

SmartMux— A Versatile Family of I/O Solutions

WRC's SmartMux family provides more options for connecting to distributed I/O than any other I/O component or systems manufacturer. The family consists of four styles with many choices within each style. The styles consist of:

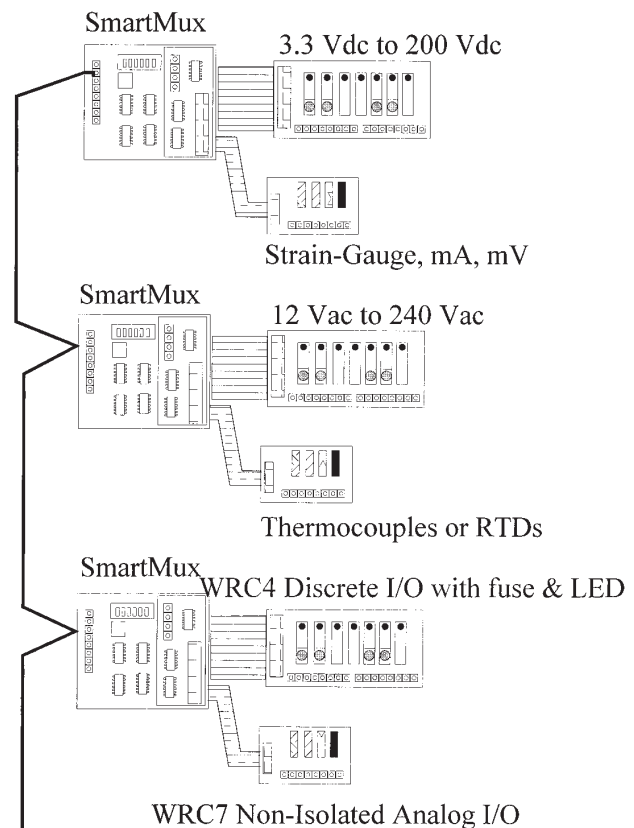
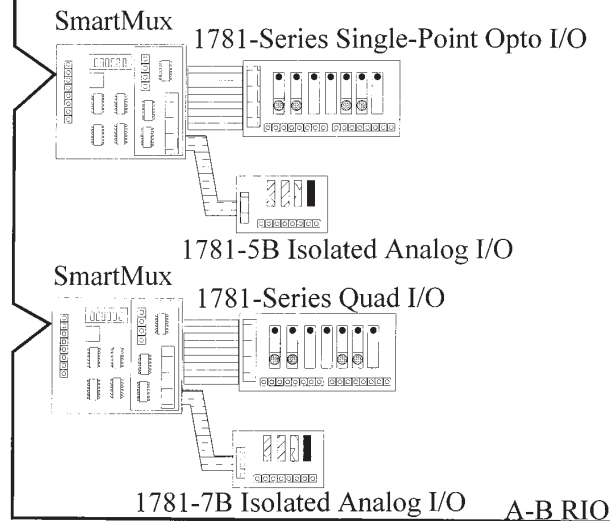
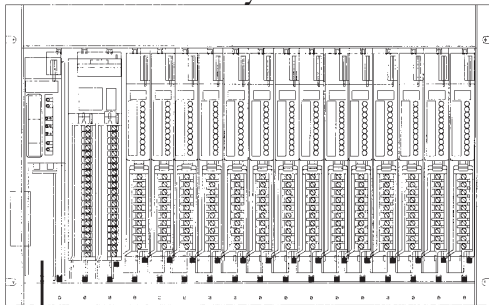
- SmartMux™ for low-cost, versatile I/O applications
- SmartMux-Lite™ for highly distributed, low-cost, low-point count DeviceNet solutions
- SmartMux-Plus™ the latest, most extensive DeviceNet or ModBus solution for analog, discrete and ASCII I/O applications
- SmartPMux™ for high speed analog or discrete I/O on a Pamux network.

SmartMux- The Original

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SmartMux

Allen-Bradley PLC's or SLC's



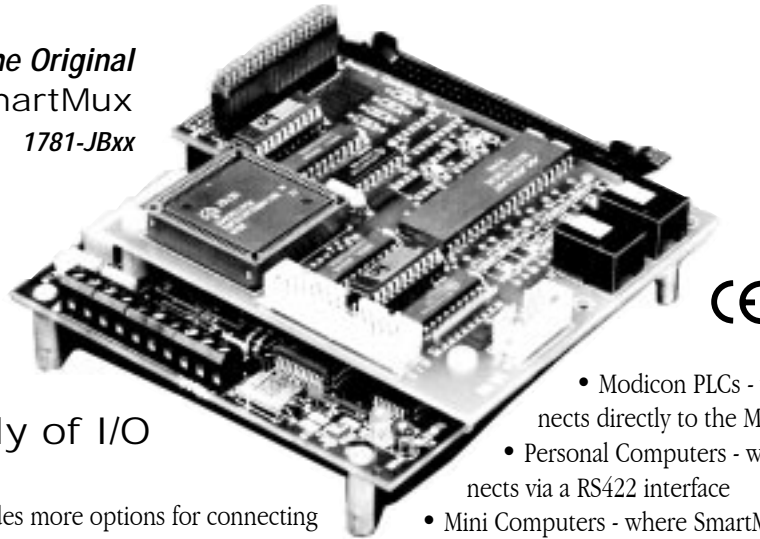
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*The Original
SmartMux
1781-JBxx*



