

User Manual

Model Name: SX-PCEAX-AP

Since this module is not sold to general end users directly, there is no user manual of module.

For the details about this module, please refer to the specification sheet of module.

This module should be installed in the host device according to the interface specification (installation procedure).

| Product Information | | | |
|---------------------|--------------------------|----------------------------|---------------|
| PMN: | Embedded wireless module | FCC ID: | N6C-PCEAXAP |
| HVIN: | SX-PCEAX-AP | ISED Certification Number: | 4908A-PCEAXAP |

Specification

| Items | Specification | | | | Unit |
|-----------------------|----------------------------|--|------|------|------|
| Power Supply | 3.3Vdc from host equipment | | | | |
| Operating frequencies | Band | Modes | Min | Max | MHz |
| | 2.4GHz | 11b | 2412 | 2462 | MHz |
| | | 11g/n/ax 20MHz | 2412 | 2462 | MHz |
| | | 11g/n/ax 40MHz | 2422 | 2452 | MHz |
| | 5GHz | 11a/n/ac/ax 20MHz | 5180 | 5825 | MHz |
| | | 11n/ac/ax 40MHz | 5190 | 5795 | MHz |
| | | 11ac/ax 80MHz | 5210 | 5775 | MHz |
| | | 11ac/ax 160MHz | 5210 | 5775 | MHz |
| Data rates | 11b | 1,2,5.5L,5.5S,11L,11S | | | Mbps |
| | 11a/g | 6,9,12,18,24,36,48,54 | | | Mbps |
| | 11n | MCS 0,1,2,3,4,5,6,7 | | | — |
| | 11ac | MCS 0,1,2,3,4,5,6,7,8,9 | | | — |
| | 11ax | MCS 0,1,2,3,4,5,6,7,8,9,10,11 | | | — |
| Modulation types | 11b | DSSS(DBPSK,DQPSK,CCK) | | | |
| | 11a/g/n | OFDM(BPSK,QPSK,16QAM,64QAM) | | | |
| | 11ac | OFDM(BPSK,QPSK,16QAM,64QAM,256QAM) | | | |
| | 11ax | OFDM(BPSK,QPSK,16QAM,64QAM,256QAM,1024QAM) | | | |

Federal Communication Commission Interference Statement

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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

FCC Notice;

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

| Antenna Type | Antenna Gain | | | | |
|--------------|--------------|--------------|--------------|---------------|---------------|
| | 2.4-2.5GHz | 5.15-5.25GHz | 5.25-5.35GHz | 5.47-5.725GHz | 5.725-5.85GHz |
| Dipole | +3.175dBi | +3.22dBi | +3.91dBi | +4.275dBi | +3.97dBi |

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: **N6C-PCEAXAP**". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

2.11 Note EMI Considerations

We recommend to use "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties. The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

2.12 How to make changes

Only the grantee is permitted to make permissive changes. Please contact us at Silex Technology, Inc.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end

user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

Prohibited for control of or communications with unmanned aircraft systems, including drones.

Innovation, Science and Economic Development Canada statement:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Label and compliance information

The following information must be indicated on the host device of this module.

Les informations suivantes doivent être indiquées sur le périphérique hôte de ce module.

| |
|---|
| Contains Transmitter Module IC: 4908A-PCEAXAP |
|---|

Or

| |
|----------------------------|
| Contains IC: 4908A-PCEAXAP |
|----------------------------|

Operation in the band 5150-5350 MHz

Operation in the band 5150-5350 MHz is only for indoor use to reduce the potential for harmful interference to cochannel mobile satellite systems.

La bande 5150-5350 MHz est réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Data transmission

Data transmission is always initiated by software, which is then passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet.

Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted. In other words, this device automatically discontinues transmission in case of either absence of information to transmit or operational failure.

La transmission des données est toujours initiée par le logiciel, puis les données sont transmises par l'intermédiaire du MAC, par la bande de base numérique et analogique et, enfin, à la puce RF. Plusieurs paquets spéciaux sont initiés par le MAC. Ce sont les seuls moyens pour qu'une partie de la bande de base numérique active l'émetteur RF, puis désactive celui-ci à la fin du paquet. En conséquence, l'émetteur reste uniquement activé lors de la transmission d'un des paquets susmentionnés. En d'autres termes, ce dispositif interrompt automatiquement toute transmission en cas d'absence d'information à transmettre ou de défaillance.

RF exposure considerations

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

Antenna Type

This radio transmitter (4908A-PCEAXAP) has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

| Antenna Type | Antenna Gain | | | | | Impedance |
|----------------|--------------|--------------|--------------|---------------|---------------|-----------|
| | 2.4-2.5GHz | 5.15-5.25GHz | 5.25-5.35GHz | 5.47-5.725GHz | 5.725-5.85GHz | |
| Dipole Antenna | +3.175dBi | +3.22dBi | +3.91dBi | +4.275dBi | +3.97dBi | 50ohms |

Le présent émetteur radio (4908A-PCEAXAP) a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

| Type d'antenne | Antenna Gain | | | | | Impedance |
|----------------|--------------|--------------|--------------|---------------|---------------|-----------|
| | 2.4-2.5GHz | 5.15-5.25GHz | 5.25-5.35GHz | 5.47-5.725GHz | 5.725-5.85GHz | |
| Antenne Dipole | +3.175dBi | +3.22dBi | +3.91dBi | +4.275dBi | +3.97dBi | 50ohms |