

# ZZxD-Nx-xR Series

## Wireless Modbus I/O

PRODUCT INFORMATION

- ✓ **Modular, Customizable Wire Replacement**
- ✓ **Modbus ASCII /RTU Compatible**
- ✓ **Wide Operating Temperature**
- ✓ **Active Repeater Functionality**
- ✓ **10 to 48 VDC & 24 VAC Input Power**

**Zlinx™ Wireless Modbus I/O - flexible enough to fit your applications.** These plug-n-play modular units from B&B Electronics combine traditional Modbus RTU remote analog and discrete I/O with built-in wireless connectivity - reducing cost, simplifying installation and support. Wireless RTU serves as Modbus slave RTU in radio-based SCADA systems, or as a peer-to-peer communication platform.

**Three Ranges Available** - Short, Medium, Long range.

**Active Repeaters** - Place I/O modules where they need to go, by the sensors. With repeater built-in functionality (-MR and 900 MHz -LR models only), you can build up a security path for all your critical communications.

**Modular** - Customize it to your application. Just snap on your I/O and you're ready to go. Base modules support up to six expansion modules.

**Wide Temperature** - Meets most indoor or outdoor applications. Rugged circuitry prevents signal degradation versus lower temperature rated wireless devices.

**Modbus Compatible** - Interface using Modbus protocol - allows data to be brought directly into most PLC systems.

**Exception Reporting** - In Modbus mode, allows the reporting of possible problems with connected devices.

**Fail Safe** - Allows you to set your I/O to a safe state in the event of a communications failure.

**Calibration** - Calculates correction factors to make I/O values better match your sensor.

**Communications Failure Alarm** - Allows the first DO to be configured as a COM failure alarm indicator.

**Invert Output** - You can invert the logic of all DO's in peer-to-peer mode.

**Monitor** - You can use the Zlinx™ Manager Software to monitor your I/O.



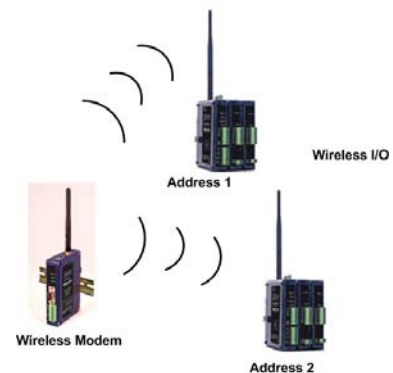
### Wire Replacement (Peer-to-Peer Mode)

Replicate any analog or digital signal from a remote location- Wirelessly! Use a pair of Zlinx™ Wireless I/O modules to read sensor inputs or control actuators in hard-to-reach locations. Inputs and outputs of the paired Zlinx radios will mirror each other, making it easy to add wireless I/O to any application.



### Modbus Peer-to-peer or Peer to Multi-peer

Seamlessly add wireless I/O to any Modbus application. Modbus is the most widely supported I/O protocol worldwide. With Zlinx Wireless I/O you can now bring wireless remote I/O into any Modbus system. Simply connect a Zlinx modem to and RS-232 or RS-485 port of the Modbus master and it can now poll up to 150 wireless I/O nodes - each node can be configured for 8 to 48 I/O points.