Description

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SmartMux— A Versatile Family of I/O Solutions

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SmartMux- The Original

In 1991, when WRC acquired the Single Point I/O Line from Allen-Bradley, the acquisition included two networked I/O adapter products, i.e. 1771-JAB for Allen-Bradley's Remote I/O Link and 1771-JBB a proprietary RS422 network. Since that time, WRC has expanded our line of networked I/O adapters. In 1992, WRC's SmartMux series began to be introduced. The 1781-SmartMux Series had several common characteristics including:

- Open frame construction
- External regulated power supplies of multiple voltage levels required
- Ribbon cabling to I/O circuits
- Dual micro-processor architecture

The SmartMux family works with a variety of hosts over several different industrial I/O networks. Common hosts include:

- Allen-Bradley PLCs - where SmartMux connects directly via the Remote I/O link
- Allen-Bradley SLCs - where SmartMux connects either via a driver provided for the Basic module, or via a 1746-SN scanner module.

- Modicon PLCs - where SmartMux connects directly to the Modbus link
- Personal Computers - where SmartMux connects via a RS422 interface
- Mini Computers - where SmartMux connects via a RS422 interface
- Using modems and the RS422 versions of SmartMux for distant communications over phone lines, radio, fiber optic, or power line carrier

In all these cases, SmartMux is viewed as a remote adapter to the host processor providing scanning of analog and digital values, data concentration, intelligent data processing, communications handling, error detection and protection against erroneous messages.

The four different protocols supported are:

- 1781-JAx version for Allen-Bradley PLCs using Allen-Bradley's patented Remote I/O Link
- 1781-JBx version using WRC's proprietary, binary protocol for efficiency
- 1781-JMx version using the Modbus binary and ASCII protocols
- 1781-JOx version using the Optomux, ASCII protocol

Features

- Integrates up to 32 analog and 24 digital single point I/O into one adapter
- Remote I/O: 10,000' (Allen-Bradley RIO) or 5,000' (RS422/485)
- I/O configuration options: digital only or digital plus analog
- Input functions such as counting, latching, filtering, burst-mode analog data acquisition, averaging and peak detection
- Output functions such as waveform and pulse generation
- Drivers available for connection to Windows, Windows NT, DOS along with support from most of the third party software packages. Ask about compatibility with other popular data acquisition and control software packages

Benefits

- Low Cost Per Point: more points on one adapter, as well as combining analog and digital functions on one adapter reduces costs



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Each version of SmartMux has a different set of capabilities, capacities, specifications and cost. The following table describes the major differences between each option.

