Wavespeed/S

WIRELESS SERIAL DEVICE

Installation Guide

Inside Out Networks

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Inside Out NETWORKS™

Digi® Connectware™

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet that is on a circuit different from the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

Warning: The connection of a non-shielded interface cable to this equipment will invalidate the FCC Certification for this device.

This equipment has been certified to comply with the limits for a class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

FCC Regulation - Part 15
Declaration of Conformity (DoC)
FCC ID Q4W55M1073-01 or Q4W55M1074-01

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and

2. This device must accept any interference received, including interference that may cause undesired operation.

This product contains either a class 1 or class 2 Bluetooth transceiver board (part numbers 55001073 and 55001074 respectively). The following statement refers to this board.

IMPORTANT NOTICE: To comply with the FCC RF Exposure compliance requirements, the following antenna installation and device operating configurations must be satisfied.

The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Department of Communication (DOC) Notice (Canada only)
This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouiller du Canada.

European Community - CE Mark
Declaration of Conformity (DOC)

According to ISO/IEC Guide 22 and EN 45014
Manufacturer's Name: Inside Out Networks
Manufacturer's Addr.: 7004 Bee Caves Rd.
Bldg. 3, Ste. 200
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declares that the product
Product Name: Wavespeed/S
Model Number(s): 301-1121-01, 301-1123-01
301-1122-01, 301-1124-01
301-1124-01

Product Options: All
conforms to the relevant EU Directives listed here:

EMC Directive 89/336/EEC |
Low Voltage Directive 73/23/EEC
Amending Directive 93/68 EEC

using the relevant section of the following EU standards and other normative documents:
Safety: IEC 950:1991 +A1, A2, A3, A4
EN 60950:1992 + A1, A2, A3, A4

EMC
The following summarizes the specifications and requirements for EN55024, EN55022 Class B & CISPR 22 Class B emission and immunity tests. If the actual test levels are higher or different than required, these levels are listed in the appropriate tables.

EN 55022 Class B (1994 w/A1 1995)

Test	Specification EN55022	Requirement
Radiated Emissions	—	Class B
Conducted Emissions	CISPR 22	Class B

EN55024 (1998)

Test	Specification EN55024	Requirement
Electro-static Discharge	EN61000-4-2	+4 kV contact +8kV air
Radiated Immunity	EN61000-4-3	3 V/m
Electrical Fast Transient Burst	EN61000-4-4	1kV (A/C), .5kV (I/O)
Surge	EN61000-4-5	2kV common mode 1kV differential mode
Conducted Immunity	EN61000-4-6	3V rms
Magnetic Immunity	EN61000-4-8	**1 A/m Not Applicable**
Voltage Dips & Interrupts	EN61000-4-11	>95%, 30% & >95%

European Contact

Digi International
Joseph-von-Fraunhofer Str. 23
44227 Dortmund, GERMANY
49-231-9747-0

UL/CSA Safety Information
This device complies with the requirements of following safety standards below:

UL 1950, 3rd edition
CSA No. 950

Quality Manager
Austin, Texas
06/03

Wavespeed™/S

The Wavespeed/S provides an easy-to-use wireless data solution targeted for legacy and future applications that use a serial link (RS-232) to transfer data between devices or between devices and a host. The serial cable between two pieces of hardware can be replaced with a Bluetooth wireless link that is transparent to the software application. The application need only address the correct serial port as before. The Wavespeed/S, following initial configuration using a Windows-based Configuration Wizard, will take on the specified DTE or DCE personality and port settings. Data and control signals on the hardware's COM port will be transmitted through the Wavespeed/S unit(s), which will then simulate the appropriate signals on their external COM port(s).

Wavespeed/S units can be configured to operate in one of two modes:

Serial Cable Replacement

Two Wavespeed/S units are paired together in a process known as "bonding." The two units then form a wireless link acting like a serial cable, only without the cable.

SPP Server

A single Wavespeed/S unit can be used in server mode. In this mode, the device will make a Serial Port Profile (SPP) available for connection with any SPP-capable Bluetooth device.

User Configuration

Serial Cable Replacement Configuration

1. Power the units and connect one of them to a serial port on your computer.

2. Place both units in configuration mode, by sliding the status switch to the right (away from the power connector) and place the units near each other.

3. Launch the WvsdpCfg.exe configuration utility.

4. In the first screen, select "Cable Replacement" in the Device Function box.

Select COM Port

5. Specify the COM port to which the local Wavespeed/S device is attached. The COM port can be selected in one of two ways.

a. If you know which COM port the local device is attached to, select the port from the combo box and select the **Set COM Port Selection** button.

b. Or, if you are unsure which port the local device is attached to, click the **Auto Detect** button.

6. After the Configuration Wizard has verified that it can communicate with the local device, it will display the current configuration and MAC address. Select the **Next** button to move to the next step of the configuration process.

Discover Devices

Device Discovery and Bonding pairs two Wavespeed/S devices by creating a unique bond that ensures that, following the configuration procedure, those two devices will transfer information only to each other. This screen detects and lists all of the Wavespeed/S devices within the operating range, approximately 10 meters. The Bluetooth Address and product name of the detected devices are displayed in the Device Selection list.

7. Select the **Search** button. The Configuration Wizard fills in the list box with the Wavespeed/S devices that are in the area. If you do not see the desired device in the list box, continue searching by selecting the **Search** button again.

8. If you do not know the address of the remote device that you want to pair with, select a device address from the list and select the **Ping** button. The green LED on the selected device will light for 5 seconds. Continue selecting addresses and selecting the **Ping** button until you find the correct device.

9. Select the address of the device you want to pair with from the list and select the **Bond** button. The Configuration Wizard will bond with the selected device and give you an indication of the status of the procedure.

