Certification Exhibit

FCC ID: SK9SNIC1

FCC Rule Part: 15.247

Project Number: 72129329

Manufacturer: Itron, Inc.
Model: SNIC1

Manual

OpenWay® Riva™ Smart Network Interface Card (NIC)

ORRN Application

OpenWay® Riva™ Routing Node ERT Gateway (ORRN)

User Guide

Identification
OpenWay® Riva™ Smart Network Interface Card (NIC) User Guide - Draft
24 March 2017 TDC-XXXX-YYY
OpenWay® Riva™ Smart Network Interface Card (NIC)

Suggestions
For more information about Itron or Itron products, see www.itron.com.
If you have questions or comments about the software or hardware product, contact Itron Technical Support Services.

Contact

- Email: support@itron.com
- Internet: support.itron.com
- Telephone Itron Technical Support North America: 1-877-487-6602

For technical support contact information by region, go to www.itron.com and select your country and language.

Contents

Regulatory Compliance

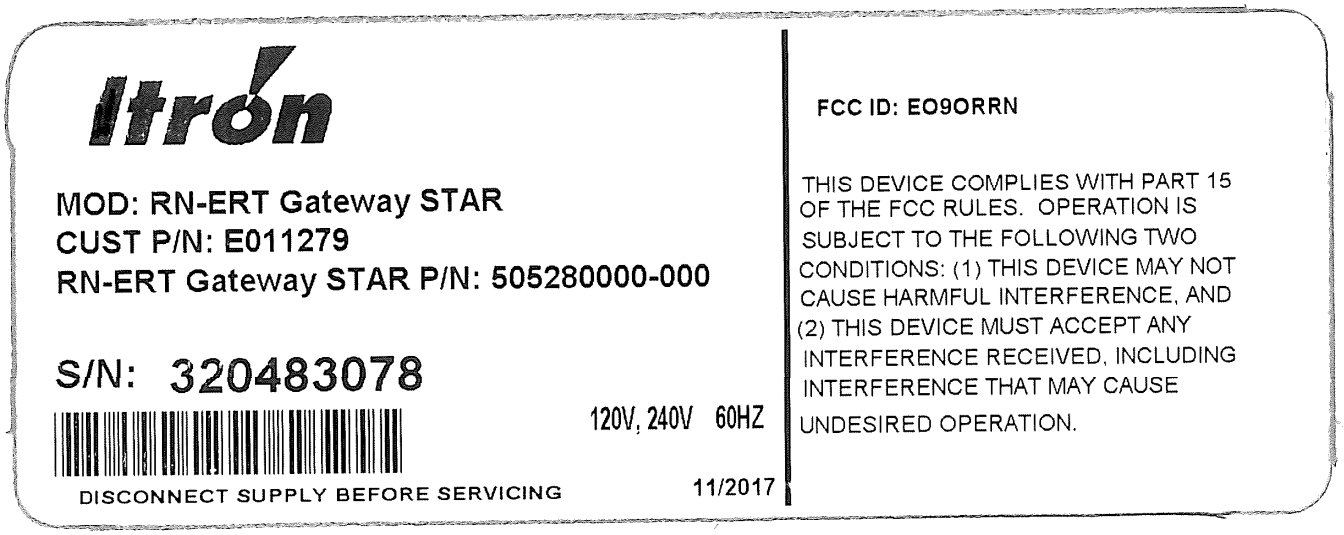
Labeling

The following requirements will be applied to any products that use this module:

The end product or host label will include the following text:

