

Zlinx™ Standard Wireless I/O Peer-to-Peer and Modbus I/O

Models BB-ZZ24D-NA-SR, BB-ZZ24D-NB-SR, BB-ZZ9D-NA-LR-A, BB-ZZ9D-NB-LR-A

ADVANTECH

www.advantech.com



Shown: 1 base I/O unit, with
3 snap-on expansion modules

PRODUCT FEATURES

- Modular, expandable A/D I/O wire replacement for serial communications - cable-free, license-free
- Baud: 250 kbps (2.4 GHz, short range); 9.6 or 115.2 kbps (900 MHz, long-range, North America only)
- Wide operating temperature: 40 to +80 °C
- DIN rail mount, 35mm
- 10-48VDC or 24VAC power input (external power source required, not included, sold separately)
- Up to 23 km (14 mi) range (900 MHz and optional antenna)
- Modbus compatible – no additional conversion needed
- UL C1/D2 (all models). CE (2.4 GHz only)

Zlinx™ Wireless Modbus I/O - flexible enough to fit your applications.

These plug-n-play units combine traditional Modbus RTU remote analog and discrete I/O with built-in wireless connectivity. Wireless RTU serves as Modbus slave RTU in radio-based SCADA systems, or as a peer-to-peer communication platform.

Two Ranges Available - Short or Long range.

Active Repeaters - built-in repeater functionality on 900 MHz (long-range -LR models, North America only) ensures vital signals get through.

Modular - Just snap on your I/O and you are ready to communicate.

Wide Temperature - Meets most indoor or outdoor applications.

Rugged Circuitry - Prevents signal degradation.

128-bit / 256-bit AES Encryption - Secures data.

Selectable RF Transmit Power - Allows you to optimize the transmitter power for your application.

Selectable Over-the-Air Data Rate - Allows you to decrease the O.T.A. data rate (on -LR models), effectively increasing the radio transmitter's range.

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

Fail Safe - Allows you to set 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 DOs in peer-to-peer mode.

Monitor - Use the Zlinx™ Manager Software to monitor your I/O.

Power Source - 10 to 48 VDC or 24 VAC wide range power input. External power source required (not included, sold separately.)

ORDERING INFORMATION - BASE MODULES ^{1,2}

MODEL NUMBER	DESCRIPTION
2.4 GHz, Short Range Base Modules	
BB-ZZ24D-NA-SR	2.4 GHz, 2 AI, 2 AO, 2 DI, 2 DO Sourcing, Short Range
BB-ZZ24D-NB-SR	2.4 GHz, 4 DI, 4 DO Sourcing, Short Range
900 MHz, Long Range Base Modules ³	
BB-ZZ9D-NA-LR-A	900 MHz, 2 AI, 2 AO, 2 DI, 2 DO Sourcing, Long Range
BB-ZZ9D-NB-LR-A	900 MHz, 4 DI, 4 DO Sourcing, Long Range

World-wide.

Note 1: Check wireless regulations/standards in your geographic area.

Note 2: Check with your local distributor for availability and options.

Note 3: 900 MHz models for North America only.

ORDERING INFORMATION - EXPANSION MODULES

-- sold separately

MODEL NUMBER	DESCRIPTION
Expansion Modules - for use with base module/s	
BB-ZZ-8DI-DC	8 Digital Inputs, 10-48VDC
BB-ZZ-8DO-R	8 Relay Outputs
BB-ZZ-4AI	4 Analog Inputs

ACCESSORIES - sold separately

BB-ZZ-PROG1-USB	Zlinx USB Programming Module, Cable, Software CD
BB-ZZ24D-ANT1	2.4 GHz Replacement/Spare Antenna
BB-ZZ9D-ANT1	900 MHz Replacement/Spare Antenna
BB-ZZ-TB1	Replacement Terminal Block Kit

All product specifications are subject to change without notice.
ZlinxStandardWirelessIO_1619ds

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BB-ZZ24D-NB-SR

SPECIFICATIONS

BASE MODULE RADIO PROPERTIES

Base Module No.	Frequency	Software Selectable RF Power Options	Factory RF Power Setting	AES Encryption	Over-the-Air Data Rate
BB-ZZ24D-Nx-SR	2.4 GHz	10mW, 16mW, 25mW, 40mW, 63mW	63 mW	128-bit	250 Kbps
BB-ZZ9D-Nx-LR-A *	900 MHz *	1mW, 10mW, 100mW, 500mW, 1000mW	1000 mW	256-bit	9.6 or 115.2 Kbps

Note: Models BB-ZZ9D-NA-LR and BB-ZZ9D-NB-LR have software selectable OTA data rates.

