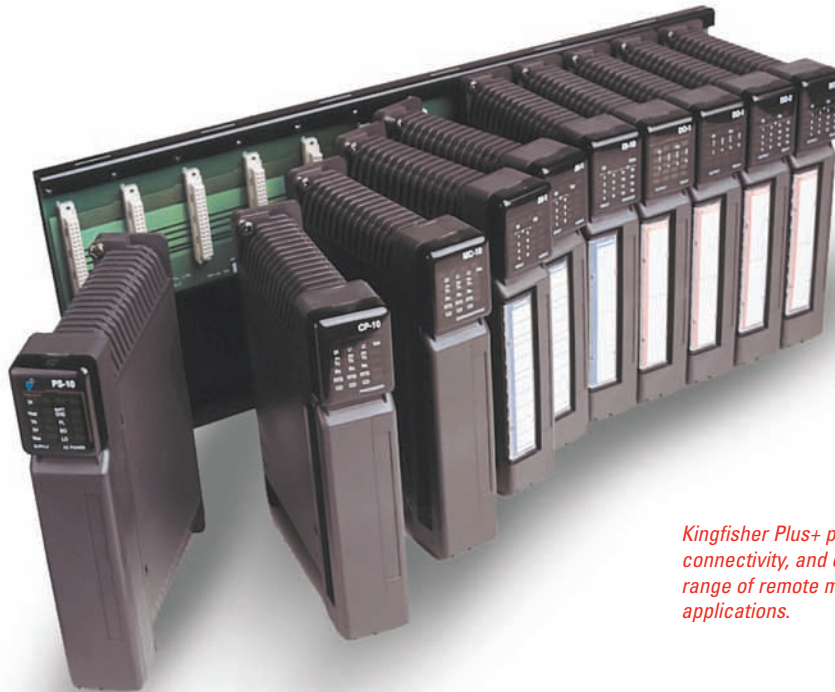




## Semaphore Kingfisher Plus+



*Kingfisher Plus+ provides advanced capabilities, IP connectivity, and open programming to a broad range of remote measurement and control applications.*

The Kingfisher Plus+™ advanced RTU has been designed as an enabling technology for today's measurement and control systems. In Kingfisher Plus+, Semaphore has focused on removing the technical constraints that have traditionally limited RTU applications.

A broad offering of proven hardware modules substantially reduces integration issues with third-party hardware and serves to minimize system design time and project risks. Modular construction efficiently adapts to the needs of individual sites.

Kingfisher Plus+ cost-effectively brings advanced I/O capabilities to the RTU world. Intelligent I/O modules provide functionality such as high-speed scanning, sequence-of-events (SOE) monitoring, and fail-safe output configuration, which are normally found only in more expensive controller models.

Kingfisher Plus+ also meets today's connectivity needs head-on. An extensive array of communication modules and support for over 70 protocols allow a Kingfisher Plus+ to readily drop into communications networks with minimal integration issues.

Perhaps most important are open software tools, which streamline applications software design, programming, testing, and startup. Semaphore's new Toolbox Plus+ utilizes Windows and Outlook-style interaction, which users will find intuitive. Since Toolbox Plus+ fully embeds ISaGRAF 5, Kingfisher Plus+ is the industry's first RTU to support IEC 61499 for distributed processing, as well as IEC 61131-3.

## Kingfisher Plus+ advanced hardware platform

The modular construction of the Kingfisher Plus+ allows it to perfectly match the needs of practically any application. Multiple backplanes can be chained together to provide communications and I/O expansion. Kingfisher Plus+ configurations range from 1 to 16 communication ports and 4 to 1024 I/O points.



### Processor modules

Kingfisher Plus+ processor modules are available in three levels of processing capability and memory capacity to allow users to best match applications requirements and budget constraints.

|              | CP-30                                       | CP-11                                    | PC-1                                      | MC-11                              |
|--------------|---------------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------|
| DESCRIPTIONS | Toolbox Plus+<br>IEC 61131-3<br>programming | Toolbox32<br>ladder logic<br>programming | Integrated<br>processor &<br>power supply | 3 port<br>communications<br>module |

### Redundancy

For users who demand reduced risk of systems failures, Kingfisher Plus+ can be ordered with redundant power supply modules as well as redundant processor modules. The CP-11 and CP-30 processor modules support hot standby redundancy. A switchover from the primary to the backup processor will occur upon failure of an I/O module scan, communications failure on selected ports, Toolbox command, or a ladder logic command.

