



WireFreeCNC™

Manual

January 19, 2006
DOC# JWC040816

Thank you for purchasing a WireFreeCNC™ device. This unit was designed specifically to integrate CNC (Computer Numerically Controlled) machinery to computers. It is equipped with a PCMCIA slot which currently contains a standard 802.11B wireless PC card. The thought process of using a PCMCIA card for the radio was to allow the WireFreeCNC™ device to be field upgraded as new radio technologies and encryption capabilities become available for PCMCIA cards.



The RS232 port is a DB9 Male with the following configuration. This configuration is the same as the com port on the PC, with the exception of Pin 9.

Power IN for the device can be supplied to either the 2.5mm jack or to Pin 9 on the RS232 port, determined by the location of the external jumper. An internal jumper allows power to be supplied to the unit as either +5 VDC OR 9-36V AC or DC(default). See specifications.

NORMAL OPERATIONAL INDICATORS

Once power is supplied to the unit, *normal operation* consists of:

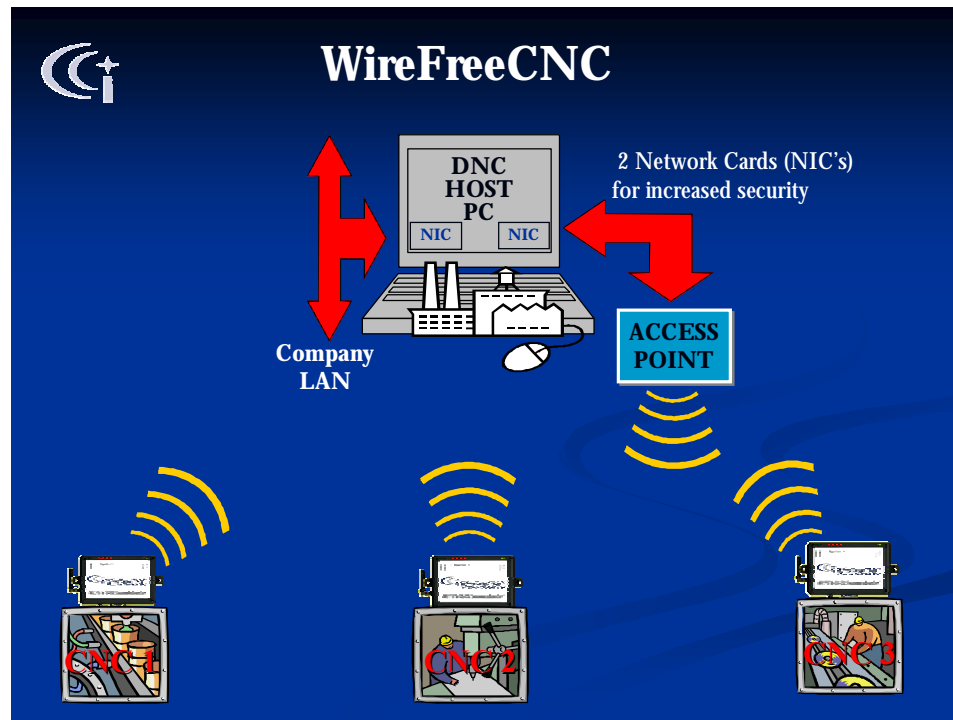
<**Power**> light illuminating.

<**Link**> light flashes until the computer that has the driver loaded on it sends a directed MAC call to the WireFreeCNC device and receives a confirmation back. The <**Link**> light will then go solid, indicating that the system is operational.

<**Signal Level**> illuminates to show a bar graph type representation of the signal strength. Initially the unit will search for an unencrypted network.

<**Radio**> light will flash periodically as wireless traffic is received and evaluated.

A typical installation example:



****Optionally a hub can be installed between the host PC and shop floor to accommodate multiple access points.**

****Multi-homing the DNC computer and assigning the NIC to 192.168 network allows for maximum security and guards against any possibility of unauthorized access to the company network.**

DEVICE CONFIGURATION

Configuring the wireless unit requires a basic knowledge of computer software installation, networking, and RS232 concepts. If you have a question regarding any information in this manual, please contact our technical support department at 860-870-5544.

Configuring the WireFreeCNC™ device

There are two methods for configuring the device with this software:

- 1) The preferred method of using the wireless radio card.
- 2) Serially (typically done for a network that is already encrypted) **See ADDENDUM**

Preferred method

Using the wireless radio card to configure the device:

1. Setup the host PC with a network connection on the same hub as the Access Point (optional: an x-over or cross over cable can be used and connected from PC directly to the Access Point).
2. Ensure the Access Point (AP) has no encryption programmed.
3. Apply power to the **WireFreeCNC™** unit.
4. Once a <Signal Level> appears, run the **WireFreeCNC™ device manager**
5. The un-configured unit will display on the list in approximately 4 seconds.
6. Click on the new unit on the list.