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### Base Modules

Model No.	RF Data Rate	Frequency	Radio Power	RF Range (indoor/outdoor with included antenna)	I/O			
					DI	DO	AI	AO
ZZ24D-NA-SR	250 K	2.4 GHz	100 mW	Up to 91 m (300 ft) / Up to 1.6 km (1 mi)	2	2+	2	2
ZZ24D-NB-SR	250 K	2.4 GHz	100 mW	Up to 91 m (300 ft) / Up to 1.6 km (1 mi)	4	4+	0	0
ZZ24D-NC-SR	250 K	2.4 GHz	100 Mw	Up to 91 m (300 ft) / Up to 1.6 km (1 mi)	2	2#	2	2
ZZ24D-ND-SR	250 K	2.4 GHz	100 Mw	Up to 91 m (300 ft) / Up to 1.6 km (1 mi)	4	4#	0	0
ZZ24D-NA-MR	9600	2.4 GHz	50 Mw	Up to 183 m (600 ft) / Up to 4.8 km (3 mi)	2	2+	2	2
ZZ24D-NB-MR	9600	2.4 GHz	50 mW	Up to 183 m (600 ft) / Up to 4.8 km (3 mi)	4	4+	0	0
ZZ24D-NC-MR	9600	2.4 GHz	50 mW	Up to 183 m (600 ft) / Up to 4.8 km (3 mi)	2	2#	2	2
ZZ24D-ND-MR	9600	2.4 GHz	50 mW	Up to 183 m (600 ft) / Up to 4.8 km (3 mi)	4	4#	0	0
ZZ9D-NA-MR*	9600	900 MHz	100 mW	Up to 457 m (1500 ft) / Up to 11.3 km (7 mi)	2	2+	2	2
ZZ9D-NB-MR*	9600	900 MHz	100 mW	Up to 457 m (1500 ft) / Up to 11.3 km (7 mi)	4	4+	0	0
ZZ9D-NC-MR*	9600	900 MHz	100 mW	Up to 457 m (1500 ft) / Up to 11.3 km (7 mi)	2	2#	2	2
ZZ9D-ND-MR*	9600	900 MHz	100 mW	Up to 457 m (1500 ft) / Up to 11.3 km (7 mi)	4	4#	0	0
ZZ9D-NA-LR*()	115.2 K	900 MHz	1 W	Up to 450 m (1500 ft) / Up to 11.3km (7 mi)	2	2+	2	2
ZZ9D-NB-LR*()	115.2 K	900 MHz	1 W	Up to 450 m (1500 ft) / Up to 11.3km (7 mi)	4	4+	0	0
ZZ9D-NC-LR*()	115.2 K	900 MHz	1 W	Up to 450 m (1500 ft) / Up to 11.3km (7 mi)	2	2#	2	2
ZZ9D-ND-LR*()	115.2K	900 MHz	1 W	Up to 450 m (1500 ft) / Up to 11.3km (7 mi)	4	4#	0	0
ZZ8D-NA-LR**	24 K	868 MHz	315 mW	Up to 550 m (1800 ft) / Up to 40 km (25 mi)	2	2+	2	2
ZZ8D-NB-LR**	24 K	868 MHz	315 mW	Up to 550 m (1800 ft) / Up to 40 km (25 mi)	4	4+	0	0
ZZ8D-NC-LR**	24 K	868 MHz	315 mW	Up to 550 m (1800 ft) / Up to 40 km (25 mi)	2	2#	2	2
ZZ8D-ND-LR**	24 K	868 MHz	315 mW	Up to 550 m (1800 ft) / Up to 40 km (25 mi)	4	4#	0	0

\*Note: 900 MHz units are not sold in Europe

() Australian version available

+ = Sourcing Digital Output

\*\* Note: 868 MHz units are not sold in North America

Add "-AU"

# = Sinking Digital Output

### Latency

Base Module	Modbus		Peer-to-Peer	
	Digital	Analog	Digital	Analog
ZZ24D-xx-SR	8mS	15mS	20mS	25mS
ZZxxD-xx-MR	56mS	365mS	827mS	643mS
ZZ9D-xx-LR	9mS	104mS	55mS	52mS

Latency times were measured in a clean RF environment with devices less than 3 feet apart.

Add 45mS per analog expansion module and 25mS per digital expansion module.

ZZ8D-Nx-LR radios have a 10% max duty cycle and were not included in the Latency testing.

### I/O Expansion Modules

Model No.	Digital Inputs	Digital Outputs	Analog Inputs	Analog Outputs	I/O Type
ZZ-8DI-DC	8	---	---	---	Pull-up, R
ZZ-8DO-T	---	8	---	---	Sourcing
ZZ-8DO-T1	---	8	---	---	Sinking
ZZ-4DI4DO-DCT	4	4	---	---	Sourcing
ZZ-4DI4DO-DCT1	4	4	---	---	Sinking
ZZ-4AI	---	---	4	---	mA, V
ZZ-4AO	---	---	---	4	V, mA (Sinking)
ZZ-4A0-2	---	---	---	4	V, mA (Sourcing)
ZZ-2AI2AO	---	---	2	2	mA, V
ZZ-8DO-R	---	8	---	---	Relay
ZZ-4RTD1	---	---	4	---	RTD

### Software Programming Kits – Required to program your system

Model Number	Description
ZZ-PROG1	Programming Module with cable, Serial Interface, NO SOFTWARE CD
ZZ-PROGKIT	Programming Kit - Programming Module, cable and Software CD, Serial Interface
ZZ-PROG1-USB	Programming Kit - Programming Module, cable and Software CD, USB Interface

Note: The software CD is only shipped with programming kits.

