N-TRON
THE INDUSTRIAL NETWORK COMPANY

702-W

The *N-TRON® 702-W* Industrial Wireless Radio offers outstanding performance and ease of use. It is ideally suited for connecting wireless devices to a wired network or for connecting two wired networks where it is not possible, impractical, or too expensive to install cable.

Product Features

- Full IEEE 802.11a,b,g,n Compliance
- One 10/100BaseTX RJ-45 Port
- Three Antennas for 3x3 MIMO Operations
- Four user definable LED's for display of signal quality
- Radio Enable, Link/Activity, and power LEDs
- 802.3af PoE Powered Device
- Extended Environmental Specifications
- Autosensing 10/100BaseTX, Duplex, and MDIX
- Rugged DIN Rail Enclosure
- Redundant Power Inputs (20-49 VDC)
- Web Browser Management

Wireless Compliance:

- IEEE 802.11a Compliant
- IEEE 802.11b Compliant
- IEEE 802.11g Compliant
- IEEE 802.11n draft Compliant

Security

- 802.11i with AES-CCM & TKIP Encryption
- 802.1x, 64/128 bit WEP

Data Rates:

- Legacy 802.11a/b/g (1-54Mbps)
- 802.11n (up to 300Mbps)

Range Performance:

- Indoor (Antenna Dependent) greater than 300m
- Outdoor (Antenna Dependent) greater than 60km

Applications

In industrial environments, situations arise where the installation of fiber or Cat5e cable and associated power cables is difficult or cost prohibitive. There are also applications which require communications with mobile devices such as forklifts, cockpits on cranes, laptop computers, and other devices that are impossible to connect with copper or fiber cable. The *N-TRON® 702-W* provides a wireless connection that can be quickly and easily deployed. With it's wide operating temperature range and 1 million hour MTBF, the *702-W* offers the industrial ruggedness that customers have come to expect of *N-TRON* products. Three antennas allows the *702-W* to utilize Multiple In, Multiple Out (MIMO) technology for increased throughput. Power over Ethernet (PoE) technology enables the *702-W* to receive power through Cat5e cable from a PoE sourcing device, such as the *N-TRON* 105TX-POE Switch or the 100-PoE4 Midspan. Temporary deployments of network nodes are much easier using wireless and PoE technology because only one Cat5e cable is required.

Industrial Packaging and Specifications

The is specifically designed to operate in industrial environments. With it's rugged enclosure and industrial specifications such as extended shock and vibrations specs plus redundant power inputs, the *702-W* easily meets and exceeds the operating parameters of the connected equipment.

Multiple Wireless Modes

The *702-W* provides a number of configuration options to allow it to be customized to suit specific application requirements.

Station: In "station" configuration the *702-W* is used to connect a single device (MAC Address) to a wireless access point.

Station, WDS (Wireless Distribution System): In "station, WDS" mode the *702-W* can be connected to a remote wired switch and will allow multiple devices (MAC Address forwarding) to be connected to the wireless access point with WDS activated.

Access Point: The "Access Point" mode allows the *702-W* to serve as a wireless switch for the attached wireless stations. Wireless access points are commonly used to create one wireless local area network (WLAN) that spans an area around the Access Point. Each access point typically supports up to 253 stations.

Access Point, WDS (Wireless Distribution System): The *702-W* in "Access Point, WDS" mode allows wireless connection of a number of access points to extend the coverage of the wireless network. The main base Access Point in WDS mode is extended using a series of relay access points in WDS mode (Extended Service Set) and can in turn form a WLAN consisting of thousands of stations. All stations should be configured in "Station WDS" mode. Correctly configured switches using WDS will create a single network, providing station mobility throughout the wireless network.

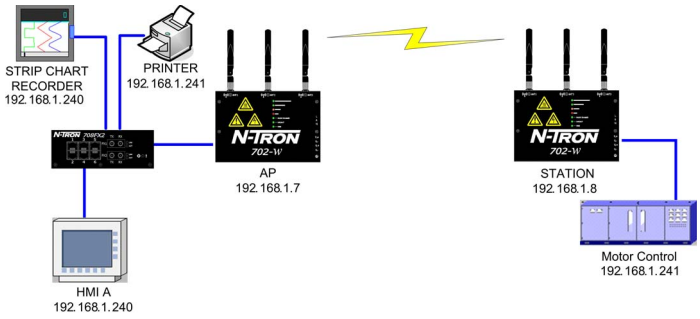
Multiple Network Modes

Bridge: In this mode the *702-W* will operate in layer two without network segmentation.

