

Instructions and Conditions for use Compex Module WLM200N5-26-ESD

The following are instructions for the use of the Radio Module (miniPCI card radio adaptor) WLM200N5-26-ESD by third parties who are integrating this device into their products

This is required to ensure that the module is utilized according to the conditions the approval was given by the FCC.

The Compex WLM200N5-26-ESD radio Module has been modularly approved by the FCC to operate in the role as a limited single-modular transmitter: a single-modular transmitter (adaptor) that complies with the Section 15.212(a)(1) modular rules, only when constrained to specific operating host(s) and/or associated grants condition(s);

This module is hosted by a single board computer and its mode of operation is controlled by drivers and software resident on the board. The module does not operate as a standalone but rather is an adaptor device and is meant to be integrated into a PC, Laptop or into a digital access point base station, subscriber access station or other similar applications. The radio module in all these cases is a peripheral radio device connected by a PCI bus of the host processor, which controls the radio.

To be integrated radio module has the following characteristics and requirements, which must be met, or not be defeated in any way by the application it is being used in. They are:

1. General

- The module complies with all specific rules applicable to the transmitters grant. The module must be used by the integrator in accordance to the conditions provided in the integration instructions by the grantee (Compex)

2. Physical Characteristics and Restrictions Guidance

- The radio elements have the radio frequency circuitry shielded which is not to be removed or modified for integration in a new product or application.
- The system has isolated / buffered data inputs (Ethernet) via the computer board port to ensure that the device will continue to comply with Part 15 requirements with any type of input signal.
- The module relies on stable power supply regulation from the computer board, which is to be 3.3V. The SBC must supply 3.3 V at full RF power at the highest data rate.



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- The module contains a unique antenna connector MMCX that must be used for attaching an antenna cable or adapter to the antenna. The product can be marketed and operated only with specific antenna(s), per FCC Sections 15.203, 15.204(b), 15.204(c), 15.212(a), 2.929(b).
- The drivers used by the integrator must be compatible with the Radio Module and not alter the functions of the radio module as to make it violate the conditions of the Modules Grant. The frequencies, bandwidths, channelization, output power, modulation types, spread spectrum and protocols must comply with part 15. Drivers can be modified for features that do not cause violation of part 15 rules. Compex supplies a driver that can be downloaded for the radio module. There are several sources for radio drivers that can be used with the radio. Drivers directly employed or modified for the radio must not allow the user to violate the FCC rules for the 2.4 GHz and 5.725 to 5.850 GHz bands.
- The unit's power adjustment range allows it to be controlled by user command. The power range of the WLM200N5-26-ESD module is +1 to 18 dBm per channel. The allowed maximum output power for devices in the 5.725 to 5.845 GHz band is 30 dBm maximum at the RF output terminals. The input sensitivity is better than -96 dBm. In MIMO applications, both transmitters will be running and synchronized to each other with the same RF output power, frame timing, BW and frequency characteristics.
- The radio module cannot be used with post power amplifiers, which cause the radio to exceed output power limitation of the bands or result in interference to other channels.
- EIRP of the antenna gain plus the maximum radio output power must not exceed the limits stipulated for the 5.725GHz to 5.850 GHz band. The levels are +36 dBm in point to multipoint links and unrestricted in point to point operations.

3. RF Exposure SAR Compliance

- The module must comply with RF exposure requirements. This module is to be used for outdoor applications, PCs or similar applications where 20 cm is maintained between the user and the radiating device. It cannot be used in laptops, tablets or similar handheld portable devices, (ref 2.1091(b) see below). Otherwise SAR criteria applies and testing must be demonstrated by Compex and any SAR requirements followed through by the integrator if necessary.
- The radio module is not to be used in a portable or handheld device unless specifically modularly approved to be used in that manner.



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- The WLM200N5-26-ESD module (Adapter) is approved and meant for fixed wireless systems for outdoor use. It can utilize integrated antennas that are part of a mast mountable enclosure or external antennas that are cabled to an enclosure using coaxial connectors.
- Any antenna used with this module must be installed to provide a separation distance of at least 20cm from all persons. The product consists of two transmitter ports, which make up the MIMO radio. These two transmit simultaneously and connect to a dual plane antenna (H/V). No other connection is allowed to a (antenna or transmitter, except in accordance with FCC multi transmitter product procedures which apply to the MIMO system.
- Definition of mobile and fixed devices can be found in FCC section 2.1091(b) 'a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.'