## Specifications

### Digital Inputs

Voltage Range:	0 to 48 VDC
Low Voltage (0):	0.8 V maximum
High Voltage (1):	4.0 V minimum
Pull Up Current:	38 micro-amps
Frequency Input:	2 DI inputs per module Software selectable as frequency counters, 0 to 5 KHz range.

### Digital Outputs

Voltage Range:	10 to 45 VDC (Sourcing) 0 to 48 VDC (Sinking)
Open Source:	40 mA per output

### Relay Outputs

Number of Relays:	8
Type:	C -normally open & normally closed
Output Connection:	3.5mm removable terminal block (2 per output)
Common Connection:	3.5mm removable terminal block
Ratings:	250VAC @ 8A, 30VDC @5A (maximum per bank of 4 as grouped on the label)

### Radio Properties (SR Models)

Frequency:	2.4 GHz
Output Power :	100 mW
Receiver Sensitivity:	-102 dbm
Antenna:	The included antenna is a 4.25 inch omni-directional with RPSMA connector. (p/n ZZ24D-ANT1)

### Radio Properties (2.4 GHz MR Models)

Frequency:	2.4 GHz
Output Power:	50mW
Receiver Sensitivity:	96RM-105 dbm @ 9.6K
Antenna:	The included antenna is a 4.25 inch omni-directional with RPSMA connector. p/n ZZ24D-ANT1

### Radio Properties (900 MHz MR Models)

Frequency:	900 MHz
Output Power:	100 mW
Receiver Sensitivity:	-100 @ 9.6K
Antenna:	The included antenna is a 6.5 inch omni-directional with RPSMA connector. p/n ZZ9D-ANT1

### LED Indicators

Receive Signal Strength:	Tri-color – Off = No Signal Red = Weak Signal Yellow = Medium Signal Green = Strong Signal
RF Data:	Green – Blinks with TD or RD Off = No Data
Local Bus Data:	Green – Blinks with TD or RD Off = No Data
Power:	Red – On = Power applied Off = No Power

### Analog Inputs and Outputs

Ranges:	0 to 10 VDC or 0 to 20 mA ZZ-4AO-2 is an active current source. All others are passive
Resolution:	12 Bit
Input Accuracy:	2.5% full scale reading typical
Output Accuracy:	0.27% full scale reading typical
AI Load Resistance:	100 Mega Ohms when configured for voltage input 250 Ohms when configured for current input
AO Max Output Current:	1 mA when configured for voltage output.
AO Max Load	450 Ohms when configured For current output @ 12V

### RTD Inputs

Number of RTD:	4
Wire Configuration:	2, 3, and 4 wire
Type:	PT100, PT1000 (Optimized for temperature coefficient of 385 C), Cu10 (Optimized for temperature coefficient of 427 C)
Input Connection:	3.5mm removable terminal block (4 per output)
Temperature Range:	PT100 = (-) 200 to (+) 650 C PT1000 = (-) 200 to (+) 100 C Cu10 = (-) 100 to (+) 260 C
Resolution:	0.1C cross at (-) 40 to (+) 80 C
Accuracy @ 25 C:	(+/-) 0.5 C typical
Accuracy (-)40 to (+) 80C	(+/-) 2.0 C maximum

### Radio Properties (900 MHz LR Models)

Frequency:	900 MHz
Output Power:	1W
Receiver Sensitivity:	-100 dbm @ 115.2 K
Antenna:	The included antenna is a 6.5 inch omni-directional with RPSMA connector p/n ZZ9D-ANT1

### Radio Properties (868 MHz LR Models)

Frequency:	868 MHz
Output Power:	315 mW
Receiver Sensitivity:	-112 dbm
Antenna:	The included antenna is a 6.5 inch omni-directional with RPSMA connector p/n ZZ9D-ANT1

### Environmental

Operating Temperature	ZZ-8DO-R -40 to 65°C (-40 to 149°F) All Others -40 to 80°C (-40 to 176°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	0 to 95% Non-condensing
Enclosure	Plastic IP30
Mounting	35mm DIN Rail
Expansion	1 Base Module supports up to 6 Expansion Modules
Dimensions	1.2 x 3.7 x 5.0 in (2.9 x 9.3 x 12.7 cm)

Software	
Supported OS	Windows ME/98/2000/XP A software CD is provided with the programming kits and contains the Zlinx Manager software, Users Manual and Quick Start Guide.