Router: Router operating mode offers layer three routing to allow network segmentation.

Scenario 1 – Basic Bridge

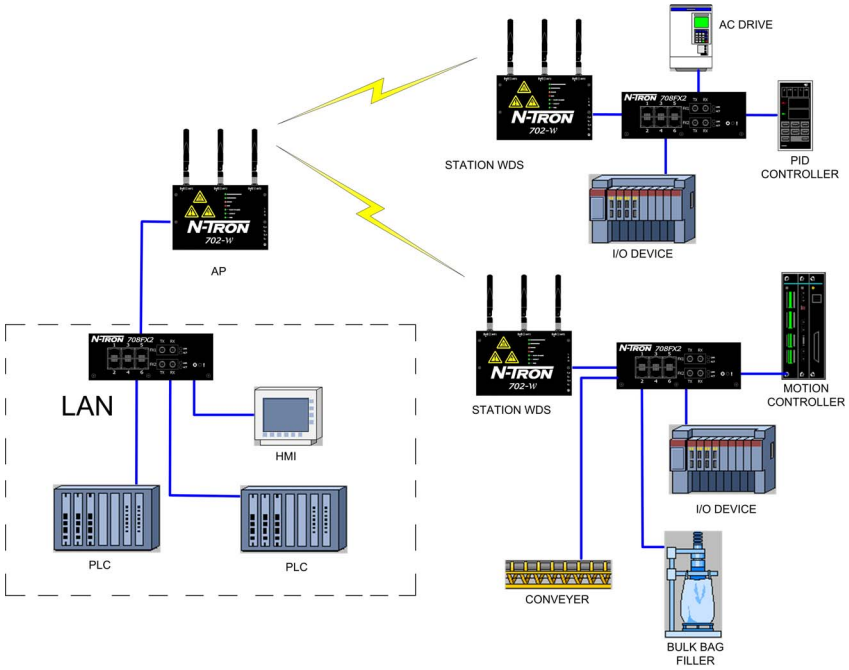
Access Point:
The "Access Point" mode allows the *702-W* to serve as a wireless switch for the wireless stations attached to it. Wireless access points are commonly used to create one wireless local area network (WLAN) that spans an area around the Access Point. Each access point typically supports up to 253 stations.



Station:
In "station" configuration the *702-W* is used to connect a single device (MAC Address) to a wireless access point.

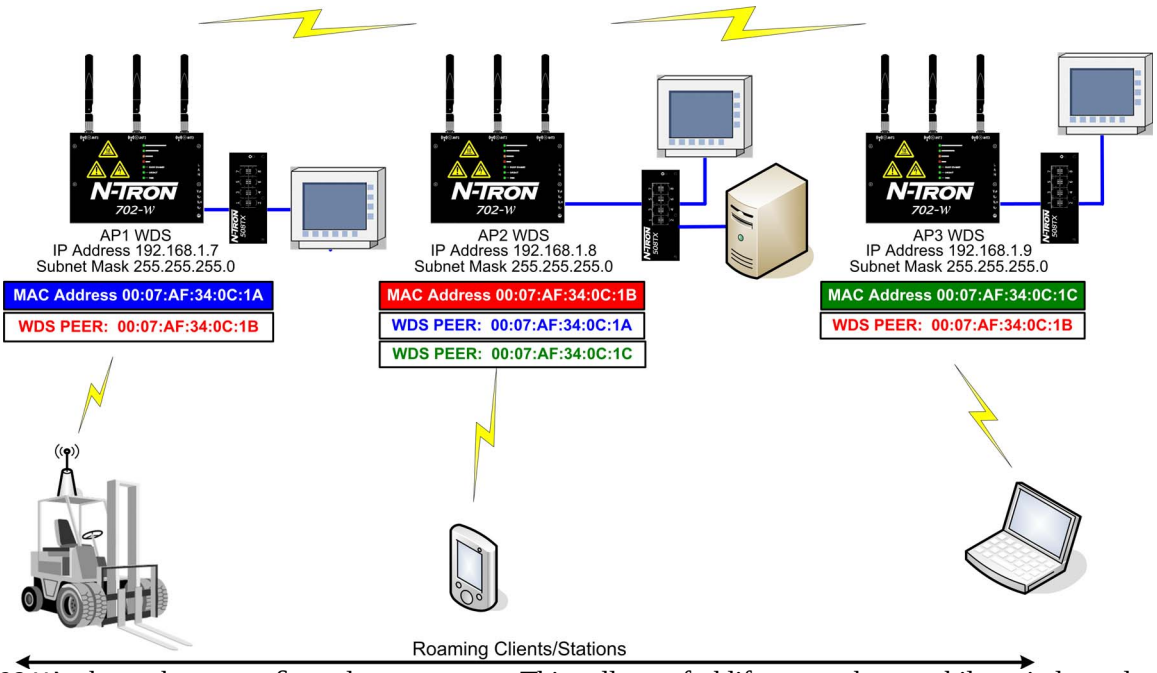
For added security, the *702-W* supports WEP, WPA™ , and WPA2™ . WPA and WPA2, TKIP (Temporal Key Integrity Protocol) and CCMP (Counter Mode with Cipher Block Chaining Message Authentication Code Protocol) are available.