Base Module No.	Range with Supplied Antenna (indoor/outdoor) maximum	Range with High Gain Antenna (outdoor) maximum
BB-ZZ24D-Nx-SR	91 m (300 ft) / 1.6 km (1 mi)	n/a
BB-ZZ9D-Nx-LR-A *	914 m (3000 ft) / 23 km (14 mi)	64 km (40 mi)

* Note: 900 MHz units North American only; not sold in Europe.

LATENCY

Base Module No.	Modbus		Peer-to-Peer	
	Digital	Analog	Digital	Analog
BB-ZZ24D-Nx-SR	8 mS	15 mS	20 mS	25 mS
BB-ZZ9D-Nx-LR-A	9 mS	104 mS	55 mS	52 mS

Latency times were measured in a clean RF environment with devices less than 1m (3 ft) apart.
Add 45mS per analog expansion module and 25mS per digital expansion module.

I/O POINTS

Model No. (base/expansion)	Digital Inputs	Digital Outputs	Analog Inputs	Analog Outputs
BB-ZZxD-NA-xx (base unit)	2 (Pull-up Resistors)	2 (Sourcing)	2 (mA, V)	2 (V, mA, Sinking)
BB-ZZxD-NB-xx (base unit)	4 (Pull-up Resistors)	4 (Sourcing)	-	-
BB-ZZ-4AI (expansion module)	-	-	4 (mA, V)	-
BB-ZZ-8DI-DC (expansion module)	8 (Pull-up Resistors)	-	-	-
BB-ZZ-8DO-R (expansion module)	-	8 (Relay)	-	-

SOFTWARE PROGRAMMING KITS – REQUIRED TO PROGRAM YOUR SYSTEM

Model Number (accessory)	Description
BB-ZZ-PROG1-USB	Programming Module Kit (USB Interface), USB cable and Software CD

Note: The Software CD is only available with the programming kit. Software and Firmware can also be downloaded at www.advantech-bb.com

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 40 VDC (Sourcing) 0 to 48 VDC (Sinking) 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	250 VAC @ 8A, 30VDC@5A (maximum per bank of 4 as grouped on the label)

ANALOG INPUTS AND OUTPUTS	
Ranges	0 to 10 VDC or 0 to 20 mA All others are passive
Resolution	12-bit
Input Accuracy	0.2% 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 Output Current, maximum	1 mA when configured for voltage output.
AO Load, maximum	450 Ohms when configured for current output @ 12V
RTD INPUTS	
Number of RTD	4
Wire Configuration	2, 3, 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 +80 °C	(+/-) 2.0 °C, maximum

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BB-ZZ9D-NA-LR-A
(North America only)