| Spec | 1781-JAB 1781-JAA 1781-JAA7 | 1781-JBB 1781-JBA 1781-JBA7 | 1781-JOB 1781-JOA 1781-JOA7 | 1781-JMB 1781-JMA 1781-JMA7 |
|----------------|--|---|---|---|
| Ambient | 0 to 70°C* | 0 to 70°C* | 0 to 70°C* | 0 to 70°C* |
| Power | 0.5 A @ 5 V dc | 0.5 A @ 5 V dc | 0.5 A @ 5 V dc | 0.5 A @ 5 V dc |
| Dimensions | 5" x 4.6" | 5" x 4.6" | 5" x 4.6" | 5" x 4.6" |
| Analog Option | ±12 V dc @ 0.1 A | ±12 V dc @ 0.1 A | ±12 V dc @ 0.1 A | ±12 V dc @ 0.1 A |
| Connections | | | | |
| Digital I/O | 50 pin header | 50 pin header | 50 pin header | 50 pin header |
| Analog I/O | 26 pin header | 26 pin header | 26 pin header | 26 pin header |
| Power | Terminal Strip | Terminal Strip | Terminal Strip | Terminal Strip |
| Communication | Terminal Strip | Terminal Strip | Terminal Strip | Terminal Strip |
| Selections | | | | |
| Address | Dip Switches | Dip Switches | Dip Switches | Dip Switches |
| Communication | Dip Switches | Dip Switches | Dip Switches | Dip Switches |
| Communications | Allen-Bradley RIO | RS422 SmartMux protocol | RS422 OptoMux protocol | RS422 Modbus Protocol |
| Digital I/O | 24 | 24 | 16 | 24 |
| Analog I/O** | 32 (1781-JAA & JAA7 version) | 32 (1781-JBA & JBA7 version) | 16 (1781-JOA & JOA7 version) | 32 (1781-JMA & JMA7) |
| Protocol | 1/4 rack w/block transfer | WRC SmartMux | OPTOMUX | MODBUS |
| Speed | 57.6, 115.2, 230.4 K baud | 300 to 38.4 K baud, selectable | 300 to 38.4 K baud, selectable | 300 to 38.4 K baud, selectable |
| Distance | up to 10,000' | up to 4,000' without repeaters | up to 4,000' without repeaters | up to 4,000' without repeaters |
| Address Range | 0 to 15 | 0 to 127 | 0 to 127 | 0 to 255 |
| Pulse Counting | up to 500 Hz | up to 500 Hz | up to 400 Hz | up to 500 Hz |
| Timed I/O | 1 ms resolution | 1 ms resolution | 10 ms resolution | 1 ms resolution |
| Latching | NA | Yes | Yes | Yes |
| Pulse Width | NA | 1 ms resolution | 10 ms resolution | 1 ms resolution |
| Spec | 1781-JAA 1781-JAA7 | 1781-JBA 1781-JBA7 | 1781-JOA 1781-JOA7 | 1781-JMA 1781-JMA7 |
| Resolution | 12-bit | 12-bit | 12-bit | 12-bit |
| Sample Rate | 200 samples/point /sec (up to 6400 system samples/sec) | 200 samples/point/sec (up to 6400 system samples/sec) | 20 samples/point/sec (up to 320 system samples/sec) | 20 samples/point/sec (up to 320 system samples/sec) |
| Alarms | NA | 1 Hi and 1 Low | 1 Hi and 1 Low | 1 Hi and 1 Low |
| Peak/Minimum | NA | Yes | Yes | Yes |
| Waveforms | NA | Yes | Yes | Yes |

* Contact the factory for extended temperature ranges.

** The 1781-JxA versions allow all points to be inputs or outputs. The 1781-JxA7 versions permit outputs in the first 8-channels only.



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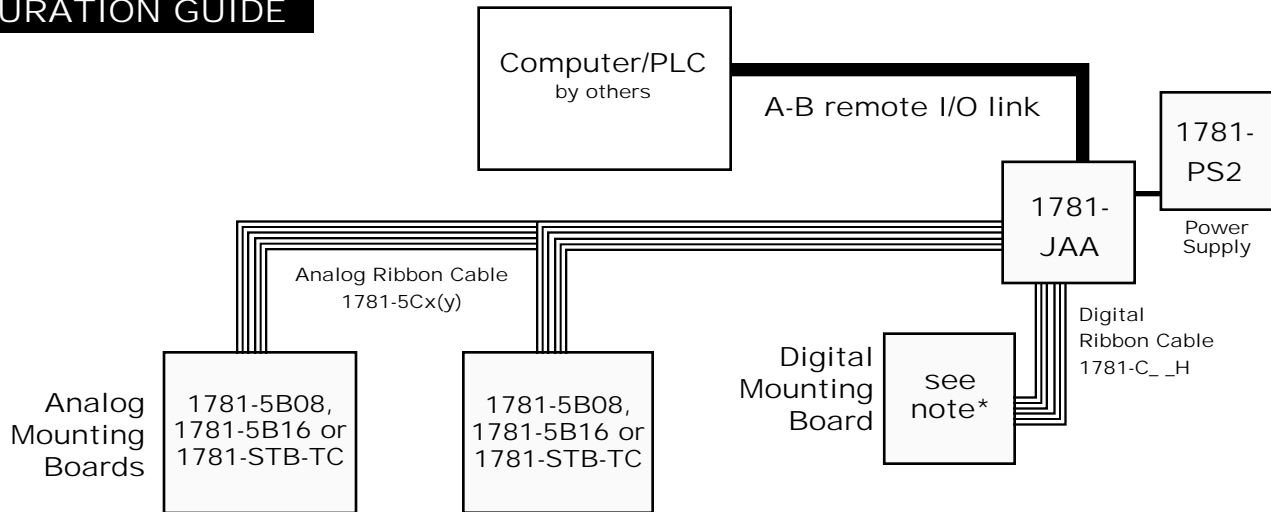
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SmartMux 1781-JAA

CONFIGURATION GUIDE



SmartMux

Analog module application: Points #1-32: Use 1781-5Bxx inputs or outputs, or 1781-STB-TC

| | | | | | |
|-----------|--|-----------|--|-----------|--|
| Point #1 | | Point #12 | | Point #23 | |
| Point #2 | | Point #13 | | Point #24 | |
| Point #3 | | Point #14 | | Point #25 | |
| Point #4 | | Point #15 | | Point #26 | |
| Point #5 | | Point #16 | | Point #27 | |
| Point #6 | | Point #17 | | Point #28 | |
| Point #7 | | Point #18 | | Point #29 | |
| Point #8 | | Point #19 | | Point #30 | |
| Point #9 | | Point #20 | | Point #31 | |
| Point #10 | | Point #21 | | Point #32 | |
| Point #11 | | Point #22 | | | |