Scenario 2 – Control Network



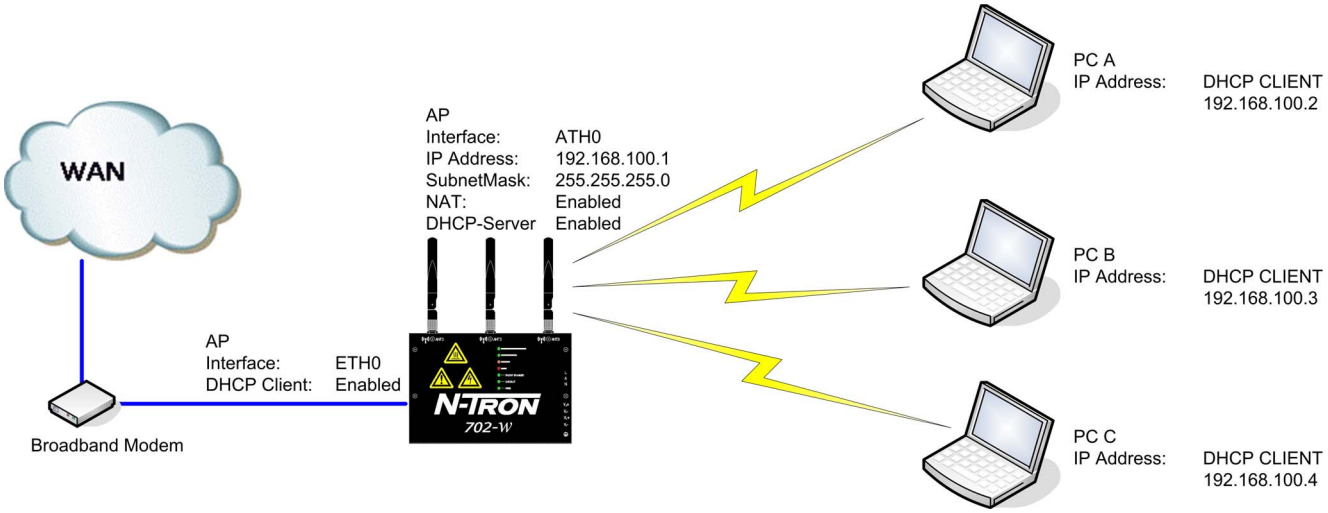
In Station WDS mode the *702-W* can be connected to a remote wired Ethernet switch with multiple devices connected to the switch.

Scenario 3 – WDS Peering



The *702-W*s have been configured as peers. This allows forklifts or other mobile wireless device to maintain communication as they move from the area covered by one *702-W* into the area covered by the next 702-W.

Scenario 4 – Broadband Modem Wireless Router (W/ DHCP)



N-TRON 702-W configured as a powered Router allows layer 3 routing to set up network segmentation. It supports the Network Address Translation (Masquerading) feature which is widely used by Access Points. NAT will act as the firewall between LAN and WLAN networks. Additional Firewall settings can be configured for Layer 3 packet filtering and access control in Router mode. It can also act as a DHCP server, automating the assigning of IP addresses.