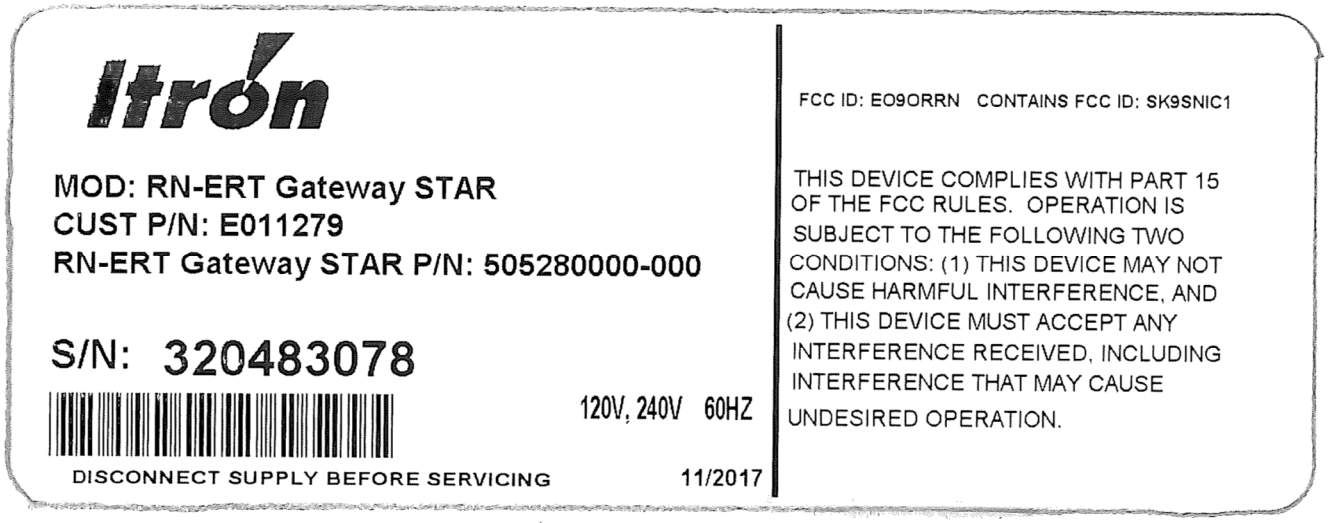
- **Contains:**
- **FCC ID: SK9SNIC1**

ORRN Label



Appendix A

Label after SNic module is installed.
See C2PC of FCC ID:SK9SNIC1 for adding module to ORRN Host.



ORRN Label Location

Appendix A

Label location after SNic module is installed.
See C2PC of FCC ID:SK9SNIC1 for adding module to ORRN Host.

The user's manual for any product that contains this module will contain the following text. If the device is large enough, then this will also be placed on the label.

"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."

FCC

The user's manual for any product that contains this module will contain the following text:

FCC Part 15, Class B

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.

Changes or modifications to this device not expressly approved by Itron, Inc. could void the user's authority to operate the equipment.

Innovation, Science and Economic Development Canada (ISED)

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. 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.

Cet appareillage numérique de la classe B répond à la norme Canadienne sur le matériel brouilleur. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif ne peut pas causer d'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

Under Innovation, Science and Economic Development Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Innovation, Science and Economic Development 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.

RF Exposure (FCC/ISED)

"This equipment complies with radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter."

"Cet équipement est conforme aux limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement do it être installé et utilisé à distance minimum de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec tout autre antenne ou transmetteur."

Miscellaneous

The user's manual for any product that contains this module will contain the following text:

Professional Installation

Any external antennas associated with this approval are intended for professional installation by the integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates any antennas.

Approved antenna types that can be used for the 900 MHz radio

Customer supplied remote antennas should meet the following specifications.

Omni-directional Vertically Polarized Antenna
Frequency: 902 - 928 MHz
VSWR: 2:1 Max
Maximum Gain: 1.0 dBi

Omni-directional Vertically Polarized Antenna
Frequency: 902 - 928 MHz
VSWR: 1.5:1 or less
Maximum Gain: 2.6 dBi

Approved antenna types that can be used for the Wi-Fi

For the ORRN application the Wi-Fi antenna is a ¼ wave patch antenna which is integrated into the RF switchboard. The antenna gain is 2.15 dBi.

Modification and Repairs

To ensure FCC compliance and system performance, this device, antenna and/or coaxial assembly shall not be changed or modified without the express written approval of Itron. Any unauthorized modification will void the user's authority to operate the equipment.

This device contains no user serviceable parts. Attempts to repair this device by unauthorized personnel may subject the person to shock hazard if removal of protected covers is attempted. Unauthorized repair will void the warranty and/or maintenance contract with your company.