Agency Approvals	
FCC Part 15 Class A	Download DoC at <a href="http://www.bb-elec.com">www.bb-elec.com</a>
CE	Download DoC at <a href="http://www.bb-elec.com">www.bb-elec.com</a>
UL	File Number E222870 ZZ-PROG1-USB & ZZ-4AO-2 are not UL listed

MTBF(Hours)			
ZZ24D-NA-SR	85547	ZZ24D-NB-SR	137106
ZZ24D-NC-SR	86247	ZZ24D-ND-SR	138362
ZZ24D-NA-MR	88006	ZZ24D-NB-MR	142946
ZZ24D-NC-MR	88746	ZZ24D-ND-MR	144909
ZZ9D-NA-MR	88006	ZZ9D-NB-MR	144746
ZZ9D-NC-MR	88746	ZZ9D-ND-MR	144909
ZZ9D-NA-LR	88195	ZZ9D-NB-LR	143446
ZZ9D-NC-LR	88938	ZZ9D-ND-LR	145422
ZZ8D-NA-LR	88195	ZZ8D-NB-LR	143446
ZZ8D-NC-LR	88938	ZZ8D-ND-LR	145422
ZZ-4AI	136050	ZZ-4AO	113996
ZZ-2AI2AO	119183	ZZ-8DI-T	317530
ZZ-8DO-T	313100	ZZ-8DO-T1	317530
ZZ-4DI4DO-DCT	197045	ZZ-4DI4DO-DCT1	200795
ZZ-8DO-R	40670	ZZ-4RTD1	243007
ZZ-4AO-2	113996		

Zlinx Radio Modem Compatibility	
ZP24D-250RM-SR	ZZ24D-NA-SR ZZ24D-NB-SR ZZ24D-NC-SR ZZ24D-ND-SR
ZP24D-96RM-MR	ZZ24D-NA-MR ZZ24D-NB-MR ZZ24D-NC-MR ZZ24D-ND-MR
ZP9D-96RM-MR	ZZ9D-NA-MR ZZ9D-NB-MR ZZ9D-NC-MR ZZ9D-ND-MR
ZP9D-115RM-LR	ZZ9D-NA-LR ZZ9D-NB-LR ZZ9D-NC-LR ZZ9D-ND-LR ZZ9D-NA-LR-AU ZZ9D-NB-LR-AU ZZ9D-NC-LR-AU ZZ9D-ND-LR-AU
ZP8D-24RM-LR	ZZ8D-NA-LR ZZ8D-NB-LR ZZ8D-NC-LR ZZ8D-ND-LR

Power	
Source	An external power supply is required (not included)
Voltage (Sourcing Units)	10 to 46 VDC, 24 VAC +/- 10%
Voltage (Sinking Units)	10 to 48 VDC, 24 VAC +/- 10%
Power Connection	Removable Terminal Block, 3.5 mm spacing.
Power Consumption	
Base Modules	
SR Models	10.0 W
MR Models	9.5 W
900 MHz LR Models	13.1 W
868 MHz LR Models	12.0 W
Expansion Modules	
ZZ-4AI	1.0 W
ZZ-4AO	1.1 W
ZZ-2AI2AO	1.2 W
ZZ-8DI-T	0.4 W
ZZ-8DO-T	15.8 W
ZZ-8DO-T1	1.1 W
ZZ-4DI4DO-DCT	8.1 W
ZZ-4DI4DO-DCT1	1.0 W
ZZ-8DO-R	3.2 W
ZZ-4RTD1	0.4 W
ZZ-4AO-2	6.0 W

Replacement Parts	
ZZ-DIN 1	Replacement DIN clip and spring For all ZZ products, also comes with spare screws for enclosure
ZZ-TB1	Replacement terminal block kit for ZZ products. Kit includes (1) Two position TB (1) Four position TB (1) Eight position TB (1) Cover for local Bus
ZZ24D-ANT1	2.4 GHZ band antenna
ZZ9D-ANT1	900 MHz band antenna

PRODUCT INFORMATION

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