local File system using the M4223-USERHW2 on-board flash memory or connect to USB memory sticks.
- USB support of: hubs, printers, keyboards, barcode scanners and serial ports (including Bluetooth)
- Password recovery
- Improved power failure handling to eliminate loss of data and file corruption

R400 LUA Overview

R400-757-201

Rinstrum indicators are built on foundation firmware with 1000's of hours R&D investment. The Lua module's custom scripts leverage this solid baseline firmware as a starting point. For example, the technician doesn't need to implement set-points with hysteresis; those features are already there. How set-points are used can be tailored to the application. Less time scripting using time-proven functionality, reduces risk while ensuring greater confidence in the delivered system.

The current Lua libraries support external software integration through the likes of:

- FTP upload/download
- SQL client (MSSQL, MySQL/MariaDB, PostgreSQL)
- Email attachment
- Web server upload
- REST API (will require a Test account to confirm)
- MQTT client (with external broker)

5. M4223-HW2 Lua Module Specification

- Ethernet and USB Port supporting speeds up to 1000Mb/s and 480 Mb/s respectively
- Embedded Linux Operating system
- Web Interface
- Lua 5.1.5
- LUA Multiplexer (for multiple connections to a single R400 device)
- 1250MHz 4-core, 64-bit CPU
- 512 MB SDRAM, 4000 MB Flash
- Requires Lua enabled firmware in the R400 indicator



6. How do I order?

If you have an opportunity that you think may be suitable, complete the questionnaire (Document R400-756 and/ or L001-706) and contact your local Rinstrum Sales Engineer to discuss the next steps. The Sales Engineer will confirm the suitability from the information provided and request clarification if necessary.

7. What are the benefits for a Dealer?

Once a dealer has understood the application and its hardware requirements, the actual programming and configuring of the R400 unit can be handed off to Rinstrum.

Confidence with quoting and profitability for the Dealer and their sales team.