### High-performance I/O modules

Intelligent I/O modules are designed for applications that require high accuracy and performance. Advanced capabilities include high-speed scanning; input counting up to 10 kHz; quadrature counting; sequence-of-events (SOE) monitoring on a 1 ms interval; and configurable, fail-safe output settings.

|                    | AI-1                         | AI-10               | DI-5                  | DI-10                           | AO-2              | DO-1                          | DO-2                    | DO-5                         | IO-2     | IO-3     | IO-4     |
|--------------------|------------------------------|---------------------|-----------------------|---------------------------------|-------------------|-------------------------------|-------------------------|------------------------------|----------|----------|----------|
| DI Digital inputs  |                              |                     | 16                    | 16                              |                   |                               |                         |                              | 8        | 4        | 8        |
| DO Digital outputs |                              |                     |                       |                                 |                   | 8                             | 16                      | 16                           | 8        | 4        | 2        |
| AI Analog inputs   | 8                            | 8                   |                       |                                 |                   |                               |                         |                              |          | 4        | 2        |
| AO Analog outputs  |                              |                     |                       |                                 | 4                 |                               |                         |                              |          | 1        |          |
| DESCRIPTIONS       | 0-20 or<br>4-20 mA<br>inputs | High<br>performance | Dry contact<br>inputs | Sequence-<br>of-events<br>(SOE) | Analog<br>outputs | Relay<br>outputs<br>N.O./N.C. | Relay<br>output<br>N.O. | Open<br>collector<br>outputs | Multi 10 | Multi 10 | Multi 10 |

### Communication option cards

A broad offering of communication options provides connectivity with the intelligent devices and networks that are used throughout today's measurement and control systems. Communication option cards are compatible with Kingfisher Plus+ processor modules and the MC-11 communications module.

|              | OPT-A                                               | OPT-D                                               | OPT-F                                          | OPT-H                                 | OPT-I                                               | OPT-J                                       | OPT-L                                              | OPT-R                                      | OPT-T                                  |
|--------------|-----------------------------------------------------|-----------------------------------------------------|------------------------------------------------|---------------------------------------|-----------------------------------------------------|---------------------------------------------|----------------------------------------------------|--------------------------------------------|----------------------------------------|
| Name         | Fiber<br>Ethernet                                   | Dial-up<br>modem                                    | Fibre serial                                   | HART                                  | Isolated                                            | Image<br>capture                            | Line & radio<br>FSK                                | Spread<br>spectrum                         | Ethernet                               |
| DESCRIPTIONS | Optically<br>isolated<br>Ethernet<br>communications | PSTN modem<br>for worldwide<br>phone system<br>V.34 | Optically<br>isolated serial<br>communications | Communicate<br>using HART<br>protocol | Isolated serial<br>communications<br>RS-232/485/422 | Capture image<br>over your<br>SCADA network | Leased line &<br>pocket radio<br>interface<br>V.23 | Wireless<br>license free<br>communications | Communicate<br>over copper<br>Ethernet |



*Users can quickly become familiar with the Outlook-style displays Toolbox Plus+ provides for advanced configuration and diagnostics.*

## Communication protocols

For compatibility with a broad range of SCADA networks and intelligent devices, Kingfisher Plus+ supports over 70 protocols. These include Kingfisher, DNP3 (master/slave), Modbus (master/slave), Allen Bradley DF1, and SNMP. Kingfisher Plus+ also supports an API for custom, user-defined protocols.

## Toolbox software

Semaphore's Toolbox Plus+ integrated operating environment combines configuration, program development, and maintenance in one simple-to-use package. Systems integrators and end users alike can view, edit, and diagnose a Kingfisher Plus+ solution with a highly intuitive, Outlook-style user interface.

Toolbox Plus+ eliminates the need to open — and switch between — multiple software packages, or engage in complicated programming. Toolbox Plus+ embeds the ISaGRAF IEC-61131-compliant environment and supports all five of the control languages it offers. This is also the first IEC 61499-compliant configuration environment that is intended for RTU products. In addition, the Kingfisher library of preprogrammed function blocks, which includes operations such as AGA flow calculations, simplifies applications development and makes it easy to add new capabilities to a Kingfisher Plus+ RTU solution.

Toolbox Plus+ is used in conjunction with the CP-30 processor module.

Systems using the CP-11 processor module are programmed using Semaphore's Toolbox 32 environment, which supports ladder logic as well as the Kingfisher library of proven function blocks. Toolbox 32 capabilities, including drag & drop, on-line help, and applications examples, are designed to streamline programming, testing, and startup efforts.

## Applications

The Kingfisher Plus+ RTU brings IP connectivity, powerful processing, advanced I/O capabilities, and open programming to applications in Semaphore's traditional end-user industries. Users in the broadcast / telecom, oil & gas, power, transportation, and water/wastewater industries will find a Kingfisher Plus+ configuration cost-effective over a broad range of installations.