4. Declaration of Conformity - Assurance

- To ensure compliance with all non-transmitter functions you are responsible as the host manufacturer for ensuring compliance with the module(s) installed and fully operational in the product. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. This will require testing of the product by an approved FCC – IC (Industry Canada) Testing Laboratory.
- Testing is required to verify whether the product will meet class A or B criteria for unintentional radiation limits.
- The installation and use of the module must follow any guidance of Compex (the modules maker) who holds the FCC grant for the module to ensure compliance with FCC Part 15B requirements.



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- Please Note: Separate approval and testing is required for all other operating configurations, including portable configurations where enclosures, antenna configurations, main or peripheral circuit boards have changed significantly with a product. (ref FCC Sect 2.1093)
- Often composite devices contain parts that are already having DoC along with certified modules. DoC testing still has to be done for the whole package since this is a different set of conditions the hardware is being utilized. This also means that the labeling must reflect both the FCC ID (or FCC IDs) of the modules and the DoC FCC logo for the overall product (see label section as well) – Ref Multiple Authorization Procedures KDB78478 D01 v07
- Importation into the US-(Reference KDB 997198 FCC documents). The requirements and different conditions that an RF product can be imported to the US are defined here. For importation, form 740 must be completed for the COMPEX radio module. The condition is that the FCC issued a “Grant of Equipment Authorization” for the FCC ID number on the radio module. For equipment that is granted under the Certification Equipment Authorization procedure and a FCC ID is issued form, 740 must be completed for importation of the module or a finished product using the module that may have its own FCC ID issued.

5. User Manual

- General Guidance
 - There will not be any illustrations or procedures in the end user manual on how to remove or replace radio modules contained in the equipment.
 - Instructions or statements made below are required to be placed in the end-user's operating manual of finished products
- The manual shall contain the following statements. They are:
 - The radio system has no user serviceable parts and must remain a sealed enclosure for warranty to stay in effect. Servicing must be done by a qualified technician or manufacturer authorized service shop. The radio portion of the product cannot be modified, or substituted in the product except under appropriate FCC approval by the product manufacturer.
 - 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 statement shall be printed n the label of the equipment if possible).



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- FCC Part 15 Class A, Radio Frequency Interference (RFI) (FCC 15.105) Statement:
 - This equipment has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, 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 and correct the interference by one or more of the following measures:
 - Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and the 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.
 - Changes or modifications to the equipment not expressly approved by the “vendor”, could void the user’s authority to operate the equipment.
 - Appropriately shielded remote I/O serial cable with the metal connector shell and cable shield properly connected to chassis ground and shielded Ethernet Cables shall be used to reduce the radio frequency interference.
 - All antenna installation work shall be carried out by a knowledgeable and professional installer.

6. Labeling and Location of Labels

- The radio module as well as the integrated product itself must have an approved FCC label in plain view. The label must have the correct content as specified by the FCC. The OEM integrator must follow the instructions provided here to ensure the equipment is shown to be compliant to the user as well to identify the equipment correctly. All FCC approved modules must be labeled with its permanently affixed FCC ID label. This



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- cannot be tampered with by the integrator and is to be installed with the device.
- In the event that the approved modules labels cannot be seen by the user from the outside, the product enclosure must be appropriately labeled and have specified information as described below. The labels' location will be described in the user manual. The label must be easily locatable by the user on the product enclosure.
- For a host using a certified modular with a standard fixed label, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: Contains Transmitter Module FCC ID: XYZMODEL1" or "Contains FCC ID: XYZMODEL1" must be used.
- The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID if possible without showing how the module can be removed.
- The label or statement shall be etched, engraved, stamped, indelibly printed, or permanently affixed to a permanently attached part of the equipment, and be visible at the time of purchase on the exterior of the equipment enclosure
- The external label shall have the following statements clearly rendered on the label **"This device complies with Part 15 of 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."**
- If the product also contains hardware that has been tested and has had a Declaration of Conformation given to it the label must reflect this by displaying the FCC logo (see sample below). This can be on a separate label with other pertinent information. The compliance statements can also be rendered on this label for information.

