

# **MCT245**

## **2.4GHz RECEIVER**

### **OEM INSTALLATION AND OPERATION MANUAL**

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## MCT245 RECEIVER

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## **MCT245 RECEIVER**

### **DESCRIPTION**

The MCT245 is a frequency hopping spread spectrum transceiver unit, designed to be compatible with US (FCC Part 15.247), Canadian (RSS-210), EU(EN 60950-1, EN 300 328, EN 301 489) and Australian() regulations for license free use in the 2.4 GHz ISM band. The MCT245 is designed for mobile applications in accordance to Part 2.1091(b).

The MCT245 remote control products are assembled by Kar-Tech, at Kar-Tech. There are no user serviceable parts on the MCT245 transceiver.

The MCT245 is not designed for multiple antenna applications and should not be used to transmit simultaneously with any other transmitter.

### **OPERATION**

The MCT245 is a radio Receiver product for the 2.4 GHz ISM bands. The Receiver microcontroller includes a CPU, GPI/O, a fully integrated frequency synthesizer, a power amplifier, a modulator and a receiver unit. The data received from antenna is sent to the microcontroller for processing. The MCT245 microcontroller monitors the input data, received data and controls outputs. The system data is sent to the RF processor and then to RF circuit, and then to the antenna. The microcontroller is responsible for the control of the entire communication. The MCT245 transceiver contains a DC regulator which generates a constant 1.8 VDC for the digital

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circuitry. The RF section runs on the 3.3V supply.

construction equipment, and other similar equipment.

The MCT245 uses Frequency Hopping Spread Spectrum that uses 16 channels for any hop mode, between 2.407GHZ and 2.470GHZ, with 1MHZ resolution.

The receivers are matched to the transmitters to use the same channels and sequence as the transmitter's signals.

The MCT245 controls outputs which can operate relays, hydraulic valves, lights, or other similar load devices, according to customer requirements.

### **Where Used**

Typical applications for the MCT245 are to controlling valves, relays and lights on agricultural equipment,

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### **INSTALLATION**

- 1) Attach the external harness to the MCT245.
- 2) Assemble the MCT245 assembly into the Enclosure.
- 3) Place a label on the outside of the enclosure on the side. On the label, include the following: "FCC ID: P4U- MCT245" and "IC: 4534A- MCT245, CE"

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### Application Requirements:

- A) Power the MCT245 Receiver with 9-30VDC nominal voltage, with peak current draw of 150mA.
- B) Assemble the MCT245, into a KAR-TECH Receiver enclosure.
- C) The MCT245 is to be installed only in mobile applications. See Part 2.1091 for definitions of mobile and fixed applications.
- D) Do not operate the MCT245 without an antenna.
- E) Documentations: In the host's User Manual include the following:
  - a. That there are no user serviceable parts in the radio product. They should not remove or install radio modules.
  - b. The "Instructions To The User" section.
  - c. The "Industry Canada Statement".
  - d. Include in the manual, "This device is granted for use in Mobile only configurations in which the antennas used for this transmitter must be installed to provide a separation distance of at least 20cm from all person and not be co-located with any other transmitters except in accordance with FCC and Industry Canada multi-transmitter product procedures."

### BEFORE APPLYING POWER!

- Check power and ground for proper polarity.

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- Read the rest of this manual.

## TROUBLESHOOTING

There are no user serviceable parts in the MCT245 Receiver. Contact your KAR-TECH representative for further instructions or servicing.

## PARTS LIST

<b><i>PART NUMBER</i></b>	<b><i>DESCRIPTION</i></b>
<b>022081A</b>	MCT245 RADIO TRANSCEIVER – REMOVEABLE ANTENNA

There are no user-serviceable parts inside the transmitter or the receiver. Return the units for service.

The information, specifications, and illustrations in this manual are those in effect at the time of printing. We reserve the right to change specifications or design at any time without notice.