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QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO 9001:2000

702-W Specifications

Physical

Height: (w/o antennas)	5.2"	(13.2cm)
Width:	7.4"	(18.8cm)
Depth (incl. DIN-Rail mount):	1.5"	(3.81cm)
Weight (max):	1.9 lbs	(0.86kg)
DIN-Rail Mount:	35mm	

Environmental

Operating Temperature:	-40ºC to 70ºC
Storage Temperature:	-40ºC to 85ºC
Operating Humidity:	5% to 95% (Non Condensing)
Operating Altitude:	0 to 10,000 ft.
N-TRON Power Supply:	NTPS-24-1.3

Electrical

Redundant Input Voltage:	20-49 VDC (Regulated)
Input Current (max):	200mA max @24 VDC
702-W Max Power:	4.8Watts max
Input Ripple:	Less than 100mV

Reliability

MTBF:	>1 Million Hours

Network Media

10BaseT:	>Cat3 Cable
100BaseTX:	>Cat5 Cable
802.11abgn:	Air

Connectors

10/100BaseTX:	One (1) RJ-45 Copper Port PoE Powered device support
802.11abgn	(3) RP-SMA connectors

Recommended Wiring Clearance (Antenna Dependent)

Front:	4" (10.16cm)
Side:	4" (10.16cm)
Top:	6" (15.24cm)

Radio Output Power:

Up to 250mW US

802.11a	**5GHz**
DataRate	Avg TX ±2dB
1-24Mbps	24 dBm
36Mbps	22 dBm
48Mbps	20 dBm
54Mbps	19 dBm

802.11b/g	**2.4GHz**
DataRate	Avg TX ±2dB
1-24Mbps	24 dBm
36Mbps	22 dBm
48Mbps	20 dBm
54Mbps	19 dBm

802.11n	**2.4GHz**	**5GHz**
DataRate	Avg TX ±2dB	
MCS0	24dBm	24dBm
MCS1	24dBm	24dBm
MCS2	24dBm	24dBm
MCS3	22dBm	22dBm
MCS4	22dBm	22dBm
MCS5	22dBm	22dBm
MCS6	18dBm	18dBm
MCS7	15dBm	15dBm
MCS8	24dBm	24dBm
MCS9	24dBm	24dBm
MCS10	22dBm	22dBm
MCS11	20dBm	20dBm
MCS12	20dBm	20dBm
MCS13	17dBm	17dBm
MCS14	17dBm	17dBm
MCS15	15dBm	15dBm

Radio Receiver Sensitivity

802.11a	**5GHz**
DataRate	Sens. ±3dB
1-24Mbps	-96 dBm
36Mbps	-95 dBm
48Mbps	-84 dBm
54Mbps	-91 dBm

802.11b/g	**2.4GHz**
DataRate	Sens. ±3dB
1-24Mbps	-97 dBm
36Mbps	-90 dBm
48Mbps	-86 dBm
54Mbps	-84 dBm

802.11n	**2.4GHz**	**5GHz**
DataRate	Sens. ±3dB	
MCS0	-97dBm	-96dBm
MCS1	-96dBm	-95dBm
MCS2	-93dBm	-92dBm
MCS3	-91dBm	-90dBm
MCS4	-87dBm	-86dBm
MCS5	-84dBm	-83dBm
MCS6	-78dBm	-77dBm
MCS7	-75dBm	-74dBm
MCS8	-96dBm	-95dBm
MCS9	-94dBm	-93dBm
MCS10	-91dBm	-90dBm
MCS11	-88dBm	-87dBm
MCS12	-85dBm	-84dBm
MCS13	-80dBm	-79dBm
MCS14	-79dBm	-78dBm
MCS15	-76dBm	-75dBm

Regulatory Approvals

UL /cUL Class I, Div 2, Groups A, B, C, D, and T4A
ANSI/ISA-12.12.01-2007 and UL 508 and 1604
FCC/CE (CFR 47, Part 15, Subpart B - Class A)
EN 301 489-3, IEC 6100-4-2, 6100-4-3,
R&TTE Directive 99/5/EC, ANSI C63.4, and ICES-003 Issue 3
GOST-R Certified, RoHS Compliant

Designed to comply with:
IEEE 1613 for Electric Utility Substations
NEMA TS1/ TS2 for Traffic control

702-W WIRELESS ETHERNET RADIO

Ordering Information

702-W	Industrial Wireless Radio
702-W-PM	Panel Mount Kit for 702-W
ANT-CAB-400-N-RPTNC-X	Low Loss Coaxial Antenna cable; 1 RP-SMA and 1 N Male connector
ANT-MD24-12	2.4GHz 12dBi Mini Directional Antenna
ANT-PD58-32	5.8 GHz Parabolic Dish 32dBi Directional Antenna
M12-DRK	DIN-Rail kit for 702M12-W
NTPS-24-1.3	DIN-Rail Power Supply 24V@1.3 Amp

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