



iC980A-K

SD.DT.G90.0e - June 2018



iC980A-K User's Information Notice

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Customer Support

Please contact our support team at support.KFR@kontron.com

Customer Service

As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.

For more details on Kontron's service offerings such as: enhanced repair services, extended warranty, Kontron training academy, and more visit <http://www.kontron.com/support-and-services/services>.

Customer Comments

If you have any difficulties using this manual, discover an error, or just want to provide some feedback, contact Kontron support. Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised manual on our website.

Symbols

The following symbols may be used in this manual:



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.



NOTICE indicates a property damage message.



Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.



ESD Sensitive Device!

This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.



HOT Surface!

Do NOT touch! Allow to cool before servicing.



Laser!

This symbol inform of the risk of exposure to laser beam from an electrical device. Eye protection per manufacturer notice shall review before servicing.



This symbol indicates general information about the product and the user manual.

This symbol also indicates detail information about the specific product configuration.



This symbol indicates important information which must be read carefully.



This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

▲ CAUTION

Warning!

All operations on this device must be carried out by sufficiently skilled personnel only.

▲ CAUTION



Caution, Electric Shock!

Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.

Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instructions



ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

General Instructions on Usage

In order to maintain Kontron's product warranty and CE compliance, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty and the CE compliance.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version, that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.



Environmental protection is a high priority with Kontron.
Kontron follows the DEEE/WEEE directive.
You are encouraged to return our products for proper disposal.

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- ▶ Reduce waste arising from electrical and electronic equipment (EEE)
- ▶ Make producers of EEE responsible for the environmental impact of their products, especially when they become waste
- ▶ Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE

Improve the environmental performance of all those involved during the lifecycle of EEE

Terms and Conditions

Kontron warrants products in accordance with defined regional warranty periods. For more information about warranty compliance and conformity, and the warranty period in your region, visit <http://www.kontron.com/terms-and-conditions>.

Kontron sells products worldwide and declares regional General Terms & Conditions of Sale, and Purchase Order Terms & Conditions. Visit <http://www.kontron.com/terms-and-conditions>

For contact information, refer to the corporate offices contact information on the last page of this user guide or visit our website [CONTACT US](#).

Table Of Contents

1 /	Introduction	1
1.1	Objective	1
1.2	Audience	1
1.3	Scope	1
1.4	General Instructions on Usage	1
2 /	iC980A-K Overview	2
2.1	RF Interface	2
2.2	Product Conformity and Compliance to Standards	3
2.2.1	FCC Compliance	3
2.2.2	IC Compliance	3
2.2.2.1	RSS General (English)	3
2.2.2.2	RSS General (French)	3
2.2.2.3	Transmitter Antenna (English)	4
2.2.2.4	Transmitter Antenna (French)	4
2.2.2.5	RF Exposure (English)	4
2.2.2.6	RF Exposure (French)	4
2.3	iC980A-K Identification	5
3 /	iC980A-K Hosts Implementation	6
3.1	Labelling	6
3.2	Host User Manual Requirement	6

List Of Figures

Figure 1: iC980A-K top View	2
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1 / Introduction

1.1 Objective

This guide provides general, regulatory information and hardware instructions of the iC980A-K module. Operating instructions, functional description, on board firmware and other software are described in separate guides.

This User's Information Notice reflects the most recent version of the product. Functional changes that differ from previous version of the document are identified by a vertical margin.

1.2 Audience

This manual is written to cover, as far as possible the range of people who will handle or use the iC980A-K module, from unpackers/inspectors, through system managers and installation technicians to hardware and software engineers. Most chapters assume a certain amount of knowledge on the subjects of single board computer architecture, interfaces, peripherals, system, cabling, grounding and communications.

1.3 Scope

This user's information notice describes the iC980A-K regulatory aspects.

1.4 General Instructions on Usage

In order to maintain Kontron's product warranty and FCC / IC compliance, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty and the FCC / IC compliance.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version, that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

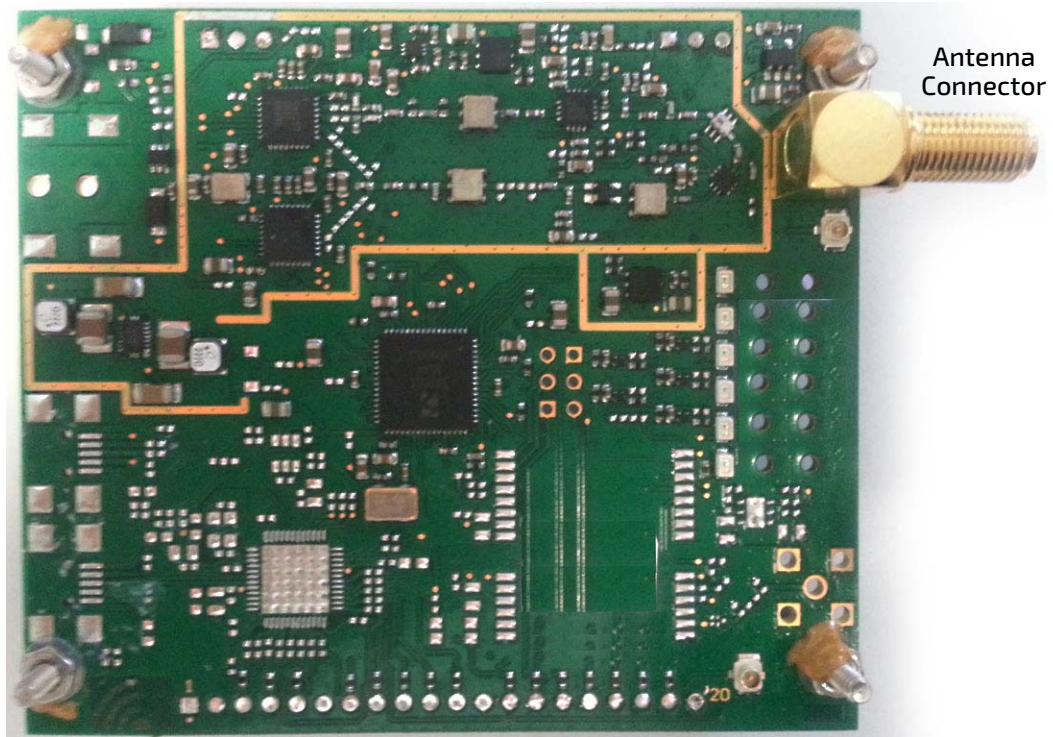
In performing all necessary installation and application operations, only follow the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