Digital module application: Points #1-24: Use 1781- _ _ 5S or WRC4- _ _ 5S inputs or outputs

| | | | | | |
|----------|--|-----------|--|-----------|--|
| Point #1 | | Point #9 | | Point #17 | |
| Point #2 | | Point #10 | | Point #18 | |
| Point #3 | | Point #11 | | Point #19 | |
| Point #4 | | Point #12 | | Point #20 | |
| Point #5 | | Point #13 | | Point #21 | |
| Point #6 | | Point #14 | | Point #22 | |
| Point #7 | | Point #15 | | Point #23 | |
| Point #8 | | Point #16 | | Point #24 | |

*Note: Digital Mounting boards include 1771-JMB, 1771-JMBH, 1771-JMB8, 1781-A8A, 1781-A16A, 1781-A16H, 1781-A24A, 1781-A24H2, WRC4-A8H, WRC4-A16H, and



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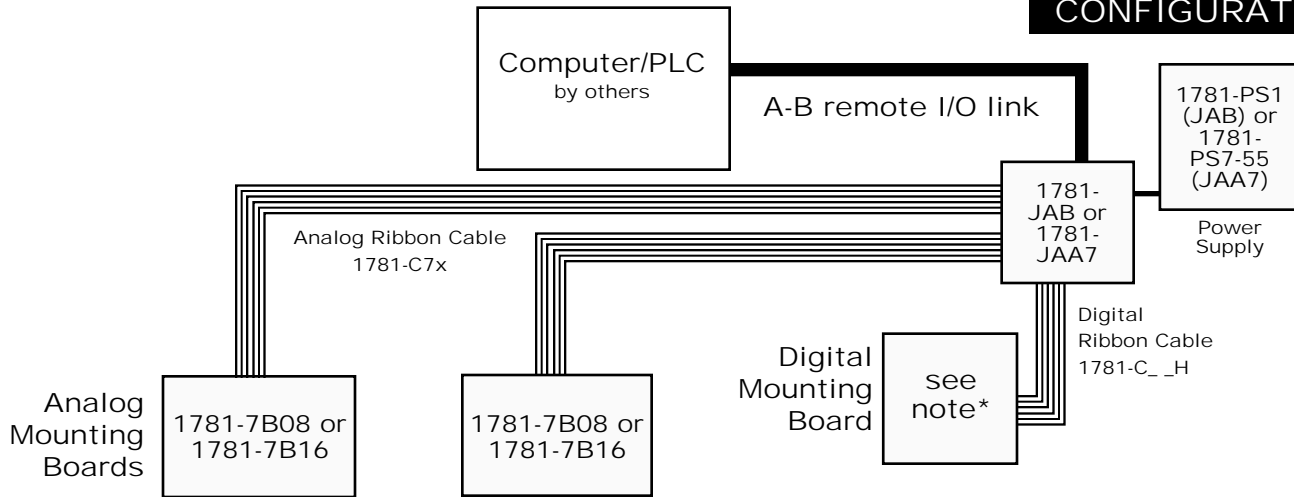
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SmartMux 1781-JAB /1781-JAA

CONFIGURATION GUIDE



| Analog module application: | | Points #1-8: Use 1781-7Bxx or WRC7-xx inputs or outputs Points #9-32: Use 1781-7Bxx or WRC7-xx inputs only | | | |
|----------------------------|--|---|--|-----------|--|
| Point #1 | | Point #12 | | Point #23 | |
| Point #2 | | Point #13 | | Point #24 | |
| Point #3 | | Point #14 | | Point #25 | |
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| Point #9 | | Point #20 | | Point #31 | |
| Point #10 | | Point #21 | | Point #32 | |
| Point #11 | | Point #22 | | | |

| Digital module application: | | Points #1-24: Use 1781- _ _ 5S or WRC4- _ _ 5S inputs or outputs | | | |
|-----------------------------|--|--|--|-----------|--|
| Point #1 | | Point #9 | | Point #17 | |
| Point #2 | | Point #10 | | Point #18 | |
| Point #3 | | Point #11 | | Point #19 | |
| Point #4 | | Point #12 | | Point #20 | |
| Point #5 | | Point #13 | | Point #21 | |
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*Note: Digital Mounting boards include 1771-JMB, 1771-JMBH, 1771-JMB8, 1781-A8A, 1781-A16A, 1781-A16H, 1781-A24A, 1781-A24H2, WRC4-A8H, WRC4-

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