

SmartMux-Plus

WRC is pleased to announce the introduction of an extension to the SmartMux family: SmartMux-Plus.

The SmartMux-Plus series of I/O adapters begins with DeviceNet and ModBus compatible products in several versions, which have these common characteristics:

- DIN rail mounting
- Self-contained power supply to operate from unregulated 24 Vdc
- Fully self-contained electronics
- Expandable design
- Ribbon cable connections to I/O devices using positive locking D-Sub connectors
- Integration of discrete / analog / ASCII I/O types
- Switch settings for address and data rate

Models currently available include the following:

DeviceNet Model #	ModBus Model #	Discrete	Analog	ASCII
WRC1-JDA-1	WRC1-JMA-1	None	32 AI	RS232
WRC1-JDAIO-1	WRC1-JMAIO/-1	None	32 AI/O	RS232
WRC1-JDB/24-1	WRC1-JMB/24-1	24 DI/O	None	RS232
WRC1-JDB/48-1	WRC1-JMB/48-1	48 DI/O	None	RS232
WRC1-JDA/24-1	WRC1-JMA/24-1	24 DI/O	32 AI	RS232
WRC1-JDA/48-1	WRC1-JMA/48-1	48 DI/O	32 AI	RS232
WRC1-JDAIO/24-1	WRC1-JMAIO/24-1	24 DI/O	32 AI/O	RS232
WRC1-JDAIO/48-1	WRC1-JMAIO/48-1	48 DI/O	32 AI/O	RS232
WRC1-JDAIO/48-2	WRC1-JMAIO/48-2	48 DI/O	32 AI/O	Isolated as 232
WRC1-JDAIO/48-3	WRC1-JMAIO/48-3	48 DI/O	32 AI/O	Two-wire RS422/RS485
WRC1-JDAIO/24-4	WRC1-JMAIO/24-4	24 DI/O	32 AI/O	RS232+ modem
WRC1-JDAIO/48-4	WRC1-JMAIO/48-4	24 DI/O	32 AI/O	RS232+ modem

Optional WRC1-COMUPGRADE Communications Upgrade

The WRC1 SmartMux-Plus remote I/O devices multiplex analog and discrete data acquisition and control signals in industrial and commercial applications.

WRC1 DeviceNet adapters are provided with serial/ASCII ports in addition to the DeviceNet port. As shipped from the factory, the serial port can be used for firmware updates and other system maintenance.

WRC1-COMPUGRADE is a firmware upgrade which allows WRC1-JD series to pass ASCII messages over DeviceNet to/from devices such as bar-code scanners, printers and other RS232/RS422/RS485 devices.



WRC1-JDAIO/48-1

The WRC1-JD series SmartMux-Plus multiplexer is designed as a "Group 2 Only" Server on the DeviceNet system and its I/O is read by and written from a DeviceNet Master. WRC1 SmartMux-Plus supports the Predefined Master/Slave Explicit Message Connection, Polled I/O, Cyclic I/O, Change-of-State (COS) and Bit-Strobe.

The device address and data rate can be changed via software configuration or by on-board rotary switches. Other parameters are software-configurable and are changed from their default values by a third-party configuration tool. Each WRC1 SmartMux-Plus has 2 green/red LED's - one for module status and one for network status.

WRC1 adapters provide a choice of serial interfaces including an integral 14.4 KB fax/data modem.

OEMS

WRC1 SmartMux-Plus is especially suited for many OEM applications where custom software is required. With its Intel-based architecture and dual-flash memories, the WRC1 unit is easily customized for many stand-alone or networked applications.