2 / iC980A-K Overview

Figure 1: iC980A-K top View



Antenna Connector Specifications:

- ▶ Supplier : AMPHENOL
- ▶ Part number : 132203RP
- ▶ Descriptive : RP-SMA Right angle connector

2.1 RF Interface

The iC980A-K supports an RF interface for the 915 MHz frequency band. By connecting an appropriate antenna to the antenna SMA connector, the iC980A-K is fully ready for communication.

▶ Appropriate antenna characteristics:

- ▶ Peak Gain: 1.2 dBi
- ▶ Impedance: 50 ohms
- ▶ Connection: RP-SMA
- ▶ Type: Omnidirectional pattern

Recommended antenna: ANT-916-CW-HWR-RPS from Linx.

2.2 Product Conformity and Compliance to Standards

Declaration of product conformity and product compliance certificates are available on Kontron website:

<https://www.kontron.com/industries/transportation>

2.2.1 FCC Compliance

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.

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 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 to correct 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 circuit different from that to which the receiver is connected
- ▶ Consult the dealer or an experienced radio/TV technician for help.

This device is considered as a mobile device.

This device complies with FCC RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.



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

2.2.2 IC Compliance

2.2.2.1 RSS General (English)

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.

2.2.2.2 RSS General (French)

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 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.

2.2.2.3 Transmitter Antenna (English)

This radio transmitter (23960-IC980AK) 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.

Following antennas shall be used:

ANTENNA REFERENCE	ANT-916-CW-HWR-RPS
ANTENNA SUPPLIER	LINX
PEAK GAIN	1.2 dBi
CONNECTION	RP-SMA
IMPEDANCE	50 ohms
TYPE	Omnidirectional pattern

2.2.2.4 Transmitter Antenna (French)

Le présent émetteur radio (23960-IC980AK) 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.

Les antennes suivantes peuvent être utilisées:

REFERENCE DE L'ANTENNE	ANT-916-CW-HWR-RPS
FABRICANT	LINX
GAIN PIC	1.2 dBi
CONNEXION	RP-SMA
IMPEDANCE	50 ohms
TYPE	Omnidirectional pattern

2.2.2.5 RF Exposure (English)

This device is considered as a mobile device.

This device complies with Industrie Canada RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

2.2.2.6 RF Exposure (French)

Cet appareil est considéré comme un appareil mobile.

Le présent appareil est conforme aux niveaux limites d'exigences d'exposition RF aux personnes définies par Industrie Canada. L'appareil doit être installé afin d'offrir une distance de séparation d'au moins 20cm avec l'utilisateur, et ne doit pas être installé à proximité ou être utilisé en conjonction avec une autre antenne ou un autre émetteur.

Les conditions suivantes doivent être remplies pour être conforme aux exigences d'Industrie Canada :

- ▶ Une distance de séparation d'au moins 20 cm entre l'antenne et le corps de l'utilisateur doit être maintenue à tout moment.



L'utilisateur apportant un changement ou une modification qui n'est pas expressément approuvé par la partie responsable de la conformité peut annuler l'autorité de l'utilisateur à utiliser l'équipement.

2.3 iC980A-K Identification

The iC980A-K module is identified with a label located on its bottom face:



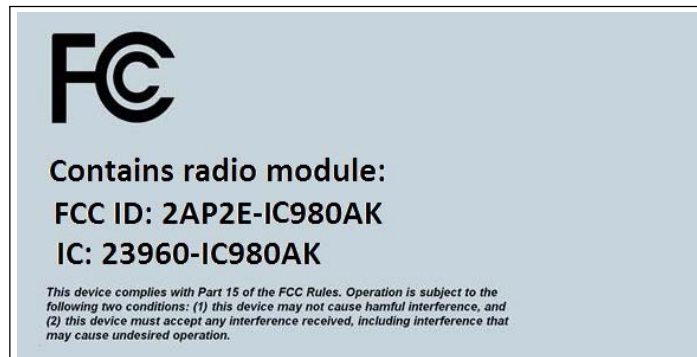
3 / iC980A-K Hosts Implementation

3.1 Labelling

The host system which implement iC980A-K module shall have an exterior label(if the FCC ID / IC of the iC980A-K module is not visible outside) referring to the enclosed module.

The label can use wording such as the following:

- ▶ Contains Radio Module
- ▶ FCC ID: 2AP2E-IC980AK
- ▶ IC: 23960-IC980AK



Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.

3.2 Host User Manual Requirement

All module warnings, module installation information shall be reported on the Host user manual.

As iC980A-K is considered as a mobile device, all RF exposure recommendations shall be reported on the host user manual.

As iC980A-K is not subjected to SAR test, antenna distance between host and another RF system shall be > to 20 cm as a minimal.



About Kontron - An S&T Company

Kontron is a global leader in IoT/Embedded Computing Technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall.

For more information, please visit: www.kontron.com



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