BB-ZZ9D-NB-LR-A



SPECIFICATIONS

RADIO PROPERTIES (2.4 GHZ – SR-A 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. (Model# BB-ZZ24D-ANT1)
RADIO PROPERTIES (900 MHZ – LR-A MODELS)	
Frequency	900 MHz
Output Power	1W
Receiver Sensitivity	100 dbm @ 115.2K, 110 dbm @ 9.6K
Antenna:	The included antenna is a 6.5 inch omni-directional with RPSMA connector. (Model# BB-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
ENVIRONMENTAL	
Operating Temperature	40 to +80 °C (-40 to +176 °F)
Ambient Air Temperature	+80 °C (+176 °F) maximum
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	2.9 x 9.3 x 12.7 cm (1.2 x 3.7 x 5.0 in)
SOFTWARE	
Supported Windows OS	XP (Home, Pro, SP1, SP2), Vista, 7, 8, 8.1, 10 (32/64 bit) A CD is provided with programming kits, Zlinx Manager software, User Manual and Quick Start Guide.
POWER - BASE MODULES	
Source	An external power supply is required (not included, sold separately)
Voltage	10-40 VDC, 24 VAC Class 2, (2.7W, maximum)
Power Connection	Removable Terminal Block, 3.81 mm spacing
WIRING TERMINALS	
Conductors	Copper Wire Only
Wire Range	One Conductor Per Terminal
Tightening Torque	28 to 16 AWG
Field Wiring Temperature Rating	1.7 lb / in 105 °C, minimum (sized for 60 °C ampacity)
Power Consumption	10.0 W 24 GHz -SR Models 9.5 W 900 MHz -LR Models 12.0 W
POWER - EXPANSION MODULES	
Source	Class 2 power derived from base modules Voltage and current listed on product label.
Power Consumption	BB-ZZ-4AI: 1.0 W BB-ZZ-8DI-DC: 0.4 W BB-ZZ-8DO-R: 3.2 W
OUTPUTS	
Type	Low Voltage, Limited Energy Communications Protocol
Wire Type	
Conductors	Copper Wire Only
Wire Size	One Conductor Per Terminal 28 to 16 AWG
Tightening Torque	0.2 Nm (Newton-Meters)

REPLACEMENT PARTS	
BB-ZZ24D-ANT1	2.4 GHZ band antenna
BB-ZZ9D-ANT1	900 MHz band antenna
BB-ZZ-DIN1	Replacement DIN clip and spring for all BB-ZZ products; also comes with spare screws for enclosure Replacement terminal block kit for BB-ZZ products. Kit includes: (1) Two-position TB (3.81mm) (1) Four-position TB (3.5mm) (1) Eight-position TB (3.5mm) (1) Cover for local bus
BB-ZZ-TB1	
REGULATORY APPROVALS	
- BASE MODULES - EXPANSION MODULES - PROGRAMMING DEVICE	
FCC Part 15 Class B CFR Title 47 - Digital Apparatus Industry Canada ICES-003 Class B - Digital Apparatus	
UL/cUL	Class 1 / Division 2 UL508 CISPR Class A
Models that are C1/D2 Listed: BB-ZZ24D-Nx-SR (2.4GHz, Short Range) BB-ZZ9D-Nx-LR-A (900 MHz, Long Range) BB-ZZ-4AI BB-ZZ-8DI-DC BB-ZZ-8DO-R BB-ZZ-PROG1-USB	
CE - Standards	EMC: ETSI EN 301 489-1 V1.9.2 - Applied in accordance with the specific requirements of: ETSI EN 301 489-17 V2.2.1 - EMC and Radio Spectrum Matters: Broadband Data Systems EN 55032 Class B - Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements EN 61000-6-3 +A1 - Generic Emission Standard for Residential, Commercial and Light-industrial Environments EN 61000-6-2 - Generic Immunity Standard for (Heavy-) Industrial Environments
2.4 GHz models only: BB-ZZ24D-NA-SR, BB-ZZ24D-NB-SR	Safety: EN 60950-1 +A11 +A1 +A12 +A2 - Information Technology Equipment - Safety - Part 1 - General Requirements EN 62479 - RF Exposure Limits
MEANTIME BEFORE FAILURE (MTBF) - MIL 217F CALCULATION METHOD	
BB-ZZ24D-NA-SR (base unit)	85547 hours
BB-ZZ24D-NB-SR (base unit)	137106 hours
BB-ZZ9D-NA-LR-A* (base unit)	88195 hours
BB-ZZ9D-NB-LR-A* (base unit)	143446 hours
BB-ZZ-4AI (expansion module)	136050 hours
BB-ZZ-8DO-R (expansion module)	40670 hours
BB-ZZ-8DI-DC (expansion module)	1147218 hours
ZLINX I/O & ZLINX RADIO MODEM COMPATIBILITY	
Zlinx I/O Base Module	Zlinx Radio Modem
BB-ZZ24D-NA-SR, BB-ZZ24D-NB-SR	BB-ZP24D-250RM-SR
BB-ZZ9D-NA-LR-A, BB-ZZ9D-NB-LR-A*	BB-ZP9D-115RM-LR*

* Note: 900 MHz units North American only.