General Description

The Itron SNIC1 is a communications module which includes a 902.2 MHz to 927.8 MHz transmitter as well as Wi-Fi. The module operates on DC voltage which is supplied by an optional power board or host device.

Recycling Information

The product you have purchased contains circuit boards. At the end of the modules useful life, under various state and local laws, it may be illegal to dispose of certain components into the municipal waste system. Check with your local solid waste officials for details about recycling options or proper disposal.

About this Manual

This technical reference guide describes the installation of the SNIC1 for the ORRN.

Overview

This document provides information on the design, construction, and operation of the OpenWay Riva Smart Network Interface Card (NIC) module.

The module is a communications board and connects to an external antenna through a RF switchboard which is part of the ORRN circuitry. The sample module housing is constructed using polycarbonate material that provides protection for the internal components. Power will be supplied from optional power board or supplied from a host supply.

This module contains the cutting edge communication technology featuring IPv6 RF and Power Line Carrier Communications. OpenWay features an innovative multimedia IPv6 network that uses both RF and PLC links within a mesh to route messages and data between standards-based smart meters (DLMS/COSEM) and the head-end system. Itron's communication module also enables secure two-way communication with home energy management devices using G3 PLC, Wi-Fi and protocol stacks SEP 2.0 and ECHONET Lite.

The communication module enables utilities to deploy the network without specific network planning and segregation for RF and PLC environments. Intelligence in the module chooses the communication link quality and modulation scheme that support the best possible data rate. Data rates of up to 500kbps are achievable by this multimedia mesh. This is done automatically in real-time by the modules without any need for pre-programming or path hard-coding. The communication modules create their own multi-hop environment using the best available physical path for communication where the routing is managed by standardized IETF routing protocols that are independent of the physical link. Itron's technology offers a unique way to deploy the same communication module anywhere, regardless of traditional network design considerations, such as geography, density, or structural environment.