The WireFreeCNC software will display the following information:

- 1) Station Name
- 2) MAC Address
- 3) SSID
- 4) IP
- 5) Subnet Mask
- 6) ComPort name
- 7) Timeout
- 8) Active
- 9) Gateway Address
- 10) WEP enabled/disabled
- 11) Firmware Version

WireFree CNC Device Mgr.

Station Name	MAC Addr.	SSID	IP Addr.	Mask	Por...	Timeout	Active	Gate...	WEP	V...
AllenBradley	00:01:F4:EC:C6:0B	WireFreeCNC	192.168.123.107	255.255.255.0	COM28	20	Yes	0.0.0.0	Disabled	3.4
Fadal Mill	00:01:F4:EC:C6:1D	WireFreeCNC	192.168.123.103	255.255.255.0	COM24	20	Yes	0.0.0.0	Disabled	3.4
Fanuc 6A	00:01:F4:EC:C5:F6	WireFreeCNC	192.168.123.105	255.255.255.0	COM26	20	Yes	0.0.0.0	Disabled	3.4
Fanuc D	00:E0:63:82:E3:7A	WireFreeCNC	192.168.123.101	255.255.255.0	COM21	20	Yes	0.0.0.0	Disabled	3.4
Hardinge	00:E0:63:83:2C:91	WireFreeCNC	192.168.123.106	255.255.255.0	COM27	20	Yes	0.0.0.0	Disabled	3.4
Matsura	00:01:F4:EC:BE:B8	WireFreeCNC	192.168.123.100	255.255.255.0	COM22	20	Yes	0.0.0.0	Disabled	3.4
Mazak	00:01:F4:EC:C6:35	WireFreeCNC	192.168.123.102	255.255.255.0	COM23	20	Yes	0.0.0.0	Disabled	3.4
Okuma 3000	00:01:F4:EC:C5:EF	WireFreeCNC	192.168.123.104	255.255.255.0	COM25	20	Yes	0.0.0.0	Disabled	3.4

Buttons: Add..., Remove, Properties

SIIR: 68 dBm
Signal: -30 dBm
Noise: -98 dBm

All communications between the host computer and the **WireFreeCNC™** unit are by directed MAC call so an IP address is not required for normal operation. If for some reason troubleshooting is required and a ping command is used, then an IP address can be assigned.

7. Click on Properties.

Device Configuration

Device MAC Address: 0001F4ECC635

Device name: Mazak

Network Name (SSID): WireFreeCNC

Domain Name:

Obtain an IP address automatically

Static or fallback IP parameters

IP Address: 192 . 168 . 123 . 102

Network Mask: 255 . 255 . 255 . 0

Gateway: 0 . 0 . 0 . 0

Wireless Encryption (WEP)

Encryption: 40/64 bit 104/128 bit

Key 1 92837485032839403098349874

Key 2

Key 3

Key 4

Serial Port

Name: COM23

Timeout: 20

Save Cancel

8. Enter the name of the CNC machine in the <Device Name> field.

9. The SSID is the wireless network name.

10. Optional: IP addresses can be assigned manually or Use DHCP server can be selected.

11. Encryption can be set for a 40 bit or 128 bit network. The paraphrase field allows a word to be entered and encryption values can be automatically generated using an algorithm entered into the 4 key fields. All encryption is in hexadecimal format.

12. Assign the Serial Port.

13. Choose <Save> to save settings on unit.



Dip switch positions

Pos #	Function
1	Used to flash microprocessor with operational software (done at factory or by an approved WireFreeCNC™ dealer.)
2	Sets unit back to factory defaults.
3	Used to set WireFreeCNC™ device with serial port.
4	Future auto configure feature.

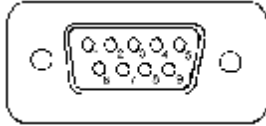
WireFreeCNC™ Specifications

2.5mm jack

RS-232 port DB9 Conn

External jumper placement

RS-232 Signal	DB9 Pinout
DCD	1
RxD	2
TxD	3
DTR	4
GND	5
DSR	6
RTS	7
CTS	8
*Pwr In	9



Ext Jack



Pin9 Pwr

*Pwr In can be supplied to the 2.5mm jack or to pin 9 of the RS-232 port and is determined by the placement of an external jumper.

(Setting shown for 2.5mm jack)

An internal jumper allows **input power** to be either **5+ VDC** or **9-36 V AC or DC**.