# KINGFISHER Plus+ SPECIFICATIONS

|             |                                             |
|-------------|---------------------------------------------|
| Designation | Industrial-grade remote terminal unit (RTU) |
|-------------|---------------------------------------------|

## INPUTS & OUTPUTS

|                          |                                                                |
|--------------------------|----------------------------------------------------------------|
| Maximum I/O points       | 1024                                                           |
| Backplanes               | Up to 4 x 12 slot backplanes and 4 x 4 slot backplanes per RTU |
| I/O configuration        | Automatic/manual                                               |
| Backplane sizes          | 4 / 6 / 12 slots                                               |
| Removable I/O connectors | Yes                                                            |
| Digital modules          | Max. 16 inputs or 16 outputs/module                            |
| Analog modules           | Max. 8 inputs or 4 outputs/module                              |

## PROCESSOR UNIT

|                 |                                                                |
|-----------------|----------------------------------------------------------------|
| Type            | PC-1: 80C188<br>CP-11/21: 80C386<br>CP-30: Cirrus ARM9 166 MHz |
| Flash RAM       | PC-1: 128 KB<br>CP-11: 1 MB<br>CP-30: 16 MB                    |
| RAM             | PC-1: 256 KB<br>CP-11: 1 MB/CP-21: 2 MB<br>CP-30: 32 MB        |
| Real-time clock | Yes                                                            |
| Battery backup  | RAM/RTC — Lithium > 10 years (CP-11); > 7 years (CP-21)        |
| RTU address     | 1 to 255 or 1-65535 (protocol-dependent)                       |

## SCAN RATE

|         |               |
|---------|---------------|
| Digital | 0.5 ms/module |
| Analog  | 1.5 ms/module |
| PID     | 4/s           |

## COMMUNICATIONS SUPPORTED

|                   |                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------|
| Total Ports / RTU | 16                                                                                              |
| Master/slave      | Yes                                                                                             |
| Peer-to-peer      | Yes                                                                                             |
| Fallback levels   | Yes                                                                                             |
| PC link           | Yes                                                                                             |
| Protocol          | Kingfisher, Modbus, DNP3, SNMP, Allen Bradley, and over 70 other protocols available on request |

## OPTION CARDS

|                   |                                                                                                                                                                                    |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PC-1              | 1 x standard serial port,<br>1 x option ports                                                                                                                                      |
| CP-11             | 1 x standard serial port,<br>2 x option ports                                                                                                                                      |
| CP-30             | 1 x standard Ethernet port,<br>2 x option ports                                                                                                                                    |
| Available options | A (fiber Ethernet)<br>D (dial-up modem)<br>F (fiber serial)<br>H (HART)<br>I (isolated serial)<br>J (image capture)<br>L (line & radio FSK)<br>R (spread spectrum)<br>T (Ethernet) |

## CONFIGURATION

|                                   |     |
|-----------------------------------|-----|
| Local (portable PC)               | Yes |
| Remote via network                | Yes |
| IEC 61131-3 (5 languages)         | Yes |
| ISaGRAF flow chart (6th language) | Yes |
| Toolbox 32 ladder                 | Yes |
| IEC 61499 distributed processing  | Yes |

## DIAGNOSTICS

|                          |      |
|--------------------------|------|
| Preprogrammed            | Yes  |
| I/O modules              | LEDs |
| CPU modules              | LEDs |
| Power supply modules     | LEDs |
| Report via network       | Yes  |
| Software                 | Yes  |
| Wireshark comms analyzer | Yes  |

## DEBUG

|                       |     |
|-----------------------|-----|
| Local watchdog timer  | Yes |
| Communication status  | Yes |
| Configuration display | Yes |
| I/O status            | Yes |
| Debug                 | Yes |

## POWER

|                         |                           |
|-------------------------|---------------------------|
| AC supply               | 90 to 260 V               |
| DC supply               | 20 to 60 V or 96 to 340 V |
| Solar supply            | 12 V dc                   |
| Power down modes        | Yes                       |
| Battery backup          | Yes                       |
| Battery size            | Various                   |
| Battery charging option | Yes                       |

## ENVIRONMENTAL

|                     |                            |
|---------------------|----------------------------|
| Ambient temperature | -20° to 70°C               |
| Storage temperature | -40° to 85°C               |
| Humidity            | 5% to 98% RH noncondensing |

## REDUNDANCY LEVELS

|                     |   |
|---------------------|---|
| CPUs/RTU            | 2 |
| Power supplies/rack | 2 |

## COMPLIANCE STANDARDS

|                            |                             |
|----------------------------|-----------------------------|
| Generic emission standards | EN61000-6-4                 |
| Generic immunity standards | EN61000-6-2                 |
| Environmental standards    | IEC 60068-2-3/IEC 60068-2-1 |

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