OEMs with special requirements should contact WRC for assistance in selecting special features and capabilities. Examples of features available to OEMs include:

- Battery-Backed Real Time Clock
- Battery-Backed RAM
- External Dial-in/Dial out modem
- Fax generation
- License to WRC's software libraries
- Intel microprocessor architecture
- Dual-flash memories
- EEPROM memory
- RAM memory
- 20 Mhz clock

SmartMux-Plus



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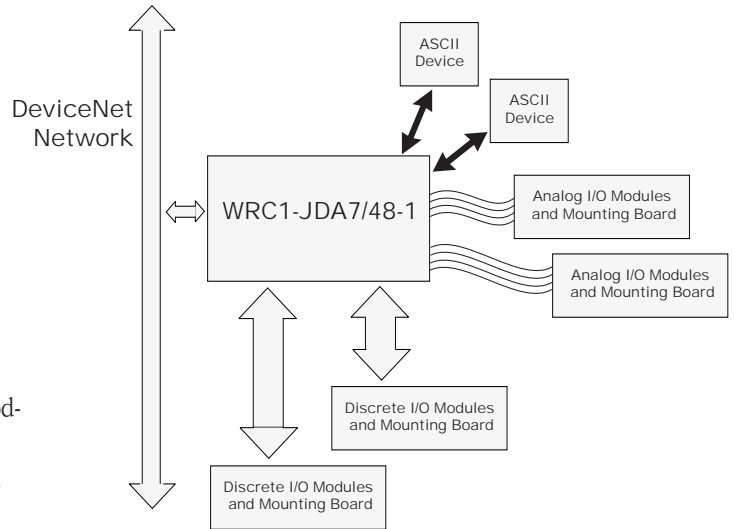
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FEATURES

Features include:

The WRC1 has the following features:

- DeviceNet compatible / ModBus compatible
- Up to 32 Analog Input Channels - 12-bit conversion
- Uses 4-, 8- or 16-channel analog mounting boards
- Mix-and-match module types
- Up to 8 Analog Output Channels - 12-bit conversion
- First 8 channels can be input or output
- Up to 48 points of Discrete Input / Output Signals
- Mix-and-match module types
- Uses 8-, 16- or 24-channel discrete mounting boards
- Discrete I/O 4000V Isolation typical (provided by the modules)
- Wide Range of Analog Inputs Available - T/C, RTD, Strain Gage, 4-20 mA, etc.
- Isolated 1781-7B Series (1500 V) and low-cost WRC7 Series Analog I/O available
- Multiple I/O Message Data Options:
 - Polled I/O
 - Cyclic Inputs
 - Change of State Inputs
 - Bit-Strobe I/O
- Software Configurable Parameters
- Address and Baud Rate set via software or hardware switches
- DIN rail mount
- Metal enclosure
- Round, micro-style DeviceNet connection
- D-sub connectors to the I/O
- Isolated DeviceNet connection
- Powered from DeviceNet network
- Discrete I/O control signals powered from DeviceNet network
- Field up-upgrades of firmware using the integral ASCII channels



- Discrete I/O signal conditioning module(s): 1781 or WRC4
- Discrete board-to-WRC1 ribbon cable: 1781-CxDx
- Power for field signals

Basic Operation

The WRC1 SmartMux-Plus operates as an analog I/O, digital I/O and serial I/O device on the DeviceNet or ModBus network. It is a slave device that can be assigned (allocated) by the system implementer to one specific master.

The DeviceNet Master can receive and send data to and from the WRC1 SmartMux Plus via the several methods described in this section. I/O methods are:

I/O Type	Polled	Cyclic	Bit-Strobe	Change-of-State
Analog Inputs	✓	✓		✓
Discrete Inputs	✓	✓	✓	✓
Serial Inputs	✓			✓
Analog Outputs	✓			
Discrete Outputs	✓		✓	
Serial Outputs	✓			

I/O System Configuration and Design Notes

The WRC1 SmartMux-Plus is the I/O multiplexer and communications interface for an I/O node. To implement a full I/O node with the WRC1 SmartMux-Plus you need some or all of the following system elements:

- WRC1-JDxx/xx-x or WRC1-JM xx/xx-x
- Analog I/O mounting board(s): 1781-7B series
- Analog I/O signal conditioning module(s): 1781-7B or WRC7 series
- Analog board-to-WRC1 ribbon cable(s): 1781-C7xD
- 1781-PS4 24V dc power for the analog I/O modules
- Discrete I/O mounting board: 1781 or WRC4



General specifications

Features include:

The WRC1 has the following features:

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- Mix-and-match module types
- Up to 8 Analog Output Channels - 12-bit conversion
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- Up to 48 points of Discrete Input / Output Signals
- Mix-and-match module types
- Uses 8-, 16- or 24-channel discrete mounting boards
- Discrete I/O 4000V Isolation typical (provided by the modules)
- Wide Range of Analog Inputs Available - T/C, RTD, Strain Gage, 4-20 mA, etc.
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- Software Configurable Parameters
- Address and Baud Rate set via software or hardware switches
- DIN rail mount
- Metal enclosure
- Round, micro-style DeviceNet connection
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- Analog board-to-WRC1 ribbon cable(s): 1781-C7xD
- 1781-PS4 24V dc power for the analog I/O modules
- Discrete I/O mounting board: 1781 or WRC4
- Discrete I/O signal conditioning module(s): 1781 or WRC4
- Discrete board-to-WRC1 ribbon cable: 1781-CxDx
- Power for field signals

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Discrete Inputs	✓	✓	✓	✓
Serial Inputs	✓			✓
Analog Outputs	✓			
Discrete Outputs	✓		✓	
Serial Outputs	✓			

Description:

Field Upgrades

WRC1-COMUPGRADE

WRC1 includes one serial channel (RS232 default) for maintenance and future firmware revisions. The purchase of WRC1-COMUPGRADE allows a user to transmit and receive ASCII data over DeviceNet to the two serial channels provided on board.

SmartMux-Plus



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PECIFICATIONS

I/O Mounting Board Connections

The WRC1 has up to six (6) I/O cable connectors - two each for analog, discrete and serial I/O. Each connection is marked, identifying it as to type and their relative I/O numbers. Your unit may have less connections implemented, depending upon the options that you ordered. In order to help insure the data integrity of your I/O, we recommend that all cables be kept as short as possible.

Discrete I/O Mounting Board Connections

The discrete I/O mounting boards are connected to the WRC1 via ribbon cables. The end that plugs into the WRC1 must have a 50-pin, female, D-Shell connector with the appropriate locking mechanism. The other end of the ribbon must have an edge, header or D-shell connector which is appropriate for the mounting board selected. The maximum length of these cables is 10 feet (3 meters).

Analog I/O Mounting Board Connections

The 1781-7B series analog I/O mounting boards are connected to the WRC1 via ribbon cables. The end that plugs into the WRC1 must have a 25-pin, female, D-Shell connector with the appropriate locking mechanism. The other end of the ribbon must have an D-shell connector which is appropriate for the 1781-7B series mounting board selected. Specify 1781-C7xDD.

Serial I/O Connections

The serial I/O devices are connected to the WRC1 via 6-wire phone cable and RJ-11 connector. The other end of the ribbon must have a connector which is appropriate for the serial device cable selected. 1781-CSD provides a 6-foot, RJ11 to 25-pin, female D-sub connector.

Power Requirements

The WRC1 SmartMux-Plus and any connected discrete I/O (see exceptions below) are powered from the 11-25 Vdc provided by the DeviceNet network. The WRC1 consumes 270 mA of current at 24 Vdc, or 6.5 Watts, typical. The power requirements of the I/O modules used with the WRC1 are listed in the catalog. To determine the total power required by the SmartMux, be sure to use the total of the WRC1, the discrete I/O modules selected and the analog option. Refer to the appropriate section in this catalog for I/O module power needs. The maximums are given in the mini-table below:

WRC1 Power Requirements

Product	Max Power (without 48 DIO)	Max Power (with 48 DIO)
WRC1	14.0 W	15.5 W

Note: 1781-7B and WRC7 analog modules need a separate power supply. They should not be powered by DeviceNet.



