



OEM Instruction Manual

F52N-PRO is a high power miniPCI card to be used in outdoor wireless systems. Please follow the following instruction while using this card. This card is meant to be operated (and used) by system integrators who are aware of the regulatory requirements in the area it is being used. The following instructions need to be followed while using the card

- 1) Before inserting the card in a host PC board, please power down the host PC board first
- 2) The antenna ports (MMCX connector) should be connected to the appropriate load or antenna before powering up the host board. Lack of Antenna (or load) while the F52N-PRO is powered up will cause severe damage to the card
- 3) Please make sure any person handling the card with bare hands follows proper ESD precautions. Improper handling could cause ESD damage.
- 4) The card should not be tampered or modified in any way. Tampering or modification could cause the card to fail standard test

FCC Warning

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 try to correct the interference by one of the following measures:

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

The use of any antenna (based on antenna design and gain) other than those certified with the product voids authorization of this equipment and are expressly forbidden in accordance to FCC rules CFR47 part 15.204. The OEM and installer shall configure the output power level based on antenna selection, gain, and installation use (i.e. point-to-point or point-to-multipoint).

Guidance of power settings and antenna selection are included in this manual for reference. Use of the lowest usable power level for each installation is recommended. This product may NOT be sold to the general public as professional installation is required. OEM's must ensure installers of end product understand the requirements and limitations of the Authorization. Professional installation is required of equipment with connectors to ensure compliance with



health and safety issues. Below are the lists of antennas certified with this product. The OEM must ensure that end product complies with FCC labeling requirements. This includes a clearly visible label on the outside of the OEM enclosure specifying the appropriate identifier for this product as well as the FCC notice below.

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.

Software Driver

Irrespective of the software driver used, this radio can only transmit in the following frequencies
2400–2483.5 MHz
5725–5850 MHz
4940-4990 MHz

Operation Frequency and Antennas

Operation in this band with antenna gains greater than 6dBi are regulated under CFR47 15.247(c)(4). Copy of regulation is included below for reference.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

(iii) Fixed, point-to-point operation, as used in paragraphs (c)(1)(i) and (c)(1)(ii) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum or digitally modulated intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

(2) In addition to the provisions in paragraphs (b)(1), (b)(3), (b)(4) and (c)(1)(i) of this section, transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams, simultaneously or sequentially, for the purpose of directing signals to individual receivers or to groups of receivers provided the emissions comply with the following:

(i) Different information must be transmitted to each receiver.

(ii) If the transmitter employs an antenna system that emits multiple directional beams but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device, i.e., the sum of the power supplied to all antennas, antenna elements, staves, etc. and summed across all carriers or frequency channels, shall not exceed the limit specified in paragraph (b)(1) or (b)(3) of this section, as applicable. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as follows:

(A) The directional gain shall be calculated as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.



(B) A lower value for the directional gain than that calculated in paragraph (c)(2)(ii)(A) of this section will be accepted if sufficient evidence is presented, e.g., due to shading of the array or coherence loss in the beamforming.

(iii) If a transmitter employs an antenna that operates simultaneously on multiple directional beams using the same or different frequency channels, the power supplied to each emission beam is subject to the power limit specified in paragraph (c)(2)(ii) of this section. If transmitted beams overlap, the power shall be reduced to ensure that their aggregate power does not exceed the limit specified in paragraph (c)(2)(ii) of this section. In addition, the aggregate power transmitted simultaneously on all beams shall not exceed the limit specified in paragraph (c)(2)(ii) of this section by more than 8 dB.

(iv) Transmitters that emit a single directional beam shall operate under the provisions of paragraph (c)(1) of this section.

2400-2483.5 MHz 802.11 operations

Maximum transmitter settings for fixed point-to-point operation installation

Antenna	Model	Gain (dBi)	Channel Width(MHz)	Software Max Power Setting	Actual Max Tx Power
Dipole	USI05-220170/2.5/5dBi	2.5	5,10,20,40	22	27
Omni Directional	62416 ODN	16	5,10,20,40	18	23
Panel	MA-WA25-20	20	5,10,20,40	17	22
Sector	62420 SN-120	20	5,10,20,40	17	22
Dish	Air802 ANGR2424	24	5,10,20,40	16	21

5725-5850 MHz 802.11 operations

Maximum transmitter settings for fixed point-to-point operation installation

Antenna	Model	Gain (dBi)	Channel Width(MHz)	Software Max Power Setting	Actual Max Tx Power
Dipole	USI05-220170/2.5/5dBi	5	5,10,20,40	22	27
Omni	65812 ODN	12	5,10,20,40	22	27
Sector	MA-WB55-20	20	5,10,20,40	22	27
Panel	MA-WA55-30	30	5,10,20,40	22	27
Dish	PX3F-52-N7	33.5	5,10,20,40	22	27



5725-5850 MHz U-NII operations

Maximum transmitter settings for fixed point-to-multi-point operation installation

Antenna	Model	Gain (dBi)	Channel Width(MHz)	Software Max Power Setting	Actual Max Tx Power
Dipole	USI05-220170/2.5/5dBi	5	5,10,20	22	27
Omni	65812 ODN	12	5,10,20	22	27
Sector	MA-WB55-20	20	5,10,20	22	27
Panel	MA-WA55-30	30	5,10,20	15	20
Dish	PX3F-52-N7	33.5	5,10,20	11	16

FCC Caution

To assure continued compliance, any changes, or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Radiation Exposure Statement

To comply with FCC RF exposure requirements in section 1.1307, a minimum separation distance of 3.9 feet is required between the antenna and all occupational persons, and a minimum separation distance of 8.7 feet is required between the antenna and all public persons.

IC Transmit Antennas

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna



type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

IC License Exempt Radio

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.