10. The Configuration Wizard automatically notifies you that the bonding was successful. If the procedure fails, retry the bonding process.

11. Select the **Next** button when bonding is complete.

Configure Local Port Settings

The next step in the configuration process is to specify the local device's port emulation settings and type. In this step, you will specify how the Wavespeed/S device communicates over the COM port to the TARGET application with which it will be interfacing (not how it communicates with the PC or laptop). In other words, if your application currently sends data at 9600 baud with 8 data bits, 1 stop bit, no parity, and software flow control, you need to specify those settings for the Wavespeed/S device. In addition, you must determine if the TARGET

Green LED

Off	The application is not running. Make sure the device has power and the 3-way switch is not in the OFF position.
Continuously On	On power up, the LED remains on while the device initializes.
One rapid blink every 5 seconds	Device is in normal operation mode and a wireless connection has been successfully made.
Two rapid blinks every 5 seconds	Device has initialized successfully but is not conencted to another device.
More than two rapid blinks every 5 seconds	Internal hardware error condition.
Continuous rapid blinking	Firmware error condition.

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Federal Communications Commission (FCC) Regulatory Information (USA only)
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

Pin Outs

DTE Device:

PIN	Direction	Signal
1	Input	DCD
2	Input	RX
3	Output	TX
4	Output	DTR
5	--	GND
6	Input	DSR
7	Output	RTS
8	Input	CTS
9	Input	RI

DCE Device:

PIN	Direction	Signal
1	Output	DCD
2	Output	TX
3	Input	RX
4	Input	DTR
5	--	GND
6	Output	DSR
7	Input	RTS
8	Output	CTS
9	Output	RI

The fastest way to determine whether a device is a DTE or a DCE device is to check the voltage level on pin 2 of the DB-9 when the COM port is active. If the voltage is –12 V to –3 V, then the device is likely a DCE. You can further confirm that conclusion by checking the voltage on pin 3. On a DCE device, the level should be at ground.

The opposite is true of a DTE device. The voltage of pin 2 should be ground and the voltage of pin 3 should be in the –12 V to –3 V range.

application is a DTE or DCE device. The Wavespeed/S device must be set to the opposite device type of the device to which it will be attached. One of the Wavespeed/S devices must be a DTE device and the other must be a DCE device. You may need to use a NULL modem adaptor on one of the devices.

12. For each port setting, select the desired value.

13. When all settings are specified, select the **Set Port Configuration** button to send the settings to the local device.

14. After viewing the confirmation message, select the **Next** button.

Configure Remote Device Port Settings

In most cases, the port settings, such as baud rate, data bits, et cetera, are the same as those set in the local device configuration. Therefore, the Configuration Wizard initializes the settings to those values.

15. For each category, select the desired value.

16. When all selections are specified, select the Set **Port Configuration** button to send the settings to the remote device.

17. After viewing the confirmation message, select the **Next** button.

18. While in the Save Configuration Settings, select the **Save** button to store the settings. Until reconfigured, the devices use the settings that you selected.

19. Place both Wavespeed/S units in the "On" mode, by sliding the three position switch back to the left (toward the power connector).

SPP Server Configuration

1. Power the units and connect one of them to a serial port on your computer.

2. Place both units in configuration mode by sliding the status switch to the right (away from the power connector).

3. Launch the **WvsdpCfg.exe** configuration utility.

4. In the first screen, select **SPP Server** in the Device Function box.

Select COM Port

5. Specify the COM port to which the local Wavespeed/S device is attached. The COM port can be selected in one of two ways.

a. If you know the COM port, select the port from the combo box and click **Set COM Port Selection**.

b. Or, if you are unsure which port the local device is attached to, click the **Auto Detect** button.

6. After the Configuration Wizard has verified that it can communicate with the local device, it displays the current configuration and MAC address. Select the **Next** button to move to the next step of the configuration process.

Configure Local Port

The next step in the configuration process is to specify the local device's port emulation settings and type. In this step, you specify how the Wavespeed/S device communicates over the COM port to the TARGET application with which it will be interfacing (not how it communicates with the PC or laptop). In other words, if your application currently sends data at 9600 baud with 8 data bits, 1 stop bit, no parity, and software flow control, you need to specify those settings for the Wavespeed/S device. In addition, you must determine if the TARGET application is a DTE or DCE device. The Wavespeed/S device must be set to the opposite device type of the device to which it will be attached.

7. For each port setting, select the desired value.

8. When all settings are specified, select the **Set Port Configuration** button to send the settings to the local device.

9. After viewing the confirmation message, select the **Next** button.

Configure Local Device

10. You may give the device a unique name.

11. You can set the number of seconds before a link is broken with the link time out. 20 seconds is recommended for most applications.

12. When all selections are specified, select the **Set Port Configuration** button to send the settings to the remote device.

13. After viewing the confirmation message, select the **Next** button.

Flash Update

14. Select the **Save** button to store the new settings.

15. Place the Wavespeed/S units in the "On" mode, by sliding the three-position switch back to the left (toward the power connector).

Specifications

Power Input

Power is input from an included 5-Volt wall-mounted power supply.

3-Position Switch

A 3-position switch (ON/OFF/CONFIG) specifies which mode the device is in. ON is the normal operational mode for the device. CONFIG puts the device in configuration mode.

Female DB-9 connector

Configurable Port Settings

- Device Type
  - DTE – Data Terminal Equipment
  - DCE – Data Communication Equipment
- Baud Rate: 300, 1200, 2400, 4800, 7200, 9600, 19200, 38400, 57600, 115200 (flow control required)
- Data Bits: 7, 8
- Stop Bits: 1, 2
- Parity: None, Odd, Even
- Flow Control
- None
- Software (user-specified XON/XOFF)
- Hardware (RTS/CTS)