

The Fluke wireless communication system (FWCS) radio module is a proprietary IEEE 802.15.4 type low power (< 1mW) radio that is approved for exclusive use in Fluke products. The range of the radio module is specified at 30ft but under ideal conditions may reach 100 ft. The RF packet structure incorporates a point to point proprietary method allowing communication with other Fluke instruments using the same packet structure technique. The radio module is marked with the Fluke internal model number (FWCS). All Fluke products using the radio module must display the FCC and Industry Canada certification number on the outside of an enclosure where it is visible by a user.

All radio module settings and protocols are programmed at the time of manufacturing assembly and cannot be modified by a user. The radio module allows Fluke products to work together to collect analog measurement data and pass the data to a central controller (another test and measurement product) for storage and display. The radio module is not intended to be sold commercially or used in products without the Fluke brand.

All radio components are mounted on a single 25mm x 10mm PCB. The module contains the transceiver IC (RF transmit and receive), a voltage regulator, and an antenna. The transceiver and regulator circuits are covered by a metal shield soldered to the PCB.

The transceiver IC (Texas Instruments CC2530F256) has an RF core that controls the internal radio segments. In addition, it provides an interface between a core 8051 MCU and the other radio circuits. This makes it possible to issue commands, read status, and automate and sequence radio events. The transceiver includes a low noise amplifier, software controlled power amplifier, onboard RF transmit/receive, phase lock loop with internal voltage controlled oscillator, an internal IC power supply regulation, and full spread-spectrum encoding and decoding. The transceiver IC is programmable in 1-MHz steps with 5.0 MHz channel spacing per the 802.15.4 standard. The transceiver IC also includes a packet-filtering and address-recognition capability.

The antenna is a 2.45GHz ceramic chip antenna with a peak gain of 3.0dBi. The antenna is the only component that is not mounted under the metal shield. The antenna is a single ceramic chip type and also soldered to the PCB.

The radio module is intended to be plugged into a host where the host CPU must communicate to the radio module through a serial peripheral interface (SPI). The SPI provides communication path for receive (RX) and transmit (TX) data transfer and control. The radio module must first be initialized by the host CPU before the transceiver is able to communicate with other Fluke products. The radio will automatically cease operation and thus communication once battery capacity reaches a specified minimum threshold. The module is used in a family of products made by Fluke Corporation and branded Fluke. All radio protocols and module-host communication protocols are Fluke proprietary and not available to the public.

Regulatory statements that must be in every User Manual of a Fluke product using the radio module are as follows:

FCC

Changes or modifications to the wireless 2.4 GHz radio not expressly approved by Fluke Corporation 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 two conditions that follow:

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

Class B digital device: A digital device that is marketed for operation in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such

devices include, but are not limited to, personal computers, calculators, and equivalent electronic devices that are marketed for operation by the general public.

The Meter was 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, can 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 or more of the measures that follow:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.

Exposure to RF Energy

THIS MODEL DEVICE MEETS U.S. AND INTERNATIONAL REQUIREMENTS FOR EXPOSURE TO RADIO FREQUENCY RADIATION.

The FWCS is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government and by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The device also meets the European Radio and Telecommunications Terminal Equipment (R&TTE) directive, for protecting the health and safety of the user and other persons.

These limits are part of comprehensive guidelines that establish permitted levels of RF energy for the general population. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

Before a device model is available for sale to the public, it must be tested and certified to operate within the limits for safe exposure established by the FCC and international organizations. The tests are performed in positions and locations (e.g., next to the body) as required by the FCC for each model. The FCC has granted an Equipment Authorization for this model device with all reported SAR levels (see below) evaluated as in compliance with the FCC RF emission guidelines

The term "IC:" before the radio certification number only signifies the device meets Industry's Canada technical specifications.

IC

Données en fréquence radio

Remarque

Toute modification ou altération de la radio sans fil 2,4 GHz non expressément approuvée par Fluke Corporation pourrait annuler l'autorisation d'utilisation de l'appareil par l'utilisateur.

Cet appareil est conforme au Chapitre 15 du règlement FCC. L'utilisation est soumise aux deux conditions suivantes :

1. L'appareil ne peut pas provoquer d'interférences.
2. L'appareil doit accepter toutes les interférences, y compris les interférences pouvant perturber le fonctionnement de l'appareil.

Appareil numérique de classe B : appareil numérique commercialisé pour utilisation dans un environnement résidentiel sans que cela interdise son utilisation dans des environnements commerciaux, d'entreprise et industriels. Ces appareils sont notamment les ordinateurs personnels, calculatrices et appareils électroniques équivalents commercialisés pour utilisation par le grand public.

Le multimètre a été testé et déclaré conforme aux limites pour les appareils numériques de Classe B selon le chapitre 15 de la réglementation FCC. Ces limites sont établies pour assurer une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet appareil génère, utilise et peut émettre des fréquences radio, qui, s'il n'est pas installé et utilisé conformément aux instructions, peuvent causer des interférences nuisibles aux communications par radio. Il n'est toutefois pas garanti que de telles interférences ne se produiront pas dans une installation donnée. Si cet appareil provoque des interférences nuisibles à la réception de la radio ou de la télévision, ce qui peut être déterminé en mettant en route

l'appareil et en l'arrêtant, il est recommandé à l'utilisateur d'essayer de corriger les interférences en prenant l'une ou plusieurs des mesures suivantes :

- Réorienter ou déplacer l'antenne de réception.
- Augmenter la distance entre l'appareil et le récepteur.
- Consulter le revendeur ou un technicien expérimenté en radio/télévision pour assistance.

Le terme « IC : » mentionné devant le numéro de certification radio n'indique que la conformité de l'appareil aux caractéristiques techniques d'Industrie Canada.

Additional statements may be required for other international approvals.