



## Semaphore Kingfisher LP-2/LP-3 RTU



*Low-power operations provide effective monitoring and control functionality to remote locations.*

### ***A powerful solution for low power monitoring, control and data logging applications.***

The LP-2 and LP-3 cost-effectively open up the world of high-tech communications and SCADA (supervisory control and data acquisition) functionality to practically all remote locations.

The Kingfisher LP-2/LP-3 Low Power RTU suits a wide range of applications that include agriculture operations, environmental monitoring, gas metering, power metering and data logging. These smart, easy-to-use RTUs have ladder logic capability and highly flexible I/O and communication ports.

Very low power consumption is achieved using three modes - communication, scanning and sleeping. The RTU is packaged in a two-part, rugged plastic enclosure that houses the electronics and communication interfaces.

LP-2 / LP-3 Low Power RTUs are compatible with the entire family of Kingfisher RTU products and are configured using the same Toolbox software. The LP-2/LP-3 is further compatible with practically any other SCADA system through the use of a broad variety of communications protocols.

## Kingfisher LP-2/LP-3 Low Power Operations

Intelligent management of power consumption allows the LP-2/LP-3 RTU to be used with battery or solar power sources. Sleep mode current draw of less than 1 mA minimizes the size and cost of the power systems.

Especially low power consumption is achieved using three modes - communication, scanning and sleeping. In sleep mode, all I/O and communication devices are powered down and consumption is less than 10mW. In scanning mode, the RTU has its I/O active and consumption is approximately 450mW. In communication mode, the RTU has all communications and I/O devices powered and the power consumption dependent on the activity and type of communication device.

In low power applications, the LP-2/LP-3 RTU is configured to spend most of its time in sleep mode, moderate time in scanning mode and minimal time in communicating mode. All sleep mode functions are programmable by the user using Toolbox Windows software.



### I/O Adaptability

The LP-2/LP-3 RTU provides 14 I/O points in an adaptable configuration, which is suitable for practically all remote locations:

- 4 Analog Inputs operate over a range of 0 to 5 V dc for use with low-power transducers or 0 to 20 mA for compatibility with current loop devices.
- 8 Digital Inputs are compatible across a broad voltage range of 3.5 to 30 V dc. Inputs 1 and 2 can be configured to wake up the RTU and can also operate as high-speed counter inputs. For added flexibility, inputs 5 to 8 are configurable as digital outputs.
- 2 Digital Outputs use magnetic latch relays, which can switch 2 Amps. When inputs 5 – 8 are configured as outputs, they are open drain outputs operating up to 300 mA.
- The LP-3 additionally provides 1 Analog Output, which operates over 0 to 5 V dc or 0 to 20 mA in sink mode.

### Communications Configurability

Up to three ports in the LP-2 and four in the LP-3 provide versatility to suit most remote application:

- Port 1: RS 232 or RS 485
- Port 2: RS 232 or RS 485
- Port 3 (LP-3 only): KF Series II option card including serial, PSTN modem, dial-up modem or fiber optic interface
- Port 4: KF Series II option card, including serial, PSTN modem, dial-up modem, or fiber optic interface

### SMS Control using a Mobile Phone

Not only can the LP-2 and LP-3 RTU send messages to mobile phone and PDA users to provide live updates, they also allow SMS control of operating parameters and outputs.



*Toolbox software provides easy-to-understand displays, which streamline programming, testing and start-up.*

## Communication Protocols

For compatibility with a broad range of SCADA networks and intelligent devices, the LP-2 and LP-3 support communications protocols including Kingfisher, DNP3, Modbus (Master/Slave), ASCII and many more.

## Toolbox Software

The LP-2/LP-3 RTU is configured using the same, Kingfisher Toolbox software that is used for the Kingfisher Series II RTU family. Toolbox is a Windows-based environment that provides menu-driven configuration, data definition, logic and diagnostics. It is supported by screen displays and easy-to-understand interactive graphical representations, which are designed to streamline programming, testing and start-up efforts.

In addition to programmable logic, Toolbox provides configuration of all communications, power operations and data logging.

## Applications

The Kingfisher LP-2 and LP-3 RTUs bring wide area networking connectivity, remote monitoring, data logging and programmable control to applications over a broad range of industries. Users in the agriculture, environmental monitoring, mining, oil & gas, power, transportation and water/wastewater industries will find a Kingfisher LP-2/LP-3 configuration to be very cost-effective in all installations.



## KINGFISHER LP-2/LP-3 SPECIFICATIONS

### General

Designation	Industrial grade remote terminal unit (RTU)
Input supply	11.5 - 13.8VDC
Power consumption, I/O scan	<45mA (option ports 3 & 4 not loaded)
Power consumption, sleeping	<1mA via DC supply
Battery	External 7 - 17AH recommended
Operating temperature range	-20°C to +70°C (excluding battery)
Operating humidity	5 to 98% R.H. Non Condensing
CPU	Hitachi H8S / 2144 operating at 32KHz or 7.38 MHz
FLASH RAM	4MB Flash RAM
Static CMOS RAM	4K internal, 512K external (battery backed)
Real time clock	Yes
Back-up battery for RAM, RTC	Yes, Lithium
Back-up battery lifetime	7 Years at 25°C
Watchdog timer	Yes
COM Port 1	RS232, 300 to 38400bps
COM Port 2	RS232/RS485, 300 to 38,400bps
COM Port 3 (LP-3 only)	Optional RS232 / RS485, 2/4 wire, dial-up, leased-line, fiber optic, radio interface
COM Port 4	Optional RS232 / RS485, 2/4 wire, dial-up, leased-line, fiber optic, radio interface
Dimensions	185 mm (H) x 130 mm (W) x 50 mm (D)

### Digital inputs

Number of inputs	4 to 8* (channels 1 & 2 can wake the RTU)
Input Voltage range	3.5 to 30 VDC = ON; 0 to 1.5 VDC = OFF
Isolation	None

### Digital outputs

Number of outputs	2 to 6* 2 latching, SPST-NO relay, 4 open drain
Maximum switching voltage	30 VAC, 30 VDC
Maximum switching current	2A
Isolation	500V (relay)
Operating power	300mW at 12V
Optional Dig. Out (DI Ch's 5 to 8)	Open drain 300mA total

### Analog inputs

Number of inputs	4 plus internal (including batt. V, RTU current, RTU temp., and ADC V Ref)
Input voltage range	0-5V (0-20mA with ext. 250 Ohm resistance)
A/D converter resolution	12 Bit
Isolation	None
Binary input range	0 to 32760

### Analog Output (LP-3 only)

Number of inputs	1
Output range	0 - 5V or 0 - 20 mA sink
D/A converter resolution	15 Bit
Isolation	500V RMS

\*Digital inputs 5 to 8 can be selected as digital outputs.

[www.cse-semaphore.com](http://www.cse-semaphore.com)

### U.S.A.

CSE Semaphore Inc.  
1200 Chantry Place  
Lake Mary, FL 32746  
U.S.A.

P +1 (407) 333 3235  
F +1 (407) 386 6284

### Australia

CSE-Semaphore  
Unit 8, 3-5 Gilda Crt  
Mulgrave, Victoria 3170  
Australia

P +61 (03) 8544 8544  
F +61 (03) 8544 8555

### Europe

CSE-Semaphore Belgium  
Waterloo Office Park — Building "M"  
Dreve Richelle, 161  
B-1410 Waterloo  
Belgium

P +32 (2) 387 42 59  
F +32 (2) 387 42 75

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