CHAPTER 1

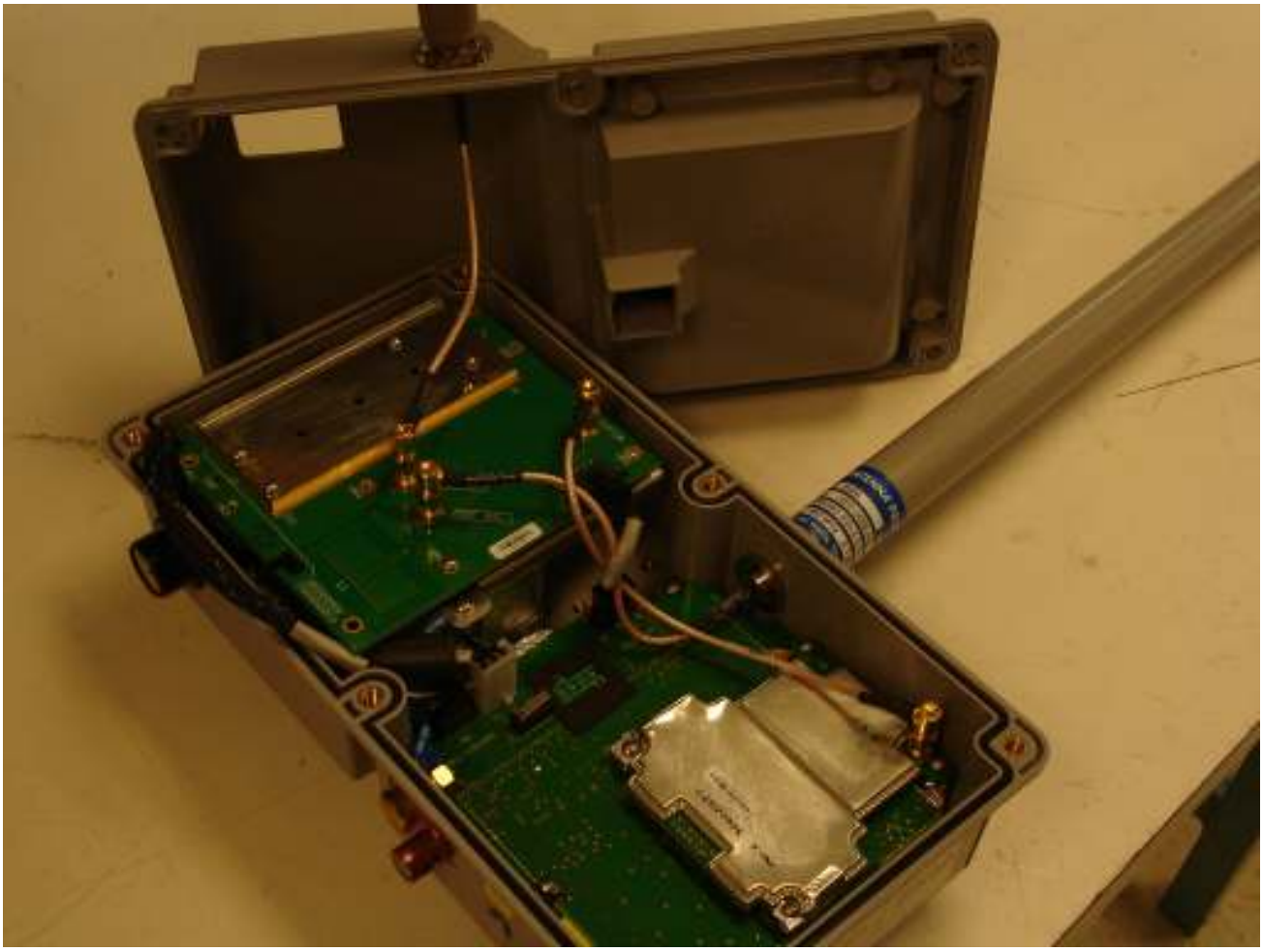
Module Description

Module board

Module (ORRN option)

The Smart NIC modules can be installed in various optional hosts.

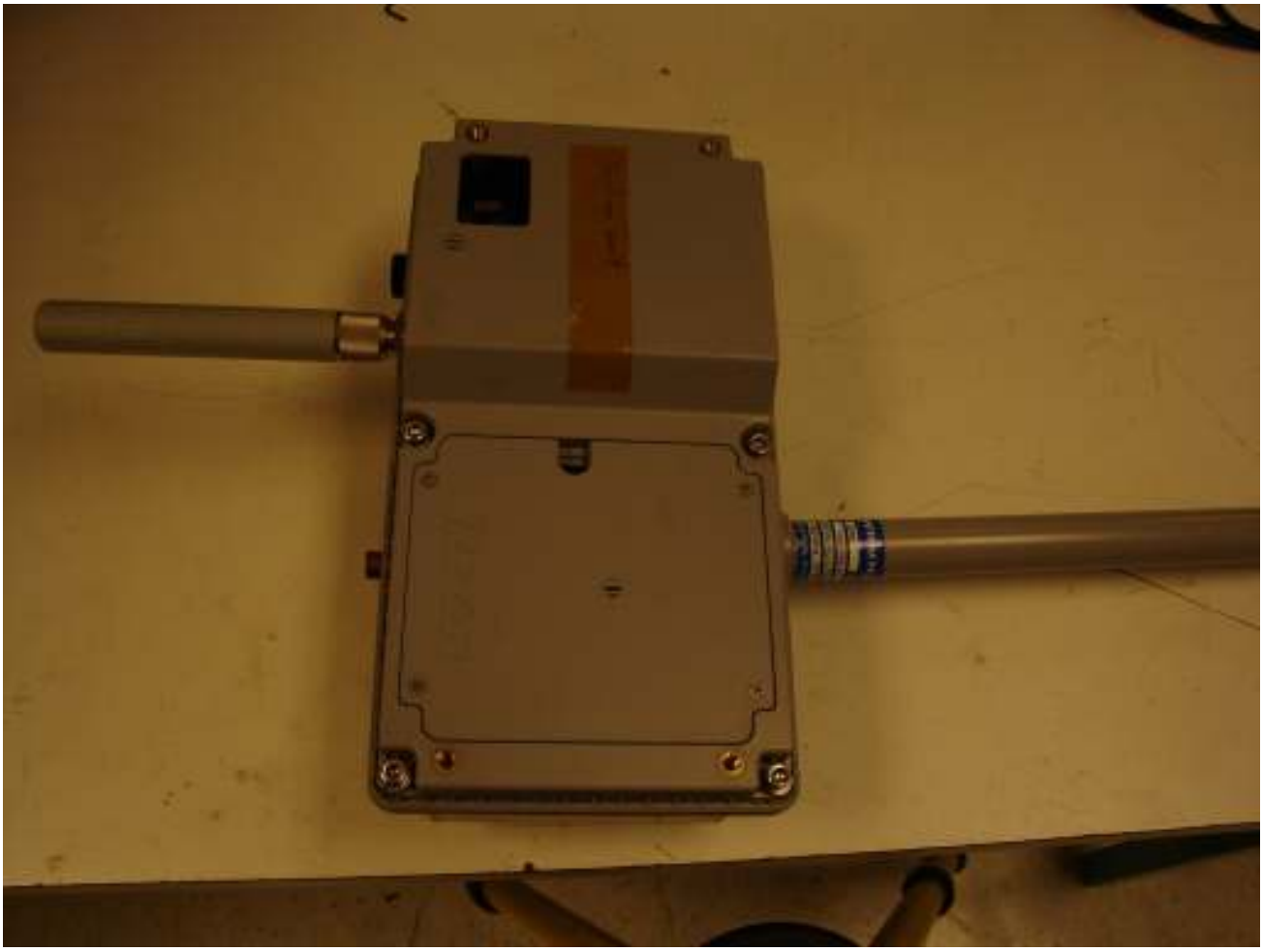
ORRN (SmartNic mounts to antenna switchboard)