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### SPECIFICATIONS

Equipment Class ..... Part 15 Spread Spectrum Transmitter  
FCC ID ..... P4U- MCT245  
ICC (Industry Canada Certification) ID ..... 4534A- MCT245

### ***TRANSCEIVER***

Power supply ..... 9-30VDC  
Operating Current ..... 48mA  
Operating temperature - Radio ..... -40°C to +85°C  
Storage temperature..... -40°C to +100°C  
RF Frequency ..... 2.4-2.48 GHz  
RF Transmit power (EIRP)..... 100 mW  
RF Receive Sensitivity ..... -126 dBm





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### **INSTRUCTION TO THE USER**

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.

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

NOTE: 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 or more 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.

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### **FCC Radiation Exposure Statement**

The product can be installed or integrated in mobile or fix devices only. This product cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

This product complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the product is installed inside another device, then the outside of the device into which the product is installed must also display a label referring to the enclosed product. This exterior label can use wording such as the following:  
"Contains Transmitter product FCC ID: P4U-MCT245"

When the product is installed inside another device, the user manual of this device must contain below warning statements;

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product

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### **INDUSTRY CANADA STATEMENTS**

This device complies with Industry Canada license-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.

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.

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.

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### **OEM Responsibilities to comply with FCC and Industry Canada Regulations**

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.

Cet appareil est conforme aux CNR exemptes de licence d'Industrie Canada . Son fonctionnement est soumis aux deux conditions suivantes :

- ( 1 ) Ce dispositif ne peut causer d'interférences ; et
- ( 2 ) Ce dispositif doit accepter toute interférence , y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

#### **IC Radiation Exposure Statement**

The product can be installed or integrated in mobile or fix devices only. This product cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

This product complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body. Cette modulaire doit être installé et utilisé à une distance minimum de 20 cm entre le radiateur et le corps de l'utilisateur.

If the IC number is not visible when the product is installed inside another device, then the outside of the device into which the product is installed must also display a label referring to the enclosed product. This exterior label can use wording such as the following:

“Contains IC: 4534A- MCT245”

## **MCT245 RECEIVER**

When the product is installed inside another device, the user manual of this device must contain below warning statements:

1. This device complies with Industry Canada's license-exempt RSSs.

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.

2. Cet appareil est conforme aux CNR exemptes de licence d'Industrie Canada . Son fonctionnement est soumis aux deux conditions suivantes :

( 1 ) Ce dispositif ne peut causer d'interférences ; et

( 2 ) Ce dispositif doit accepter toute interférence , y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

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### EUROPE

#### CE NOTICE

This device has been tested and certified for use in the European Union. See the Declaration of Conformity (DOC) for specifics.

If this device is used in a product, the OEM has the responsibility to verify compliance of the final product to the EU standards. A declaration of Conformity must be issued and kept on file as described in the Radio and Telecommunications Terminal Equipment (R&TTE) Directive.

The 'CE' mark must be placed on the OEM product per the labeling requirements on the Directive.

#### Declaration of Conformity (DOC)

This DOC can be downloaded from the [www.kar-tech.com](http://www.kar-tech.com).

The device complies with RF specifications when the device used at your body.

Caution: Must use the original antenna. Other antennas are not allowed to be used.

The device according to the regulation in Directive 1999/5/EC and complies with standards as follow:

EMC (Article 3.1b)	ETSI EN 301 489-1 V 1.9.2 ETSI EN 301 489-17 V2.2.1 (2012-09)	Report No.: CTL1512313913-WE
Radio (Article 3.2)	ETSI EN 300 328 V1.8.1	Report No.: CTL1512313913-WR
Safety (Article 3.1a)	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013	Report No.: CTL1512313913-WS
Health (Article 3.1a)	EN 62479: 2010	Report No.: CTL1512313913-WH
	[Titles, dates of publication of documents mentioned ]	

The image shows the CE mark, which consists of the letters 'C' and 'E' in a stylized font, followed by the number '0700'.