- **Operating Temperature:** -40°C to + 85°C
- **Humidity:** 5 to 95%, non condensing
- **Frequency Range:** 2400 MHz to 2484 MHz
- **Spreading:** 11-chip Barker sequence
- **Typical Wireless Range:** 200 ft radius
- **Modulation Technique:**
 Direct-sequence spread spectrum
 CCK (11Mbits/s, 5.5 Mbits/s)
 DQPSK (2 Mbits/s)
 DBPSK (1 Mbits/s)

Powered by:



Regulatory Body Approvals/ Compliance

- **Electromagnetic Compatibility:** FCC CFR47 Part 15
- **Product Safety:** IEC 60950/L 1950, CB
- **Radio Regulations:** FCC CFR47 Part 15 C, para 15.247



The main advantages of wireless communications are:

- **Move machinery anytime with NO extra cabling cost ever.**
- **Eliminate the downtime due to costly repairs after a lightning strike.**
- **Save costly set-up time and increase quality by transferring files to machines at highest possible rate.**
- **Reliable error checking protocol right down to com port.**
- **No wiring necessary - ideal for new shops or shops with overhead cranes, dangerous cable runs, etc.**
- **Wireless infrastructure allows laptops, PDA's, barcode scanners, etc. to connect into network.**
- **128 -bit WEP encryption and multi-honing ensure high level of security.**
- **Eliminates conflict between coordinating multiple departments when moving machinery.**

ACCESSORIES

Internal mounting kit Consisting of the items listed below:

RS232 Inline Wedge

5.5 dBI Mag mount antenna with rubber grommet

DB25F IDC connector with 12" 25 pin ribbon cable attached

DB25M IDC connector

3' DB9F x DB9F straight-thru cable

(2) 4" strips of dual lock fastening and cleaning pads

9VDC 600mA power supply wall transformer with 6 ft. zip cord

External mounting kit Consisting of the items listed below:

9VDC 600mA power supply wall transformer with 6 ft. zip cord

3' DB9F x DB25M null modem cable

Peripheral products

RS232 Inline Wedge

5.5 dBI Mag mount antenna

3' DB9F x DB9F straight-thru cable

3' DB9F x DB9F null modem cable

3' DB9F x DB25M null modem CNC machine cable

9VDC 600mA power supply wall transformer with 6 ft. zip cord

2.5mm ID / 5.5mm OD jack power cord

DB25F IDC connector with 12" 25 pin ribbon cable attached

DB25M IDC connector with 4/40 screws

(2) 4" strips of dual lock fastening

Rubber Grommet

Self Tapping Screws

Warranty

All units come with a 2 year manufacturer's warranty.

WireFreeCNC will repair its products with new or rebuilt parts, free of charge, for two (2) years from the date of original purchase in the event of a defect in materials or workmanship. Product must be shipped back to WireFreeCNC for repair. Shipping charges for all returns fall onto the responsibility of the customer. This warranty is extended only to the original purchaser. A purchase receipt or other proof of date of original purchase will be required before warranty performance is rendered.

This warranty only covers failures due to defects in materials or workmanship which occur during normal use. It does not cover damage which occurs due to failures which are caused by products not supplied by WireFreeCNC or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, or modification of the product, or service by anyone other than WireFreeCNC, or its agents or damage that is attributable to acts of God. All shipping breakage must be reported to carrier within 7 days; claims must be made with carrier. All returns of first quality goods (whether due to product refusal or return), are subject to a 20% restocking fee.

Limits and Exclusions

There are no express warranties except as listed above.

WireFreeCNC SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion or limitations of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

ADDENDUM

Using the serial port to configure the device

Edit device parameters

Computers Comm Port: 1 [Read Device]

Device name: []

Network name (SSID): []

Domain name: []

Use DHCP

Static or fallback parameters:

IP address: [] [] [] []

Network mask: [] [] [] []

Gateway: [] [] [] []

Wireless Encryption:

Encryption on/off 40/64 bit 104/128 bit

Passphrase: [] [Generate keys]

Key 1: []

Key 2: []

Key 3: []

Key 4: []

[Update device] [Cancel]

This requires **WireFreeCNC.exe**
Open the **WireFreeCNC™ Com Port Manager**

1. Setup the host PC with a null modem RS232 DB9F x DB9F cable.
2. Set dip switch 3 down.
3. Apply power to the **WireFreeCNC™** unit.
4. From the drop down menu chose **<Edit>** and then **<Via serial port>**.
5. Choose the appropriate com-port and click on **Read Device**.
6. The **<Serial>** light will go solid as data is being sent to the configuring PC.
7. Enter the name of the CNC machine in the **<Device Name>** field.
8. The SSID is the wireless network name. Setting an SSID is a good way of ensuring that the device powers up and specifically looks for the assigned SSID value.
9. Optional: IP addresses can be assigned manually or Use DHCP server can be selected.
10. Encryption can be set for a 40 bit or 128 bit network. The paraphrase field allows a word to be entered and encryption values can be automatically generated using an algorithm and put into the 4 key fields. All encryption is in hexadecimal format.
11. Choose **<Update Device>** to save settings on unit.
12. Set dip switch 3 up and cycle power to the device.