SmartNic installed

SmartNic installed on switchboard (with shield)

Cover installed with antennas attached.



CHAPTER 2

Module Specifications

Power

Requirements	**Description**
Peak Power Consumption:	
Total Instantaneous Peak @ 24vdc:	13W
Long Term Thermal Average @ 24vdc:	3.5W
Idle Average (Receive Only) @ 24vdc only:	2W

Environmental

Environmental	**Description**
Operating Temperature	
-25°C to +70°C	Normal operating temperature
-40°C to +85°C	Limited operating temperature*

Note*: Limited operating temperature is defined as being type tested at temperature extremes for operation up to 16 hours.

Humidity	
5% to 95%	Noncondensing

Interfaces

Signals	**Description**
Power Line Carrier (PLC)	
Single Phase Connection	2-pin interface Protection & Coupling included on Host device/meter
Protocol	
IEEE 1901.2	Adaptive Tone Mapping, Mesh
Operational Bands(one of three bands, based on target markets)	
FCC above CENELEC	~ 155kHz to 488kHz
ARIB2	~ 155kHz to 403kHz
Modulations	Data Rates
D8PSK	200 kbps
DQPSK	165 kbps

DBPSK	100 kbps
ROBO	34 kbps
Super-ROBO	23 kbps

Radio Frequency (RF)

Embedded Antenna	For devices/meters with plastic enclosure
Optional RF Connector	For devices/meters with metal enclosure or special needs
Protocol	
IEEE 802.15.4g/e	Frequency Hopping, Mesh
Operational Bands (one of three bands, based on target markets)	
900 MHz ISM	Channels adjusted for market specific needs
870 MHz	Channels adjusted for market specific needs *(For international markets where permitted)*
Output Power	
1 Watt	Maximum EIRP. Power adjusted to meet local requirements
Modulations	Data Rates
802.15.4g OFDM option 3	200 kbps,600 kbps and 1.2Mbps
802.15.4g FSK	150 kbps (or 50 kbps mandatory mode)
Long Range mode	6.25 kbps, 12.5 kbps

Wireless

Wi-Fi	802.11 b/g/n