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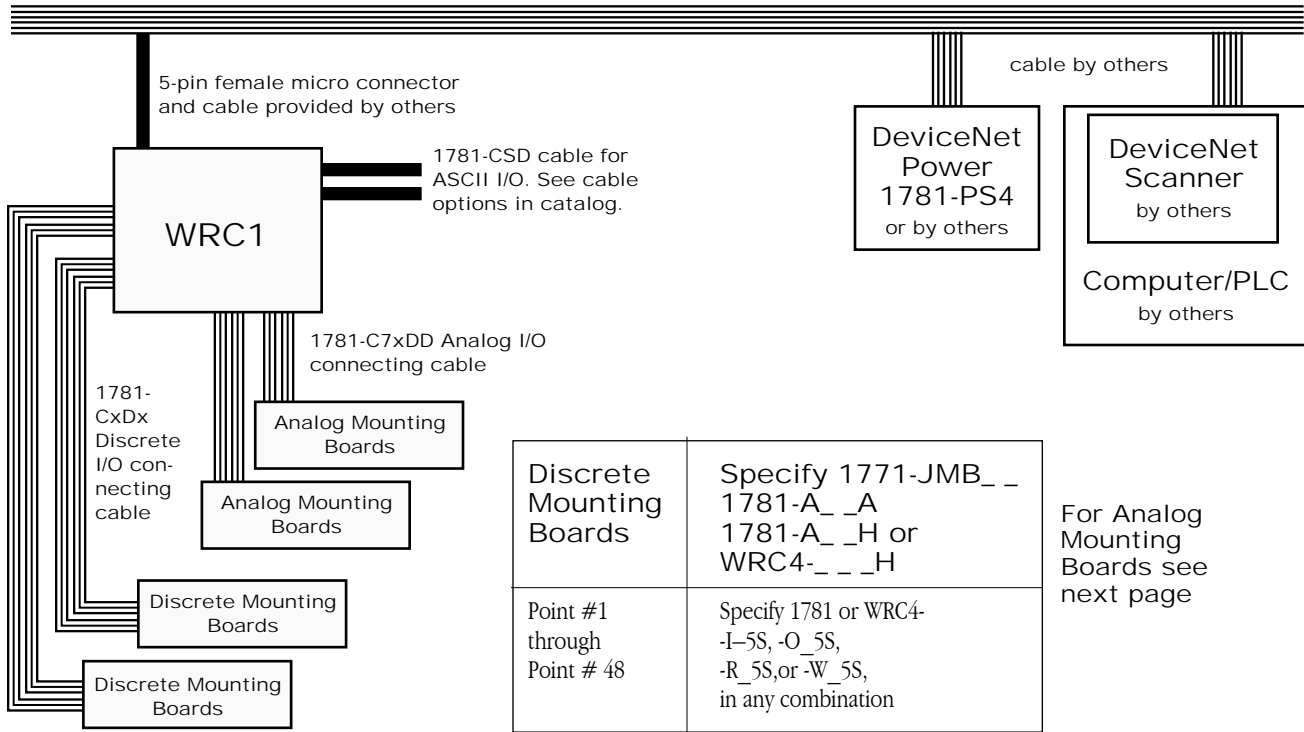
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DeviceNet cable by others



SmartMux WRC1

This Discrete I/O application:

Model #	Power	Model #	Power	Model #	Power
Point #1		Point #17		Point #33	
Point #2		Point #18		Point #34	
Point #3		Point #19		Point #35	
Point #4		Point #20		Point #36	
Point #5		Point #21		Point #37	
Point #6		Point #22		Point #38	
Point #7		Point #23		Point #39	
Point #8		Point #24		Point #40	
Point #9		Point #25		Point #41	
Point #10		Point #26		Point #42	
Point #11		Point #27		Point #43	
Point #12		Point #28		Point #44	
Point #13		Point #29		Point #45	
Point #14		Point #30		Point #46	
Point #15		Point #31		Point #47	
Point #16		Point #32		Point #48	
Discrete I/O power subtotal:		Discrete I/O power subtotal:		Discrete I/O power subtotal:	
Discrete I/O power total:					



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SmartMux WRC1

CONFIGURATION GUIDE

Analog Mounting Boards	1781-7B04 (4-point) 1781-7B08 (8-point) or 1781-7B16 (16-point)
Point #1 through Point #8	Specify 1781-7B/WRC7 Input or Output
Point #9 through Point #32	Specify 1781-7B/WRC7 Input

SmartMux WRC1

This Analog I/O application:								
	Model #	Power		Model #	Power		Model #	Power
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			Analog power subtotal:		
Analog power subtotal:			Analog power subtotal:			External analog power requirements (Add 3 subtotals):		
							Analog DeviceNet power total:	1.5 W

WRC1 Power Summary:

WRC1	6.5 W
Discrete I/O	
Analog Option	1.5 W
Total DeviceNet power:	



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